AN ABSTRACT OF THE DISSERTATION OF

Mason Tattersall for the degree of Doctor of Philosophy in History of Science presented on March 17, 2015

Title: Exploring the Structural Dynamics of Human Understanding: An Historico-Philosophical Analysis of the Problem of Meaning in Heidegger and Bohr

Abstract approved: _______________________________________________________

                           David S. Luft

This dissertation explores the structural dynamics of human understanding and particularly the concept of meaning and its connections to concepts of ultimate ground, necessity and contingency, language, and perception. It focuses on the history of the concept of meaning in early twentieth-century European physics and philosophy, through an analysis of the work of Martin Heidegger and Niels Bohr. Using the work of these two immensely important thinkers as case studies, the dissertation attempts to approach the problem of meaning, which lies at the root of the problem of understanding, from an empirical standpoint, observing two vital confrontations with the problem of meaning and its attendant connections to epistemology, ontology, and the philosophy of science, in two radically different fields, in a synchronous moment in the tumultuous world of early twentieth-century European thought. The dissertation thus presents two historical case studies: the young Heidegger’s confrontation with the problem of meaning from his early graduate work to the 1927 publication of Being and Time and Bohr’s confrontation with the problem of meaning from his proposal of the quantized atom in 1913 to his 1927
formulation of the principle of complementarity, which underlies the so-called
“Copenhagen interpretation of quantum mechanics.” Through careful analysis of these
two historical instances the dissertation attempts to discover general properties of
meaning as it functions within systems of understanding. At the same time the
dissertation offers itself up as a methodological example in an implied argument for the
fruitful use of historiological research as an observational empirical science in its own
right, with its own proper domain of research and its own appropriate methods and logic.
Exploring the Structural Dynamics of Human Understanding: 
An Historico-Philosophical Analysis of the 
Problem of Meaning in Heidegger and Bohr

by
Mason Tattersall

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I understand that my dissertation will become part of the permanent collection of Oregon State University Libraries. My signature below authorizes release of my dissertation to any reader upon request.

_____________________________________
Mason Tattersall, Author
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LIST OF ABREVIATIONS

Books
CPR – Kant’s *Critique of Pure Reason*
LI – Husserl’s *Logical Investigations*
GA – Heidegger’s *Gesamtausgabe*

Courses
WS – Winter Semester
SS – Summer Semester
KNS – “Kriegsnotsemester” (War-Emergency-Semester, 1919)

Aristotle Abbreviations
*APo* – Aristotle’s *Posterior Analytics*
*Met* – Aristotle’s *Metaphysics*
*NE* – Aristotle’s *Nicomachean Ethics*

Organisations
PTR – *Physikalisch-Technische Reichenstalt* (Imperial Institute of Physics & Technology), Berlin
For Allan Smith
The view that every scientific issue within the larger compass of science has its definite place, its measure and its limit, and thereby precisely its harmonious blending in the whole as well as its legitimate participation in what is expressed by the whole, is not merely a pium desiderium that ennobles the man of science by its enthusiastic and melancholy infatuation. This view is not merely a sacred duty that commits him to the service of this totality and bids him renounce lawlessness and the adventurous desire to lose sight of the mainland; it also serves the interest of every more specialised deliberation, for when the deliberation forgets where it properly belongs, as language often expresses with striking ambiguity, it forgets itself and becomes something else, and thereby acquires the dubious perfectibility of being able to become anything and everything. By failing to proceed in a scientific manner and by not taking care to see that the individual issues do not outrun one another, as if it were a matter of arriving first at the masquerade, a person occasionally achieves a brilliance and amazes others by giving the impression that he has already comprehended that which is still very remote. At times he makes a vague agreement with things that differ. The gain is always avenged, as is every unlawful acquisition, which cannot be owned legally or scientifically.

Kierkegaard, The Concept of Anxiety
Hail, daughters of Zeus! Give me sweet song,
To celebrate the holy race of gods
Who live forever, sons of starry Heaven
And Earth, and gloomy Night, and salty Sea.
Tell how the gods and earth arose at first,
And rivers and the boundless swollen sea
And shining stars, and the broad heaven above,
And how the gods divided up their wealth
And how they shared their honours, how they first
Captured Olympus with its many folds.
Tell me these things, Olympian Muses, tell
From the beginning, which first came to be?
Hesiod, Theogony

Preface

This dissertation arose out of my earlier work on Heidegger in my Master’s and Honours theses at the University of British Columbia. My first engagement with Heidegger was during a fairly run of the mill bout of teenaged “existentialist” reading, beginning with Camus and Sartre, and moving back to Heidegger, Nietzsche, and
Kierkegaard. I can now, with complete certainty and confidence, say that I did not understand what I read of Heidegger then. But I was exposed to certain types of questioning and certain philosophical problems that would define and direct the course of my thinking to this day. During much of my time as an undergraduate I wanted to be a medievalist and worked toward that goal, studying medieval history, literature, and Latin, with a healthy dose of classics (the world of my boyhood dreams) for good measure. However, the questions of my young “existentialist” phase remained, and they needed me. In the first year of the history Honours Programme at the University of British Columbia, I changed tracks and began to focus on modern, rather than medieval intellectual history, and particularly on Heidegger. My honours thesis, under the direction of Alan Smith, attempted to explore the implications of Heidegger’s *Being and Time* for historiographic theory. And my work as a Master’s student continued along this trajectory.

My Master’s thesis – “The Concept of Authenticity in Heidegger’s *Being and Time*: Thoughts and Revisions on a Critical Theme” – explored Heidegger’s concept of authenticity [*Eigentlichkeit*] in terms of its relation to meaning and ultimate grounds, in terms of relative and transcendent meaning. That study was rather narrowly focused on a single problem of intellectual history, as manifested within a single work (and its relations to other works, in particular, to the thought of Søren Kierkegaard). This dissertation takes up the broader underlying themes of meaning and ground and explores them in a different way, engaging with the concepts in a manner that I hope leads to both deeper and broader insights.
I see this work in terms of the history of concepts, or, better, in terms of the history of problems, which informs my methodological approach. This is a history of the problem, or concept of meaning. It focuses on two particular individuals (Martin Heidegger and Niels Bohr) through a particular stretch of time (from their earliest work in the teens of the twentieth century to 1927). In this manner I delimit a particular region in which my examinations will take place. The idea is to study the concept of meaning as it was engaged by two extremely important thinkers who dealt with it in particularly important ways, both in terms of their own time and in terms of their influence on the history of thought that followed. In the work that follows, I attempt to present a history, or enact an historiography, if you will, as a kind of empirical science of ideas (explained further in the introduction). As such, the heart and soul of this work is exploratory rather than expository. Whether this methodological peculiarity of mine would be ultimately successful (as I think it has been) was by no means guaranteed from the start. I have been pleasantly surprised at various points along the way that it has led me to new insights about the matter in question. And this has been my one criterion for success: whether the process has allowed me to see something that I had not seen before – whether it has opened any doors for my thinking. Hopefully it does the same for you the reader. That has been the intent; whether it has been successful I cannot myself declare.

In any large-scale work one incurs many debts; when one is a student that is particularly true. My debts have been many, and in many cases deep. First and foremost I want to thank the string of great teachers who have given me the tools, support, and stimulation in order to arrive at this point. From Barrie Brill, my first medieval history
teacher and my first mentor, to Gwyneth Lewis, who taught me Latin, Steven Taubeneck, Richard Unger, Tim Brook, Alan Sinel, and Philip Harding, I owe many thanks. Chris Friedrichs, my great teaching mentor whose assistant I had the great privilege to be for two years, taught me to teach and to listen, but I also learned a great deal about reading and writing in his seminars and I took his boundless energy as an inspiration. Bob Brain encouraged my interest in both Heidegger and science, and his wonderful seminars and omnivorous and eclectic approach to knowledge and its possibilities became a template for me in many ways. It was also Bob who introduced me to Robert Musil (demanded that I read him in fact), without which, the step to working with my final great mentor David Luft may never have happened.

Last, but first amongst my UBC mentors is Allan Smith, to whom this work is dedicated. He encouraged all of my strange ideas and taught me the profound importance of thinking. He was my supervisor and mentor through my honours and masters theses and has provided the prime example to me for how and why we do what we do as thinkers, writers, and as teachers. I left UBC with a strong sense of these ideas and they have never left me.

The next great step in my education came as a result of working with David Luft. I first encountered David’s work in a review essay that he wrote on the Heidegger controversy. I was impressed and looked him up in the library catalogue only to discover that he had written a book on Musil, whose The Man Without Qualities I had just finished reading on Bob Brain’s insistence. I checked David’s Robert Musil and the Crisis of European Culture out of the library and my future trajectory was set. David has taught
me a great deal about writing, about teaching, and about very different approaches to thinking to those to which I had been used; these have been both a challenge and an inspiration. But David has also become a great friend and a mentor outside of academia. This was not something I could have anticipated, and it has been of profound importance to me.

Oregon State University has given me the opportunity to work on something that is very important to me and which, I hope, will interest others as well. And they have also given me the opportunity to teach, which is more important to me than even the deep obsessions with questioning that drive my research. I would like to thank my students from these past years and those wonderful people who gave me the chance to teach and who have supported me so well throughout my doctoral work: David, Jon Katz, Jake Hamblin, and Ben Mutschler, the head of our school, who has been so supportive and encouraging. I would also like to thank Dwanee Howard and David Bishop, who have done so much to ease the terrible stress of a foreign graduate student, who often felt at the mercy of strange bureaucratic forces beyond his control.

OSU has a great number of amazing people who have offered friendship, advice, and support that I would also like to thank: those already mentioned, of course, David, Ben, Jake, Dwanee, Bob Peckyno, David, Jon, and the wonderful Carmel Finley, Mike Osborne, Kara Ritzheimer, and the rest of the department. But it is my committee from whom I have the most to thank, for their patience with this very big project, even though it took a long time, but for much more besides. I have read a great deal of each of their
work to my great delight and profit and benefited from them in ways to which I cannot give justice here.

Bob Nye not only encouraged me but offered his sympathy and understanding in the early years when I found myself a fish out of water in small town Oregon. Anita Guerrini, whose work I have assigned to students whilst teaching the history and philosophy of science, reached out to me and invited me to join the multidisciplinary theory group, a gesture that meant more than it may have seemed. Phil McFadden, with his passion for philosophical exploration, encouragement, and enthusiasm helped to make me feel at home in Corvallis, and I have missed our afternoons drinking iced tea and discussing philosophy and science immensely since I moved to Portland. And Gary Ferngren, whose insistence on complication over inaccurate simplicity makes his work so enjoyable to read, in addition to being encouraging and supportive, has also been a kind friend. I also offer my heartfelt thanks to Kara Ritzheimer, who not only has been a welcoming and supportive presence in the department, but agreed to give up her time and come on board with this committee to deal with this odd dissertation. Her friendship, encouragement, and support have been greatly appreciated. I have been very fortunate to have such a committee of very different people, with different outlooks and approaches and I offer them my heartfelt thanks.

Finally, I would like to thank a few people who are not teachers: my two closest friends, who have been like brothers to me for so many years now, Chris Clements and Jason R. Young, my comrade and compatriot, who has come through the PHD process with me, and been there every step of the way, my father, who instilled a work ethic and
encouraged creativity. And finally, though it sounds almost trite because the words must inevitably fall so far short, I thank my wife Lisa, my companion since childhood:

Vergognando talor ch’ancor si taccia,
Donna, per me vostra bellezza in rima,
ricorro al temo ch’I’ vi vidi prima
talc he null’altra fia mai che mi piaccia;
ma trovo peso non da le mie braccia,
né ovra da polir colla mia lima;
però l’ingegno che sua forza estima
ne l’operazion tutto s’agghiaccia
Più volte già per dir le labbra apersi,
Poi rimase la voce in mezzo ‘l petto;
Ma qual sòn poria mai salir tant’alto?
Più volte incominiciai di scriver versi,
Ma la penna e la mano e l’intelletto
Rimaser vinti nel primier assalto

Petrarch, Sonnet XVIII
Men can do nothing without the make-believe of a beginning. Even Science, the strict measurer, is obliged to start with a make believe unity, and must fix on a point in the stars’ unceasing journey when his sidereal clock shall pretend that time is at Nought. His less accurate grandmother Poetry has always been understood to start in the middle; but on reflection it appears that her proceeding is not very different from his; since Science, too, reckons backwards as well as forwards, divides his units into billions, and with his clock-finger at Nought really sets off in medias res. No retrospect will takes us to the true beginning; and whether our prologue be in heaven or on earth, it is but a fraction of that all-presupposing fact with which our story sets out.

George Eliot, Daniel Deronda

Introduction:

The History of a Problem

This is the history of a problem. This work falls within the fields of the history of philosophy and the history and philosophy of science. It deals with a space where the two fields overlap and come into contact with each other on the level of basic ideas. In particular, this work explores an intersection between theoretical sub-atomic physics and
philosophy in Europe in the 1920’s. But it is not, at its core at least, about either. This is the history of a problem.

This work focuses on two thinkers, both of the same generation, one a German and one a Dane. The German, Martin Heidegger (1889-1976), was one of the most important philosophers of the twentieth century. His 1927 opus *Sein und Zeit* opened up a new world of philosophical exploration, spawning new movements and re-configuring the intellectual landscape of the West. The Dane, Niels Bohr (1885-1962), was one of the twentieth century’s most important physicists. The 1927 Copenhagen Interpretation of quantum mechanics, centred around his concept of complementarity, initiated a new paradigm in physics and likewise spawned new philosophical movements both inside and outside of the natural sciences. Both of these figures are enormously important. But, at its most basic core at least, this is not a story about either of them. This is the history of a problem.

This may seem like a mystifying, obscurantist, and downright confusing way to begin, but it seems to me to be vitally necessary to make the operational parameters of this study clear. This is a work of history, a work in the history of philosophy (particularly dealing with the thought of Martin Heidegger leading up to and during the 1920’s), and the history and philosophy of science (particularly dealing with the work of Niels Bohr leading up to and during the 1920’s), but it does not begin with Bohr or Heidegger, or physics or philosophy. It begins with a problem.

What interest me are the problems that confront human thought, that unceasing enterprise that my honours and master’s supervisor Allan Smith called, simply,
“thinking.” These problems can, in most cases, be formulated in terms of questions that we may pose, whether to ourselves or the universe. Every problem that confronts human thought has a history. The problem of “the nature of the Good,” for instance, has a continuous history in the West from at least the ancient Greeks to the present day. Each historical instance of human beings’ attempts to solve, understand, or even just express a problem involves vastly complex historical circumstances, textual and contextual relations, internal forces, external influences, and so on. These are historical manifestations of a problem for thought. They are the instances of actuality in human time and space of a problem for thought, which always exists in potentiality.

Some problems for thought are rigidly bound by time and space. The question of the impact of digital information technology, for instance, could not have manifested itself before said technology. Other problems for thought are perennial. In addition to the specialised areas of investigation that have evolved through the passage of time, philosophy also still confronts the primal questions of man facing the phenomenal manifold: What? How? Why? Science does this too, but the why question has, to some degree, fallen out of fashion. These most basic questions are, at the same time, the most difficult. Their histories are vast and unwieldy. Yet they are the questions that are, in a still present way, most dear to us.

The problem that concerns us here is not one of these most basic questions, but it is also not at too great a remove from them. The problem that is the central concern of this dissertation is one that I have been pursuing in one form or another since my undergraduate work: the problem of meaning. We can get a sense of the basic dimensions
of this problem if we frame it in terms of our basic, primal questions: What is meaning? How does meaning work? And why does meaning play the role that it does? None of these questions permit of an easy answer. How indeed can anyone hope to come to any sort of an understanding of the problem of meaning at all? If we ask in the most simple way: “What does meaning mean?” we already run into problems. If we want to better understand meaning – and I certainly do – then how shall we proceed?

The a-historical approach to such questions, favoured by Kant and many post-Kantian modern philosophers, seems to me to be misguided. Certainly the problem of meaning has been attacked in this manner – by attempting, though the sheer force of one’s reason, to think though the problem, beginning from scratch, free of the contaminating influence of earlier wrong theories and come to the solution. And earlier theories must, after all, have been wrong because they did not solve the problem once and for all. The problem with this strategy however, especially when applied to such a longstanding problem as that of meaning, is that the evidence of past failure seems to indicate that present failure is also likely. And even if approximation to understanding is taken as a modified goal, one runs the risk of merely exploring trodden ground without an historically informed starting point.

My own method – the one that seems to me to hold the greatest potential for bearing fruit – is to employ a sort of historico-empirical method, which will be an experiment for me. This method borrows from the spirit of the natural sciences, if not the letter. I believe that the most fruitful method of philosophical investigation begins, not with first principles, but with phenomena. This dissertation will proceed empirically then,
with the observation of phenomena. But where are we to find the phenomena of the
problems of thought if we are not planning to stand next to a philosopher and interrogate
her as she goes about her business? We find our phenomena in the history of thought.

Thus we will explore our problem, the problem of meaning – or, if you will, the
question of the meaning of meaning – first by observation of the historical manifestations
of this problem. We will observe the problem of meaning in its spatio-temporal
actualisations (i.e., the phenomena that we examine will be *historical phenomena*). It
follows then in this experiment for myself, as in any experiment, that we will have to
establish the limits of our observation, to carve out an appropriately sized piece of the
vast array of phenomena available to us. In defining the limits of our experiment we will
attempt to maximize the potential insights to be gained. Thus, I have chosen a period, and
particular thinkers in whose work this problem not only played a key role, but had
massive seismic effects in the world of Western thought, creating new trajectories that
continue to be important to this day.

Observation is, however, not the only goal of this study. I also intend to poke and
prod the phenomena; I picture this portion of the experiment as akin to what goes on in a
particle accelerator. I want to bring phenomena together in order to create and observe

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1 Historical phenomena are much more than just things that have happened in the past.
History is a mode of inquiry, a complex human activity that explores relations. In what
follows I will differentiate between “historio*logy*,” as the “science of history” or “the
systematic study of history” and “historio*graphy*,” as “the writing of history,” which is a
crucial part of historio*logy*. Exploring history means examining data from and about the
past and discovering and tracing relations between these remnants and signs of past
human activity. The process is historio*logical*; the act of communicating what one
discovers in this manner through the written word is historio*graphic*. It is important to
constantly bear in mind that history is not merely things that happened in the past, but our
living relation to them; it is a human *activity*, a way of being.
collisions to see what we may learn from them. And, since – so the old cliché from
driving lessons goes – 90% of all collisions happen at intersections, an area of
intersecting intellectual phenomena is ideal. This introduces a speculative component into
the historico-empirical task. Here philosophical elements enter into the work, and
philosophical history and historical philosophy blur.

Though this is indeed a work in the history of philosophy and the history and
philosophy of science it is not primarily about Bohr or Heidegger, or about physics or
philosophy: it is about meaning. This is a work that attempts to come to a greater
understanding of the problem of meaning through an experiment in historico-empirical
methodology.² It is, of course, also a work in the history of philosophy as it is also a work
in the history and philosophy of science, but, first and foremost, it is the history of a
problem. It explores a brief but important episode in the long history of meaning in order
to follow the ever-receding track of understanding, at least for a while.

Before we begin the experiment proper, however, a few more preliminary remarks
and definitions are in order.

² That is, this is an experiment in approaching philosophical problems by observing
historical phenomena. These historical phenomena are past instances of human
encounters with the philosophical problem under study. The past instances are the
historical material to be studied. The experiment is to use the historiological and
historiographic relating (by me, as the historian) as an observational philosophical
encounter. I take inspiration from Bohr’s contention that “by the word ‘experiment’ we
refer to a situation where we can tell others what we have done and what we have
learned…” In this sense, this dissertation is an account of what I have done. The unusual
form and presentation arises from the difficulties of attempting to convey information
about what I found by examining this historical phenomena, the examination itself, and
the methods I employed. The dissertation does not read like a straightforward book, and,
though this is a lot to hope for, it is something that may need to be read multiple times.
Identifying our Quarry:
The Basic Outlines of a Definition of Meaning

The problem of defining terms is always difficult, but in an exploration such as this, and with a concept such as meaning, the problem becomes acute. If meaning is to be the quarry we are to pursue, then we must have some sense of it before we go on. Yet our goal for the entire work is to understand meaning. We seem to be in a problematic place, but it is not a hopeless one. Though we may not be in possession of a complete understanding of meaning at this stage we can sketch out some of its basic features. Heidegger, in the beginning of *Sein und Zeit*, notes that we have a pre-theoretical understanding of the meaning of being (*his* primary quarry) and that this initial, pre-theoretical understanding is where we can begin our search for a more complete understanding.\(^3\) The same applies to meaning, but we need not couch it in such esoteric terms here. Meaning is a functional concept in human thought. It is a concept that we use in our everyday lives as well as in philosophical endeavours. If we suss-out the basic operational parameters of this functional concept, we gain a rough picture of the basic shape of our quarry and will have a place to begin.

“Meaning” is one of those difficult words – difficult because its common use makes its meaning seem self-evident, and yet, as self-evident as it seems, it is remarkably difficult to pin down. “Meaning” is difficult to discuss without invoking the term itself. It

\(^3\) This method of beginning an interpretive process with a pre-understanding and then moving into ever deeper levels of understanding through interpretation is known as the hermeneutic circle.
has such a central place in our language that it is hard to discuss “the meaning of meaning,” or ask the question “what does ‘meaning’ mean?” and answer with a statement in the form of “‘meaning’ means X” without evoking a strange sort of reflexivity that nevertheless emanates from what sounds like a perfectly reasonable phrase.4 “Meaning” is what we might call a load-bearing word: it supports a varied and polysemic superstructure of intentions, connotations, and denotations; yet there is a commonality at play in each of the various uses of the term that suggests its appropriateness as a support.

In the twentieth century “meaning” became a central issue in the philosophy of language, producing the discipline of semantics and spawning a century of contestation between theories of meaning rooted in verification, intention, use, cognition, and so on. These theories attempted to understand and explain the nature of meaning as pertaining to linguistic utterances and signs; they grappled with the question: what sort of thing is the “meaning” of a statement or sign? The philosopher of language, William Alston, suggested that the question “is best formulated as follows: ‘What are we saying about a linguistic expression when we specify its meaning?’ That is, we are trying to give an adequate characterization of one of the uses of ‘mean’ and its cognates.”5 This goal has been one of the primary aims that philosophers have pursued in the past hundred years when approaching the question of meaning. But “mean” has many other uses besides its

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4 For clarity’s sake when “mean” is used in the form of “X means Y” or “what does X mean?” we are referring to the semantic content of X (this is a meaning-laden statement itself); that is, we are referring to that which X designates, denotes, etc. “Meaning” in quotes signifies the word itself, etc.

application in theories about linguistic expressions. At this early stage Alston’s brief list of some of the “many other uses of ‘mean’” may serve to situate us.

Alston notes that there are other uses of the term “mean” and lists seven of them “which might be confused with [his] sense.” From these we may begin to arrive at a broader sense of the term’s many uses:

1. That is no mean accomplishment. (insignificant)
2. He was so mean to me. (cruel)
3. I mean to help him if I can. (intend)
4. The passage of this bill will mean the end of second class citizenship for vast areas of our population. (result in)
5. Once again life has meaning for me. (significance)
6. What is the meaning of this? (explanation)
7. He just lost his job. That means that he will have to start writing letters of application all over again. (implies)

Alston’s list is by no means exhaustive, but it allows us to begin to get a sense of the multitude of different denotations that “meaning” and “mean” may convey. This short list of common uses of “mean” brings forward the specific disciplinary character of the sense of “meaning” that philosophers of language explore when they conceive of the question of the meaning of “meaning” strictly in terms of the meaning of linguistic formulations.

In what follows we will attempt an exploration of the broader meaning of “meaning” that

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6 Ibid.
explores this linguistic sense, but also others, with the aim of arriving at a sense of a common essence of the term that underlies its manifold uses.

**Explorations of Etymology**

“Meaning,” like all terms and, indeed, like all things pertaining to humans, has a history. The multitude of meanings of the term is the product of a complicated history of use that can be traced in broad outline, giving us a preliminary basis upon which to proceed with our exploration. The root of “meaning,” the word “mean,” has multiple manifestations, serving varied purposes: it may appear as a verb, a noun, or an adjective. And within each of these categories it may signify a number of different things.

Part of the complexity of the varied uses of the word “mean” is that the various meanings of the term arise from different roots; that is, there are two different sources in English for two different uses of the word “mean.” One use of “mean” is adjectival: that which is “mean” is “in the middle;” it is “intermediate.” This usage of “mean” has also led to a devolved adjectival sense of the term: “mean” as “base” or “low;” it arises from the previous sense of “mean” as “something held in common” being applied to things that are “common” in the sense of that of the base masses. Both of these uses of “mean” arise from the Middle English word “mene,” which signifies “that which is in the middle” and can be traced through the Old French “meien” to the Late Latin “medianus,” which signifies the same thing.  

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7 Hence “mean” as cruel, etc.
The other sense of the word “mean” is verbal: to “mean” is “to have in mind,” which comes from the Old English word “maenen” which is “to mean, signify, intend; to speak of” and, in a now obsolete usage: “to mourn, moan” or “complain.” This word is related to the German word “meinen,” meaning “to think, suppose, be of opinion.” This word can be traced to an earlier Indo European base: “main-, mein-” meaning “to be of opinion, think.”

From these two stems come the wide variety of modern usages, with their different connotations and denotations. And it seems, at first glance, that what we have is a mere case of mistaken identity, stemming from the simple problem of two different words evolving into identical spellings and creating a confusing linguistic situation. But there are commonalities and common connotations that seem to link these words together in promising ways that point to older roots.

Indeed, there is great temptation to push back still further into the pre-history of our language, though, as Calvert Watkins notes, we should be cautious about reconstructions of the semantic content of the ancient roots of languages, as “the meaning of a root can only be extrapolated from the meanings of its descendents.” And “[o]ften these diverge sharply from one another, and the scholar is reduced in practice to inferring only what seems a reasonable, or even merely possible semantic common

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*See The Oxford English Dictionary*, Vol IX, pp. 516-21 for an account of the various modern usages of “mean.”
denominator.” There is indeed though, a very tempting set of “me-“ Indo-European prefixes that can, at the very least, give us a sort of impressionistic sense of what seem to be the early linguistic ancestors to the modern words “mean” and “meaning.”

The “me-“ prefixes range from the “oblique form of the personal pronoun of the first person singular” as in “me” myself, and the possessive, as in “mine” to the familiar “in the middle” and “expressing certain qualities of mind” (including, not just thought, but “mood,” and “feeling”) that lie at the root of the Old and Middle English terms above. Other derived meanings of “me-“ prefixes include “to measure,” “big” as in “more” and “greater,” and even “to cut down grass” as in “to mow.” This is a disparate group of words with a wide range of denotations. But in some, not only can we see the established roots of the Old and Middle English senses above, but we can discern some other possible links, ephemeral and speculative though they may be.

To this group we can add other related Indo-European roots such as “mei-” meaning “to change, go, move; with derivatives referring to the exchange of goods” and “common, public, general,” and “men-” meaning “to think; with derivatives referring to various qualities and states of mind and thought” (from whence come “mental,” “memory,” etc.). What sort of speculative sets of relations can we discern among the “meanings” of these roots? Disregarding “to cut down grass” and “big” we are left with notions of the personal (me), measurement, being amongst (or middleness), exchange,

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13 Ibid. p. 52.
14 Ibid. p. 54.
and qualities of the mind (involving thinking and feeling). In what way do these ancient words shed light on the confused signifier “meaning” today? One way to think about how they might relate to each other is to think of these different “meanings” of the word “mean” in relation to the Heideggerian concept of world.

Being amongst, measurement, exchange, qualities and states of the mind, and even notions of the personal all pertain to what we could call worlds, in a Heideggerian sense\(^\text{15}\) – we can think of them as similar to but not identical to “forms of life” in Wittgenstein’s terms, which are the socio-historical contexts within which languages can have meaning\(^\text{16}\) – and ways of being that are intrinsically related to worlds. The most important thing to bear in mind about worlds is that we live in them. Worlds are spaces that we inhabit, whether we think of them in terms of physicality, as in the physical world or in terms of concepts, as in the world of science, worlds are spaces inhabited by beings of one kind or another. “Worlds” then, as we are using the term here, are horizons of disclosure; that is, to use Heidegger’s terms, worlds are “region[s] which [embrace] a multiplicity of beings. For example, when we speak of the ‘world’ of the mathematician,

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For texts in other languages I have used the standard English translations where available and adequate. In some instances (as indicated below) I have modified translations where I believe it may help the reader to better understand the original ideas. For the most part this has meant substituting more literal and less elegant translations, which, though they may lose fluidity in English, gain in clarity for the reader. Where published translations are not available translations are my own (again, as indicated).

we mean the region of all possible mathematical objects.” At any moment we are operating in a multitude of different worlds, even if we do not pay any explicit theoretical mind to them. Worlds are both ranges of beings and sets of relations and interpretations that we inhabit, relate to, and, ultimately, could not exist without and still be recognizable as the type of beings that we are.

If we think of the various senses of the word “mean” in relation to this concept of world, some evocative connections come to light. Being amongst certainly can be seen in the light of worlds – indeed, being amongst presupposes worlds at its most basic level, as does measurement, which is a specialised form of relating beings to other beings. We can see notions of the personal in much the same way, to the extent that the idea of an “I” always involves and presupposes a “thou.” If we look at the various meanings of “mean” in this light, then, they seem to have a common connection in the relational nature of innerworldly structures. But, if this speculative connection means anything, where do qualities and states of mind fit in? The answer is fairly straightforward.

The verb “to mean” in the sense of “to have in mind” is to intend, and intending and “having in mind” also presuppose worlds. To intend something in the linguistic sense

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17 Heidegger, *Being and Time*, pp. 64-5.  
18 We might say, in Heideggerian terms, that the more common sense of “being amongst,” that pertains to most every day parlance is a vulgarization of the primordial being amongst that is Heidegger’s being-in-the-world.  
19 There can be no such thing as measurement of a single thing in isolation – indeed, quantification itself is only a refined and specialised version of comparison. For an excellent account of the relation between quantification and comparison see Carnap, Rudolf. *Philosophical Foundations of Physics*. New York: Basic Books, 1966, pp. 51-9 and 62-9.  
is to involve predicates,\textsuperscript{21} and predicates, as structures, relate to beings in worlds. Paul Ricoeur conceives of meaning in terms of discourse, and notes that all discourse is grounded both in the intentions that lie behind propositions and the world to which they refer. As he puts it, “language is not only directed towards ideal meanings, but also refers to what is.”\textsuperscript{22} Even the sense of “to intend” as in “to plan” involves worlds, as, again, planning involves other beings and presupposes worlds. And in each of these senses of intention, what is referred, to is relational; it is based on a relational structure (world); that is, we plan to achieve a certain state of affairs (a set of relations), and we intend to convey predicates, which point to states of affairs (relations). All of this will become clearer as we progress.

At this point, the discussion seems to have reached a level that is too broad to be of interest, in that, worlds are so basic to the mode of being of humans that anything to do with human beings presupposes worlds. This is a fair observation, but the essence of this speculative relating of meanings is the way in which these senses of the word “mean” pertain to worlds. Each of these senses of “mean” points to the \textit{relational nature} of the structures of worlds, whether it be the I and thou, the amongstness of spatiality or categorisation, or intention, as pointing and planning. But before we can begin to pull these threads together we need to move from Indo-European root words to say a bit more about philosophical uses of the term “meaning,” and we will begin by returning to the philosophy of language and the discipline of semantics.

\textit{But What Does it Mean? – Meaning and Semantics}

\textsuperscript{21} Ricoeur, \textit{Interpretation Theory}, p. 10 also see p. 12.
\textsuperscript{22} Ricoeur, \textit{Interpretation Theory}, pp. 12 + 11-12, 21, 88, 92.
Semantics as a discipline has evolved since the term first came into general use in the early decades of the twentieth century. And, though many specific formulations of the nature of meaning as a linguistic concept have been brought forward, competed with each other, and waxed and waned in popularity, the basic sense of the concept has remained.\(^\text{23}\) Meaning in this sense is the “sense” of a linguistic expression; it is the semantic content of a linguistic expression.\(^\text{24}\) But this formulation itself is unclear as to its actual meaning. Much of the debate in semantics in the twentieth century has revolved around the difficult and seemingly riddle-like question of what “the meaning of a linguistic expression” means.

The naming theory of meaning, supported by Russell and, at one time, by Wittgenstein,\(^\text{25}\) focused on names as the bearers of meaning. This theory proposed that the meaning of names lay in the objects that they pointed to. The naming theory was contested in the 1950s by the use theory (Strawson and Grice), which moved the focus of linguistic meaning away from names and, broadening the scope of exploration, sought the meaning of linguistic expressions in their use.\(^\text{26}\) This theory was more inclusive than the verification theory of meaning championed by the logical positivists whose line of


\(^{24}\) Meaning: “Of language, a sentence, word, etc.: The signification, sense, import; a sense, interpretation. Also, the intent, spirit as apart from the ‘letter’ (of a statement, law, etc.).” *Oxford English Dictionary*, Vol. IX, p. 522.

\(^{25}\) Tractatus – proposition 3.203 [“The name means the object. The object is its meaning.”] Russell, “On Denoting” 1905

\(^{26}\) For a brief account see Martinich, A. P. “Philosophy of Language,” in Canfield, John V. (Ed.), *Philosophy of Meaning, Knowledge, and Value in the Twentieth Century* (Routledge History of Philosophy vol. 10), (London: Routledge, 2004).
thinking found its source in the work of the Vienna Circle. The logical positivists sought to remove statements that they saw as “meaningless” from serious philosophical discussion, and the verification theory of meaning was devised as a methodological device to sort out the meaningful from the meaningless.27

Focussing on propositional statements, the verification theory of meaning asserted that a statement was meaningful if and only if it could be verified by observation. This theory claimed that the only meaningful statements were those that were about the “objective” world, that could be proved either true or false by empirical observation. Thus statements could be false and yet still count as meaningful – the criterion for meaning being whether or not they were testable not whether or not they were true.

Each of these semantic theories enjoyed its periods of greater and lesser popularity, but no one theory has been accepted as the commonly agreed upon theory of meaning whether within the philosophy of language, or, more broadly. In a sense, we can see the semantic theorists as looking for “meaning” as an unknown quantity that would be a key to unlocking the philosophy of language; they sought “meaning” as “[w]hatever it is that makes what would otherwise be mere sounds and inscriptions into instruments of communication and understanding.”28 As A. P. Martinich puts it: “Semantics is the study of the meaning of words and sentences.” And “[m]eaning has generally been thought of as a relationship between words and the world.”29 But “meaning” has played a role in philosophy outside of the philosophy of language, in ethics, metaphysics (a domain

which the logical positivists saw as entirely concerned with the meaningless), and ontology. And there are many senses of “meaning” and “mean” in ordinary parlance that do not refer to the semantic content of linguistic expressions. If we are to understand meaning more broadly we must look beyond semantics and into some of these other philosophical and popular uses.

**Meaning, Purpose, and Significance**

What does someone *mean* when she uses a phrase such as “the meaning of life”? It seems as though she means something more than the semantic content of the word, as a definition of “life” as a term. If someone asks what the meaning of life is, she is more than likely not expecting a description or definition of the *bios*; she is, as we know, looking for something more. A phrase such as “the meaning of life” refers to an intangible and elusive something that seems to be out there in the aether, as difficult to grasp in its basic parameters as it is to define in its details. The meaning of life seems to be an impossible concept to define or describe, and yet the meaning of life is a much used (and abused) concept. How are we to account for this?

In this use, “meaning” seems often to be related to purpose and significance. If we ask someone to be clearer and to further define what she means when she speaks of “the meaning of life” we might get a response along the lines of: “well, I am asking about the *purpose* of life” or “I am asking about life’s *significance.*” As ill-defined as these words too may be in the speaker’s mind, “purpose” and “significance” are often what people *mean* when they use the word “meaning.”
A purpose is a goal; it is something that one “sets out to do or attain;’ it is “an object in view; a determined intention or aim.” If someone speaks of “the meaning of life” and thinks of this in terms of life’s purpose, she is equating meaning with the aim or goal to which life strives, its telos. Meaning as purpose is “[t]he reason for which something is done or made, or for which it exists;” again, it is its telos. If we define meaning as purpose we encounter a long-standing metaphysics of goals and aims that traces its lineage far back into the Greek roots of Western philosophy. And purpose can also mean “resolution, determination, intention,” as the quality of striving towards aims. Thus the word “purpose” covers both striving towards goals and the goals themselves. And, to track from purpose back to meaning, “purpose” also, in what is now a rare usage, also refers to the semantic content of words.³⁰ “The meaning of life” in this sense then, would be something akin to a goal or aim of life and the striving towards this goal. Here we again see a bridge between the linguistic sense of the meaning of a phrase, as that which the speaker “means” to convey and this sense of “meaning” as purpose: The meaning of a phrase is that which the phrase intends and the telos of something is that to which the thing intends. But we also noted that when someone explains what she means by the phrase, “the meaning of life,” she may instead or also suggest that this “meaning” refers to life’s significance. Here we have another term to explore that should prove fruitful.

“Significance” is “importance, consequence” as well as “the meaning or import of something,” which brings us full circle, as tracing synonyms often does.\(^{31}\) The phrase, “the meaning of life,” as meaning “life’s significance” then refers to the import and consequence of life. And here meaning touches on value and becomes wrapped up in a metaphysics of worth.\(^{32}\) When we begin to add up these different senses of meaning as purpose and significance we arrive at a different, though related, set of concerns from those held by the semantic theorists. The meaning of something, in these new terms is its weighty \textit{telos}, the aim and purpose to which it strives and its gravity and consequence. The question of the \textit{who} of this \textit{meaning} – as “significance” – is, at this structural stage, not necessary to answer, but it does present itself. Is this \textit{meaning}, in this sense, something universally present in entities, from inanimate objects to people, and concepts such as “life”? Or is this \textit{meaning} something that is only present for and in the eyes of a beholder? Or is it something communally held and, likewise, communally constructed?

In \textit{Being and Time}, Heidegger takes the position that meaning and significance do not exist in entities themselves (things, other people, ideas, etc.), but exist \textit{in our relation to} these entities. \textit{Meaning} in the above sense, as purpose and significance, is a function of our understanding. According to Heidegger:

\begin{quote}
When entities within-the-world are discovered along with the being of Dasein – that is, when they have come to be understood – we say that they have \textit{meaning}
\end{quote}

\begin{footnotes}
\footnote{Oxford English Dictionary, Vol. IX, p. 458.}
\footnote{With the notion of value we touch on the domain of ethics as well.}
\end{footnotes}
But that which is understood, taken strictly, is not the meaning but the entity, or alternatively, being. Meaning is that wherein the intelligibility [Verständlichkeit] of something maintains itself. That which can be articulated in a disclosure by which we understand, we call ‘meaning.’ The concept of meaning [Begriff des Sinnes] embraces the formal existential framework of what necessarily belongs to that which an understanding interpretation articulates.\(^{34}\)

Meaning is the ‘upon-which’ of a projection in terms of which something becomes intelligible as something; it gets its structure from a fore-having, a foresight, and a fore-conception. In so far as understanding and interpretation make up the existential state of being of the ‘there,’ ‘meaning’ must be conceived as the formal-existential framework of the disclosedness which belongs to understanding. Meaning is an existentiale of Dasein, not a property attaching to entities, lying ‘behind’ them, or floating somewhere as an ‘indeterminate domain.’ Dasein only ‘has’ meaning, so far as the disclosedness of being-in-the-world can be ‘filled in’ by the entities discoverable in that disclosedness.\(^{35}\)

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\(^{33}\) German has two words for which English generally uses the one. Both \textit{Sinn} and \textit{Bedeutung} mean “meaning.” They are often distinguished in translation (as “sense” and “meaning” or “sense” and “reference” [along Frege’s lines]) but they are also often used interchangeably in German. For more see Appendix 2. And for an argument for using “meaning” for both \textit{Sinn} and \textit{Bedeutung}, see Husserl LI 1.15.

\(^{34}\) Joan Stambaugh renders this last sentence as: “The \textit{Concept of meaning} includes the formal framework of what necessarily belongs to what interpretation that understanding articulates.” Heidegger, Martin. \textit{Being and Time}. Joan Stambaugh (Trans.). Albany: State University of New York Press, 1996. P. 151.

\(^{35}\) Heidegger, Martin. \textit{Being and Time}. New York: Harper & Row, 1962. p. 151. This is a lot to take in at the moment, but it will eventually become more clear as we move toward Chapter 4 where we will encounter this passage again.
“Meaning,” for Heidegger, is _our understanding_ of a thing. And, if he is correct here, this may give us a clue as to why our attempt to come to an understanding of the meaning of meaning has been so difficult thus far. In Heidegger’s sense of “Meaning” [Sinn], we never understand the meaning of a thing; we understand the thing itself, and the meaning of a thing _is_ this understanding. And for Heidegger, understanding is an interpretive process.

After he gives this definition of meaning, Heidegger goes on to note that the _concept of meaning_ [Begriff des Sinnes] describes a formal structure of our existence and notes that this structure has “a fore-having, a fore-sight, and a fore-conception.”^36^ By these terms Heidegger is indicating that in all understanding there are certain structural elements present: that which we already have (in a general sense we can think of this in terms of a whole set of background knowledge, assumptions, points of view, understandings, etc.), an advance view or first appropriation of that which is to be understood, and a sort of advance grasp of that which is to be understood that is a conception of it that we either will stick with or modify.^37^ This structural account of meaning that Heidegger offers presents a path that may lead us out of the morass we have arrived at, even if we do not take over his particular account wholesale. And herein lies a clue to a way in which we might begin to bring these manifold senses of “meaning” together.

**The Structure of Meaning-Systems**

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^36^ Ibid.

^37^ Ibid p. 150.
As a way of bringing some semblance of coherence to this seeming ramble – in the sense of a wandering stroll – I would like to here propose a structural conception of meaning that is rooted in a sense of meaning’s fundamental plurality, which, at the same time, hopes to provide a common basis for the above existential, epistemological, and linguistic senses of what “meaning” means. This is a systematic account of meaning; it is a new definition and theory of meaning that posits meaning as having a systematic nature,\(^{38}\) analysable in terms of a structural account of this kind of system that pertains regardless of specific content.

A system is “a set or assemblage of things connected, associated, or interdependent, so as to form a complex unity.”\(^{39}\) What I am outlining here is a theory of meaning systems, not in regard to any specific content, but in regard to their structures, in regard to “the manner in which [they are] put together.” As “the mutual relation of the constituent parts or elements of a whole as determining its peculiar nature or character.”\(^{40}\) Systems are structural wholes that can be examined in terms of the nature of their constituent parts but cannot be imagined to be the same sort of thing if dissected; they are organic wholes. They have discernable elements that operate and interact in discernable ways, but none of these elements is ever conceivable on its own, cut-out, in abstraction.\(^{41}\)


\(^{41}\) Aristotle uses the example of a hand, which is only understandable as a part of a body.
The systems that I want to describe are living systems. To this end I will bring in some of Yair Neuman’s thoughts on the nature of living systems (in the case of his work though not mine, both human and non-human) and the way in which living systems create meaning as they interact with their environment. Neuman stresses that “a living system is always interacting with its environment in a way that defines its identity.”

Living systems are always not only embedded in their environment but fundamentally involved and implicated with it as well; they “involve units (whether human or non-human) that on the one hand appear systematically closed but on the other hand must communicate/interact with their environment and with other units in order to constitute their identity or self.”

Neuman’s focus is on the way in which living systems create meaning, and this he equates with the constitution of their identity (as noted above) through interaction with their environment and by the very process of the creation of meaning. As he puts it:

As enactive systems, living systems constitute their identity and construct meaning by continuously responding to the environment in accordance with their unique boundary structure. That is, meaning is the result of the system’s efforts rather than a given property outside or inside the system. According to this suggestion, the cognitive representational conception should be rejected in favour of an interactional perspective that considers meaning (i.e., structured experience)

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43 Ibid. p. 395.
as it appears to the observer from his or her unique coupling with his or her environment (e.g., relations, boundary, history, evolution).^{44}

Here Neuman offers a refinement of Heidegger’s contention that meaning is not found in things but in our relationship to them. Neuman notes that it is this interaction between the system and the environment that, by enacting this relation, *creates* meaning.

Neuman sees this meaning-creation process as “interactional,” involving not a static relation but a dynamic and ever-shifting interaction between system and environment that takes place along a boundary that is not a sharp dividing line between subject and object or self and world, but rather is an oscillating place of interaction that plays a crucial role in the defining relationship that is meaning-creation. Neuman proposes the concept of an oscillatory boundary as “an alternative to the conception that the system precedes any form of interaction but comes into being through interactions.” “Therefore,” as he notes, “from a phenomenological perspective the boundary is not parasitic on the entities it defines but precedes and constitutes them through its indeterminacy.”^{45}

Again, reiterating the post-Heideggerian phenomenological insight, Neuman notes that “in contrast to information, meaning emerges as a result of a communication process and not as an attribute given a priori and objectively in an external or internal message.”^{46}

Meaning then is our understanding-interaction with the world. *It is the relationality that obtains between ourselves and the phenomena of the phenomenal world.*

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^{44} Ibid. p. 397.

^{45} Ibid. p. 400.

^{46} Ibid. p. 402.
Meanings are the very relata of that relationality (indeed, at its most basic level they are the relata of relationality itself).\(^\text{47}\) That meaning is relationality may seem to be a strange conclusion. If we understand meaning as relationality we arrive at a concept that draws together the disparate senses of the term noted above and explains the commonality that seemed to unite them despite their difference. We can see why questions of meaning lie at the heart of all thought about language, but also all questions of ethics, epistemology, and indeed of human existence (all of which are fundamentally relational).

We live out our lives in a constant state of relating (to things, to states of affairs, to ideas, other people, and to ourselves) until we relate no more (and even then we are related to as a person no longer living, yet still present in a new way to those who knew us). The question of the meaning of the meaning of life is then the question of the essence of human life: the nature of this very relationality.

Kierkegaard defines the human self in relational terms. We relate to others but we also relate to ourselves. The self, according to Kierkegaard, is found in this reflexive relation and is something achieved, or performed rather than a static thing:

 Theodore is spirit. But what is spirit? Spirit is the self. But what is the self? The self is a relation that relates itself to itself or is the relation’s relating itself to itself in the relation; the self is not the relation but is the relation’s relating itself to itself. A human being is a synthesis of the infinite and the finite, of the temporal and the eternal, of freedom and necessity, in short, a synthesis.

\(^{47}\) I further explore these ideas in my article “Notes Toward a Phenomenology of Meaning: A Quantitative Approach” (currently under review).
synthesis is a relation between two. Considered in this way, a human being is still not a self.

In the relation between two, the relation is the third as a negative unity, and the two relate to the relation and in the relation to the relation; thus under the qualification of the psychical the relation between the psychical and the physical is a relation. If, however, the relation relates itself to itself, this relation is the positive third, and this is the self.

If we conceive of human existence in these Kierkegaardian terms, the question of meaning reveals the question of the self. The essence of a human being is to be found in the particular relating that she is. And if we follow Kierkegaard one sentence further we encounter the question of ground: “Such a relation that relates itself to itself, a self, must either have established itself or have been established by another.” This will be another key theme for our examination.

In all of this explication thus far however, we have still only been talking about the question of meaning, and then only in structural terms. If we are to remain in the realm of demonstrable accuracy we must remain in this structural realm of the question. Any pretense to answers and specific content must be strictly ruled out here. The bare structural account (difficult enough) is the focus here; it provides a framework for understanding and identifying our quarry (meaning) that will allow us to move forward with our investigations, which we hope will shed further light on the structural problem-situation and its historical manifestation.

The structural account presented above gives us a rough and schematic sense of meaning; it establishes the basic parameters of the object under study. In the dissertation that follows, I hope to fill in this schematic picture – to hang some flesh on the bones, if you will. The method will be historico-empirical experimentation. I will define a particular historical area and examine it.

In the 1920’s a veritable foundational crisis of meaning occurred in a wide variety of fields from the arts to theology, from the natural sciences to philosophy. In this study I will examine the work of two figures who played central roles in this crisis in the particular fields of physics and philosophy. The work of Heidegger and Bohr in this period engaged with the problem of meaning in profound and fundamental ways. And, unexpectedly, these two very different people working in very different fields engaged with the problem of meaning in structurally similar ways. Philosophy and physics intersect in this period in a way that has drawn historians’ interest ever since. This study traces the intellectual trajectories of Heidegger and Bohr’s engagement with this problem of meaning, culminating in their respective breakthrough works of 1927. My plan here is to observe thought-processes and trajectories as they play out in time, and to examine the region in which they intersect. Through this observation – I hope – new insights will arise. A few more introductory tasks remain before we can proceed:

1) The clarification of a few more concepts that will illuminate the particular parameters and issues involved in the particular confrontations with the problem of meaning that occurred in the 1920’s
2) A brief outline of the philosophical history of the problem of meaning leading up to our particular area of concern (Heidegger and Bohr’s engagement with the problem in the first decades of the twentieth century)
3) An outline of the project as a whole, indicating the basic moments of the experiment (chapter structure, etc.)

Establishing the Experimental Parameters Part 1:

The Problem of Meaning in Modernity – Necessity, Contingency, & Ultimate Ground

If meaning is relationality and meanings are the relata of relating, then meanings are also the very stuff of understanding. We understand in and through meanings. Our understanding of the world, the cosmos, the vast \textit{phenomenal manifold} (things, people, ideas, rules, comparisons, words, locations, i.e. the whole infinite array of phenomena that stands before us in our lives), is relational from the ground up. We know what a word means, what an idea stands for and conveys, what a thing is, through meaning, through the constant significative relating between ourselves and the world that goes on in every second of our lives. Indeed, our lives are a constant and infinitely complex process of relating within spatio-temporal bounds.\footnote{Kierkegaard would say that our self is the enactment of our relating to this relating.} We understand the world by mapping relations between phenomena, by creating ever-shifting webs of meaning that represent to us what things, ideas, people, etc. are, what they are for, what they do, what they are worth, how we feel about them, and so on and so forth. Some of this we discover and determine for ourselves, much of it we learn from others in the world with us. Some of it stays fairly

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stable throughout our lives, much of it shifts, whether subtly or drastically. (Again, we must avoid the temptation to slip into specific content here; we must remain in the structural realm.) Our understanding operates relationally; it operates through meaning.

A further question that arises out of the discussion of the nature of the understanding is that of the categories. That is, if our understanding works by developing networks of meaning-relations that describe the world to us (differentiating the phenomenal manifold), are there fundamental ways of describing? Are there basic kinds of relations that come into play in the mapping-describing-relating of our understanding of the world? Are there basic categories of description? Are they finite in number? Aristotle believed that there were such categories and that there were 10 of them:

1) Substance (being or essence)
2) Quantity (how much)
3) Qualification (quality)
4) Relative (in the sense of to something, not strictly in the broad modern sense of “relation” but in the more restrictive sense meant in “X is double of Y”)
5) Place (position in regard to the environment)
6) Time (position in time)
7) Being-in-a-position (or posture)
8) Having or state (as in having the state of, being in the state of)
9) Doing (action)
10) Being affected (being acted upon, or affected by)\textsuperscript{50}

These ten categories represented the most basic kinds of possible determinations for Aristotle. “The categories are the ultimate classes into which whatever exists or is real may be said to fall.”\textsuperscript{51} The nature and number of these categories continued to be debated in the centuries between his death and the early twentieth century. They played a crucial role in Kant’s critical philosophy and, as we shall see, were an early problem tackled by the young Heidegger. At this point however, we merely need to take note of their proximity and relation to the problem of meaning, which is our primary concern.

Along with the question of the categories, another question arises out of our discussion of understanding: that of ground. Upon what, we may ask, are our determinations based? Are they strictly based upon our relation (intellectual, emotional, physical) to the phenomena that confront us? Are they entirely subjective? Or is there some kind of order inherent in the phenomena or in a specific kind of relation to it? Is there such a thing as objectivity in this relational world of meaning? What guarantees do we have, if any? This question of ground is closely related to the question of truth. Is there such a thing as truth? Can we say that our understandings are true? True to what? True to the phenomena? In what way? True to some kind of inherent, if implicate, order? If there is truth, upon what is it based? What is the ground of truth? Are meanings (true


\textsuperscript{51} Lloyd, Aristotle, p. 114.
meanings? false meanings?) only relative to our perceptions? Or only relative to the phenomena experienced? Or both? Are they merely relative and therefore contingent (relative relationality specific to X circumstances [this observer’s perception of these phenomena]), or is there such a thing as necessary and therefore transcendent meaning?

This question of necessity and contingency of meaning, and of the necessity and contingency of truth, is tied to that of ground: are there merely grounds of certain relations, and the grounds of those grounds, and so on ad infinitum, or is there an ultimate ground that transcends the relative world of relationality itself (a transcendent ground)?

For centuries, thinkers in the western intellectual tradition thought this was the case. The ultimate transcendent ground of truth, of meaning, and, indeed, of existence itself, however one specifically defined it, was God. By the turn of the twentieth century, however, this was no longer an acceptable answer for many. The disappearance of this answer as an option and the aftermath of this disappearance is one of the key elements in this particular period in the history of meaning that played out in the western intellectual world in the first decades of the twentieth century, and it is one of the crucial themes of this dissertation.

Meaning, truth, ground, necessity and contingency, understanding, the categories… we have accumulated a large number of major philosophical problems. One more remains, which will prompt an initial encounter with the young Heidegger: logic. The problem of logic relates to each item on the above list. Are there rules for relating? Is there a type of relating that provides a kind of guarantee of truth? Is there an order amongst the categories? Amongst phenomena? Determinations? Does our understanding
function according to rules? By the early twentieth century logic had developed into a sophisticated body of rules for valid reasoning, but the question of just what it actually represented (the deeper questions beneath the straightforward definition of logic as rules for right reasoning), and the ground upon which it rested were hotly contested issues. It was into this discussion that the young Heidegger made his first foray into the world of academic publication.

In a 1912 serialized article on then current developments in logic, the young Martin Heidegger summed up some of what he saw as the most important developments in Logic from the late nineteenth and early twentieth centuries. This was a time of great change and exciting fundamental discoveries in the field. Logic had undergone great expansions and evolutions in the nineteenth century due, in part, to new developments and, in part, to the rediscovery of previously forgotten domains of logic that had been known in the Middle Ages but subsequently lost. This was a time when logic was questioning its own foundations and essence. Heidegger opened his review by noting that

Since the turn of the century, scientific logic has been conducting a full-scale clarification of its principles. The possibility and fact of such a critical reflection must undermine the ground of the traditional conception of logic as an un-increaseable sum of un-deepening and self-regulating thought-forms. With the ‘abolition’ [Aufhebung] – to use the full Hegelian sense – of these convictions, the

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existence of logical problems, including un-cultivated fields of research is guaranteed.\textsuperscript{53}

Heidegger explored these fields in his own graduate work, focusing on questions of the ground of logic, theories of the categories, and meaning. In his 1912 review, Heidegger was still speaking of the work of others, but he was already staking out a territory that he would explore in his own work in a few short years.

In this early review the young Heidegger focuses on logic, addressing various recent attempts to ground logic, to account for logic as something more than a system of conventions, contingently arrived at. Here he “confronts the major current theories of logic, including the metaphysical grounding of logic in Neo-Scholasticism, Neo-Kantianism, ‘critical idealism’ (transcendental logic or epistemology as first philosophy), O. Külpe’s ‘critical realism,’ and Husserl’s phenomenology.”\textsuperscript{54} This analysis of current trends in the study of logic took on issues far more fundamental than the questions of practical application and the formal mechanics of logical practice. Steven Galt Crowell offers a concise summary of some of the issues at stake:

Whether inspired by Aristotle or Kant, logical theory sought to account for concepts which make empirical scientific knowledge possible, the ground of the ‘objective validity’ of knowledge. Thus logic did not merely elaborate formal properties of argument; as transcendental logic or ‘logic of truth’ it embraced fundamental questions of the theory of knowledge and science. Even Neo-

Scholastic positions subordinating logic to metaphysics were formulated in terms of the transcendental question of the conditions of possibility for knowledge…

Since the publication of Kant’s First Critique, epistemological questions had risen to prominence. Philosophical debate in the decades around the turn of the century, across a wide range of disciplinary and methodological positions, felt the influence of Kant, in epistemology, in alethiology, in the Geistwissenschaften more broadly (from the philosophy of history to religious thought and beyond), and indeed, in the philosophy of science. The expansion that logic experienced in the nineteenth century came in Kant’s wake and could not have occurred without him.

The question of finding an ultimate fundamental ground, for finding a degree of necessity in the face of contingency became urgent in the light of nineteenth century crises of historicism, reason and irrationalism, and ultimately, of the issue of relativism. The nineteenth century produced a series of foundational crises that came to a head in the first decades of the twentieth. These crises shook the faith of some intellectuals in the old guard in terms of grounding ideals and certainties.

The intellectual crises of the nineteenth century concern us here in two senses. In the first sense, they produced a general, cumulative sense of crisis and uncertainty for intellectuals at the close of the century and the opening of the next. This has been characterised variously as a crisis of culture, reason, faith, the self, etc. I characterize

55 Ibid.
57 There are a wide range of accounts, see for instance: Burrow, J. W. The Crisis of Reason: European Thought, 1848-1914. New Haven: Yale University Press, 2000,
this phenomenon as a more general “crisis of meaning” a term that, I believe, gets at the structural nature of this crisis and is thus able to account, on a fundamental level, for its various appearances and manifestations in diverse and often disconnected fields.

The second way in which these nineteenth century crises affect our story here is far less general. There were also specific crises in the nineteenth century within philosophy and the sciences that both Heidegger and Bohr were attempting to come to terms with and find solutions to. There are then both the general, cumulative cultural sense of crisis that was “in the air” and the specific practical-intellectual trajectories that lead from specific intellectual crises in the nineteenth century and attempts on the part of the two key figures of this story to come to terms with and hopefully to solve them.

While many accounts of crisis in the nineteenth century stress the romantic rejection of the Enlightenment project as a starting point, the specific trajectory that interests us here begins earlier, with Kant’s attempt to come to terms with Humean scepticism. Kant’s 1781 Critique of Pure Reason had an impact on the world of Central European philosophy that is hard to overestimate. By the early twentieth century, in the form of neo-Kantianism, Kant’s ideas had become enshrined as the dominant mode of academic philosophy in Germany. It was in this environment that the young Heidegger began his career in philosophy, and when he turned to the problem of meaning in his


58 See below for a clarification of this misrepresentation.
Habilitationsschrift he was focusing on a problem that had its roots in Kant’s response to Hume.

**From Kant to Heidegger**

Kant’s importance for our story originates in the simple fact that he took Humean scepticism seriously. Hume had argued, seemingly contrary to common sense, that there “is no ‘necessary connection’ among matters of fact,” that cause and effect were mere inferences and that there is no reason to believe that our ideas about the nature of the universe (both those received and those we develop on our own) necessarily correspond to reality. As William Jones puts it,

> Hume regarded reason as merely an instrument for detecting relations among ideas; reason can tell us nothing, he thought, about the real world. We do experience nature – the real world – as ordered. But there is no evidence, Hume maintained, that the order we find there is necessary. There is no rational in nature to which the rational mind of man conforms.⁶⁰

This line of argument amounted to a rationalistic destruction of much of the edifice that Enlightenment thinkers believed they were building out of reason. “Hume in effect was driving a wedge between reason and nature.”⁶¹ This was a ground-level scepticism that brought down hopes of building up rationalistic pictures of the universe. As Hume put it:

> The most perfect philosophy of the natural kind only staves off our ignorance a little longer: as perhaps the most perfect philosophy of the moral or metaphysical

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⁶¹ Ibid.
kind serves only to discover larger portions of it. Thus the observation of human blindness and weakness is the result of all philosophy, and meets us at every turn, in spite of our endeavours to elude or avoid it.62

This Kant could not ignore.

Kant took Humean scepticism to be a dangerous threat to the ideals of Enlightenment to which he subscribed. But Hume’s ideas could not easily be dismissed. Kant realised that to address them adequately he would have to approach Hume’s problems from another angle. Kant’s earlier work in metaphysics, logic, and ethics became supplanted by a new critical turn that his philosophy took in the decade leading up to the publication of the Critique of Pure Reason. As Kant put it in the Prolegomena to any Future Metaphysics “the remembrance of David Hume was the very thing that many years ago first interrupted my dogmatic slumber and gave a completely different direction to my researches in the field of speculative philosophy.”63

The dogmatic slumber that Kant refers to is the belief in the powers of an unproblematic reason and the subsequent pursuit of what he refers to as “dogmatic” metaphysics.64 Hume had shown the lack of absolute and universal certainty in the

64 Kant breaks metaphysics up into three movements, which he places in a (very) rough historical schema: first comes dogmatic metaphysics, which believes that through the use of pure reason alone it can come to the heart of things, then follows scepticism in metaphysics, which denies reason any real knowledge, and then, finally, Kant’s own critical method becomes the arbiter of the battles between the dogmatists and the sceptics in the field of reason. [See the preface to CPR second edition, from B XIV] [See also
products of reason. Dismayed by this failure of reason, Kant set out to determine the limits of reason’s proper application. This is the project that he embarks upon in the First Critique: delimiting the proper sphere of application of pure reason.

One of Kant’s key goals was to find a solid ground upon which the edifice of reason could be built. If it was not to rest on mere speculation about things that could never be ascertained with absolute and universal certainty, and if it was not to be based upon the contingent realities of our everyday experience (the two problems are interrelated), then reason had to find a solid ground; it needed to find something absolutely certain upon which to build. If this ground could not be found then the fruits of reason would rot on the vine, dissipating into a fundamental relativism.

The concept of ground in Kant is a difficult one; it is both important, and, for the most part, ill defined.\(^6^5\) Ground is that out of which things grow; it is also that upon which things stand. But a ground is also a reason for something, as in “grounds for dismissal.”\(^6^6\) The English word “ground” comes from the German “Grund,”\(^6^7\) which is

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\(^{66}\) Howard Caygill in his Kant Dictionary refers to ground as “an extremely rich and ambiguous concept which Kant uses in several senses…”, noting in particular that “it is often synonymous with ratio or reason as well as with cause and, on occasions, with principle. This polysemy has generated severe problems with translating the term, which has consequently rendered Kant’s usage even more opaque.” Caygill, Howard. *A Kant Dictionary.* Oxford: Blackwell Publishers, 1995, p. 217.

\(^{67}\) Indeed, Kant will often use “ground” for “reason,” or even “cause.” Ibid.

\(^{67}\) The *Oxford English Dictionary* notes that there are no known cognates outside the Germanic languages.

Ground is: “The bottom; the lowest part or downward limit of anything.”
the term Kant employed. “Grund” carries virtually the same connotations and denotations as “ground.”\textsuperscript{68} Grounds, for Kant, are the foundations of a given thing; and he is concerned, in the First Critique and elsewhere, with various different kinds of ground (grounds of knowledge, grounds for judgement, etc.).

“Grund” itself has a long history in German philosophy. Kant is particularly concerned with disentangling what he sees as incompatible cases of different types of grounds in the then prevalent “Leibniz-Wolff philosophy.” As Caygill notes,

Wolff in particular founded his entire philosophical system upon the ambiguities of the term ground, using it to unite the fields of logic, metaphysics, ethics and

politics into a rationalistic system. Kant consistently opposed this project throughout his career... and the focus of his criticism was precisely the ambiguous notion of ground.69

The main problem that Kant saw with Wolff’s use of ground to unite these disparate fields of philosophical endeavour was that he conflated different types of ground that have nothing to do with one another. In particular, Kant argued that Wolff conflated logical and ontological grounds in an attempt to unite logic and ontology.

Kant defined the term in *A New Elucidation of the First Principles of Metaphysical Cognition* (1755), which predates his critical turn by several years:

That which determines a subject in respect of any of its predicates, is called the *ground*. *Grounds* may be differentiated into those which are antecedently determining and those which are consequentially determining. An *antecedently* determining ground is one, the concept of which precedes that which is determined. That is to say, an antecedently determining ground is one, in the absence of which that which is determined would not be intelligible. A *consequently* determining ground is one which would not be posited unless the concept which is determined by it had not already been posited from some other source. You can also call the former the reason *why*, or the ground of being or becoming, while the latter can be called the ground *that*, or the ground of knowing.70

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70 *A New Elucidation of the First Principles of metaphysical Cognition*, in:
Kant is here differentiating first, between the ground or reason by which we may say *that something is* (the ground of knowing) – representing the question: “By what do I know that a thing is?” (by sensory information for a physical object, for instance), and, second, the ground or reason by which we can say *why* a thing is (the far more difficult ground of being) – representing the big, and probably unanswerable, philosophical question: “Why?”

There are, of course, an infinite number of lower order, derived questions pertaining to grounds of being that *are* answerable. These are what we might term *regional* why-questions (as opposed to the fundamental why-question). “Why is the scotch bottle empty?” may find an adequate answer in the statement: “Because I drank its contents.” But the further we move from specific why-questions toward more general why-questions, the more difficulty we encounter. The question of the ground of the empty scotch bottle may itself be questioned: “Why did you drink its contents?” “Because I fancied a drink.” “Why did you fancy a drink?” and so on, until we realise that we have arrived at the dreaded *regressus ad infinitum*. And if we attempt to circumvent this infinite chain of why-questions by posing the big why-question (which Heidegger once formulated as the question “Why are there beings and not nothing?” but which could just as easily be posed by the more economical “Why?”) we leave the realm of philosophy’s *individual* difficulties and arrive at its *fundamental* difficulty: the infinite *why*, so incomprehensibly vast and manifold in its very infinity that, as with the concept of infinite quantity, we can only deal with it as a unity: $\infty$-why.

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In his “proof of the reality of [the above] definition” of ground Kant expands and explains with an example:

Suppose we seek for the ground of all evils in the world. What is being sought is not the ground that, in other words, not the ground of knowing, for experience takes its place. What has to be specified is the ground why, that is to say, the ground of becoming. In other words, the ground which has to be specified is the ground, the positing of which renders intelligible the fact that the world is not antecedently indeterminate in respect of this predicate. By contrast, once the ground is posited, the predicate of evils is posited to the exclusion of its opposite. A ground, therefore, converts things which are indeterminate into things which are determinate. And since all truth is generated by the determination of a predicate in a subject, it follows that the determining ground is not only the criterion of truth; it is also its source. And if one abandoned it, one would indeed discover a great deal which was possible, but nothing at all which was true.\textsuperscript{71}

Kant’s concept of the determining ground, which he offers as replacement for the concept of sufficient ground (known to us in English as the principle of sufficient reason) represents the type of quarry that the metaphysical why seeks. His proposition that “nothing is true without a determining ground” is meant to apply to all predicates posed about any subject whatsoever (and thus contains the problem of the vicious circle within itself though Kant does not seem to be bothered by this).

\textsuperscript{71} Kant, \textit{New Elucidation}, p. 12.
Kant arrives at Heidegger’s formulation of the big question when he examines the issue of “the ground which determines existence.”\textsuperscript{72} If we are not to have a \textit{regressus ad infinitum} then there must be an ultimate ground that establishes (\textit{grounds} [verbal]) an infinitely expansive host of antecedent grounds.\textsuperscript{73} This ultimate ground can neither have a ground exterior to itself (in which case it would not be an ultimate ground), nor can it be its own ground (which is an impossibility). But here we have come up against the problem of the uncaused cause – much more than a mechanical prime-mover of matter, motion, and life, but a ground for the ever shifting relational manifold of meaning.

Following the chain of grounds back to an ultimate source leads Kant to the problems of necessity and contingency. If we grant that things that exist must have grounds, and then follow the line of questioning to the grounds of these grounds and so on and so forth, back to the question of either a \textit{regressus ad infinitum} of grounds, or of an ultimate ground, we come across what Kant would later describe as an antinomy of reason in the First Critique. Is all that is merely an infinite set of relations and relations of relations, ground upon ground, unending, in which case all meaning \textit{ultimately} dissolves into contingency (it \textit{is} but with \textit{no ultimate ground}), or is there necessity in existence, in which case, the \textit{regressionem causa petendi} must come to an end at an ultimate ground?

If we are to argue that this sort of absolute necessity exists – beyond the second order necessity within specific relations within an ultimately contingent existence

\textsuperscript{72} Kant, \textit{New Elucidation}, p. 14.
\textsuperscript{73} At this point in his career and on this subject Kant is in line with Aristotle and Duns Scotus, both of whom we will encounter later.
(necessity merely within ultimate contingency) – then, Kant argues, we come across an ultimate ground that must be ungrounded (that must simply be).

If anything, therefore, is said to exist absolutely necessarily, that thing does not exist because of some ground; it exists because the opposite cannot be thought at all. This impossibility of the opposite is the ground of the knowledge of its existence, but an antecedently determining ground is completely absent. It exists; and in respect of the thing in question, to have said and to have conceived this of it is sufficient.\(^{74}\)

The Kant of 1755, of the New Elucidation, finds this ground in God. As he puts it in Proposition VII: “only one such being exists absolutely necessarily. Thus there is a God, and only one God, the absolutely necessary principle of all possibility.”\(^{75}\)

Kant piles everything on top of this ultimate ground (as, of course, is proper to an ultimate ground). He supports this with further propositions, arguing that, “Of all beings, God is the only one in which existence is prior to, or, if you prefer, identical with possibility. And as soon as you deny the existence of God, every concept of possibility vanishes.”\(^{76}\) Everything, seemingly, rests upon this concept.

Kant argues that everything must have its ground, and therefore he needs an ultimate ground upon which to build any conception of existence. In the New Elucidation he finds this ultimate ground in God.

\(^{74}\) Kant, New Elucidation, p. 13.
\(^{75}\) Kant, New Elucidation, p. 14.
\(^{76}\) Kant, New Elucidation, p. 17.
And thus by tracing one’s way along the inexorable chain of events which, as Chrysippos says, once and for all snakes its way along and weaves its path through the eternal series of consequences, one eventually arrives at the first state of the world. And this state immediately reveals God, the Creator, the ultimate ground of events, and the fertile ground of so many consequences. Once this ultimate ground is posited, other grounds follow, and others from them, down through the ages which follow, in accordance with an ever constant law. But what happens, as it did with Kant later, when “the ground that, or the ground of knowing” of this posited ultimate ground comes into question?

Kant’s Copernican Revolution came, in part, as a result of confronting this very issue. The problem of the ground of knowing of God became a problem for Kant. The Fourth Antinomy explains and confronts the problematic nature of the question of whether there is or is not a necessary being. And, in addition to and in combination with Hume’s challenge, it was through grappling with the antinomies that Kant came upon the problems that the Critique was supposed to solve. The world of European philosophy had, in large part, been safe from ultimate contingency and relativism in its speculations because of the solidity of its belief in God as the ultimate ground. But when this solidity was shaken, the question of the ultimate ground was opened again, and the body of philosophy was left vulnerable to the troubling problem of relativism. Faced with this problem, Kant attempted to ground philosophy in some remarkable ways that opened up

77 Kant, New Elucidation, p. 21.
78 Kant, Critique of Pure Reason. B 480-595.
philosophical problems that became acute in the early twentieth century, and, indeed, persist to this day.

Stepping back for a moment to a more general sense of “ground,” I argue that an essential goal of the Critical Philosophy is, in fact, a grounding. In the First Critique and his subsequent work, Kant attempts to ground philosophy. The critical philosophy is an attempt to ground philosophy by putting it on a firm foundation (the firmest foundation that Kant thinks is possible). It lays the ground for a new kind of (albeit restricted) science of metaphysics. But it also puts philosophy’s feet back on the ground by putting an end to the flights of fancy of what Kant referred to as dogmatic metaphysics and the uses to which it puts speculative reason. Ground is also the “downward limit of anything”\footnote{Oxford English Dictionary, p. 449.} and in this sense as well Kant had hoped to ground philosophy by discovering what he thought was the downward limit of scepticism, the bane of dogmatic metaphysics.

That this essential goal of grounding is not the only thing that the critical philosophy is about is obvious. And I am not even arguing here that this was what Kant consciously had in mind when he wrote the First Critique. Rather, I am arguing that this was an essential part of the nature of the project. It was an intellectual trajectory that played out in the Critical Philosophy as part of a broader historical development of the philosophical problems of ground, meaning, necessity and contingency, epistemology, and ontology.
There is a certain physics to philosophy. Certain problems, ideas, arguments, etc. open up potential intellectual trajectories. Lines of thought, of argument, of questioning exist potentially or actually in a probabilistic historical universe of thought. Intellectual actions and reactions form links in chains of thought, interlacing and connecting to form the nomologic web strewn through the spatio-temporal matrix of the history of thought – each instance of communicated thought opens up probabilities that either will or will not be actualised, creating further probabilities, and so on.

Kant’s confrontation with the problems of ground and the subsequent attempts to ground philosophy in the critique opened up a range of possibilities and set various intellectual trajectories (Romanticism, German Idealism and materialist reactions against it, neo-Kantianism, Transcendental Value Philosophy, etc.) in motion that would play out in various fields through the nineteenth century and culminate in the 1920’s as a foundational crisis of meaning, centred on the still unresolved problem of ultimate ground. Our question is not about the significance of Kant for philosophy. Our question is about the problem of meaning, examined from the point of view of Heidegger’s groundbreaking philosophy and the strange intersection between physics and philosophy in Central Europe in the 1920’s. In particular, in the thought of Bohr. Thus the question of Kant’s overall significance is ultimately unimportant here. What is important is the question of Kant’s significance for our problem. And here, the above account is the prime significance.

Karl Jaspers, who, in the 1920’s was one of Heidegger’s close friends and philosophical allies (in fact, at this time, the two thinkers saw themselves as brothers in
arms), has an account of the essence of Kant’s thought and its significance that is remarkably similar to the one I describe above. Jaspers notes that, early in his career,

[Kant] became acquainted with traditional ontology and metaphysics…

[Particularly Wolff and Leibniz] He shared their fundamental certainty, their questions and problems. But in his dealings with his predecessors and contemporaries he strove for one thing above all: indubitable certainty.80

Indeed, Jaspers points directly to our problem as essential to understanding the intellectual path Kant travelled:

This train of thought distinguishes the ground of being (or becoming) from the cause of knowledge. The former is the determining, productive ground which determines a priori, the latter is the cause that determines a posteriori, that merely explains. If we think that God or absolute unconditional being necessarily exists because the opposite is unthinkable, what is lacking in this line of reasoning is the a priori determining ground of the existence of an absolutely necessary being.81

Here we come upon the problem described above.

Thus there is no proof of the existence of God. Possibility and impossibility provide no basis for apprehending the existential ground… In these ideas, Kant strives to penetrate to what precedes every possible thinkable. Being and thinking are not the same. Thinking presupposes reality. Reality may not be taken as logical necessity. The logical necessity of what we think is not the real necessity

81 Ibid.
of being. *Logical relations may not be mistaken for real relations.* Being cannot be derived and constructed from logical necessity.\(^{82}\) Jaspers here draws attention to the problem faced by the Kant of the First Critique: the problematic nature of his earlier determination of the ultimate ground.

Belief provided no way out of this problem. “A sense of conviction is an avowal, not a compelling argument.”\(^{83}\) Kant was faced with a chasm beneath the feet of philosophy. He then doubted the possibility of any metaphysics whatsoever. But he still desired certainty and thus tried to find new ways of securing it.

If Kant’s negative insight was not to be mere resignation, he would have to find new certainty along new paths of metaphysical thinking… From the outset Kant accepted as self-evident the ill-defined traditional view that thinking is the adequate source of knowledge. But what is thinking? Where does it find its ultimate ground? What is the source of the concepts? These questions spurred him on.\(^{84}\)

This searching for a new line of thinking would eventually lead Kant to the critical philosophy, and it was rooted in the problem of ultimate ground. This was not merely the ground of physical existence, the source of the material world; it was also the source of knowledge, value, and meaning.

This line of questioning continued to evolve, developing further and further until the relationship between the subject and object of thought itself came into question for

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\(^{82}\) Ibid.

\(^{83}\) Ibid. p. 238.

\(^{84}\) Ibid. pp. 239-40.
Kant. “This is the new element in Kantian thinking. He gives the problem new depth by making a question of what had hitherto been regarded as self-evident: the existence of the relation between subject and object.”\(^8^5\) The question of certainty evolved into the question of how we know things, to the question of the ground of cognition:

Kant’s answer to the ground of our cognition will be: We know things in the world, because we have produced them, not in respect to their existence (for in existence they must be given), but in respect to their form. Thus our concepts are valid only in the realm of possible experience. Outside it they are empty because without objective meaning. They can have objective meaning only in experience, in reality based on sense perception.\(^8^6\)

One of the problems with this answer however was that it was deeply unsatisfying. Kant produced a structural account that provided as much certainty as he believed was possible, but it basically denied us access to objective meaning.\(^8^7\) Kant argued that our knowledge springs from two stems, sensibility and understanding. By the former, objects are given, by the latter they are cogitated… Sensibility as such is inarticulate, infinite, meaningless…. Understanding requires intuition if it is to become cognition rather than mere thought. Intuition requires understanding if it is not to remain a mere subjective jumble, if it is to become an object and thus take on objective meaning.\(^8^8\)

\(^8^5\) Ibid. p. 243.
\(^8^6\) Ibid. p. 245.
\(^8^7\) Ibid. p. 262.
\(^8^8\) Ibid. p. 254.
Meaning then, in Kant’s account, comes from form and sensibility, but the ultimate question of the grounds for this is beyond our reach. “[B]eing is invoked as the one root, which remains unknown to us.”\(^{89}\) Even if this answer remained (and remains) unsatisfying, in the wake of Kant it would be difficult to ever look at the problem in the same way again.

That Jaspers, someone from Heidegger’s intellectual world and engaged with similar philosophical problems, came to such a remarkably similar account of the essence of Kant’s thought is indicative that we are on the right track. Kant’s critical philosophy was a crucial event in the intellectual history of the problems of ground, meaning, necessity and contingency, epistemology, and ontology; and the reverberations of this event, the new probabilities that it created, will play themselves out throughout the rest of this dissertation. For now, however, we will return to the concept of ground itself.

Ground was an important concept for Heidegger as well. In 1929 Heidegger gave a lecture “On the Essence of Ground”\(^{90}\) exploring and explaining the nature of this weighty concept in German philosophy, but “grounds” of various sorts feature throughout his work. And grounding, as discovering the base, and as putting on a solid foundation, are crucial tasks that come up again and again in the corpus of his work. In the decades around the turn of the twentieth century this problematic question of ground became acute in the rapidly evolving field of the philosophy of logic.

\(^{89}\) Ibid. p. 255.
Logic had experienced breakthroughs in the decades surrounding the turn of the twentieth century. These breakthroughs had caused convulsions that shook the field, worrying some of its practitioners and theorists, and leaving the edifice of modern logic on shaky foundations. Heidegger’s 1915 *Habilitationsschrift*, as much as it was a

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There is scant room here to describe these developments fully, but a few major trends of particular importance both for the history of logic in general and our story in particular should be noted. Many forms and branches of logic that had developed by the time of the medieval scholastics had been lost to general knowledge and were little known by the end of the eighteenth century, by which time logic had become largely focussed on scientific discovery (post-Descartes). The nineteenth century saw massive developments in logic beginning, humbly enough, with a new spate of textbooks that compiled information on logic and presented it in one place. Many developments followed, some of the most important being the development of symbolic logic, and new ideas about the relation of logic to thought (starting with the work of Bolzano). The two most significant trends played out around the questions of the relationship between logic and mathematics (movements towards the mathematization of logic and the logicization of mathematics), and the relationship between logic and psychology. The mathematization of logic and the logicization of mathematics became two of, if not the most important trends by the turn of the 20th century through the work of Frege, Russell, and others. Mathematical and symbolic logic had developed into powerful systems that would further develop through the next century, leading in large part to the electronic world we live in today. In the first decades of the 20th century the importance of these developments was easy to see. What was less clear was the exact nature of the relationship between logic and mathematics that underlay them. The other major question, that of the relationship between logic and psychology, had begun with a trend towards reducing logic to psychology. But this move had been rejected by Frege, Husserl (who had briefly supported psychologism but had changed his mind after corresponding with Frege and then became one of its harshest critics), Russell and others. The young Heidegger also took a strong stand against psychologism early in his career (see below). These two key relational themes (between logic and mathematics and logic and psychology) contributed to the charged atmosphere and sense of flux and uncertainty that Heidegger stepped into as a student in 1912. See: Baldwin, Thomas (Ed.) *The Cambridge History of Philosophy: 1870-1945*. Cambridge: Cambridge University Press, 2012, pp. 119-73, 383-90. Dumitriu, Anton. *History of Logic*. Vol. III. Tunbridge Wells: Abacus Press, 1977, pp. 135-63, 311-74. Shanker, Stuart (Ed.) *The Routledge History of Philosophy: Vol 9 – Philosophy of Science, Logic, & Mathematics in the Twentieth Century*. London: Routledge, 1996, pp. 9-88.
somewhat expedient exploration of scholastic philosophy (see Chapter 1), was also a serious attempt to ground logic in light of these troublesome new developments. A solidly grounded logic would then provide a touchstone and could itself become a basis for new phenomenological-philosophical building. Buildings will only stand properly if we first prepare the ground.

Various other attempts to find an ultimate ground followed in the aftermath of Kant’s critical philosophy, continuing throughout the nineteenth century. Fichte sought a ground in the self and in its relation to the world, which he saw as an oscillating relation between the subject and object or the I and the not I. The German Romantics took this a step further and argued that there was in fact no first principle (ground) as Fichte conceived it; there was no ultimate foundation or unitary absolute. Hegel found his

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92 Heidegger’s *Habilitationsschrift*, influenced as it was by the practical realities of life as a student, was, for all that, a genuine, serious, and sophisticated attempt to put logic, that crucial branch and tool of philosophy, onto a firm foundation.

93 At this time logic was still in the midst of its greatest period of change and development. As Peter Simons sums it up: “From the end of the Middle Ages to the nineteenth century, logic languished in stagnation and neglect. At the end of the eighteenth century Kant declared it incapable of further improvement. Yet within a hundred years of the first stirrings in the early nineteenth century it had undergone the most fundamental transformations and substantial advance in its history. Between 1826 and 1914 logic was irreversibly changed… the story of this transformation is one of the most astonishing in the history of ideas.”


Steven Galt-Crowell characterises Heidegger’s work in this period as an attempt at “making logic philosophical again” and combating “the homelessness of logic.” Crowell points out that it was in his working through of the problems of logic that Heidegger first engaged with the crucial problem of meaning.

ground in the unfolding history of reason, which was akin to the thinking thoughts of God’s mind. Materialists reacted against this idealism, grounding their worldview in the seemingly absolute and inviolable laws of physical phenomena. Instead of a solid ground, Kierkegaard posited an abyss, bridgeable only by a leap to faith, inaccessible through reason. And in Germany, as the nineteenth century drew to a close, neo-Kantianism, a movement based on the rediscovery and reinterpretation of Kant’s ideas, given its impetus by Hermann Cohen, became the dominant philosophical movement.

Cohen’s 1871 book, *Kant’s Theory of Experience*, had created a new interest in Kant that bypassed the idealist gloss that had been added by Fichte and Hegel. Cohen was attempting to save the objectivity of human reason from subjectivist interpretations of Kant that saw the forms of thought as manifestations of a subjective element that interprets the data of the objective world. These interpretations of Kant came in the form of idealist arguments (that this was what Kant thought and that it was correct), and materialist criticisms (that also claimed that this was what Kant thought, but that it was incorrect). Cohen argued that the a priori forms of thought that Kant posited were, in fact, objective structures as they were *necessary* for our experience, rather than merely contingent.⁹⁴ Cohen’s return to a conception of objectivity in Kantian thought caused a great deal of excitement and spawned an entire movement. The exploration of the a priori objective forms of thinking became an enterprise that was seen as securing the foundations of modern science, rescuing it from idealism and scepticism. By the first years of the twentieth century this neo-Kantianism became the dominant philosophical movement.

⁹⁴ See the *Stanford Encyclopaedia of Philosophy* for a good account: http://plato.stanford.edu/entries/cohen/
mode in Germany. It had split into two main schools, one centred around the university of Marburg, which, under Cohen’s influence focused on epistemology and grounding scientific thinking, and the other in Baden, centred largely around Freiburg, that focused on questions of value.

By the early decades of the twentieth century, when Heidegger and Bohr entered their student years, what was crucial in philosophy was not so much a body of findings, as a set of prominent unanswered questions. These were the questions of the nature of meaning, of ground, of necessity and contingency, of the categories, of the subject/object relation, etc. These questions provide the background necessary for the chapters that follow here. A brief summary of the chapters now follows, which will help to indicate where we are going.

Establishing the Experimental Parameters Part 2:
The Basic Outline of the Experiment

The basic outline of this historico-philosophical experiment takes the form of an historical study of the place of meaning and the related concepts of ground, necessity and contingency, and truth in Heidegger’s early thought (chapters 1 to 4), followed by an analysis that outlines a set of preliminary experimental findings derived from this historical exploration (chapter 5). The preliminary experimental findings will then be tested in a new problem situation in an historical study of the place of meaning and the above related concepts in Bohr’s thought (chapters 6 and 7). A general conclusion will then bring the study to a close.
Though the broader goal of this dissertation is an historio-philosophical engagement with the problem of meaning, the individual iterations of the experiment (first in Heidegger’s thought, then Bohr’s) will take the form of investigations in the history of philosophy and the history and philosophy of science respectively. This project attempts to explore an exceedingly difficult philosophical problem. The unusual methodological approach is a result of this difficulty. I have attempted to introduce a methodology that responds to the uncertain and nebulous problem under question. My hopes were that this approach would allow me to come into a better understanding of the nature of meaning, and I believe that it has. I also hope that, by narrating the history of my experimental research in the way that I have, the reader will be granted access to this increased understanding.

This was a difficult project to carry out, and it may also be a difficult project to follow. In recognition of this I have added a considerable amount of “extra apparatus,” if you will, that should help the reader along. The individual iterations of the experiment (chapters 1 to 4 and chapters 6 to 7) follow the historical trajectories of meaning within the thought of Heidegger and Bohr. In these investigations it becomes incredibly easy to lose the main track of our experimental focus as we become carried away by the force of the ideas that these two powerful minds produce. I will sometimes move between two levels of investigation, following the ideas within the context of Heidegger or Bohr’s thought, which may not at any given time be expressly focused on the question of meaning, and then tying the ideas within this thought back to the question of meaning. Generally, when I do this, I will use phrases like: “our topic” and “our concern,” and so
I am painfully aware of the inelegance of formulations such as these, but they seem to be the most useful way to “call back” to the exploration of the problem of meaning and put developments within the experimental observations into the context of the experiment’s goal, lest we get lost in the material itself.

The overall method of analysis of this dissertation is hermeneutic and analytic; it is interpretive, and it is dissective. It is based on reading texts, tracing ideas, analyzing logical contextures, exploring semantic threads, and discovering and exploring context. As such, a certain amount of repetition is necessary. Many key ideas will be encountered multiple times, often in very different contexts and, indeed, in different shapes and forms. The difficult material necessitates such an approach. There is a vast amount of difficult material to engage with and it may take quite some time before the reader feels as though we have progressed, before things begin to seem to come together.

Terms may be encountered before they are fully defined; sometimes, initial encounters will have only their context by which one can discern their meaning. A lexical glossary has been added (Appendix 2), which should help in this regard, but often, when a term is not explicitly defined in an initial encounter, the intent is to leave its meaning indeterminate for the moment. The glossary can fruitfully be read as a whole at any point.

The hermeneutic method, which we will encounter in our discussion of Heidegger, involves multiple re-readings of texts, each building upon the last, in the attempt to come to ever-deeper levels of understanding. In our first encounters the material will be hazy, indefinite, and ill-understood; but through the pursuit of further encounters we will increase our familiarity, discern more connections, see the finer grain of the problems, gain a better understanding of connections, etc. For more, see Gadamer, Hans-Georg. *Truth and Method*. New York: Continuum, 2003. Esp. pp. 265-380, and Gadamer, Hans-Georg. *Philosophical Hermeneutics*. Berkeley: University of California Press, 1977, Esp. p. 8.
in the story (between chapters 2 and 3 would be a helpful moment); and the reader can consult it for individual terms at any point.

Two other appendices have also been added. The first (Appendix 1) gives a narrative of Heidegger’s lecture courses from 1919 to 1926. These courses are the primary source for our understanding of the development of his thought in this period. While chapters 1 to 4 focus specifically on the problem of meaning in Heidegger’s thought, Appendix 1 gives the broader picture, summarising the courses in regard to their basic arguments and concerns rather than specifically in regard to “our prime concern:” the problem of meaning. Like the lexical glossary, this appendix can be referred to at any point in the story, but a particularly useful moment to read it as a whole would be between chapters 1 and 2.

Appendix 3 provides an historical timeline of the development of quantum physics. It begins in the nineteenth century and marks major developments in the physics of the sub-atomic realm from Maxwell to the conclusion of our study in Bohr’s concept of Complementarity and the attending so-called “Copenhagen Interpretation” of quantum mechanics. Our discussion of Bohr and quantum physics will be shorter than our discussion of Heidegger’s thought. Initially this was not the plan. But as research developed it became apparent that Heidegger’s thought was the more fruitful place to introduce the ideas and to carry out the initial experiment. The original plan of a “back and forth” presentation was then abandoned in favour of the current approach, which begins with Heidegger and follows his thought through to its culmination in Being and Time, was developed. The prime reason for this decision was that the ideas under
question are dealt with more explicitly in Heidegger’s thought, and there is a certain narrative force present in his development that carries the experiment along. An unexpected result of this change in direction is that the exploration of Heidegger’s thought provides a frame through which to view the development of quantum physics that allows us to see its development in a new and particularly revealing way. This was entirely unexpected, but it has been an unho-ped-for boon.

Another unexpected development that resulted from this project is the light it sheds on the question of the nature of science. Heidegger spent much of the 1920s in a dialogue with science. This relationship was often a fraught one, but the question of the nature of science was always one that he took seriously. Our study encounters his thoughts on science in many different forms at different points in his development. We will also encounter Bohr’s ideas about the nature of science. Both of these encounters will give us food for thought, but they will also become entangled with “our primary concern:” the problem of meaning. Meaning – and the various related philosophical phenomena we have encountered thus far – is intimately tied to understanding,\textsuperscript{96} as is science; and it is at the nexus of this relational entanglement that we will explore the question of the nature of science, both in the two experiments, and in the analysis of their findings.

There are also several figures included throughout the dissertation. With the exception of Heidegger’s own “KNS Schema” in Chapter 2 and some images from

\textsuperscript{96} Indeed, though our central aim is to discover what “meaning” means, as meaning is that through which understanding operates, another way of saying this is to say that we aim to explore what it means to \textit{understand}. 
physics texts, all of these figures are my own creations. Like the appendices, they have been added in order to help the reader to understand the often obscure and difficult concepts and their connections.

*The Chapter Structure*

**Chapter 1** offers further historical, methodological, and terminological introduction; it lays out many of the key issues that will be important throughout the dissertation and some of their basic connections. It begins our engagement with the problem of meaning in Heidegger’s thought in his 1915 *Habilitationsschrift*. Chapter 1 may be the most difficult in the entire project. As a first encounter with many of the issues under investigation much will be murky and for the reader it may feel as though the path forward is very unclear.

**Chapter 2** continues to follow Heidegger’s engagement with the problem of meaning through his earliest lecture courses, which focus on the nature of philosophical inquiry itself. This is the period where Heidegger really becomes *Heidegger*. And in this section the experimental historical-examination begins to bear real fruit, we begin to see ideas about meaning that illuminate the concept in new ways. And, at the same time, ideas begin to emerge that foreshadow and already begin to shed light on the later discussion of quantum mechanics.

**Chapter 3** examines the problem of meaning in Heidegger’s courses on the phenomenology of religion and finds its central focus on his engagement with Aristotle.
Heidegger’s engagement with Aristotle proves to be the crux-moment of the developmental history that we are tracing. Here Heidegger encounters the problems of relativism and scepticism, those of necessity and contingency, and ultimate ground, all of which come together in a critical account of the nature of understanding and the history of philosophy.

Chapter 4 further explores the results of Heidegger’s Aristotle engagement. It outlines the positive alternative metaphysical project that Heidegger begins in an aborted attempt to write a book on Aristotle, which leads to the more successful – though itself incomplete – attempt that is Being and Time. Here Heidegger’s refined, phenomenological account of meaning is presented and analysed, providing the culmination of our first experiment.

Chapter 5 presents the preliminary findings of the first experiment. It locates a structural historico-philosophical trajectory as well as a series of structural findings pertaining to the phenomenon of meaning. These findings will be further tested against the different problem situation of quantum mechanics in the chapters that follow.

Chapter 6 introduces and begins the second experimental situation. It traces the problem of meaning in the early history of the quantum problem and Bohr’s role in the development of quantum physics culminating in his quantized model of the atom’s structure in 1913.
Chapter 7 traces the birth and development of a rational quantum mechanics and the problem of its interpretation. It then describes Bohr’s “quantum philosophy” centred on his notion of complementarity and examines them in relation to the theoretical findings about meaning, gained in the examination of Heidegger’s engagement with the problem of meaning and outlined in Chapter 3.

The Conclusion brings it all to a close. It summarises the findings of the experiment, and poses new questions for further research.

Appendixes and Bibliography follow.
...it is only with meanings that philosophical reflection begins

Heidegger

Chapter 1 – The Problem of Meaning in the Early Heidegger

Martin Heidegger began his confrontation with the problem of meaning at least as early as his 1914 doctoral dissertation. But his 1915 Habilitation thesis was his first serious exploration of this theme, which was to become one of the central problems of his career. In this chapter I will chart the development of Heidegger’s thought on the problem of meaning during his student years, culminating in 1916 in a research programme that Heidegger laid out as his time as a student came to an end and his professional career began. I want to tell the developmental story whilst avoiding the temptation to read forward to Being and Time. This is extremely difficult to do, since the temptation to pick up ideas that prefigure aspects of Heidegger’s central opus and “run with them” can be very powerful. There are many ways in which giving in to this temptation can be profitable – in less historically bounded philosophical explorations, for instance – but for the historical exploration of ideas, which I believe to be the most fruitful way to let thought speak to us, a developmental account that follows processes, rather than obliterating them, seems the best way to proceed.

I take my structural cues from Theodore Kisiel’s insistence on Theophrastus’ approach to understanding thinkers of the past, sorting out what Kisiel refers to as the
BCD of the philological method – that is: biography, chronology, and doxography. The biographical content will be kept to a minimum, focusing on those aspects of both Heidegger and Bohr’s lives that help us to understand the development of their respective ideas. A light hand with the biography leaves more room for historical examination of the ideas themselves and helps to avoid the pitfall of biographical reductionism, which can, whether intentionally or unintentionally, reduce the relation between life and thought to one of cause and effect, which can conceal more than it illuminates.

The chronologic aspect will manifest itself most noticeably in the decision to follow the progression of ideas as they develop and to stress the distinctly historical nature of thought. But it begins in the minutia of establishing the precise sequence of events, which, thankfully in both Heidegger and Bohr’s cases, has been worked out through the tireless labour of dedicated scholars. This is the necessary initial groundwork for the history of thought. Without this chronological skeleton upon which to hang the flesh of ideas, the vital historical examination of thought would be futile.

Doxography deals with the content of a past philosopher’s thought. Literally “opinion writing,” the task of Doxography is to get straight what a philosopher actually said/wrote and hopefully, a sense of what they meant – no an easy task to say the least. My methodology is largely doxographical, contextual, analytic, and, predominantly textual – as long as “textual” is taken to always be related to context and to relational nexuses of texts. My approach should not be taken to imply a belief in the importance of

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98 Kisiel is one of these in Heidegger’s case.
internalist accounts of intellectual history and the history of science over externalist accounts. It is my belief that both internalist and externalist accounts are equally important for a full understanding of history, an understanding that is communal and ever changing and evolving. That my approach is largely internal is due to my training, my interests, and my cognitive strengths. I hope to make my own partial – though, I hope, valuable – contribution to the dialogue in the domain where I am best able to contribute: that of abstract ideas.

I begin then with some brief biographical notes that will situate the early Heidegger and help the reader to understand “where he was coming from,” what sort of historical situation this thinker and his ideas arose out of and what sort of background presuppositions and ideas he entertained, held, struggled against, and modified.

Heidegger’s Early Biography

Heidegger was born on September 26th, 1889 in the town of Meßkirch in Baden. His upbringing in Germany’s Catholic South had a profound effect on the development of his life and thought. Heidegger’s family was neither well off nor particularly poor, but was incapable of financing an expensive education, and it was thanks to the Catholic Church that he was able to receive an education, first in Meßkirch and then at the Catholic gymnasium in Konstanz and Freiburg. Heidegger’s entire career owed a debt to the Catholic Church that manifested itself at times as a source of certitude, and, at others, a burden.

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99 Hugo Ott notes, based on an 1896 income assessment of artisans in the region, that the family’s income was “enough for a family of five to live on, but it did not leave a penny to spare to send gifted children to a school that led to higher education.” Ott, Hugo, Martin Heidegger: A Political Life. Hammersmith: HarperCollins, 1993, p. 47.
Heidegger’s principal biographers, Hugo Ott and Rudiger Safranski, point to the importance of this South-German Catholic upbringing for the development of the nature of Heidegger’s thought.\(^\text{100}\) As Heidegger himself put it in *Unterwegs zur Sprache*:

“Without these theological origins I should never have found my way to philosophy.”\(^\text{101}\)

Heidegger remained deeply affected by the worldview he imbibed as a child and young man. At times he was guided by it, at others he rebelled against it; he modified it, abandoned it, and embraced it, but it was always with him.\(^\text{102}\) The period of Heidegger’s life dealt with in this study can be broken down into three sections, representing three phases of religious outlook in his philosophy:\(^\text{103}\) 1) the earliest period, when Heidegger was actively guided by Catholic philosophy, ending with his 1919 break with “the system

\(^{100}\) Ott, *Martin Heidegger*. Safranski, Rüdiger, *Martin Heidegger: Between Good and Evil*. Cambridge: Harvard University Press, 2002. Safranski’s account uses Ott’s original research extensively (as do most works in the field) therefore citations will predominantly be from Ott’s seminal work. Translations of primary documents cited in Ott are those of Alan Blunden, who did the English edition of Ott’s book cited above.


\(^{102}\) Note Heidegger’s 1935 letter to Karl Jaspers, also quoted by Ott, where he mentions “the struggle with the faith of my birth.” *Heidegger-Jaspers Briefe*, Quoted in Ott, *Martin Heidegger*, p. 37.

\(^{103}\) The issues of Heidegger’s religious beliefs and the place of religion in his thought are complex and threaten to drag us into discussions too large to delve into here. Nevertheless, a few brief remarks may be helpful: Religious questions and religious beliefs played an important role in Heidegger’s intellectual world throughout his life. But Heidegger often steers clear of an explicitly religious philosophy (to the extent that the place of religion within his thought has often been confused and misunderstood). Pronouncements by Heidegger in the 1920’s that philosophy must be atheistic are only complicated by his use of structures from the world of religion in a de-sacralised manner (sin for instance) in the same period. A key point for us to note at this stage is that Heidegger’s own religious beliefs and their influence (or lack thereof) on his philosophy, and the space he devotes to religion in his philosophy (whatever specific content that may enclose), are not the same thing. And we must remember to keep these issues distinct in order to better understand the relations between them.
of Catholicism,“104 2) his developing career through the early 1920’s, when he became exposed to other influences (converting to Protestantism), and 3) a move away from confessionally oriented Christianity (some time before 1925) in general and his pursuit of a philosophy detached from the theological.

These three periods can be related to three phases of Heidegger’s philosophical growth in general: 1) the period under the direct influence of Scholastic thought (student years), 2) the period under the influence of Dilthey and Lebensphilosophie (the period of his early teaching career and his rapidly growing reputation, when he worked out his ideas), and 3) his engagement with Aristotle and the development of the existential analytic and fundamental ontology of Sein und Zeit (the years before and after Sein und Zeit). Each of these phases will be explored chronologically, beginning, in this chapter, with Heidegger’s Catholic period, under the influence of scholastic philosophy, but also the dominant Neo-Kantianism, the logical theory of Emil Lask, and Husserl’s early phenomenology. The central work for understanding Heidegger’s thought on meaning in this period is his 1915 Habilitationsschrift, Die Kategorien und Bedeutungslehre des Duns Scotus.105 And this work will provide the primary focal point for this chapter.

Heidegger’s path to this work was a groping one, full of false starts and disappointed aims. In 1903 the young Heidegger moved from his local elementary school to a Catholic boarding gymnasium in Konstanz. His future career in the priesthood (the

104 Ott reproduces the January 1919 letter in which Heidegger announces this break to his friend the Catholic philosopher Egelbert Krebs, citing “epistemological insights applied to the theory of historical knowledge” as the prime contributing factor. Quoted in full in Ott, Martin Heidegger, pp. 106-7.
105 GA1 Frühere Schriften, including The Category and Meaning Theories of Duns Scotus.
goal for gifted young Catholics from the countryside) seemed set when in 1906 he transferred to a different gymnasium in Freiburg in order to qualify upon graduation for a scholarship in theology at the University of Freiburg, the conditions of which were graduation from the Bertholdgymasium and the future goal of the priesthood.

Heidegger’s goal at this early stage was to become a Jesuit priest. In “September 1909 Heidegger entered the novitiate of the Society of Jesus at Tisis near Feldkirch” but “on 13 October… the young candidate was allowed to leave again, for unspecified reasons.”\(^\text{106}\) The general consensus is that Heidegger had heart problems (which he would deal with his entire life) and thus was not up to the Jesuits’ standards for physical fitness forcing him to abandon his career with them. As Ott notes: “In other words, the decision to leave was not Heidegger’s but the Jesuits’.”\(^\text{107}\) With his career as a Jesuit priest terminated before it began, Heidegger then applied to the seminary in Freiburg, beginning his theological studies at the university that winter.\(^\text{108}\)

Once enrolled as a student of theology, Heidegger also began to devote time to “the philosophical studies that formed part of the syllabus anyway.”\(^\text{109}\) He delved into Husserl’s *Logical Investigations*, Aristotle, Aquinas, and others. The theologian Carl Braig had a profound influence on the young student. “In his final year at grammar school Heidegger had already come across Braig’s treatise *On Being: An Outline of Ontology*” along with (as Heidegger’s own oft cited account states) Brentano’s *On the

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\(^{106}\) Ott, *Martin Heidegger*, p. 56.  
\(^{107}\) Ibid.  
\(^{108}\) Ibid. pp. 56-7.  
\(^{109}\) Ibid. p. 57.
Manifold Meaning of Being According to Aristotle at the Bertholdgymnasium.\textsuperscript{110}

Heidegger’s background then as a student of theology in 1910-11 was a combination of Catholic theology and dogmatics, early phenomenology, some scholasticism, ontology, and, particularly, logic. He was also well versed in German literature and was building his knowledge of the philosophical and literary traditions daily, while his overall outlook remained distinctly orthodox Catholic.\textsuperscript{111}

Heidegger’s health problems, however, intervened again and closed another career door. Denied a career as a Jesuit because of his heart problems, he was now denied any career in the priesthood for the same reason: his health simply was not up to the required standards. The issue came to a head in the winter semester of 1910-11 when Heidegger again experienced heart problems. As Ott puts it:

The young student had simply been working too hard. In addition to his not insignificant workload in theology he was also immersing himself in the study of philosophical systems and exploring the great legacy of Greek and medieval texts, learning the language of philosophical thought. All of this taxed the strength of the slightly-built theologian. In mid-February, before the winter semester was over, Heidegger had to break off his studies when a medical examination once again revealed nervous heart trouble ‘of an asthmatic nature’.\textsuperscript{112}

Heidegger returned to Meßkirch to recuperate but was faced with a serious problem. As he summed up the situation, he “was told that there was very little prospect of my being

\textsuperscript{110} Ibid. pp. 51, 55, 57.
\textsuperscript{111} Ott. \textit{Martin Heidegger}, pp. 57-65.
\textsuperscript{112} Ibid. p. 64.
able to serve later in the Church." Heidegger, now for the second time, faced a change in career plans and the possible termination of his studies (his scholarship had the priesthood as a required telos).

What was Heidegger to do? His first choice may seem surprising to those unfamiliar with this early stage in his career; amongst the options of pursuing philosophy, continuing with theology without the career goal, he also considered, and chose, to pursue mathematics and the physical sciences.

In 1911, Heidegger enrolled as a student of mathematics at the university of Freiburg. His goals for his own work in the field of mathematics were ambitious. He was interested in the logical underpinnings of mathematics and of the concept of number itself. Ott quotes a letter from Heidegger to Joseph Saur that describes, as Ott puts it, “a research programme of extraordinary substance and startling modernity…” I quote this letter at length for reasons that will be obvious. Heidegger describes his plan as “an extensive investigation into mathematical logic,” and notes:

If the whole undertaking is not to become a sterile exercise in faultfinding, a scholastic exposure of contradictions, then the problem of time and space must at least be brought close to a preliminary solution by applying to it the principles of mathematical physics. That task is made the more difficult by the fact that the theory of relativity has thrown everything in physics into a state of flux at the present. At the same time the study of logic has recently sought to merge with the

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113 Heidegger, 1915 CV, Quoted in Ott, *Martin Heidegger*, p. 65.
114 Ott notes a future goal of taking the state examination in order to become a teacher. Ott, *Martin Heidegger*, p. 67.
general theory of objects, which in turn serves to simplify the investigation again very considerably.\textsuperscript{115}

Heidegger notes that he does not yet have a clear position on the issues he wishes to discuss: “In short, my chosen field of study is itself in such a state of turmoil that it would be premature for me to adopt a firm position – quite apart from the fact that I do not yet feel competent to do so…” But the domain he stakes out as his field of investigation is as exciting as Ott finds it.\textsuperscript{116}

Again however, Heidegger’s projections for his future were denied. He simply did not have the financial resources to continue,\textsuperscript{117} and the grant that was to become his financial salvation was also to be the end of his plans to explore mathematical logic. He switched his focus from mathematics to philosophy, writing his 1913 dissertation on “The Doctrine of Judgement in Psychologism (Die Lehre vom Urteil im Psychologismus: Ein kritisch-positiver Beitrag zur Logik),” but he still planned to write on the logic of the number concept for his Habilitation thesis. The grant that Heidegger applied for and received from 1913 on however, restricted him in his choice (indeed “it was only financial considerations that prevented him from going to Göttingen to do his doctoral and Habilitation work under Husserl”\textsuperscript{118}). One of the stipulations was that the student must work on aspects of Thomistic philosophy.\textsuperscript{119} Heidegger’s Habilitationsschrift then

\begin{itemize}
\item \textsuperscript{115} Ott, Matin Heidegger, p. 71.
\item \textsuperscript{116} Ibid.
\item \textsuperscript{117} A grant that he received from Summer 1912 onwards proved to be insufficient. Ibid. p. 72.
\item \textsuperscript{119} Ibid. pp. 76-9.
\end{itemize}
was the result not only of several different influences (as we will see below) but also of several key changes in direction – from the young priest-to-be, to the student of mathematics and the natural sciences, to the philosopher of the logic of the number concept, to a confrontation with scholastic philosophy and, crucially, the problem of meaning.

Heidegger’ *Habilitationsschrift* represents the combination of several influences that come from disparate philosophical schools and, indeed, different subject matters, into a coherent response to a consideration of a single nexus of fundamental problems centring on the foundations of logic and a theory of meaning. Heidegger’s choice of topic was the result of several contributing factors – both driving interests and pressing necessities. His driving interests were: ontological concerns and questions about the foundations of logic. He was particularly against the reduction to an aspect either of psychology or of metaphysics (though his opinion on the later would change between 1912 and 1916). He was already keenly interested in epistemology and questions about the nature of and relation between knowledge, truth, being, and our understanding of entities, as well as the nature of the relation between language and logic. His interest in the theory of the number concept – explored by Husserl and others – also played a significant role, as did other Husserlian concerns – specifically concerns with the nature of meaning and refutations of psychologism. This was in impressive and difficult collection of interests to attempt to pursue, to say the least.

The pressing necessities Heidegger faced at the time were of two kinds: those related to his finances (the constraining conditions of his grant), and those related to his
career (Heidegger had hopes of getting an open chair in Catholic philosophy, and, in order to make himself a better candidate he was obliged to pick a topic in the history of scholastic philosophy.) All of these concerns came together in Heidegger’s Habilitationsschrift in which he was able, while accommodating the necessities, to explore his varied interests by focusing on a root problem that united them. By pursuing a theory of the meaning of meaning in his Habilitationsschrift, Heidegger was able to explore the semantic ground in which each problem had its root. Each of Heidegger’s areas of interest involved the problem of meaning in its own way. And it was through the problem of the meaning of meaning that he was first granted access to what he later saw as the larger fundamental issue – what he referred to as the Sache, or object, of his thinking.

The best way into the Habilitationsschrift is to first examine Heidegger’s individual concerns and then to see how they come together in the final project, but it is not immediately clear which of these concerns is the most appropriate place to start. It would seem to make sense to begin with Heidegger’s ontological concerns, following the account of the later Heidegger, who tells the story of receiving Brentano’s dissertation On the manifold sense of Being in Aristotle\(^\text{120}\) as a gift at the age of 17 in 1907. This is the primary event in the later Heidegger’s origin myth, but it may be unwise to put too much emphasis on this later account, especially since doing so draws attention away from other

\(^{120}\) Brentano, Franz, On the manifold sense of Being in Aristotle.
important sources. Of just as much importance were Heidegger’s concerns with the nature of logic, enhanced by his readings of Husserl, Rickert, and Emil Lask. One of Heidegger’s core concerns in his student period was establishing a solid ground for logic. His Habilitationsschrift was a serious attempt at contributing to this project.

**Heidegger’s Habilitationsschrift:**

*The Doctrine of the Categories and of Meaning in Duns Scotus*

How to establish a solid ground upon which to which the grand and imposing edifice of logic could stand? In his 1913 doctoral dissertation on the problem of psychologism, Heidegger had already achieved the negative task of condemning a certain site as unfit for construction. *Die Lehre vom Urteil im Psychologismus* points out that psychologism is a marshland, thoroughly unsuitable for building the solid edifice of logic. The problem with deriving the rules and structures of logic from human psychology for Heidegger (as well as for Husserl, Rickert, and others) is that, while logical judgements play out within a thinking human being’s mind, they remain, independent from the actual thought-acts of that thinking human being: Logical considerations remain the same whether I think them, you think them, or no one thinks them. Thus, although the rules, structures, and contents of logical considerations stand in

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122 Lask was Rickert’s student who made a great deal of progress toward bridging the gap between Rickert’s neo-Kantian value philosophy and Husserl’s phenomenology but he died in the Great War, bringing a tragic end to so much philosophical promise.
a certain relation to human thought – they are embodied in actual acts of thinking – they
cannot themselves be derived and dependent upon human thought.\textsuperscript{123}

If logic is not to be grounded in a swampy psychologism and its grand category
mistake, upon what solid ground can it be built? Heidegger’s answer to this question
comes in the form of a category theory combined with a logical-systematic theory of
signification. The two theories are connected and intertwined in an overall structure that
covers, not only the divisions of the most basic domains of existence, but also the ways in
which things are connected in meaningful relations for us. In order to do this, Heidegger
brought to bear all of the tools at his disposal, combining insights across broad swaths of
time and theoretical approaches. “In his Habilitationsschrift,” as Ott points out,
Heidegger “laid the foundations of a particular interpretive approach, whereby scholastic
patterns of thought were subjected to a phenomenological interpretation inspired by the
work of Husserl.”\textsuperscript{124} But this statement does not entirely describe the situation, nor does it

\textsuperscript{123} As Kisiel sums it up: “Logic deals with the laws of thought. But ‘thought’ is an
equivocal term. It can refer to the actual psychic activity of, say, judgement made by an
individual at a certain point in time, or it can have reference to the object intended by
such activity (i.e. to the meaning of logical content of the judgement, which belongs to an
ideal order not subject to temporal fluctuation and variegation). The object of thought
(e.g. a sentence in its sense) accordingly remains identically the same in and through any
number of acts that think it. From this it follows that logic and psychology have distinctly
different topics and problematics. The identical ideal content of meaning is the proper
topic of logic, the real psychic activity the topic of psychology, and the confusion of the
latter with the former is a logical psychologism. Nowadays such confusions of levels of
being are sometimes called ‘category mistakes.’ Such difficulties are circumvented only
if logic single-mindedly concentrates on the stable identical factor of meaning pervading
the dynamic flux of mental activity like a continuous thread.”

\textsuperscript{124} Ott. Martin Heidegger. pp. 79-80. Roderick Stewart describes the Habilitationsschrift
as an attempt “to assimilate a medieval signification theory to then-available neo-Kantian
logical theory and budding Husserlian intentionality theory.” Stewart, Roderick,
give a full sense of the creativity of Heidegger’s project. For Heidegger did not just bring
the tools of phenomenology to bear on scholastic thought; of equal importance was the
fact that he employed scholastic thought to clarify, expand, and further problems in
modern philosophy (phenomenology and modern logic included). And, although the
Habilitationsschrift does indeed owe much to Husserlian phenomenology (as Heidegger
imbibed it from the 2 volumes of the Logical Investigations and the first volume of the
Ideas), it also draws heavily from Rickert (Heidegger’s neo-Kantian supervisor), Lotze,
and particularly from another of Rickert’s students, Emil Lask.  

Heidegger’s Habilitationsschrift is a difficult text that demands a lot from its
reader. What follows here will be dense and difficult at times, and the way may seem
unclear, but as we progress we will encounter some crucial problems for our own
exploration of the question of meaning that will set the stage for the chapters that follow.
The only way forward at this point is to plunge in. I ask the reader to trust me that they
will not drown. To the text then.

Early in the Habilitationsschrift Heidegger notes that this work is to be “a genuine
philosophical evaluation of scholasticism,” and further that “philosophy, like any other
science, has its worth as a cultural value. At the same time, it also has as its own-most, to

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“Signification and Radical Subjectivity in Heidegger’s Habilitationsschrift. Man and
125 Indeed, it appears as though Heidegger’s use of Lotze comes primarily through Lask.
See especially Kisiel, “Why Students of Heidegger will have to read Emil Lask,” in
126 Heidegger, Martin. Die Kategorien und Bedeutungslehre des Duns Scotus. In Frühe
Schriften. Frankfurt: Vittorio Klostermann, 1972. P. 137 Translations are mine unless
otherwise noted.
raise this claim of value as a value for life."\textsuperscript{127} By opening in this way, Heidegger indicates that this Habilitationsschrift itself, if it is to be called philosophy, must provide a value for life. What this value is to be is, in these first pages, yet uncertain, but I will argue that putting logic on a solid foundation, as opposed to and against psychologicistic reduction – an illusory non-foundation based on a category mistake – is indeed this contribution. And this is to be done by finding an ultimate ground, though the Habilitationsschrift is only a step on the way.

How does Heidegger hope to achieve this goal in a work that is both an historical philosophical exploration of scholastic thought\textsuperscript{128} and, at the same time, an exploration of a crucial current problem in modern philosophy? Here we have to delve deeply into this difficult work to find our answers.

Early in the text Heidegger notes that “there lie, in the scholastic type of thinking, moments of phenomenological examination, and indeed, possibly most strongly exactly in this type of thinking.”\textsuperscript{129} The particular instances in which Heidegger is interested here revolve around the theory of categories. Heidegger proposes that this is a “certain problem” that we must “look at in the perspective of modern research. And, indeed, to be more precise, it has particular importance for modern logic, which is concerned with it in an especially intense way.”\textsuperscript{130} He then goes on to stress the importance of this problem

\textsuperscript{127} Ibid. Emphasis in original.
\textsuperscript{128} Ibid. P. 137.
\textsuperscript{129} Ibid. p. 144.
\textsuperscript{130} Ibid.
for modern thought, quoting Windelband and Hartmann.\textsuperscript{131} The theory of categories is of central importance for modern philosophy; it is also, we shall see, the problem that Heidegger will use to provide a ground for logic, thus something solid for human thought to stand on – a great value for life in an age increasingly in the grips of turmoil and anxiety.

If we look to scholastic logic, not as antiquarians, but “from the viewpoint of modern logic,”\textsuperscript{132} Heidegger argues:

Then there results for oneself another aspect. One learns a totally new characterisation, namely, that the totality of that which is experienced, and that which is thinkable, hold together [or cohere] and form basic systematic concepts.\textsuperscript{133}

Heidegger finds these vital new insights for modern thought particularly in the work of Duns Scotus, the medieval \textit{Doctor Subtilis}.\textsuperscript{134} Heidegger argues that Scotus’ thought has

\textsuperscript{131} “That this task (an outline of the system of categories) is the turning point for the movement of science since Kant is, for those who know the history, without question.” (Windelband 1900) “And Eduard Hartmann, the author of the first modern, complete theory of the categories, spoke of the ‘determinate role that the comprehension of the theory of the categories has for philosophy,’ and the role that the history of the theory of the categories has played.” (Hartmann 1896). Ibid.

\textsuperscript{132} Ibid.

\textsuperscript{133} Ibid.

\textsuperscript{134} John Duns Scotus (1256-1308) was one of the greatest philosophical minds of the Middle Ages. Dubbed the “\textit{Doctor Subtilis}” for the sheer complexity of his thought, Scotus was a perfect choice of subject for the young Heidegger. His work ranged from logic and metaphysics to ethics and theology and beyond. But most important for our story is his work in natural theology and what we today would call epistemology. He argued for our ability to know God through the exercise of our reason (in addition to knowing God through revelation). His epistemology and natural theology come together with his metaphysics and the other aspects of his thought to form a consistent and coherent picture of being, God, creation, and our access to and knowledge of them.
things to show modern philosophers that will help them with their current problems (particularly grounding logic). He notes Scotus’ “total individuality as a thinker,” and twice in the course of the Habilitationsschrift points to Scotus’ modernity. Heidegger also immediately draws attention, not just to Scotus’ importance for understanding the theory of categories, (the most important philosophical problem since Kant), but also his work (actually that of Thomas of Erfurt) on “the theory of forms of meanings.” Here, in a

Against Aquinas, Scotus argued that the predicates we use to describe God are univocal and thus, though our knowledge of God is analogical, the language we use is not, it is univocal. The difference, Scotus argued, was in degree. God was infinite being, and, as such, an infinite qualitative difference obtained between God and beings. “Infinite being” was the simplest definition of God. This definition contained all the other essential attributes of God (the pure perfections such as God’s infinite power or goodness are, Scotus argues, coextensive with his infinite being, and can be extrapolated from it). We can come to know about God through (in addition to revelation) the use of our intellect, by reflecting on the pure perfections and, most certainly, through meditating on cause and effect. Scotus posits God as the ultimate ground of all being, not by arguing from that presupposition to the world of beings, but by beginning with the world and arguing back to the cause. He begins with the world as we experience it, permeated with causes and effects that play out in time, and argues back: all effects must have causes, and those causes must have their own causes, and so on. In Aristotelian fashion he denies the possibility of a regressus ad infinitum, and therefore arrives at a necessary first, uncaused cause, a prime mover as the ultimate ground of being. The first cause is, in addition to being the first efficient cause, also the ultimate telos (the first final cause), and the highest (first in eminence). This is what Scotus refers to as the “triple primacy” of God; God is the ultimate ground in all conceivable senses. See Ingham, M. & Dreyer, M. The Philosophical Vision of John Duns Scotus. Washington: The Catholic University of America Press, 2004, Cross, Richard. Duns Scotus. Oxford: Oxford University Press, 1999, Duns Scotus, John. Philosophical Writings. Indianapolis: Hackett, 1987, Duns Scotus, John. Treatise on God as First Principle. Kessinger Legacy Reprints: 2012, and Dumitriu, History of Logic. Vol. II, pp. 94-8.

136 Thomas of Erfurt was an early 14th century philosopher, who worked, most importantly in the field of speculative grammar (see below). His Tractatus de modis significandi seu grammatica speculativa was falsely attributed to Duns Scotus for centuries. It was only after Heidegger’s Habilitationsschrift was published that its correct authorship was discovered by Martin Grabmann. For our purposes however, this later revelation is of little import. Our interest is in Heidegger’s work, not Duns Scotus; and
crucial moment, Heidegger ties the category problem (upon which he hopes to provide a
ground for logic to stand), with the problem of meaning.

*Meaning*, as we noted in the introduction, is a load-bearing term (to continue with
our architectural metaphors). Meanings are the intention-contents that words denote, as
well as the connotations that they carry (“*Schwein* means ‘pig’”; “when I call someone
‘a pig’ I mean that he is uncouth”). But meanings also represent import; they are the
weights and values of utterances, acts, situations, etc. (“It means so much to me that you
came”). Meanings are related to signs and signification in manifold ways (“dark clouds
mean rain”; “this means war”; “what does this word mean?”; “what does this poem
mean?”). Meanings are related to *teloi*, to ultimate purposes (“the meaning of life is…”).
The wide range of ideas, structures, denotations and connotations that this single little
word stands for present a vast, complicated web, extremely difficult, if not impossible
to disentangle. Just as, in following a thread, we think we have arrived at one
signification, we find that we are merely back along the track to another.

The problem of meaning is one of the central problems of twentieth century
thought. We find it whether we look in philosophies of values, religious philosophy, the
value-related sphere of existentialism, the value-exploring world of hermeneutics, or

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Erfurt’s speculative grammar was easily integratable within Scotus’ system, Erfurt having
been influenced by Scotist thought. See: Dumitriu, *History of Logic*. Vol. II, pp. 438-41, and
Caputo, John, “Phenomenology, Mysticism and the ‘Gramaatica Speculativa’: A Study of
Heidegger’s ‘Habilitationsschrift’” in *Journal of the British Society for Phenomenology.*
Geistesleben Abhandlungen Zur Geschichte Der Scholastic Und Mystik*. Ismaning: Max
Hueber Verlag, 1926.
137 Ibid.
138 Dare we say: “the wide range of meanings that this word, ‘meaning,’ means”?
under the rubric of philosophy of language, semantics and semiotics, or the deep debates in twentieth century philosophy of science; in the course of twentieth century thought meaning is seemingly everywhere. In this early work, Heidegger ties this central problem of twentieth century thought to the problem of the categories (again, as Hartmann argued: the central problem of modern thought since Kant), the systematic clarification of the ultimate domains of reality.

Heidegger, noting Husserl’s interest in this aspect of Scotist thought, tells us that the theory of the forms of meanings “stands in an essential coherence with the theory of the categories, insofar as the decreasing categorial forms form ‘meaning in general’ they lay the ground for all further treatments of logical sense and problems of validity.”

After an introduction that lays out his methodology, Heidegger begins his task proper with “Part 1: The Theory of Categories: Systematic laying of the Foundation for the Understanding of the Theory of Meaning.” He tells us that in order to explore Duns Scotus’ *Grammatica Speculativa philosophically*, as a theory of meaning, we must “necessarily” make “a preliminary examination of the elements and conditions, which first will make possible any understanding of the troublesome problem region at all.”

Heidegger then argues that the theory of meaning must be “elevated to a concept,” it must be examined in its broad structural features, as a theory of *meaning in general*. If we are to construct a theory of meaning, what must it contain? What must it be able to do? The “general elements” of a theory of meaning “must be understood.” The “grammar” of a

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140 He notes that this order is nothing natural; it is merely of instructional value.
141 Ibid. p. 149
theory of meaning must act as a structure that provides the “solid divisions of the totality of that which can be known.” It is to this preliminary project (determining the divisions and bounds of what can be known) that Heidegger now turns.

Heidegger’s project of demarcation begins with a brief discussion of classificatory systems. He then moves on to the theory of categories, noting that this will not be an exploration of Aristotle’s ten categories, which Heidegger – following Lask and others, and, according to Heidegger, Scotus too – argues only apply to a determinate range of beings (those of actually existing beings); rather, Heidegger is interested in exploring a more basic level still. If Aristotle’s categories are ‘not directly the categories,” (i.e. they do not represent the totality of the most basic categories), but there exists a more basic level below them, then what is this and what are its own features and distinctions? Heidegger says that this touches on the overall “drift” and prime “concern of [his] whole research.” If there are “diverse domains of reality” beyond and below Aristotle’s categories, then we need to demarcate them and understand the relations between them.

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142 Ibid.
143 In pp. 150-2 he discusses grounding the sciences and philosophy.
144 Aristotle’s 10 categories (substance, quantity, quality, relation, place, time, attitude, state, action, and affection) apply only to actually existing things. If we want to describe domains other than that of existing things, we need different categories (see Figure 1).
146 Ibid. pp. 152-4
Figure 1, A Schema of the Categories in Heidegger’s *Habilitationsschrift*

**Habilitationsschrift Schema**

Everything that can be experienced
In consciousness
(In Kantian terms:
Everything that can be a possible object for thought)

Natural Reality
(Empirical Objects
Possessing spatio-temporal existence

Organic
Inorganic

(Aristotle's 10 Categories Apply)

Non-Sensory Reality
(Non-Empirical Objects)

Mathematics
Logic

(Aristotle's 10 Categories do not Apply)

(Ens, Sein)
(Gelten)

(In terms of "Objects of...", rather than as acts)
Claiming to know Scotus better than he knew himself (a claim that will become a commonplace in his career), Heidegger proposes “to bring together what we find scattered in his [Scotus’] writings in order to form a surveyable whole.”\(^{147}\) Out of this surveyable whole, we will see a picture of the primary divisions of reality, which will, in turn, enable us to understand the nature of the domain of meanings, which will be then be explored. This is no small task. Understanding “the diverse domains and their distinctness” will enable us to see “the totality of what can be thought in its clarity [,
which] will then put us in a position later to assign a proper place to the domain of meanings.”\(^{148}\) Heidegger’s Habilitationsschrift is an ambitious project indeed!

Heidegger employs a topographic metaphor to explain the nature of the primary divisions of reality and their relations. Each basic constituent part of the most primordial divisions of reality – at least (a la Kant), that which can be known – has a “logical position”:

Every phenomenon that belongs in the range of that which can be thought overall, requires a determined location. Every order is grounded in a spatial determination, [and] an order is only possible out of a ground in an overall system of reference. The location in this logical sense rests, in the same manner, in an order according to its own logical place in a certain referential whole.\(^{149}\)

The task then is to determine the places of the various plots of ground that underlie the diverse domains of reality, or, to change the metaphor slightly, to place the various

\(^{147}\) Ibid. p. 154
\(^{148}\) Ibid.
\(^{149}\) Ibid.
continents on the map of the world of the referential whole (the totality of the intelligible in its intelligibility). This, as Heidegger notes, not only gives us new insight into scholasticism, but it also provides us with “the substructure for understanding the theory of meaning”;\textsuperscript{150} that is, scholasticism also sheds light on a crucial problem of modern philosophy.\textsuperscript{151}

Philosophy is ultimately concerned with thinking. All thinking is thinking of objects (whether physical things or ideas).\textsuperscript{152} The category theory, as a theory of the fundamental divisions of reality is, at its base, a theory of what can be thought (a theory of thinkable objects).\textsuperscript{153} Heidegger sticks close to Kant, adhering to the Kantian distinction that all objects are objects for thought. The category theory then can be seen as a theory of domains of thinkable objects (according to Kant, the only kind of objects available to us). Roderick Stewart sums up the nature and task of Heidegger’s category theory in the \textit{Habilitationsschrift} thus:

Category theory is not just a theory for thinking, but for thinking about objects. Since some categories (what Rickert’s student, Emil Lask called ‘reflexive’ ones) are alleged to apply to any object, however intuited, and others only apply to empirically intuitable ones, we are led to a natural division between domains of objects: empirical and non-empirical ones. And we may give (partial) essential

\textsuperscript{150} Ibid.
\textsuperscript{151} And also demonstrating the “different, distinct domains of reality.” Ibid.
\textsuperscript{152} Indeed, “‘Being an object is first common to all that is.’ In every object of knowledge, this \textit{Ens} is given, insofar as it just is an object. As each object of sight, black or colourful, \textit{is a colour}, so is each object, overall, itself always describable as an \textit{Ens}.” Ibid. p. 156. In 1912 Heidegger noted that this was the main point of Meinong’s \textit{Theory of Objects}, but argued that the idea itself was fairly obvious and, in any case, nothing new. Pp. 37-9
\textsuperscript{153} Thus the ground of the categories is the ground of thought in general.
descriptions of each of these: members of the one are spatio-temporally extended, the others are not. Moreover, we may find that each division has sub-divisions: on the one hand, perhaps ‘animate’ and ‘inanimate’, etc.; on the other, logical and mathematical, etc., in each case supplying appropriate differentiae. Each division gives us a ‘sector’ of possible intentional objects under general (eidetic) descriptions; each sub-division gives us a more specific perspective (noematic sense) on the object. In principle, we get an inventory of the possible objects for consciousness.\textsuperscript{154}

One of the main tasks of the category theory that Heidegger develops here, bringing together Scotus, neo-Kantian influences (including and especially Lask) and Husserl, is the discovery and description of the transcendentals,\textsuperscript{155} those “reflexive categories” that apply to any object of cognition at all.\textsuperscript{156}

Heidegger breaks up the first part of the Habilitationsschrift, which deals with the category problem, into three chapters. Conforming to the primary distinction mentioned above by Stewart – between physically existing empirical objects and non physically existing, non empirical objects – Heidegger begins with the more familiar realm of actual empirical objects. He outlines the four primary and universal categories for Scotus (and

\begin{footnotes}
\item[155] “A transcendental is that which has no genus beyond it in which it inhere. Nothing more can be predicated of it.” Heidegger. Die Kategorien und Bedeutungslehre. P. 158.
\item[156] “Typically, of course, such ‘regional ontology’ or category theory concerns itself with the most general descriptions (the transcendentiae of any ens for “Scotus”) under which any objective may be thought.” Stewart. “Heidegger’s Habilitationsschrift.” p. 367.
\end{footnotes}
scholasticism in general), the *unum*, the *verum*, the *bonum*, but discusses only the first two in this work.\(^{157}\)

In “Chapter 1 – The Unum, mathematical, natural, and metaphysical reality”, Heidegger explores the distinction between natural, empirical reality and non-empirical reality through an examination of the first transcendental, the *unum*, “the one.” *Ens* is the ultimate predicate of empirical reality; that is, everything that is, *is. Ens* then is the primordial category of empirical reality. “*Ens* belongs to the *maxima scibilia,*** and, as such, “has the exact meaning of ‘the condition for the possibility of knowing objects in general.’”\(^{158}\) Heidegger here derives this distinction from Scotus,\(^{159}\) but this early manifestation of a (if not yet the) *Seinsfrage* will not escape the notice of those familiar with his later thought. Heidegger goes on to say that *Ens*

This *Ens* presents an ultimate and utmost, beyond which questioning cannot go…

this is also the genuine philosophical meaning of objective determinations, which the scholastics knew under the name of the ‘transcendentals.’ A transcendental is that which has no genus above it in which it can be contained; we can predicate

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\(^{157}\) There has been speculation as to why Heidegger leaves out the *bonum* – that a discussion of this transcendental would bring up religious issues he was not keen to discuss with Rickert and others. There seems to be some confirmation of this in the Conclusion Heidegger added to the *Habilitationsschrift* on its publication in 1916, but it seems equally true that the *unum* and *verum* are the proper transcendentals for discussing the particular problem of the grounding of logic. Invoking the *bonum* for such a task would, in the world of modern philosophy that Heidegger found himself, seem like an inappropriate *Deus ex machina*. And there is much to suggest that Heidegger himself would have seen it this way even if he privately held such beliefs. (See below)

\(^{158}\) Heidegger. *Die Kategorien und Bedeutungslehre*. P. 157

\(^{159}\) “In Duns Scotus we find a strikingly modern sounding remark. Thus *ens* means the total sense of the objective sphere *in general*, thus it is the permanent moment in the objective, the category of categories. *Ens* remains in every *object…*” Ibid. pp. 156-7.
nothing more about it. This *ultimateness* of *ens*, as objectiveness in general, is the essence of a transcendental… the other transcendental, such as *unum*, *verum*, *bonum*, etc., seem to function as quasi-attributes [or “qualities”] of *ens*. Hence, they are not in the same sense, primordial, as is *Ens*, as objectiveness in general...  

And yet, whenever we have *ens*, the other transcendental are already involved. And so Heidegger moves on to a discussion of the *unum*.

Heidegger’s exploration of the *unum* touches on a topic near to his heart – the philosophy of number. At times in the text this reads as a sideline interest that Heidegger felt compelled to include; yet the discussion is important for distinguishing between the mathematical and logical domains (both non-empirical but different) and to avoid another category mistake. Stewart’s concise account sums it up:

> Chapter 1 rearticulates “Scotus”’ distinction between primitive and derivative senses of *unum* (namely, “one as opposed to another” *versus* “the number one”) in light of work by the senior neo-Kantian philosopher and logician at Freiburg, Heinrich Rickert. A clear distinction is “shown” (*aufgewiesen*), though not “proven” (*bewiesen*), between ideal reality (of logical and mathematical sorts) and empirical reality.  

Whenever we have an object in empirical reality it is “this one object” and not any other. Individuality (manifest *haeccentas*), is true of all objects and is the basis of the totality of what confronts us as the manifold. “The one and the other are both given together

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161 Stewart, “Heidegger’s *Habilitationsschrift*” p. 361
immediately in the object (not as one or the other, but as one and the other)…

heterothesis is the true origin of thought as mastery of the object.”¹⁶² The phenomenal manifold that presents itself to us in the domain of empirical reality is only knowable as distinguishable into constituent parts, as composed of individual objects on the basis of the unum.¹⁶³

Two senses of unum are to be distinguished: the transcendental sense described above, and its sense as: the number one. Deriving one from the other is a mistake, and Heidegger takes some time to debunk this idea. Number, the matter of the domain of mathematics has, as its basis, quantity. Quantity can relate to empirical reality in acts of counting and measurement (of which counting is a form), but numbers have their existence regardless of any connection to empirical reality. To modify one of Heidegger’s examples: the number 10 does not disappear if the 10 trees I count are chopped down and burned. Nor is 10 different in the case of “these 10 trees” or “these 10 dogs”, though the empirical objects measured are themselves different. Quantity is thus an homogenous realm,¹⁶⁴ whereas empirical reality represents a heterogeneous manifold. We will return to this concept briefly when the domain of the logical will be contrasted with the domain of the mathematical (both are metaphysical, yet they have different grounds).

¹⁶³ “With the ens I gain the first determinateness and ansofar as each ens is an unum, the first order [or “arrangement”] in the manifold fullness of objectivity [literally “object-ly-ness]. Thus determination has something to do with the order in the given. It makes it conceivable, knowable, comprehensible.” Ibid. p. 166. “Consequently, heterothesis is the true origin of the thought of the object.”
¹⁶⁴ There being no difference between this 10 or that 10, quantity is therefore homogenous as the real world of existing things is not.
Chapter 2, “Verum and logical reality”, deals with the second transcendental, “the true.” Here Heidegger links the medieval verum with neo-Kantian notions of truth and judgement. As Stewart puts it again:

Chapter 2 interprets the medieval maxim that every object as such is a true object into the neo-Kantian axiom all objects must be objects of knowledge, and all knowledge must be of objects. Moreover, in this Kantian tradition such knowledge is only possible in true (predicative) judgements. The object as known (ens logicum) becomes, then, a judgemental-content, an abstract (intentional) entity which must be distinguished ontologically from any particular mental act of judging. A further categorical or ontological distinction is drawn – this time between psychologically real events and ideal “logical” entities.

Heidegger notes two senses of the true in Chapter two. An object is itself true in a basic sense if it is an object in cognition. All objects are, in this sense, true objects. But he

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165 “Transcendental philosophy has found the most precise expression for this relation: the object is only an object as an object of cognition…” Ibid. p. 208.
166 Stewart, “Heidegger’s Habilitationsschrift” p. 361.
167 “Every object is one object. Every object is a true object. …The object is a true object in regard to cognition. Insofar as the object is an object of cognition, it can be called a true object. In it we see the fundamentum veritatis.” Heidegger. Die Kategorien und Bedeutungslehre. Pp. 207-8. Noting the Kantian conception, Heidegger then concedes that “certainly it would now be too far-reaching a reinterpretation if we wanted to interpret the ‘verum’ of the scholastics in this sense. In principle, however, it does not mean anything other than the relationship of each object to knowledge. Due to the fact that the object somehow enters into knowledge, is affected by it, it is an object of knowledge, i.e. knowledge stands within the subject.” Heidegger. Die Kategorien und Bedeutungslehre. P. 208. “The ‘verum’ does not bring anything factually new to the object; it only invests it with a particular index and states that every object has a possible relationship to knowledge [or “cognition”]. It is only in knowledge that we can first speak properly of truth. Every object is an object and therefore is based on knowledge.” Ibid. p.
also notes, in Kantian fashion, that all thought comes in the form of judgements; thus there is a second sense of truth, which is truth as embodied in correct judgements.\textsuperscript{168} It is this second sense of truth – truth in judgement – that is most important for Heidegger here.\textsuperscript{169}

Judgements happen; they exist in time.\textsuperscript{170} But the content of judgements, the proper matter of a philosophical exploration of the problem of judgement – rather than examining the judgemental act, which lies within the field of psychology\textsuperscript{171} – either obtain for the material to which they are applied or they do not; they hold or they do not hold; they are true (in what Heidegger calls the proper sense), or they are false.\textsuperscript{172}

\textsuperscript{168} Indeed, for Kant, the faculty of judgement (CPR B94) is the same as the faculty of thinking (CPR B106). As Heidegger puts it in this discussion: “The knowledge whose truth has its contrast in falsity, is judgement. The judgement is what may be called true in the actual sense. All knowledge is a judgement, every judgement is knowledge [proper].” Ibid. p. 210.

\textsuperscript{169} “Not without reason has it [judgement] recently been called the ‘cell’ of logic.” Ibid. p. 210.

\textsuperscript{170} Kant called time “the inner sense” (CPR B49), by which he meant that time is what defines and distinguishes our inner life (Heidegger will later make much of this) while space (in the form of position of extended objects) distinguishes the physical world we inhabit.

\textsuperscript{171} Heidegger notes the great benefit to be gained from looking to Scotus on this regard: “Compared to the idea that understands logical problems and their solution in the psychological sense, which has only recently begun to go on the decline, scholastic thought, though it is so often restricted to generalizing views, has a maturity of vision, not to be devalued [or “underestimated”], [that notices] the peculiar and the intrinsic value of the scope of the logical. Because the knowledge of logical validity has been sharpened and deepened in the fight against psychologism, it will be of no little interest to see just how far Duns Scotus went in his demarcation of a boundary against the psychically real.” Heidegger. \textit{Die Kategorien und Bedeutungslehre}. P. 217.

\textsuperscript{172} “…the content, the meaning [or “sense”] of the psychic acts… This content is that which obtains, it is that of which we can say: ‘it is true.’ The single psychic acts of
Heidegger focuses his discussion on the predicative copula *is*. In the sentence: “The door *is* red.” the distinction *red* either obtains for *the door* or it does not. The door either *is* red or it is not red, but nothing about the actual act of making the judgement changes this (thus if a colour-blind person mistakes the red door for green it is nonetheless red for others). The meaning-content in the judgement comes not from the judgemental act, but from the material itself (the red door). Thus Heidegger says that “this means there is a *boundedness to the object*” (contra the copy theory of truth, for instance). Heidegger goes on:

The meaning content of the objective material, which is to be given along with the form of reality proper to, it is taken up by judgement. To put it better: the content in question becomes *formed* through judgement and through this [forming, or “putting into form”] it becomes valid cognition. Knowledge constitutes the true.

Thus judgemental acts (the acts of cognition itself) constitute the true as true judgements. But the determining markers of true judgements are to be found not within the act itself but in the object (whether they be physical objects in the spatio-temporal realm or non-

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judgement, strictly speaking, are neither true nor false, but exist or do not exist.” Ibid. pp. 219-20.

173 Ibid. pp. 212-3  
174 Ibid. p. 212.  
175 Ibid. pp. 212-3.
corporeal objects like ideas). Following Lask, Heidegger refers to this as the *material determination of [form] meaning* (as in informing).

And what is the content of judgements? What currency do judgements deal in? The answer for Heidegger is *meaning*. It is “the meaning content of the objective material which comes to be given along with the form of reality proper” that is “taken up by judgement.” Thus meaning is intimately related to judgement and its transcendental, *verum*, the true:

The capacity of the judgement sense [the sense of the act of judgement], orients [or “attaches”] itself directly to the conceptual meaning content of the judgement, which enters into judgement and contains, *virtualiter*, the [whole] judgemental relation. The meaning content of the data, the facts simply beheld, is the measure of the judgement-sense; it directs its objective validity from this.

The content of judgements then is meaning, which is determined by the material itself. True judgements create valid knowledge. And the domain of valid judgements is the proper province of logic. Heidegger is weaving together here a web-like account of cognition (and indeed, of human experience in general) out of judgement, meaning, sense-perception, and truth. He is grounding logic in an interrelated complex of human cognition that takes all of these features into account. What Heidegger is presenting here...

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176 [The existence of the domain of the logical] is independent of any real existence in actual reality.” Ibid. p. 221. “Our awareness of life, thought and cognition in nature is gauged to the actual objects of immediate reality.” Ibid. p. 227
177 Ibid. pp. 212-3.
178 Ibid. p. 215.
179 “…all knowledge, that is, all judgements are built out of meanings, as their necessary stable components.” Ibid. p. 249.
is more than a category theory, an epistemology, or a theory of meaning; the relational-whole is more than the sum of its parts. Soon (in Part 2) Heidegger will incorporate an account of language and signifying acts into his theory.

The three transcendentals, all relying on the ens of all that is, then hang together in a way that allows for our understanding of the manifold that confronts us. Unum, the primordial individuality of all objects allows us to distinguish within the manifold and know things (as distinct from a sensory mass) through their haeccentas. Verum is manifest in the domain of judgement – in actual thinking acts – where we create knowledge as the product of cognition (and all cognition according to Heidegger, following Kant, comes in the form of judgements). Meanings are expressed in judgement and are the matter of truth. The mode of reality for physical things is to exist (in spatio-temporal forms), whereas the mode of reality of judgement/truth/meaning is to obtain or hold. The actual acts of judgement, of course, either exist or they do not exist, but their contents, as distinguished from the instances where they are thought, either obtain or they do not obtain.\textsuperscript{180} Individuality and judgement come together in meaning (where, for instance, meanings are applied to objects in acts of judgement). This is the triad of human experience. The realm of valid meaning, as the realm of logic, is the realm of valid cognition of experience. As Heidegger puts it: “Whatever is known, and whatever judgements are made upon, must enter into the world of sense, only in [the world of

\begin{footnotesize}
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\item In Husserl’s terms, the activity of cognition is Noesis and the content is Noema.
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sense] are things known and judged. *Only by living in the valid, do I know about existence.*”181

Reality is, for Heidegger, “grasped by the logical and…the domain of the actual can be covered over as it were by the logical.”182 The logical exists as an *ens diminutum*, abstracted from the actual and either holding or not holding within the domain of the logical (the realm of valid sense). This domain is differentiated from both physical reality and from the realm of mathematics. Its mode of being is not physical existence, nor is it quantity; its mode of being is obtaining. Heidegger sums up the connections thus:

The entering of reality into sense is only possible, so that through the logical, reality can be *grasped*, so that something can be torn out of it, made separate, and thus distinguished, and put in order. That which establishes order is something *formal*. Forms are determined in their meaning by the material of the objective world and so they are thus again applicable to it. The ordering form of the logical in general is *judgement*. The subject relation can also be expressed as follows: for the logical content it is essential that ‘it can be said’ [or “predicated”] (*praedicati*). This is only possible because it obtains [or “holds,” “is valid”]. In the domain of the real, that which exists as real is designated in the logical realm in a particular way, namely, according to judgement, that is, it is referred to, i.e. [given a] ‘meaning’ (*praedicari est intentio*)… Through the judgement we have knowledge. The particular components of this ordering form are the categories.183

181 Ibid. p. 222.
182 Ibid.
183 Ibid. pp. 222-3.
Heidegger then sounds a distinctly Husserlian note and states that “the regulatory moment that determines and characterizes the logical realm is the intentional, the valid, and the sayable [“predicable”].”

Husserl’s concept of intentionality is central to the Habilitationsschrift, and Heidegger, in a characteristic move for this work, pins Husserlian terms to terms in Scotus, creating a new medieval/modern philosophical description in the process. Intentionality is what distinguishes the logical domain from the (also non-physical and also homogenous) domain of the mathematical: the mathematical has its basis in quantity and the logical has its basis in intentionality. “The homogeneity of the logical domain rests on intentionality, which has a validating character. To the extent that intentionality and quantity are removed, so too is there a difference between logic and mathematics.”

Throughout the first two chapters, particularly in regard to hammering further nails into the coffin of psychologism, Heidegger stresses the fundamental distinction between acts, which exist in time and are manifold as enacted by the thinking human being, and the contents, which, in the domain of logic and valid sense are timeless and univocal. He continues by reiterating this fundamental distinction (as between judgement and judgements) in the realm of meaning – thus between meanings as the contents of logic, directed by intentionality and meanings as intended and expressed. Thus a distinction between meaning and language emerges that seems strange. Meanings seem then to be independent of the language forms that express them. And, indeed, Heidegger

\[184\] Ibid. p. 223.
\[185\] Ibid. pp. 223 & 226, for instance.
\[186\] Ibid. p. 225.
confirms this, noting that the sounds and visual images that are the actual manifestations (as signs) of meaning have no necessary relation whatsoever to the actual meanings (the word “tree” has no necessary connection to the concept tree).\(^{187}\) This is true, but, as Heidegger realizes, meanings circulate in our lives in the form of language, thus there is an intimate connection among meaning and logic and language. Quoting Stewart again:

> Yet, what Chapters 1 and 2 of Part 1 put asunder, Chapter 3 and Part II of the *Habilitationsschrift* seek to join together. The contents or senses of judgements, whether about natural objects or ideal mathematical and propositional entities, are all *expressible*. They find their way into words and are communicated and “signified” by them. Hence, a theory of signification comes to the fore. And for Heidegger’s interpretation of “Scotus,” this signals a further assimilation of this medieval text to the concepts of Husserlian phenomenology…\(^{188}\)

The particular Husserlian concept that comes to the fore is the *meaning bestowing act*\(^{189}\) whereby meanings are tied to signs and expressions. Heidegger then moves on to a discussion of meaning and language and finally to a text by Thomas of Erfurt (at the time attributed to Duns Scotus) in which Husserl himself was interested, the *Grammatica Speculativa*.

In Chapter 3, The Form and Content of Language: The Domain of Meaning, Heidegger explains and stresses the difference between logic and language and then notes that this is an ideal distinction. For any actual existing human being, operating as we do

\(^{188}\) Stewart, “Heidegger’s *Habilitationsschrift*” p. 361
in and through language, this distinction – though no less true – is a theoretical one only.

After outlining the difference he immediately states:

As necessary and valuable as the separation [or “divorce”] of the realms of logical sense structures and grammatical language structures may be for the working out of their heterogeneous character, it becomes necessary that this separation should again be removed, *forgotten so to speak, as soon as we live in knowledge and its representation. It reduces the alogical nature of linguistic structures;* they [then] reveal themselves as having a very peculiar reality, as carriers of meaning and semantic structures, and through these… signs for objects. Thus, one might say that, for one who lives in actual speech, that the spheres of existing grammatical structures and validating logic, which were, in the preceding, so radically torn apart, are merged together again into one.”

As all of us live “in actual speech” and “in knowledge and its presentation,” the question of the connection between logical structures and grammatical structures indeed cannot be avoided.

Heidegger then goes on to discuss the nature of signs as bearers of meaning contents (citing both “Scotus” and Husserl). And he comes to the conclusion that a field hitherto derided as “apparently so poor in valuable content and fullness of life” will become essential: that of grammar. Signs are relational in content and referential in character and, though the individual sounds and sights of signs and their combinations bear no necessary connection to their contents, in their expression they must conform to

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191 Ibid. p. 238.
certain rules if they are to be true. The rules of establishing true judgement are, of course, the rules of logic. And though logic and language are not the same thing, Heidegger (following Husserl and “Scotus”) believes that there are fundamental principles of linguistic expression that determine whether statements convey sense or are non-sensical (whether individual utterances are true or false is a separate matter).

In Part 2, The Theory of Meaning, Heidegger examines “Scotus”/Erfurt’s *Grammatica Speculativa* as a theory of meaning. He begins with Chapter 1: Meaning and Function of Meaning: The Principles of the Theory of Meaning. Heidegger reiterates that all knowledge comes in the form of judgments, and that the stuff of judgements is meaning. He then reminds the reader of the tie to truth and shows the way forward, noting that “the chief value of the study of meanings is, therefore, that of truth as the validity of meaning [or “sense”]”. He then goes on to explore the categorical forms of meaning with their relation to truth and judgement as a touchstone.

In Chapter 1 Heidegger explores the relations he finds between “Scotus’” notions of the *modi essendi, significandi,* and *intelligendi.* The *modi essendi,* the modes of being of the objects themselves, inform the *modi intelligendi* in terms of the material determination of form. As John Caputo puts it: “This correspondence is given its highest expression in the transcendental *verum,* which correlates the object of knowledge with

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192 This is an idea that would play its part in analytic philosophy in general and in the logical positivism of the Vienna Circle in particular.
knowledge of the object.” This relation, in turn, lays the ground for the way objects of thought are expressed in their *modi significandi*. These modes of being, thought, and signification and their relations, determine the correct grammatical relationships that link logic and language (not any specific existing language but any language that conveys sense whatsoever). This set of relationships is the subject of *a priori* or speculative grammar. As Caputo sums it up:

> The speculative grammarians held that there were certain ultimate grammatical principles which every empirical language was bound to obey. The rules of grammar could not be reduced to merely conventional prescriptions about the correct and incorrect use of language. These thinkers did not of course deny the element of contingency in all empirical languages… Nor were they saying that the grammar of a given language was deducible from the principles of speculative grammar… Stated in its most general terms these medieval philosophers of language held that the way things are (*modus essendi*) determines the way we think about them (*modus intelligendi*), which itself determines the way in which we express ourselves in language (*modus significandi*). The medieval held

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195 Heidegger speaks of the “modes of meaning hav[ing] the *ultimate foundation* of their determinateness in the *modus essendi*” of objects. Heidegger. *Die Kategorien und Bedeutungslehre*. P. 259. He sums up the basic relations obtaining between *modi* thus: “…the forms of meaning (*modi significandi*) are inferred in the guidelines of givenness (*modus essendi*), which is, in turn, only givenness as known (in the *modus intelligendi*). Ibid. pp. 263-7.

196 We need not get into Heidegger’s discussion of individual *modi* (as in the distinction between active and passive modes of signification, etc.) to grasp the point here.
therefore that there is both a metaphysical and a logical import to language.

Language is, in its most ultimate structures, determined by the laws of being and the laws of thought. Philosophical or speculative grammar is the study of these ultimate structures of language.\textsuperscript{197}

But it was, again, no mere antiquarianism that drove Heidegger to consider these medieval ideas. Establishing the firm relations amongst logic, language, and thinking, and their ground in the being of objects themselves was a current and vital project for the young thinker. And Husserl’s own insistence on the importance of \textit{a priori grammar} testified to this fact for the phenomenologically inclined Heidegger.\textsuperscript{198}

Heidegger tells us that there are “categories of meaning [which] constitute the individual ‘parts of speech.’” These are “the non-sensorial logical categories of meaning” that “Scotus” lays out in the \textit{Grammatica Speculativa}.\textsuperscript{199} These categories of meaning determine, \textit{a priori}, the possible meaningful combinations of terms within language:

The categories of meaning are shaping [or “forming” (\textit{gestalt})] ideas of possible concrete meanings. These shaping [or “forming”] ideas determine [concrete meanings], on the basis of their own content, in their reciprocal mutual relations; in the forms of meaning there lies an immanent lawfulness, which, \textit{a priori}, rules the possible contexts [and connections] of meaning.\textsuperscript{200}

\textsuperscript{197} Caputo, “Phenomenology, Mysticism and the \textit{Grammatica Speculativa}.” P. 102.
\textsuperscript{198} Meanings are grounded in the way things are, but what is the ground for the way things are?
\textsuperscript{199} Heidegger. \textit{Die Kategorien und Bedeutungslehre}. P. 265.
\textsuperscript{200} Ibid.
Heidegger follows these sentences with a long quotation from Lotze’s *Logik* where he, according to Heidegger, “describe[s] what role the *modi significandi* perform”\(^\text{201}\) though, of course, Lotze does not use the medieval terms. Lotze uses an architectural metaphor to describe the regular relations amongst forms of signification. He tells us that we can make a pile of balls “if it does not matter if they are formed into a regular shape,” but to build a house we need blocks that fit together in a regularised way.\(^\text{202}\)

It is in Chapter 1 too that Heidegger shows the connection of these structures to logic most explicitly. Noting the above-described connections amongst objects, thought, and expressible sense, all tied to truth and judgement (as all thoughts are judgements and as the proper realm of truth), Heidegger is now in a position to place logic in his scheme:

The direction-sense [or “sense of direction” or “orienatation” (*Leitungssinn*)] of the *modi significandi* is therefore of syntactic value and the value of the *modus intelligendi* comes from out of the value of understanding. The *modi significandi* first of all constitute the object, which is evaluated in terms of the truth value; the order prescribed by the *modi significandi* is the presupposition for the complex of meaning, giving access to the obtaining context of sense… Through this relation of the categories of meaning to the sense of judgement they obtain an increased importance, an epistemological dignity. In this way the closest of relations occurs between the theories of meaning and logic, and, indeed, it is really nothing other than a subsection [or “branch” (*Teilgebeit*)] of it. For one conceives of logic as a

\(^{201}\) Ibid.

\(^{202}\) Lotze is speaking of thought, where impressions from the sensory manifold are brought together in representations, which, in turn, may be expressed meaningfully in language. Ibid. p. 2666.
theory of the theoretical sense, which in itself comprises the theory of the stable components of meaning [Sinnbestandstükken] (the theory of meaning), the theory of the structure of sense [Sinnstruktur] (the theory of judgement), and the theory of structural differentiations and their systematic forms (the theory of science).

“The theory of meaning,” for the Heidegger of the Habilitationsschrift, partakes of the “particular nature of logical questioning” by being part of logic. Heidegger here has tied together a host of concerns (epistemological, logical, semantic, etc.) in a relational schema that finds its solid base in a priori rules of sense-determination and the material determination of form. Here he finds yet another place to remind his readers that this rules out discussion of actual acts of thinking and signifying (which are to be left to psychologists) and thus psychologism as an explanation for the roots of logic.

The Habilitationsschrift, as presented to the philosophical faculty at the University of Freiburg, concludes with “Chapter 2: The Theory of the Forms of Meaning.” In this concluding chapter Heidegger engages in the “special task” of an “investigation of the senses of meaning [Sinnes vom Bedeutung],” which delves into the “presentation and the characterisation of the individual meaning-functions.” This is an

203 Ibid. p. 279.
204 Ibid.
205 Ibid. And he also notes that a genetic examination of the historical provenance of logic is also beside the point: “The requirement of a logic of grammar, need not presuppose a theoretical view that sees the grammatical use of language as actually deduced from the laws of logic. The question of how language has come to be, of what creative factors it owes its existence to, is not a problem of logic… the systems and structures of languages have meanings. And it is only at this point that philosophical reflection begins, as the reduction to the categorial moments and the evaluation of them from the system of the theory of categories. …” Ibid. p. 281.
206 Ibid. p. 283.
– at times mechanical – exploration and characteristics of the meaning functions of individual parts of speech (the noun, the pronoun, the verb, etc.) as outlined in the *Grammata Speculativa* of “Scotus”/Thomas of Erfurt. If this task of somewhat mechanical enumeration seems a disappointing way to end such a promising work, the reader need not despair, for a year later, for the *Habilitationsshrift*’s publication as a book, Heidegger added a conclusion.

**Duns Scotus’ Theory of the Categories and of Meaning: Conclusion**

This conclusion, which opens by quoting a Novalis fragment, is much more than a mere summing up of the text as delivered to the philosophy faculty. It sounds a new note in Heidegger’s thought, prefigures new thought-paths to come, sheds light on other influences, and offers a degree of criticism of the mechanical nature of what preceded it.

Heidegger’s conclusion registers his own dissatisfaction with the work that precedes it. It reiterates that his aim in the work had been historical; hence, he had not laid out a systematic account of the basic problems at hand from the outset, but had dealt with them *in situ*, as it were, in the works of another thinker. In this conclusion Heidegger hints that there is a deeper problem out there… lying under the theories of categories and of meaning. This deeper problem is the problem of *ultimate ground*. The problem of ultimate ground is left open in Kant’s critical philosophy – indeed as we have seen, Kant denied that we could have access to it at all – and it is left out (though perhaps, at points, gestured towards) in the main body of the *Habilitationsschrift*. If meanings are...

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grounded in objects, in the way things are, what grounds the way things are? Is there a regressus ad infinitum? Or can we find an ultimate ground? I should note that Heidegger does not expressly use this terminology in the conclusion; in fact he is rather vague and more than a bit mysterious and hinting, leaving later thinkers much room for speculation. What he does offer are a handful of proposed solutions to the more basic problems that are to lead to a more satisfying solution of the category problem – which, as we will recall, is the ground of thought in general – an argument for the centrality of the problem of judgement, the problem of truth, and the problem of immanence and transcendence – all of which point to the problem of ultimate ground as the unspoken foundation.

In the body of the *Habilitationsschrift* Heidegger had worked out the connections amongst objects, thoughts, and signification in a structural manner, based in the work of Duns Scotus, Husserl, Lask, and Rickert. He had provided a structural ground for logic in a relational totality that obtains amongst these three domains. However, the question of just what underlies this relational whole, if anything, was not raised. And the issue of how this relational whole operates (as a structure of and for the real existing acts of human experience, thinking, and communication) *in real life* was, at best, only grazed. Heidegger, in the conclusion, *does not see the problem* of the categories as solved by their demarcation in the body of the *Habilitationsschrift*. With the help of Scotus, Husserl, Lask, and Rickert, he had outlined and described the categories’ primary divisions and taken some note of their connection to intentionality, but the further question of how this all works in real, lived experience (beyond the structural hanging-together) was by no means adequately solved. He had achieved: “*the characterizing*
demarcation of the various domains of objects into sections which are categorially irreducible to one another.” And this helped to disturb then current views of medieval logic as “needy” and uninteresting. He had proven, indeed, that in Duns Scotus medieval logic had things to show modern philosophers that were helpful for working through current problems. But this had been, for the Heidegger of the conclusion, “a strictly conceptual and, in a certain sense, one-sided” affair that, though necessary, had required a “conscious suspension of deeper-reaching metaphysical sets of problems.”

Heidegger’s conclusion seeks to outline these more profound problems, or, at least, to indicate the direction in which they may be found. That direction is toward the subject, as a real, judging, historically situated being (note that this is still related to the important problems of the categories and of meaning):

We may only understand these [previously excluded metaphysical questions] as being ultimately decisive for the problem of [the] categories if we recognize a second fundamental task for any theory of categories: situating the problem of categories within the problem of judgement and the subject.

Heidegger notes that scholastic logic does indeed touch on this problem, but never truly develops a theory of the subject in the sense required (though, he concedes, the

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209 Ibid.
scholastics can hardly be blamed for this). The concept of *verum* in Scotus comes closest to this:

Nevertheless, there are two things that are lacking which are connected with our understanding of the problem of knowledge: first, consciously working the problem of judgement into the subject-object relationship and, second, placing the category in relation to the judgement.

Heidegger then notes that, if we are to come to a solution to this vital problem of cognition, it must be a metaphysical one.

Heidegger then takes account of the relations amongst objects, sense, and judgement; and he justifies his insistence here that the subject be brought into clearer view thusly:

The category is the most general determination of an object. Object and Objectivity [*Gegenständlichkeit*] only have sense as such for a subject. Objectivity [*Objektivität*] is constructed in the latter through the judgement.

Consequently, if we want to conceive of the category fully as a determination of

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an object, then we must establish its essential connection to that structure [Gebilde] that erects objectivity.\textsuperscript{216}

In the neo-Kantian view all cognition is cognition of objects, but all objects are, of course, objects for a subject. “This means that a merely ‘objective’ universal theory of objects without regard to the ‘subjective’ side remains necessarily incomplete.”\textsuperscript{217}

Before the conclusion Heidegger had discussed the material determination of form (found in Scotus and in Lask), and, in the context of language, had brought in Husserl’s conception of meaning bestowing acts; but he had not adequately explained just how a meaning bestowing act functions. How indeed – to pose a more fundamental question – are transcendentals involved in immanent existence at all? In the conclusion Heidegger gestures in the direction we must seek an answer to this question:

Even the problem of the ‘immanent and transeunt (lying “outside of thinking”) validity’ of the categories should, then, be solved with a view towards the judgement. It doesn’t even make any sense to speak of immanent and transeunt validity without taking into consideration a ‘subjective logic.’ Immanence and transcendence are relational concepts which acquire their secure meaning if we establish that in relation to which something is immanently or transcendently thought. It is indispensable ‘that all transeunt Geltung [validity] stands and falls with the recognizing of objects’… only, the problem is precise to know what sort

\textsuperscript{216} “Thus, it is no ‘accident’, but lies grounded in the innermost core of the problem of the categories, that problem makes its entrance with Aristotle, as with Kant, in some sort of connection with predication, i.e., with judgement.” Stewart (Trans.) “The Problem of the Categories,” p. 380 (Heidegger. \textit{Die Kategorien und Bedeutungslehre} p. 345).

of objectivity this can be, once one considers the fact that objectivity makes sense only for a judging subject; without this subject we could never succeed in bringing out the full sense of what we designate by the term ‘Geltung’ [validity].\(^\text{218}\)

Thus there is no meaningful consideration of the problem of objectivity without considering the subject, but the precise nature of how any objectivity comes to be from the subject remains undetermined. Heidegger does however propose a place to look for an answer: “in the concept of the Living Spirit.”\(^\text{219}\)

In order to explore this concept of Living Spirit and, indeed, in order to solve the category problem, we must move outside of “the logical sphere of sense and of the structure of sense.”\(^\text{220}\) If we want to arrive at more than a systematic/structural/relational grounding of logic, [account of cognition, concept of truth, etc.] we must move out of logic itself:

We cannot view logic and its problems in the true light at all if the context from which it is interpreted is not a translogical one. Philosophy cannot dispense for long with its own [true] optics, Metaphysics. For a theory of truth, this means that we must give consciousness a final, metaphysical-teleological interpretation.

What is of value [das Werhafte] lives in consciousness in a profound and genuine fashion, insofar as it is an active, living deed that is itself full of meaning and actualizes meaning. None of this is understood in even the remotest way if it [this

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\(^{219}\) Ibid.

\(^{220}\) Ibid.
active, living deed of consciousness] is neutralized into the concept of a
biological, blind matter of fact.\textsuperscript{221}

Here we have arrived at one of the most important paragraphs of the conclusion and it will help us to proceed on firmer ground if we unpack it before moving on.

The problem of logic is not itself a logical problem; in Heidegger’s terms it is, or must become, a translogical problem.\textsuperscript{222} But Heidegger’s first sentence indicates something more as well. Logic and its problems gain their meaning out of a relationship, the relationship between the thinking, judging human being, immersed in meaning, and the objects of thought. Heidegger is arguing here that we will better see the fundamental problems of logic if we look at the thinking, judging human being and her relation to the objects of thought in a way that transcends logic. But he is not slipping into a kind of psychologism – that particular approach was disproved on logical grounds and a solution here must be translogical, \textit{not} counter-logical; it must employ a metaphysical approach and viewpoint that must transcend categories rather than attempt to reduce one to another on the basis of a category mistake.

How are we to conceive of this translogical, metaphysical way of looking at the human being that is to shed the proper light on the problems of logic? The problem of truth, which brings together problems of cognition, judgement, and meaning, must be


\textsuperscript{222} "If we contrapose the first sentence we get roughly, ‘if the context from which it [logic] is interpreted is a translogical one, [then] we can view logic and its problems in the true light.’ In other words, the ‘translogical context’ or ‘light’ by means of which we are to view ‘logic,’ as including signification-, judgement-, and Wissenschafts-theory, is best measured by the ‘optics’ of philosophy, metaphysics.” Stewart, Roderick. “Signification and Radical Subjectivity.” \textit{Man and World} 12 (1979) pp. 360-77, p. 370.
provided a new interpretation of consciousness (this will be a metaphysical-teleological interpretation). Consciousness is to be rooted in an understanding of its role as an active, living deed rather than as a mere biological fact (the activities of the brain of a physical animal rationale). This new interpretation of consciousness is to be found in the concept of Living Spirit that Heidegger introduces in the conclusion, though he does not go into great detail.

The notion of Living Spirit is not sufficiently explained or expanded upon by Heidegger. Indeed the conclusion reads very much like a preliminary advertisement of further work rather than a place where Heidegger feels compelled to lay-out or justify a new philosophical project in any sort of concrete manner.223 We can however, gain a fairly good sense of the basic outline of this concept. The concept of Living Spirit is to provide an interpretation of consciousness that includes more than a structural description of the subject-object relationship; it is to be translogical; it also – importantly – must break free from a merely theoretical approach into real life itself. As Theodore Kisiel puts it:

223 In two separate footnotes Heidegger actually describes and advertises future projects – one on the mysticism of Meister Eckhart (in its philosophical significance and value, rather than as a straightforward explication from a religious point of view) (LVI, Heidegger. Die Kategorien und Bedeutungslehre p. 344), and the other where “the author hopes to be able, in the very near future to present some major assessments on being, value, and negation in a more extensive work.” (LVII, Ibid. p. 349) As we will see after the Habilitationsschrift, Heidegger in fact published nothing for a decade until, in order to secure a chair at Freiburg he rushed Sein und Zeit to the presses.
The logical problems of category and judgement are to be reinserted into the ‘translogical’ context of the ‘Living Spirit’ in which meaning is first realised,\(^{224}\) where the theoretical attitude is only one possibility and by no means the most significant. The rich and variegated life of the spirit includes within itself the fullness of achievements of its history, which must be made operative in order to work out the ‘cosmos of categories,’ which is to displace the impoverished schematic tables of categories hitherto proposed. …The concept of the living spirit thus takes us to a fundamental level in which the uniqueness and individuality of acts and the self-sustaining validity of meaning are brought into living unity, where the character of this unity in and through its differentiations poses the most difficult of ontological problems. But only with the ‘breakthrough into the true reality and real truth’ will it be possible to arrive at a satisfying answer to questions such as how ‘unreal’ (ideal) meaning grants true reality to us, and to determine the sense and the limits of the form-matter relationship as an account of how categories structure our judgements.\(^{225}\)

Though this project that Heidegger proposes ultimately was not executed, we have here a guidepost for the direction in which his thought was tending in the last years of the decade. We see the young logician (as he once described himself) moving into broader realms and challenging the more narrow focus of his earlier work. We also see evidence here that the primary concern that underlies these considerations is in fact that of ultimate

\(^{224}\) “[Heidegger] calls for their rejuvenation by setting them back into the meaningful coherences and continuities of the immediate life of the subject in complex correlativeity with its objects.” Kisiel, *Heidegger’s Way of Thought*, p. 89

\(^{225}\) Ibid.
ground: that upon which true reality is founded, that which grants it meaning, the ultimate sense and limits of the form-matter relation, etc. – all of this points to the deeper fundamental question: “upon what solid foundation – if any – is all of this based?”

Living-Spirit, Ultimate Ground, and Romanticism

Heidegger’s indications in the conclusion point to the concept of Living Spirit as an area where we may find an answer to this question. We should note here the academic context of the conclusion: it takes the form of a research programme; rather than proposing a completed answer, the conclusion points to what Heidegger at the time saw as the most fruitful potential area for future research. The problem that this brief statement has left for future generations of interpreters is that Heidegger nowhere gives a complete or even adequate definition of this “Living Spirit” [der lebendige Geist]. In the remaining pages of this chapter I will offer an explanation of this term, based on hitherto unexplored textual connections and their relationships to the intellectual and religious context of Heidegger’s life at the time. And I will argue for the significance of Heidegger’s formulations in the conclusion to the Habilitationsschrift for understanding the subsequent development of his thought. The speculative project that Heidegger outlines in the conclusion, that which would complete a solution to the problem of categories and thus the problem of knowledge, represents a crucial turning point in the history of the development of his thought about meaning and ultimate ground.

The first clue we have as to what this exploration of “Living Spirit” would add to Heidegger’s search is the fact that he ties the term to Friedrich Schlegel, one of the early

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226 Kisiel, Heidegger’s Way of Thought, p. 120
German Romantics, who was part of the Jena Circle and later a Catholic convert.\footnote{227} Schlegel was an interesting character. Born in 1772, brother to August Wilhelm Schlegel, and nephew of the playwright Johann Elias Schlegel, he came to philosophy and literature from philology, establishing a lifelong connection to the problems of language. In his earliest literary/philosophical work he praised the ancients as superior to the moderns. But Schlegel was gradually won over to the modern, romantic position through participation in the Jena Circle.

The philosophical world of early German Romanticism found its centre of gravity in the question of where philosophy was to go in the aftermath of Kant’s critical philosophy:

In the ‘first generation of Kant readers,’ the group of thinkers of which Schlegel was a part, we find important challenges to defining philosophy in terms of mathematical and scientific models of necessity and certainty and a move toward incorporating history into philosophy and of bringing philosophy closer to poetry,

\footnote{227 The early German Romantics were a group of thinkers active in the late 18th and early 19th centuries who were deeply affected by the multitude of powerful swirling trends in philosophy, art, science, literature, and politics of their time. They were some of the first thinkers in the wake of Kant’s critical philosophy and were profoundly influenced by Fichte and others who were, themselves, reacting to Kant (see below for a more detailed account. The Jena Circle (Ludwig Tieck, the brothers Schlegel, Novalis, Friedrich Schleiermacher, and others), centred around Jena in the years 1798-1804 and represented the crucial heart of early German Romanticism. Their philosophical and literary discussions created a fertile ground which allowed new thought to flourish (see below). Much of their ideas were published in their journal the Athenäum.}
in what was part of a more general move to establish a philosophical method for understanding the unity of all branches of knowledge.  

This approach was in contrast to Fichte, Jacobi, Reinhold, and others who attempted to complete Kant’s revolution by correcting it. Schlegel, on the other hand, …was not interested in showing that he had understood Kant better than Kant himself, or in searching for the missing premises of Kant’s arguments… In short, he believed that Kant’s critical philosophy was fine as far as it went, but it just did not go far enough. With Schlegel, we find an important call toward the completion of critique in philosophy via a critique of philosophy itself.

Schlegel argued that the sort of searches for first principles that Fichte, Jacobi, and others proposed were problematic from the beginning. And he was concerned with their continued lack of historical sense, a problem that is all too prominent in Kant himself.

The early German Romantics were influenced by Jacobi and were deeply impressed by Fichte, even as they ultimately remained unconvinced. They found Fichte’s powerful systematic arguments compelling, but unconvincing. Going beyond a rejection of Fichte’s positing of the first principle in the I/not-I relationship, they denied that philosophy could be based on any single first principle at all. This view was shared by all members of the group, from Hölderlin and Novalis to the brothers Schlegel.

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229 Ibid. P. 119.
230 “Schlegel wanted to get to a higher level of criticism than the one Kant had reached, but not, as Reinhold and Fichte had tried to do, by establishing a principle higher than the one given in Kant’s Transcendental Deduction, that is, by establishing an absolute or unconditioned principle, which by definition would be beyond the conditions of knowledge set out by Kant in the *Critique of Pure Reason*.” Ibid. P. 120.
The fact that the early German Romantics gave up on a final systematic philosophy built up from a first principle does not, however, mean that they gave up on reason and became irrationalists (as they have incorrectly been characterised).\textsuperscript{231} They rejected the idea of building up a systematic philosophy from a first principle on rational grounds.\textsuperscript{232} As Manfred Frank puts it, the early German Romantics “were of the opinion that we could not grasp the Absolute or the unconditioned in thought, to say nothing of being able to arrive at it in reality.”\textsuperscript{233} If we were able to contain the infinite absolute in

\textsuperscript{231} There has been a great deal of interest in the philosophy of early German Romanticism in the past couple of decades. Scholars such as Manfred Frank, Andrew Bowie, and Elizabeth Millán-Zaibert, have done excellent work on the topic, making great headway toward correcting mistaken notions about this cluster of thinkers. Amongst other things, they have raised awareness about the facts that: Early German Romanticism was not an exclusively literary movement, having nothing to do with philosophy. The early German Romantics were not irrationalists who placed all value in feeling over thinking. They were not anti-Enlightenment thinkers battling reason with irrationalism and feeling. They were profoundly influenced by the reception of Kant’s critical philosophy, and, indeed, wanted critique to be taken further than Kant and his immediate successors had done. Reason continued to be (as Millán-Zaibert puts it) “the ultimate touchstone for truth” (Ibid. p. 122) for the early German Romantics. But they thought that feeling needed to be incorporated as well. And rather than wanting to be rid of science, they wished to incorporate art and science together, to combine philosophy and poetry and develop a less narrow way of viewing reality and human experience. See: Frank, Manfred. \textit{The Philosophical Foundations of Early German Romanticism}. Albany: State University of New York Press, 2004, and Millán-Zaibert, Friedrich Schlegel, for more information.

\textsuperscript{232} “While the Early German Romantics do not abandon reason as the ultimate touchstone of knowledge, they do abandon the idea that philosophy begins with any first principle… and the view that philosophy, understood as a solitary system standing outside of change, outside of history, can frame reality. Once we understand this move away from philosophy understood as the production (in the form of a system) of an isolated thinker created \textit{ex nihilo}, as the ultimate frame for reality, we can begin to understand the concepts that underlie Schlegel’s interest in beginning philosophy in the midst of a philosophical tradition that has much to teach all thinkers who seek truth. Schlegel’s historical approach to doing philosophy is rooted in a conviction that philosophy, insofar as it is a search for truth, can never come to an end.” Millán-Zaibert, Friedrich Schlegel. P. 122.

\textsuperscript{233} Frank, Manfred. \textit{Philosophical Foundations}. P. 24.
our thought it could not, by definition, be infinite.\(^{234}\) Hence, Frank follows the above sentence with the Novalis fragment that Heidegger uses as a motto for his conclusion: “Everywhere we seek the unconditioned (das Unbedingte), but find only things (Dinge).”\(^{235}\) Nevertheless, the early German Romantics did not give up on philosophy because of this, nor did they give up on truth, or even systems. Instead, they developed a new conception of philosophy (best expressed by Schlegel) as an infinite task.

Schlegel developed a conception of philosophy as a living, dynamic process that never reached completion, but that, at the same time, was not merely arbitrary, lacking any sort of solidity. Rather, they saw philosophy’s relation to truth as a process of ever-greater approximation.\(^{236}\) Schlegel stressed the need for at least two principles to begin philosophising, starting not with a first foundation (which Fichte and others sought as the first foundation) but two, neither of which was ultimate or unconditioned. When philosophy begins with two principles, it begins its exploration with a relation. Because neither principle would, or could be ultimate or unconditioned, in essence, any two principles would do to make a start of philosophy.\(^{237}\) It really does not matter where one starts, what matters is that one makes a start somewhere, and proceeds with the right

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\(^{234}\) Kant had already explained the difficulties of this problem in the Antinomy of Pure Reason where he notes that Reason runs into problems “when it tries to liberate from every condition and to grasp in its unconditioned totality, that which can always be determined only conditionally in accordance with the rules of experience.” CPR 496

\(^{235}\) Frank, Philosophical Foundations. P. 24.

\(^{236}\) As Einstein and Infeld once put it, “The more we read [the book of nature], the more fully do we appreciate the perfect construction of the book, even though a complete solution seems to recede as we advance.” Einstein, A. & Infeld, L. The Evolution of Physics. New York: Simon & Schuster, 1966, p. 4.

\(^{237}\) The “real-life” human being thus begins philosophy with principles from her philosophical culture, provided by history, and it matters little which ones she begins with.
degree of rigour and honesty (especially honesty about one’s own limits). Schlegel sums all of this up in an evocative way by saying that real philosophy does not begin with a static first principle, but in Medias Res, like an epic poem. Out of this comes Schlegel’s insistence that philosophy must be historical.

All of this sounds like a perfect answer to the problem of finding an ultimate ground… we don’t need one! Everything is simply a moving, changing, living relational nexus. This almost sounds like a thorough relativism… but it is not. Schlegel and the early German Romantics were relativists to a point, but only to a point. They did not believe that everything was relative, that there was no absolute. They simply recognised that human beings can never encompass the absolute in thought; indeed, if the absolute could be encompassed in thought it would not be absolute; to know the totality of infinity is impossible, even if, by a sort of calculus, we achieve ever-greater degrees of near-completion. They thought that there was a “big-T” truth out there, and that, although humans can never grasp it fully, we can get closer and closer to it. There is a conception of perfectibility at play in their concept of truth that is related to the perfectibility writ large in Hegel, and indeed, in positivism later on; though there are, obviously, great

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238 It is in this sense that Schlegel believed Kant’s Critical Philosophy had not been nearly critical enough.
240 Schlegel, philosophy must be historical quote
241 As Elizabeth Millán-Zaibert puts it: “Schlegel’s references to the relativity of truth point to a conception of truth claims as uncertain but not indeterminate. His view of truth is not antirealist, though; it is more like a coherence theory of truth than like a correspondence theory of truth. Schlegel’s acceptance of uncertainty does not amount to an abandonment of a shared, objective reality against which we may measure our claims.” Millán-Zaibert, Friedrich Schlegel. P. 49.
differences in each case as well. Philosophy, in Schlegel and early German Romanticism in general is, indeed, infinitely perfectible. As Schlegel puts it:

Infinite are the steps forward which yet remain to be taken. Not only is the content inexhaustible, but also the form, every concept, every proof, is infinitely perfectible. Even mathematics is not excluded from this…”

Schlegel saw the movement towards this infinite perfectibility in terms of a reciprocal movement between principles (a *Wechselerweis*, “a reciprocal, or alternating manner” as he terms it).

That Heidegger invokes both Schlegel and Novalis precisely at this point, where the question of ultimate ground again begs itself, is significant as indicating the opening-up of his philosophical horizons, and there is much in the philosophy of the early German Romantics that finds resounding echoes in his later thought. This adoption of early German Romantic ideas is a crucial developmental step in Heidegger’s thinking, and it certainly presents a promising approach to the problem of ultimate ground. But there is

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242 This idea recurs throughout the early German Romantics and throughout Schlegel’s whole career. “Schlegel did not view philosophy as a deductive science nor as a practical science but rather… as a historical, comparative science that would remain open-ended.” Millán-Zaibert. *Friedrich Schlegel*. p. 134. Also see the aphorism of the mirrors below. See also Schlegel, Friedrich. *The Philosophy of Life*, in, *The Philosophy of Life and Philosophy of Language: In a Course of Lectures*. New York: Harper & Bros. 1848. (“knowledge raised to a higher power”), p. 196.

243 (Quoted in Millán-Zaibert, *Friedrich Schlegel*. P. 134 [KA18 p. 518, #9])

244 “The *Wechselerweis*, as a structure to understand how principles work together to lead us to truth, is related to Schlegel’s holism and his endorsement of a coherence view of truth. For Schlegel, nothing is known in isolation but always as part of the whole of the parts that comprise it. All elements of our system of knowledge interact with one another.” Millán-Zaibert. *Friedrich Schlegel*. p. 135.
also more to the issue than this connection to *early* German Romanticism, and particularly more than the connection to the *early* Schlegel.

As far as approaches to the problem of ultimate ground go, the early German Romantic solution has much to commend itself. It is both rational and reasonable, and, if the notion of infinite perfectibility is perhaps not convincing enough to refute a thorough relativism, the whole is not unsalvageable for this. But it is *unsatisfying*, as all relativistic systems seem to be. This is something that Schlegel and the early German Romantics had a notion of, and indeed, this problem of our inability to be satisfied with incomplete or relativistic knowledge was already prefigured by Kant.\(^{245}\)

The conception of philosophy that Schlegel and the other early German Romantics developed was of an unending search for knowledge that, though it achieved ever-greater degrees of perfection, never reached its goal. And the engine of this moving search was, in fact, dissatisfaction. For Schlegel and the others, philosophy was driven by humanity’s inborn desire, our *need* for certainty, totality, and finality. The *need* for an ultimate ground drives us forward, even if we can never reach it. As Frank puts it:

…we finite beings… strive toward a completeness of knowledge, but can never arrive at it, since we have a finite number of intuitions available upon which to base our judgements. The early German Romantics, in reference to this infinite project spoke of the “longing for the infinite”… In “longing for the infinite,” the

\(^{245}\) See, for instance, CPR B389 for Kant’s comment on reason’s demand for unconditional grounding.
early German Romantics believed themselves to have provided an unconventional, but by no means unsuitable translation of the Greek *filosofia*. Though we can *never* reach the unconditioned we strive towards it. Kant believed this led to illusions. Describing this feature of human nature in the Transcendental Dialectic he noted: “human reason has a natural propensity to overstep all… boundaries…” Though Kant had already warned that this led to illusions, and though Schlegel, along with the other early German Romantics, had forsworn ultimate answers, it is hard not to look for something more. And this tendency played out in Schlegel’s own intellectual development after the early period of German Romanticism, when the Jena Circle broke up and he made a change in direction that is important for our story here.

An atheist earlier in his life, as early as the late 1790’s Schlegel had been discussing religion. He had, at various times in his life, expressed feelings of lack, akin to the descriptions of the motive force for philosophy. In 1808 he converted to Catholicism. As Hans Eichner puts it:

[The early] Schlegel… insisted that man made his own Gods and that any God not so made was a mere idol… But those were days when, buoyed up by his own

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246 Frank, *Philosophical Foundations*. 29. See also p. 184. See also, *Philosophy of Life* p. 39 (“Out of this root [longing] springs almost every thing that is intellectually beautiful and great – even the love of scientific certainty itself, and of a profound knowledge of life and nature. Philosophy, indeed, has no other source, and we might in this respect call it, with much propriety, the doctrine or the science of longing.”)

247 CPR 590


249 “…it had been his constant complaint, in his earliest extant letters, that his own personality was unbalanced…” Eichner, *Friedrich Schlegel*. p. 138, See also pp. 74-5.

250 See Eichner, *Friedrich Schlegel*. pp. 91-144, esp. 106-11. “He reached the conclusion that Christianity was not one mythology among many, but the Truth…” p. 103
accomplishments and full of high hopes for himself and mankind, he was persuaded that man could live by his own strength and was in need of no other guidance or consolation than that derived from his own ideals. …when he began to accept a God given to man, rather than created by man, as a symbol of his highest aspirations, those hopes had been thoroughly crushed. …the time to search for external support, for a different meaning to life, for supernatural solutions and reassurances had come…”

After his conversion he reinvented himself, first as a public servant to the Habsburg Emperor, and then as a Catholic philosopher.

His late works are pale shadows of his earlier output. The energy, wit, and feeling of his earlier works are, in the later ponderous systems, replaced with a rigidity and closed-ness. Whereas, in his early work, and in the thought of the early German Romantics in general, there was a healthy realisation of the limits of our ability to have the answer, in the later works, the answer provided by the Catholic religion is the correct one and other, competing answers are “heathen” or the work of the devil or other evil spirits. There is a religious dogmatism at play in Schlegel’s last works that feels very

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252 “Schlegel’s conversion was one step of many that signalled his growing conservatism… According to Bieser, when Schlegel attempted to account for his conversion to the Roman Catholic Church, he referred to the sense of belonging he felt within it. In 1817 he claimed that his intellectual career could be described as an attempt to attach himself to a whole greater than himself. ‘In my life and philosophical apprenticeship there has been a constant searching after eternal unity… and an attaching to something external, a historical reality or a given ideal… There was an attaching to the orient, to the German, to freedom, to poetry, finally to the Church, as everywhere else the search for freedom and unity was in vain. Was this attaching not a search for protection, for a final foundation?’” Millán-Zaibert. Friedrich Schlegel. p. 18.
much like he is trying to convince himself as much as he is trying to convince his listeners.\footnote{Deeply unhappy throughout much of his life, with a constant feeling of lack and a desire for some firm thing to hold onto and give his life completion and meaning, Schlegel seems emotionally to put all of his eggs in one basket, and believed that his conversion would provide him with what he was looking for and felt that he lacked. That his conversion did not seem to do this is reflected in his biography: he took to heavy drinking and overeating and was notably morose and depressed much of the time. His claims in his last works that commitment to what he now claimed was the one true philosophy, healed the fractured soul of modern man ring hollow in light of this. And indeed, the statements are made with a degree of seeming assertive desperation that hints at the continued disharmony within. See Eichner, \textit{Friedrich Schlegel}. pp. 126-44 for an account of Schlegel’s unhappy later years.} And yet, as little as he is read today, this ossified, conservative Schlegel is vitally important for understanding this crucial turning point in Heidegger’s development.

The importance of the late, Catholic Schlegel for Heidegger’s development has not yet been explored.\footnote{As there is so much in what follows that is new and hitherto unnoticed I hope to put it together into an article sometime soon.} Indeed, few seem to even read the late Schlegel today, even after much interest has been revived in his earlier work. But if we look closely at the outline for future work that Heidegger sketches in his \textit{Habilitationsschrift} conclusion, we find that it is, in fact, the late Schlegel, so little studied, and – perhaps with some good reason – unfavourably compared with the work of his younger self, who has the more profound influence here. The connection between Schlegel and the concluding chapter has never been a secret; Heidegger mentions Schlegel by name, but this connection has never been fully explored. Most commentators note the reference “to life” and move on, exploring the important connection to Dilthey – who becomes very important for Heidegger after this point but is not, in fact, mentioned at all in the conclusion – and the then current resurgence of interest in his philosophy. But an exploration of the
importance of the late Schlegel for this crucial point in Heidegger’s career in fact pays
great dividends. It helps us to understand the kinds of issues Heidegger was grappling
with, particularly in regard to one of our essential concerns here: the question of ultimate
ground and its relation to meaning. And it sheds light both on the ways in which
Heidegger’s work up to this point had not solved the problem, and on one of the new
paths he was to take later.

In the conclusion, Heidegger lays out a set of problems that must be tackled if the
problem of the categories (and thus of the problem of knowledge) is to come to a
solution:

1) A demarcation of their domains must be made. (This, Heidegger feels he has
done to an adequate extent in the body of the Habilitationsschrift.)

2) The problem of judgement must be incorporated with the problem of the
categories. (This Heidegger had touched on in the body of the Habilitationsschrift
but believed he had not fully explored.)

3) The problem of history, as a sense-determining element must also be
incorporated.

All of this must come together in a theory of logic and the categories (the “problem of
cognition itself” as Heidegger generalises it\(^{255}\)) that is metaphysical and trans-logical. The
concept of Living Spirit is somehow supposed to provide a way forward. If it is to
succeed in bringing these philosophical problems to some sort of a satisfactory
conclusion, this concept of Living Spirit must then incorporate the problems of

\(^{255}\) Heidegger. *Die Kategorien und Bedeutungslehre* p. 344.
judgement and history (as sense-determining element) into a trans-logical metaphysical account that provides a degree of solidity to the seemingly arbitrary domains of the categories, and their relations to the domains of judgement and history. Though Heidegger did not complete this project, knowing some of its parameters and its inspirational source, as well as the context in which Heidegger proposed it, we may be able to offer a partial and schematic reconstruction of what he had in mind.

The concept of Living Spirit is from Schlegel. Aaron Bunch points to an early use in Schlegel’s 1800 “Dialogue on Poetry,” where Schlegel uses it to describe a kind of vital force. He then goes on to expand on the concept, quoting some of Schlegel’s other uses of the word “spirit” on its own. This expands our sense of the source Heidegger is drawing from, but it over-broadens it at the same time, and we lose the specificity that allows us to see deeper. “Spirit” is, as anyone who has studied German philosophy knows, at once a widespread, polyvalent, and multi-faceted term. Schlegel uses the word “spirit” countless times, and in many different ways. Indeed, there are many different kinds of “spirits” that haunt the works of this often-troubled thinker.

The concept of Living Spirit that Heidegger invokes comes not from Schlegel’s earlier, more exciting and widely read works, but from a very late work, from the last two

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256 “Whenever Living Spirit appears captured in a formed letter, there is art…” Schlegel, Friedrich. “Dialogue on Poetry.” In Willson, Leslie (Ed.) German Romantic Criticism: Novalis, Schlegel, Schleiermacher, and others. New York: Continuum, p. 84. This sense of Living Spirit as vital force is not absent in the later concept described below, rather it is incorporated into a much larger, more powerful, and, at the same time, more specific and defined concept.

years of his life in his final, Catholic period: The Philosophy of Life in a Course of Lectures. It is here that Schlegel develops a concept of Living Spirit, as opposed to using the phrase in a looser, more evocative, but less defined and developed way in the “Dialogue on Poetry.” The Philosophy of Life develops the idea of a vital philosophical outlook that is as much a philosophy for life as it is of life. The Philosophy of Life is a living philosophy. It is a spiritual philosophy that stands in opposition to the “dead” philosophy that Schlegel saw as poisoning the thought of his time. In the Catholic Schlegel’s eyes, the two great competing philosophical ideologies of his day, empiricism and idealism, a dead, mechanistic natural science and an equally dead, empty reason, were detrimental to human beings. These ways of looking at existence fractured human consciousness, making the human mind and soul into houses divided against themselves. They were dead philosophies that made people spiritually dead. And they needed to be replaced with a living philosophy of life that would reunite our divided selves.

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258 Schlegel, The Philosophy of Life.
259 This looser use is as characteristic of the younger Schlegel’s poetic mode of expression as the more clearly developed concept is of his more ponderous later style. In fact, I would argue that the earlier use of the term as a sort of vital energy in individual works and in historical periods, is related to the later, larger, more developed and defined concept, which encompasses it (by way of a concept of vital energy and the idea of an historical manifestation of a Living Spirit [and this before Hegel]).
260 This focus on life and living force was not something entirely new to this later phase in Schlegel’s thought, nor to the later phase of Romanticism in general: “Life is the premise and paradigm for what is most innovative and distinctive in Romantic thinkers. Hence their vitalism: the celebration of that which lives, moves, and evolves by an internal energy, over what is lifeless, inert, and unchanging.” Abrams, M.H. Natural Supernaturalism: Tradition and Revolution in Romantic Literature. New York: W.W. Norton & Co. 1971. p. 431-2
It is not only the fact that *The Philosophy of Life* is the key work where Schlegel develops the term Living Spirit into an actual philosophical concept that points to this work as Heidegger’s source. Crucial to this determination is the nature of Schlegel’s concept and the uses Heidegger wants to put it to, Heidegger’s own brief, compact, and, by no means satisfactory definition of the term at the end of the conclusion (to which I shall return), and a specific quotation that seems to have gone unnoticed, or at least unexplored, in the scholarship. Though Heidegger scholars have observed His connection of the concept of Living Spirit to Schlegel, they have not followed the text closely enough. When Heidegger first uses the term there is no mention of Schlegel. Whilst discussing validity and objectivity, Heidegger mentions “deeper-lying groups of problems which are embraced in the concept of Living Spirit and unquestionably are closely connected with the problem of value.” It is only with the second use of the term that Schlegel’s name comes up, and here it is associated not directly with the concept of Living Spirit – which Heidegger does not seem to think requires a citation – but with a direct quotation from Schlegel:

> Only by taking its orientation from the concept of *lebendinger Geist* [Living Spirit] and its ‘eternal affirmations’ (Fr. Schlegel) will an epistemological logic be guarded from limiting itself exclusively to a study of structures, and only [by taking this orientation] will it make logical sense, *even in its ontic meaning, into a* 

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problem. Only then will a satisfactory answer be possible as to how ‘unreal’
‘transcendent’ sense guarantees for true reality and objectivity. 263

The quotation (Living Spirit and its “eternal affirmations”, to which we shall return to
below) comes from Schlegel’s Philosophy of Life, in which Living Spirit is developed
into a full-fledged concept. If this concept comes from Schlegel’s Philosophy of Life, how
might it have helped Heidegger to solve the problems he saw before him? To answer this
it will help to explore Schlegel’s concept and the philosophical situation in which
Heidegger found himself in tandem.

Bits of Schlegelian and Romantic language occur throughout Heidegger’s
conclusion. He speaks of the “essential potencies” of the problem he examines264 and of a
“raising of powers” within “the structural manifold of what is logical,”265 echoing
Schlegel’s aphorism of the mirrors.266 He notes that the potencies of the problem
“condition one another reciprocally,”267 seemingly invoking Schlegel’s concept of the
Wechselwerweis. And, immediately following that, Heidegger notes, in harmony with

und Bedeutungslehre p. 348).
265 Ibid. p. 347.
266 “Romantic poetry is a progressive, universal poetry… It alone can become, like the
epic, a mirror of the whole circumambient world, an image of the age. And it can also –
more than any other form – hover at the midpoint between the portrayed and the
portrayer, free from all real and ideal self-interest, on the wings of poetic reflection, and
can raise that reflection again and again to a higher power, can multiply it in an endless
succession of mirrors.” Schlegel, Athenaeum Fragment 116
The early Schlegel’s philosophical fragments are full of calls for a poetry of poetry that
would be a philosophy of philosophy and join the two activities together. “Potentiation”
occurs in The Philosophy of Life as well. See pp. 156,
the early German Romantics: “What is apparently immediate and unmediated is always mediated; moreover, what we establish individually in what follows, gets its full sense only in the totality.”268 This, of course, is intended to invoke the opening motto from Novalis that Heidegger has chosen for the conclusion: “We seek everywhere for the unconditioned, and continue to find only things.”269 But the idea is also fully supported by Schlegel. All of these ideas, central to the world of Early German Romanticism, are still present in Schlegel’s later work. He does not give up on these ideas; rather, he comes to a new conclusion about the source of the unconditioned and the totality. For the later Schlegel it is the God of the Catholic Church.270 In the later, Catholic Schlegel there is still acceptance of a degree of relativism, but there is solidity, provided by religious conviction. One can see the potential attraction here for Heidegger, the young Catholic philosopher dealing with questions of contingency, relativism, and ground.

In addition to the above echoes of Romanticism, the conclusion is also peppered with the metaphorical language of death and life, which ties this discussion to Schlegel’s *Philosophy of Life*. Heidegger speaks of the “lethal vacuity” of the merely theoretical account of the problem he has presented up to this point.271 Schlegel’s lectures on the Philosophy of Life are riddled with statements about the “deadly” and “empty” effects of

269 Ibid.
270 Questions about the mode of our access to the totality and any source of certainty for this particular interpretation in the later Schlegel are not particularly well worked out, he points to four sources of “revelation” that are supposed to grant us access to this knowledge and certainty (see below), but offers us no ground for taking his word on this, but this is beyond our scope here.
merely theoretical thinking.\textsuperscript{272} In speaking about historical understanding, Heidegger notes that we need to seek beyond dry standard “‘explanation’ [the scare-quotes are Heidegger’s], which is generally preferred in the historical sciences” to arrive at a “living understanding of a ‘period.’”\textsuperscript{273} In The Philosophy of Life (1828) and in his Philosophy of History (1829), Schlegel too is concerned with a reformation of historical understanding. And he proposes that what we need to arrive at is a living understanding of historical periods beyond a dead recounting of mere facts. “A history that enters into the spirit,” as he puts it early in the book.\textsuperscript{274} And here is a key point of conversion between Schlegel’s interests at this point in his life and the young Heidegger’s interests at this point in his own: their shared historical interest in and emotional and spiritual connection with the Middle Ages.

Heidegger’s connection to the Middle Ages had begun early, in the medieval roots of the Catholic tradition in which he had been raised, in his earliest coursework, while he was still a seminary student, and in his continuing engagement with medieval philosophy up to and including his Habilitationsschrift. He maintained a lifelong interest in the world of the Middle Ages, even if he soon moved beyond a life’s-work that was devoted to it.

\textsuperscript{272} See Schlegel, The Philosophy of Life, on: The vacuum of the absolute idea (p. 21), philosophy as idle speculative and dead science (p. 99), dead abstractions alien to life (p. 185), mere abstract and dead thinking (p. 224), etc.


\textsuperscript{274} Schlegel, The Philosophy of Life. P. 11. Heidegger’s “mental unrest” (Die Kategorien und Bedeutungslehre p. 343) about history is here matched by Schlegel when he disapproves of history being taken too far and too exclusively, nothing that the history of philosophy is not philosophy itself Schlegel, The Philosophy of Life. P. 11.
Schlegel’s interest in the Middle Ages arose out of his connection to other members of the early German Romantic movement, who participated in a general re-discovery that the Middle Ages were more than the dark and gloomy age that they had been portrayed as at least since Petrarch. Schlegel had begun as a convinced classicist but had been won over by Novalis and others to the charm and emotional depth of medieval “romance” works, developing an appreciation for the period that seems to have had a hand in the confessional choice in his conversion and became a central feature of his understanding of the history of spirit.\(^{275}\)

Both Schlegel and Heidegger saw grave problems with the worldview of their own age: Schlegel described the lack of spiritual foundation in his own time,\(^ {276}\) where the “whole of life has ceased to be understood in its symbolical character,”\(^ {277}\) and Heidegger noted the “broad but fleeting content” of the modern “two-dimensional” way of life with

\(^{275}\) “…whereas Kant looked toward the future, which he hoped would bring progress beyond the former and present stages of history, Novalis saw the ideal embodied in [and] …glorified the Middle Ages as the period of unity and peace, in which Europe formed a spiritual empire under the leadership of a wise clergy. Religion was the breath of medieval civilisation, and the church gave the human mind ideals of supreme beauty and truth. Novalis found symptoms of decline as early as the latter Middle Ages, but the full decay was caused by Protestantism and modern rationalism. The religious division gave soulless states the opportunity for usurping ecclesiastical authority. Rational scientific thought destroyed the beauty that sprang from the medieval order and finally dethroned God by making him an idle observer of a self-propelled mechanical universe.”

Holborn, Hajo. *A History of Modern Germany: 1648-1840*. New York: Alfred A. Knopf, 1973 p. 349  Obviously this is an idealised and in many ways inaccurate view of the Middle Ages and the Catholic Church of the time, but this evocative view of Novalis’ was a powerful force in the Catholic revival of the time in which Schlegel took part.


\(^{277}\) Ibid. p. 265.
its “possibilities of growing uncertainty and complete disorientation.”

And in (their picture of) the medieval worldview both of these thinkers saw a better way of viewing existence, a better way of viewing our relation to the world and to the divine. For Heidegger, the medieval worldview was possessed by a “peculiar will-to-live and [a] refined, spiritual sobriety,” in its philosophical orientation. Heidegger marked the concept of analogy in the Middle Ages – as characterising the relation between the phenomena of this world and the spiritual world – as being particularly important. This contains, Heidegger says,

…as the dominant principle in the categorical sphere of sensory and non-sensory reality, the conceptual expression of the qualitatively imbued, value-laden, and transcendentally-related world of experience of the medieval man; it [the concept of analogy] is the conceptual expression of that specific form of inner existence that is anchored in the transcendent, primal relationship of the soul to God, - an inner existence as it was alive in the Middle Ages with rare resoluteness. The manifold of vital relations between God and soul, the other World and this World, was altered in virtue of the respective distance or proximity (in the qualitatively intensive sense). The metaphysical fastening-together accomplished through transcendence is at the same time the source of various antithetical claims, but

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For Heidegger then, the worldview of the Middle Ages had a solid, ultimate ground in which it was “anchored,” in the transcendental relationship between human beings and God. This contrasts sharply with the untethered, relativistic situation of man in the modern world, with “its broad but fleeting content.” The contrast between the medieval worldview, anchored in the transcendent relationship with God, and the modern worldview, lost in the ungrounded sensory world is stark for Heidegger:

The possibilities of growing uncertainty and complete disorientation are much greater and even limitless for this standard of living that elapses in a two-dimensional fashion, while, on the other hand, the basic pattern to the form of life of medieval man from beginning to end did not in any way anchor itself nor lose itself in the broad current of sensory reality; rather, it subordinated sensory reality itself, as something requiring anchoring, to a transcendent and necessary goal.

These thoughts all have their equivalents in the late Schlegel.

For Schlegel, the modern worldview also led to uncertainty and disorientation. It divided human consciousness and led to emptiness and spiritual death. His own age was “the direct contrary” of the ideal. He says “the present age may be likened to a noble

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283 Schlegel, The Philosophy of Life. P. 265.
house, fallen from its primitive wealth and magnificence into decay and ruin,\textsuperscript{284} which Schlegel also contrasted with his vision of the medieval worldview. For Schlegel, the medieval period was “the very centre of man’s history,” where “science and life were again at unison, as at the beginning.”\textsuperscript{285} Analogy was a key concept for Schlegel’s understanding of the Middle Ages as well. Medieval man saw “the whole of life… in its symbolical character,”\textsuperscript{286} an ability that modern man, with his too empirical or too idealistic outlooks had lost.\textsuperscript{287}

Both thinkers, each in his own time, reacted against what they saw as an empty, deadening, groundless relativity in philosophy. Both saw this as detrimental to the spiritual development of the individual. And both looked back to the medieval world as a sort of golden age that had a solid ground in the human relationship with God. In the later Schlegel, the young Heidegger – confronted with serious, fundamental philosophical problems – saw a potential solution to the problem of ultimate ground. In his conclusion to the Habilitationsschrift, Heidegger sketched out a research programme based on Schlegel’s concept of Living Spirit as a potential way forward. Ultimately, he was not to carry through this programme – a situation that will be explored in Chapter 2 – but we can

\textsuperscript{284} Ibid. p. 266. Also p. 319: “…we must admit that in this period they have taken more or less a destructive tendency, and one that threatened in this scientific burrowing to undermine the foundations of everlasting truth.” Schlegel hoped that this would come to an end, and that the excesses of materialism in the sciences and idealism in philosophy would be tempered and the two disciplines would return to harmony with religion in a new “theocracy of science.” See also pp. 320-9.

\textsuperscript{285} Ibid. p. 245.

\textsuperscript{286} Ibid. p. 265.

\textsuperscript{287} Schlegel also draws on these themes in his Philosophy of History, which he saw as being part of a triptych, along with the Philosophy of Language and the Philosophy of Life. See Schlegel, Friedrich, The Philosophy of History in a Course of Lectures. London: Bell & Daldy, 1873.
see why Schlegel’s philosophy seemed to be a tempting way forward for Heidegger at the time.

“Living Spirit,” the concept that Heidegger pulled from Schlegel and believed would offer a way forward that would bring together logic, a theory of the subject, judgement, and history, is, in fact, an ultimate ground, or rather, the ultimate ground. This is the most important thing that the young Catholic philosopher finds in the later Schlegel: something solid to hold on to… certainty and necessity in a relativistic and contingent philosophical world. One of the key advantages of Schlegel’s *Philosophy of Life* over other accounts providing a ground upon which to stand is its acceptance of degrees of relativity and uncertainty while, at the same time, still positing a first cause, ultimate source of and standard for truth, and, in a concept that encompasses both of the former, an ultimate ground for meaning. Though our knowledge of this ultimate ground will never be complete or perfect, we can, as Schlegel sees it, move toward ever greater degrees of perfection in our knowledge and rest assured that all meaning is neither arbitrary nor solely relative.

Schlegel’s presentation of his *Philosophy of Life* through the course of 25 lectures is somewhat tedious and involves degrees of detail and repetition that are unnecessary to delve into here. It may help us to better understand his philosophy if we describe it in phenomenological terms. This is, by no means, Schlegel’s own method in the course of lectures, but the ease with which his *Philosophy of Life* can be presented in this manner speaks to yet another of its attractions for the young Heidegger.
Schlegel’s *Philosophy of Life* is a philosophy that centres on the living human being who confronts life. The living human being – in the terms I use in the introduction – confronts a phenomenal manifold. We can break up this phenomenal manifold, as it pertains to Schlegel’s *Philosophy of Life*, into some broad domains. The living human being confronts the phenomena of the natural world, and, along with this, encounters the body of knowledge produced by natural science. The living human being also confronts the body of knowledge about humanity’s past that is history. In addition to this, the living human being confronts the knowledge imparted by revealed religion. All of this takes place through the medium of language (or, at least, all thought about it does). And, in addition to all of this, the human being confronts that which is the central content and proper subject of philosophy: the human being itself. Schlegel’s Philosophy of Life is a philosophy of the living relation of the living human being to all of these domains that finds its ultimate ground in Living Spirit that anchors the living human being’s relationships to each domain.

Central to understanding the relation to Living Spirit that grounds and governs the other relations in Schlegel’s Philosophy of Life is his concept of the structure of human consciousness. For Schlegel, the human being has a tripartite nature; we are composed of Soul, Spirit, and Body. The Body is primarily the concern of the natural sciences, if we seek to understand it, or of medicine if we seek specifically to heal its maladies. The Soul and the Spirit together make up consciousness, and each is divided into two faculties. Thus, though the human being is tripartite in nature, human consciousness is fourfold.

The Soul is composed of the faculties of Reason and Fancy. The Fancy is the
imagination; it is that faculty by which we build up ideas, by which we dream.\textsuperscript{288} The Reason, Schlegel claims, is both a positive and a negative faculty; it is that faculty by which we divide up the phenomenal manifold into categories, by which we discern individuals, determine difference, etc. and by which we combine phenomena into groups. It is the very faculty of discernment, of division and combination.\textsuperscript{289} Its negative nature is not necessarily something bad, though. In fact, this dividing capability is absolutely vital and necessary. But it can lead us into problems if we give it too much leeway and allow it to rage on unchecked, dividing and tearing apart without restraint. Likewise, a Fancy allowed too much slack, producing visions unchecked by the necessary constraints of reality, and allowed to pose as reality itself, also leads us into error.\textsuperscript{290} We might say with Goya that “the sleep of reason produces monsters.”\textsuperscript{291}

The Spirit is divided into the Will and the Understanding. The Will is fairly self-explanatory: it is our drive and it governs commitment. And, as such, Schlegel notes, the Will is of central importance to our connection with God.\textsuperscript{292} The nature of the Understanding, however, requires slightly more explanation. As the Will is the faculty by

\begin{small}
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\item \textsuperscript{288} Its importance for philosophy is summed up by Schlegel when he says that philosophy does nothing but dream… “scientifically dream” Schlegel, \textit{The Philosophy of Life}. P. 9.
\item \textsuperscript{289} Reason is also the faculty that gives language “its logical order, and its grammatical forms and laws of construction,” while it is the Fancy that first produces language and creates its content. Ibid. 48.
\item \textsuperscript{290} “That… the Reason, no less than the Fancy, has its peculiar – one might almost say innate – optical delusions, must be too well known to every one who has made the slightest progress in the art of logic, and advanced beyond the mere elements of a philosophical examination of this faculty.” Ibid. p. 214.
\item \textsuperscript{291} Goya, \textit{Capricho} No. 43.
\item \textsuperscript{292} Because our proper relationship with God, according to Schlegel is one of commitment. This involves both one’s willing for God and the suppression of one’s will for oneself. Schlegel, \textit{The Philosophy of Life}. pp. 107-9
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which we relate to God, the Understanding is the faculty by which we know God. For Schlegel, while Reason is an active power, always dividing and combining, Understanding is more receptive. There are “many steps and degrees of understanding.” Understanding is something we must attain and build. And while Reason is the faculty for sorting out the phenomenal manifold, Understanding is our sense of phenomena themselves and the whole of the manifold itself. Reason carves up the manifold but understanding is our sense of it, in whole and in part.

The Understanding is the faculty that deals with meaning. That Schlegel ties the faculty that deals with meaning to the faculty by which he claims we know God is significant. As Schlegel puts it:

We understand a phenomenon, a sensation, an object, when we have discerned its inmost meaning, its peculiar character, and proper significance, understanding its real meaning and purpose.

The understanding works partly in tandem with Reason, but, whereas Reason is speculative, the understanding is empirical, and understanding is the only source of certain knowledge. For this reason, Schlegel believes that it is by the faculty of Understanding that we come to know God, rather than by exercising our Reason.

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293 Ibid. p. 158.
294 “…inasmuch as the perfect intellection of a single object results from the totality alone – the significance and spirit of the whole – therefore the understanding is the sense for that Geist which manifests itself in the sensible world, whether this be a human or natural or the supreme divine intelligence.” Ibid. p. 67.
296 “…no living certainty and complete reality is attainable by it.” Ibid. p. 60.
Knowledge of God is, for Schlegel, empirical, rather than speculative. This is why, he believes, Reason runs into so many problems and conflicts when it tries to think God, and thus often leads to unbelief.

Schlegel’s *Philosophy of Life* aims to provide a philosophy of the whole living human being in its relation to life, and thus it takes into account the faculties of Reason and Understanding, combining rationalism and empiricism while, at the same time, avoiding the excesses of both… tempering one with the other. His philosophy “sets out from the Soul as the beginning and first subject, then contemplates the Mind or Spirit as the highest and supreme object,” composed, as it is of the two faculties dominant in the relation to God. Schlegel’s *Philosophy of Life* is a picture of the living human being in relation not only to itself and its world, but also to history and, most importantly, to the Deity that provides the focal point and ground of his whole philosophy:

Accordingly, in its doctrine of the Deity, directly opposing every rationalistic tendency, it conceives of Him and represents Him as a Living Spirit, a personal God, and not merely as an absolute reason or a rational order. If therefore for the sake of distinction, it requires some peculiar and characteristic designation, it might, in contrast to those errors of materialism and idealism… be very aptly

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297 “Knowledge of God is a high and peculiar kind of science of experience.” (57) “Ill would it fare with the knowledge of God and of divine things, if they were left to be discovered, and, as it were, first established by human Reason.” Ibid. p. 57. “If so, it would always be in doubt whether it were real or a mere idea of the human mind.” Ibid. p. 60.

298 See Ibid. pp. 55, 59-60, Schlegel warns of the error of unfettered idealism (p. 60), but also that empiricism must also not be taken along the road of unfettered materialism; both paths, according to Schlegel, are unhealthy errors.

299 Ibid. p. 64.
termed Spiritualism… It is an inward experimental science of a higher order.

…[And, to avoid] the pretension of system… it is best indicated by a simple name, such as we have given it in calling it a Philosophy of Life.\textsuperscript{300}

Schlegel’s philosophy, which he calls both “spiritualism” and “an experimental science” is an attempt to take into account some modern developments in the sciences and in philosophy, but only in so far as they do not present a problem for the revealed religion he had adopted.

“Living Spirit” is a concept of the God of the Catholic religion in His relation to the living human being. This is the central point around which Schlegel’s philosophy circles. This is why he says that it does not matter where on the circumference we begin as long as we find the centre.\textsuperscript{301} The Living Spirit that is the personal God is at once the centre of this circular philosophy,\textsuperscript{302} the ultimate ground of all meaning (and thus of understanding itself), the ultimate ground of and touchstone for all truth,\textsuperscript{303} and the source and \textit{telos} of all life.\textsuperscript{304} Schlegel’s Philosophy of Life is a religious philosophy.\textsuperscript{305} Its ultimate ground is the Living Spirit, the personal God. “…even philosophy must in every case take God for the basis of its speculations – set out from Him and draw in every

\textsuperscript{300} Ibid. pp. 64-5.
\textsuperscript{301} Ibid. pp. 16, See also p. 222, etc.
\textsuperscript{302} Ibid. p. 222.
\textsuperscript{303} Ibid. pp. 141, 168 (“all truth has its ground and principle in Him alone”), 227, etc.
\textsuperscript{304} “…a superabundance of Love in God we must, however, call the final cause – ground of all creation, inasmuch as he stood in no need of it…” Ibid. p. 128. “The Philosophy of Life attains this high dignity beyond a mere philosophy of Reason, or of nature, simply on this account – that the supreme life and the ultimate source of all other degrees of life is even God.” Ibid. p. 188.
\textsuperscript{305} “… the Philosophy of Life [is] actually and in fact a true philosophy of God.” Ibid. p. 187.
instance from this divine source.” In this way it is “no idle speculation and dead science – but a vital effort.”

Heidegger’s only definition of “Living Spirit,” comes at the very end of the conclusion, after his remarks about the advantages of the medieval worldview over the modern. He says:

The philosophy of the Living Spirit, of the deedful love, of the revering intimacy with God, the most general aims of which we can only hint at, especially a theory of categories which is derived from its basic trends, faces the major task of a fundamental showdown… with Hegel.

The other formulations with which Heidegger equates the term Living Spirit make it clear enough that it is the later Schlegel’s concept that he refers to, but the closing proclamation – that the philosophy of Living Spirit must face a showdown with Hegel – comes directly from Schlegel’s Philosophy of Life, where he contrasts the eternal affirmations of Spirits created by God with Hegel’s conception of Spirit, which, for Schlegel is purely a spirit of negativity.

Though this philosophy then is anchored in an ultimate ground, it is still not a philosophy that claims we can or will ever have perfect or complete knowledge of this ground. It retains the degrees of relativism mentioned above and remains cautious about our ability to come to any sort of complete or perfect understanding, while remaining optimistic about the potential for progress. But how is this progress to be made? We

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306 Ibid. p. 99.
308 See Schlegel, The Philosophy of Life. pp. 21, 144, 185, etc.
come to know about the Living Spirit through four channels of revelation. The most obvious source, for a Catholic thinker is, of course, “the written word of Holy Writ.”

But Schlegel finds God’s revelation in other places as well. Revelation also comes to us through the natural world, hence Schlegel’s enthusiasm for natural science (particularly of the vitalistic sort that avoids what he sees as the errors of a thorough mechanism). Revelation also comes to us through the inner voice of conscience (Heidegger will expand on this idea in a de-sacralised way in Being and Time).

And finally, revelation comes to us through history (particularly through universal history, in which Schlegel sees the hand of Providence). Indeed, for Schlegel, all four sources of knowledge come from God, as their ultimate ground. He calls these four sources of revelation “the four springs of life and streams of truth.” True philosophy for Schlegel is a “dialogue of the soul in its free meditation on divine things.” And, though the soul of man is “prone to error, it is capable of receiving divine communications.” The Philosophy of Life then is and will always remain imperfect, “but imperfection belongs to real science” as, on the other hand, does perfectibility. “And

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309 Ibid. p. 65.
310 See Ibid. p. 65 for a brief overview of Schlegel’s outline of world history.
311 “In very many and different, not to say infinitely various ways it may be shown, pointed out, and established, that without this full and correct notion of the supreme being, every other species of existence and of knowledge must be without coherence and proper significance.” Ibid. p. 197.
312 Ibid. p. 68.
313 Ibid. p. 69.
314 Ibid. p. 74.
this toilsome advance which, in a certain sense, never arrives at more than ‘knowing in part,’ is the law of every department of human science.”

Schlegel places a great deal of importance on the faculty of judgement, which he calls the “crown and perfection” of human consciousness. Here too he offers something that Heidegger had deemed necessary for further working out the problem of categories and the solution of the broader “problem of knowledge.” Schlegel, in a move that also chimes with what Heidegger was looking for, notes that the importance of the problem of judgement extends beyond its specific meaning within logic. When he speaks of judgement, he means “the judging Geist,” the judging living human being. This is a theory of judgement that includes, but goes beyond, the logical, centring on a theory of the subject, all within a larger (trans-logical) metaphysical philosophy of life. He declares: “Judgement is something higher than this mere coupling in thought of some special A with some general B,” as in logic. It is tied not just to Reason, but to the Understanding as well; that is, Judgement utilises the Reason, but it deals in meanings, which are the domain of the Understanding. He says:

Understanding is the cognition of the Spirit and of that which has been uttered, and Judgement is the decision between two things understood, or the ‘discerning of spirits.’ …In this one act of judging, therefore, there is contained both functions of the Geist, Understanding and Willing; and as the loving soul is the

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315 Ibid.
316 Ibid. p. 166.
317 Ibid. See also p. 255.
318 Ibid. p. 167.
centre of the consciousness, so the judging mind or spirit is the highest of all its operations.\footnote{Ibid. p. 167.}

This is where everything begins to come together in just the way that Heidegger prescribes.

Judgement itself is grounded in God, as the source of the living, judging individual, and of all truth:

He is himself is the truth; and, therefore has the standard of truth in Himself, and all truth has its ground in principle in him alone. Every individual judgement and decision in all important matters, has its ground either mediately or immediately, in this divine basis, and its rectitude must be established according to this standard.\footnote{Ibid. p. 168. See also pp. 323, 333, etc.}

And in the Living Spirit of the personal God, Schlegel offered up an ultimate ground that was, at least for the young, still Catholic Heidegger of this period, compelling. This ultimately grounded philosophy, with its degrees of acceptance of uncertainty and relativism seemed like a good anchor in the very uncertain world of early 20th century philosophy, already in the grips of a foundational crisis, and in the midst of the great existential crisis and calamity of the Great War. Schlegel himself sums up what his view has to offer:
He who, in thought, in science, and in faith, adheres to this divine foundation – the best and most certain he can find, or that is anywhere offered to him, may rest calm and composed; he has done the utmost that lies in his power.\textsuperscript{321}

That Heidegger ultimately abandoned this path and delved deeper into philosophy’s crises whilst travelling further and further away from any sort of ultimate ground whatsoever is testament both to the \textit{ultimately} unsatisfying nature of Schlegel’s solution in light of the deepening crisis, in light of the continued insolubility of the philosophical problems Heidegger found himself confronted with, and also to the crisis of faith that he was to undergo in the coming years.

The \textit{Habilitationsschrift} represents the culmination of many impulses and interests. As John Caputo put it in 1974:

\begin{quote}
It is an unfamiliar Heidegger whom we encounter in these pages – at work on the problems of logic and grammar, displaying an interest in the questions of the foundations of mathematics, faithfully adhering to the thought and expression of Husserl’s \textit{Logical Investigations} and the first volume of the \textit{Ideas},
\end{quote}

\textsuperscript{321} Ibid. p. 168. Additionally: “This is the only road that can be safely trod by those who desire above all things to retain a divine faith, but at the same time not to renounce the pursuit of higher science. And is not this the difficult position in the present day of every well-disposed person who is in any way connected with science…? And it is only by following a similar course in the internal investigations of philosophy that we shall ever arrive at a stable position and the \textit{firm ground} of eternal truth. By any other method we shall most assuredly lose ourselves…” Ibid. p. 200 (emphasis mine).
sympathetically although not uncritically expounding the ‘world-view’ of medieval philosophy.\textsuperscript{322}

And yet the gestalt entity that the Habilitationsschrift is represents more than the sum of its parts. The conclusion that Heidegger adds is no different. Discussions from German Idealism come up and the influence of Dilthey’s thought can perhaps also be felt; but the strongest influence is German Romanticism, and, particularly, the Philosophy of Life of the late, Catholic, Schlegel. No doubt, if Heidegger had pursued this line of thought in a published work he would have continued the pattern already established in his appropriation of the ideas of Scotus, Husserl, Lask, and others: using what he felt was useful, never uncritically, and creating something that was uniquely his own. One certain thing is that Heidegger would not have taken up Schlegel’s Philosophy of Life wholesale, but we can certainly see the aspects that made this philosophy attractive to Heidegger at the time. The story of Heidegger’s subsequent thought on the problem of meaning, however, played out not in published works, but in his lecture courses of the following decade, the decade of seeming silence, during which Heidegger published nothing between the Habilitationsschrift and Being and Time. It is to this period that we now turn.

Chapter 2 – The Development of Heidegger’s Concept of Meaning:

From 1916 to The Phenomenology of Intuition and Expression (SS 1920)

In the years following the publication of his Habilitationsschrift as The Category and Meaning-Theory of Duns Scotus⁴⁴, Heidegger did not follow through with the research programme he had outlined in his conclusion. There are a number of reasons for this: philosophical, personal, confessional, and professional. During the decade between the publication of his Duns Scotus book and Being and Time Heidegger published nothing. This decade was, for a long time, a blank for later Heidegger scholars. But this decade was also the time where Heidegger cemented his reputation as one of the leading philosophers of his day and developed the line of thinking that would come together in the existential analytic of Being and Time, as a project of fundamental ontology. This chapter charts the development of Heidegger’s concept of meaning through His earliest extant lecture courses, which focus on the nature of philosophical inquiry.

The Long Road to Being and Time

When we left Heidegger in 1916 he was confidently proposing a new philosophical endeavour, drawing inspiration and guidance from the Catholic

Romanticism of the later Schlegel, and grounded firmly – as with the later Schlegel – in the certainty and necessity of God.

But Heidegger did not follow through with this plan. Indeed, in the years 1916-1919 we have no published traces of his philosophical work by which to attain any understanding of the changes that occurred in this period. Changes there certainly were: confessional changes, philosophical changes, and personal changes. Heidegger emerged from this period a Protestant (of sorts), a veteran (of sorts), a phenomenologist (of his own sort, and Husserl’s assistant), and married. The next piece of philosophical evidence we have after 1916 is Heidegger’s lecture course in the 1919 Kriegsnotsemester, a special “war-emergency-semester” designed to get students back from the front and immediately into classrooms. As we delve into this remarkable course we will find that enormous changes have indeed occurred in Heidegger’s philosophical outlook, changes that, in part at least, we may speculate about by referring to the excellent biographical work done by Hugo Ott, Theodore Kisiel, and others.

Heidegger’s decade without publication is not, in fact, as dry a source for the historian of philosophy as one may think. Our primary sources for this period are Heidegger’s lecture courses, first as a lecturer and Husserl’s assistant, then as a professor at Marburg (1923) and Freiburg (as Husserl’s replacement after 1928). These lecture courses are of a sort fairly foreign to North American academia of our own day. Here Heidegger presented original philosophical research, almost as it happened. Here we find him working out ideas and presenting them directly to the students. The courses are challenging and incredibly exciting. It was on the basis of the overwhelming student
excitement over these lecture courses that Heidegger’s early reputation was made. These lecture courses, compiled from Heidegger’s own notes and student transcripts, which were excitedly circulated (sometimes taken down word-for-word in shorthand), have been published as part of the Heidegger Gesamtausgabe.\(^{324}\) These courses, full of immediacy and vitality, are the crucial evidence of Heidegger’s philosophical evolution as it happened, and they offer, for the historian, material that often can be more exciting than the finality of his polished, published treatises.

KNS 1919 (*Kriegsnotsemester*),\(^{325}\) the first lecture course that we have, was explosive in its impact – Kisiel notes that after KNS “Heidegger’s courses regularly tripled and on occasion quadrupled in official enrolment with a large following of unofficial attendees”\(^{326}\) – and is startling as a next step after the *Habilitationsschrift*. All of our central themes (meaning, necessity and contingency, and ultimate ground) appear in the course, but they do so in new configurations that betray the scope of Heidegger’s evolution in the intervening years. The late Schlegel’s Catholic Romanticism has disappeared, replaced with a rigorous phenomenology that makes the Husserlian portions of the *Habilitationsschrift* seem like baby steps. This is “Heidegger Zero” as Van Buren puts it; this is where the Heidegger that will arrive at the existential analytic that was to


bring him worldwide recognition and spark new philosophical movements first steps out onto the stage. As Kisiel puts it:

1919 must be regarded as the pivotal year in Heidegger’s development of the ideas which resulted in *Being and Time*. …It seems that, after a two-year absence from the university for a stint in the army, Heidegger came back from the front philosophically transformed, an enthusiastic proponent of phenomenology (perhaps naturally, as Husserl’s assistant) but, as we shall see, already bent on taking it in his own new direction.327

And this is one of the other remarkable things about KNS 1919 – here the young Heidegger, still merely a lecturer, and Husserl’s assistant, is already charting his own course within phenomenology, a course that will lead him to fundamental insights that will overshadow the founder of phenomenology himself.

This second chapter will take us through the years 1919-20, charting the development of Heidegger’s thought on the topics of meaning, necessity and contingency, and ultimate ground. It begins with KNS 1919, both as a new beginning, and as an indication of the changes that occurred between 1916 and 1919, and ends with the publication on the eve of Heidegger’s courses on the phenomenology of religious life. Beyond this, and the Aristotle courses that follow those on religion, *Being and Time*, published in 1926-7 looms. *Being and Time*, and the polished account of meaning that it presents, will stand as a culmination of sorts for this portion of this dissertation that deals with Heidegger, but we should bear in mind that *Being and Time* too was just another

327 Kisiel, *Heidegger’s Way* p. 137.
station along the way in Heidegger’s philosophical history. The first part charts this
developmental history chronologically, broken up into four periods that have been
determined by Heidegger’s own topical foci in these years (see Appendix 1 for more
information on periodization).

**Finding a Primordial Science (1919-20 – The “Breakthrough” Period)**

The title of KNS 1919 was “The Idea of Philosophy and the Problem of
Worldviews.” It was first published in 1987; and it aroused immense excitement amongst
Heidegger scholars. Van Buren notes that the publication of Heidegger’s early work “led
to a new field of Heidegger scholarship and changed the whole face of Heidegger
studies.” And Kisiel argues that “the importance of this groundbreaking course in all
its vital rawness and freshness pointing the way to all of Heidegger… cannot be
overestimated.” It is a very different Heidegger we find here. In this our first view of
Heidegger since the Habilitationsschrift the changes of the intervening years are palpable
and this is, very much a new beginning. But the fundamental problems (meaning,
ultimate ground, necessity and contingency) remain the same. What has changed is that
Heidegger has abandoned (philosophically at least) God as the ultimate ground for his
philosophical efforts. Gone is his emulation of the later, Catholic Schlegel. This course
takes on the question of primal philosophy posed in a radical manner as a pre-theoretical
science and rejects the anchor provided by a certainty-providing God in a way that almost
seems anathema to the outlook of the young Habilitation student. What happened?

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Our sources for the intervening years are slim. As noted, there are no publications, and no preserved lecture courses until KNS 1919 itself. What we do have are biographical sources, discovered by Hugo Ott, Kisiel, Van Buren, Thomas Sheehan, and others. These are: letters between Heidegger and a handful of friends and colleagues, and the diary entries of Heidegger’s friend, the Catholic priest Engelbert Krebs who married Heidegger and Elfriede Petri, a protestant, in 1917. These sources, in addition to the starting point that is the Habilitationsschrift and the ending point that is KNS 1919, provide the traces and indications of this time of great change in Heidegger’s philosophical life. Our best way to begin to unravel the twisted threads, philosophical, religious, professional, and deeply personal, is to outline the basic facts as we know them – to begin with what we definitely know happened.

In the years between his Habilitationsschrift, with its 1916 conclusion, and KNS 1919 Heidegger broke with what he called “the system of Catholicism” and became a kind of non-dogmatic Protestant. Philosophically, he became a full-blown phenomenologist (of his own stamp). This means that he broke with the Neo-Kantianism of Rickert and Windelband and that he broke with Neo-Scholasticism (both still at play in the Habilitationsschrift). He became closely allied with Husserl, becoming his assistant in 1919. And, if we look to our textual beginning and end-points we can see another enormous philosophical change: He gave up on the religiously grounded approach to philosophy that found its “anchor” in the absolute solidity of God as ultimate ground. The core of this chapter will be an historical tracing of the consequences of this momentous change.
All of the above changes are intimately connected to each other. Heidegger’s confessional, philosophical, professional, and personal worlds all underwent fundamental changes in this period and all were related. Heidegger experienced a profound crisis in each of these parts of his life. The palpable tension in the concluding chapter of the Habilitationsschrift betrays a sense that a crisis is looming. In the period that followed his Habilitation Heidegger lost his faith in God as an adequate ultimate ground for philosophy; this is not to say that he lost his faith in God in this period, which is a different matter altogether. The development of his thought in the years that follow, played out in the lecture courses and Being and Time, represent his different attempts to deal with the consequences of this lost ground. Or, to put it another way, they represent the effects of this loss of ultimate ground playing out in his philosophy.

Summing up Heidegger’s early career, from his desire to enter the Jesuit order, through his student years as a promising Catholic logician, up to 1919, John Van Buren points to the period between 1916 and 1919 as a crisis that first let Heidegger become Heidegger:

After giving up his theological studies, Heidegger had tried his best to become a Neo-Scholastic, a mathematician, a phenomenological Neo-Kantian, a pure logician, but it was not in him. Instead, after 1915 he turned into Heidegger the young romantic and passionate rebel who advocated a fundamental critique of his own metaphysical heritage and a revolution to a new postmetaphiscal beginning…
His thought entered a *krisis* (the first of many to come) in the double sense of danger and decision, which would lead eventually in 1919 and thereafter to a clear abdication of his earlier claim to a homogeneous, unchanging kingdom of the sense of being.\(^{330}\)

The change in Heidegger’s fundamental outlook takes on a kind of inevitability in Van Buren’s account, where the young Heidegger, with his particular personality, and exposed to particular materials, could not help but end up as the *Young Heidegger* of the years leading up to *Being and Time*:

> After completing his two dissertations, all the poetry, mysticism, hermeneutics, Dilthey, Kierkegaard, Nietzsche, and who knows what else that the young logician and Neo-Scholastic had been reading started to catch up with him. The philosophical tension between timelessly valid sense and spatiotemporal reality was at this time also a tension within Heidegger’s own philosophical personality – and it would soon snap. His phenomenological suspension (*Ausschalten*) of the flux of spatiotemporal reality was also a suppression of his own philosophical impulses. *Ausschalten* ordinarily means “turning off” something – the water or the electricity, for example. Between 1916 and 1919, the damming up of Heidegger’s philosophical and religious impulses finally burst, and we have been trying to cope with this explosion ever since.\(^{331}\)

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\(^{331}\) Ibid p. 88.
We know, from the biographical work done by Van Buren, Ott, Kisiel, and others that Heidegger was indeed studying the above sources intensely in this period. He was also delving deeper and deeper into phenomenology. And it was out of this conglomeration of readings and interests that Heidegger was to fashion something philosophically unique in 1919.

When Heidegger wrote to his friend Krebs in January 1919 to inform him of his break with the Church he was announcing a *fait accompli*. Krebs had in fact already been told in 1918 by Heidegger’s wife that “My husband no longer has his faith in the Church… His faith was already undermined by doubt at our wedding [March 21, 1917]… Both of us now think in a Protestant manner (i.e., without a fixed dogmatic tie…” In his letter to Krebs Heidegger places the confessional change in a philosophical context, highlighting the inseparable connection between these two parts of his life. Indeed, though Krebs already knows of Heidegger’s confessional decision, Heidegger begins philosophically:

Dear Professor,

The past two years [thus 1917-19], in which I have sought to clarify my basic philosophical position, putting aside every special academic assignment in order to do so, have led me to conclusions for which, had I been constrained by extra-philosophical allegiances [note the difference from the religiously “anchored” Christian philosophy of the later Schlegel that Heidegger championed in the

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Habilitationsschrift conclusion], I could not have guaranteed the necessary independence of conviction and doctrine.

Epistemological insights applied to the theory of historical knowledge have made the system of Catholicism problematic and unacceptable for me – but not Christianity per se or metaphysics, the latter albeit in a new sense. [Again, note the connection to the Habilitationsschrift conclusion.]

I believe I have felt too keenly – more so, perhaps, than its official historians – what values are enshrined in medieval Catholicism, and we are still a long way removed from any true assessment or interpretation. [Again we see traces of the conclusion in this statement of continuing commitment to the Middle Ages.] I think that my phenomenological studies in religion, which will draw heavily on the Middle Ages, will do more than any argument to demonstrate that in modifying my fundamental position I have not allowed myself to sacrifice objectivity of judgement, or the high regard in which I hold the Catholic tradition, to the peevish and intemperate diatribes of an apostate. [Ott and others note that in later years Heidegger did in fact engage in anti-Catholic diatribes.]

That being so, I shall continue to seek out the company of Catholic scholars who are aware of problems and capable of emphasizing with different points of view. It therefore means a very great deal to me – and I want to thank you most warmly for this – that I do not have to forsake the precious gift of your friendship. My wife (who has informed you correctly) and myself are anxious to maintain our very special relationship with you. It is hard to live the life of a philosopher;
the inner truthfulness towards oneself and those for whom one is supposed to be a teacher demands sacrifices and struggles that the academic toiler can never know.

I believe that I have an inner calling for philosophy, and that by answering the call through research and teaching I am doing everything in my power to further the spiritual life of man – that and only that – thereby justifying my life and work in the sight of God. Your deeply grateful friend, Martin Heidegger.

My wife sends her warmest regards.\textsuperscript{333}

With a great deal of tongue in cheek Ott calls the closing line where Heidegger imitates Luther by noting that God shall justify him “a trifle overplayed.”\textsuperscript{334}

From the letter we learn that Heidegger has been trying to clarify his basic philosophical position for the past two years (1917-19). This is certainly a departure from the confident proclamation of his philosophical position in the conclusion. During this time of clarification Heidegger came to conclusions that Catholic dogma would have impeded. Epistemological insights applied to the theory of historical knowledge made the system of Catholicism problematic and unacceptable for him. These insights must have run contra the basis of Catholic philosophy, with its roots in dogma. These insights would then also have been contra the dogmatically grounded Catholic Romantic Philosophy of the later Schlegel that Heidegger allies himself with in the conclusion.

\textsuperscript{333} Ott, \textit{Martin Heidegger}, pp. 106-7.
\textsuperscript{334} Ibid. p. 108.
Historical relativism of a Ditheyean sort is likely to have contributed to this change. Heidegger studied Dilthey intently in this period and we find him already incorporating Ditheyean insights in KNS 1919.

At this moment Heidegger does not, however, abandon “Christianity per se,” rather, he abandons the system of Catholic thought. Instead, he now subscribes to an undogmatic Protestantism; or, it may be better to say an “undogmatic Christianity,” because he has definitely not replaced a Catholic dogma with a Protestant dogma. We will begin to arrive at a better understanding of Heidegger’s new religious outlook when we review his religious courses that follow where we have the first evidence of the religious project he mentions to Krebs.

And at this moment Heidegger asserts too that he does not abandon metaphysics, per se, but this “in a new sense.” What this means is hard to say, but it is certainly a great distance from the conclusion’s statements about “philosophy’s proper optic.” Certainly the Heidegger we see in the KNS seems to have abandoned any traditional metaphysics whatsoever. Speaking about the Heidegger of this period and quoting the Krebs letter Van Buren notes: “On the philosophical level, the former Neo-Scholastic and Neo-

\footnote{335 The argument would run roughly like this: All philosophical systems are the products of history, thus one cannot base one’s philosophy on any particular historical system as though it were an eternal (rather than a temporal) verity. Speaking about the Heidegger of KNS 1919 Van Buren puts it thus: “Heidegger now clearly resolved the ontological alternative posed in his student writings by affirming that categorical sense and God are not merely externally interwoven into history, but rather are themselves historical. In subjecting his earlier pure logic and speculative theological metaphysics to a radical destruction, he now became a kind of exiled hidden king who decisively abandoned the \textit{Reich} of the place, Dasein, and truth of pure logical sense, as well as the speculative ontotheological Kingdom of God…” Van Buren, \textit{The Young Heidegger}, pp. 134-5.}
Kantian now became an anti-philosopher for whom metaphysics was no longer ‘acceptable’ in the light of ‘the theory of historical knowledge.’”  

In the years between the *Habilitationsschrift* conclusion and KNS 1919 Heidegger had radically altered his “basic philosophical position.” He had been studying Dilthey, Kierkegaard, Nietzsche, phenomenology (both Husserlian and otherwise), Hegel, Fichte, and many others. And he came to the conclusion that the dogmatically grounded system of Catholic philosophy and its attendant worldview were no longer acceptable to him. He lost the dogmatic ultimate ground in God for his philosophy, and, as we shall see, he now moved toward a philosophy cast adrift that attempted to operate without an anchor. And yet, as we also shall see, Heidegger did not relinquish the idea of grounding... far from it in fact.

The impact and significance of this change in Heidegger’s fundamental outlook would be difficult to overestimate. Ott calls it “a decision of momentous significance for the rest of his life, a decision that perhaps he never got over”  

It had philosophical as well as personal-religious consequences, but it was also tied up with changes in Heidegger’s professional life as well. Heidegger had begun his career as a Catholic philosopher, under the patronage of the Catholic Chair in history Heinrich Finke. Finke had led Heidegger to believe he had a chance to attain the vacant professorship in Catholic philosophy at Freiberg (Krebs too had hoped to gain this position and, for a time, the two friends were competitors). But the chair went to Josef Geyser in 1916 and Heidegger’s dream of attaining a professorship so early in his career vanished. He was,

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337 Ibid. p. 106.
however, still operating as a Catholic philosopher, and still under the patronage of Finke in the years leading up to 1919, the year not only of the KNS course and his letter to Krebs, but the year he became Husserl’s assistant.

The young Heidegger had been attempting to cultivate a relationship with Husserl since 1916, but Husserl had been resistant (due in part to his perception of Heidegger as a Catholic philosopher and as Finke’s man\(^{338}\)). In the years 1917-18 however, the ice broke, and by the time Heidegger was serving as a meteorologist on the Western Front he was exchanging friendly letters with Husserl who looked forward to his return and their further collaboration. “Repeatedly Husserl uses the distinctive term *symphilosophein*, meaning ‘to philosophize together, with mutual pleasure.’\(^{339}\) By the time of KNS 1919 Heidegger was firmly in the phenomenological camp, establishing himself as a disciple of Husserl (and already as an innovator in the field), his Catholic philosophical allegiance a thing of the past.\(^{340}\)

Heidegger’s shift from Catholic philosophy to phenomenology was, of course, more than a change in professional allegiance, just as his confessional change had implications beyond the personal and into the philosophical. In the years following his *Habilitation* he had delved deeply into phenomenology, which had replaced his earlier

\(^{338}\) “In all this we must not overlook the active role played by Husserl, who had a considerable influence in matters of academic policy. For him it was self-evident that true philosophy had to be practiced without preconditions, unfettered by any kind of confessional ties. As for the notion of a ‘Catholic’ science, he thought it was nonsense.” Ott, *Martin Heidegger*, p. 114.

\(^{339}\) Ibid. p. 104.

\(^{340}\) “…the years 1918/19…saw the institutional ‘turn’ or change of direction, whereby Heidegger, who was still formally attached to the department of Christian philosophy (Philosophy II), now openly switched, in effect, to a different philosophical discipline.” Ibid. p. 116.
Neo-Kantian and Neo-Scholastic outlook. Our first indication of the new, phenomenological Heidegger is “The Idea of Philosophy and the Problem of Worldviews” in the War Emergency Semester of 1919. This new Heidegger is a thinker who has cut loose the “anchor” of ultimate ground found in God and who now attempts to deal with the problem constellations already engaged with in the Habilitationsschrift (meaning, understanding, necessity and contingency, intuition and expression – ultimately the primal questions of philosophical knowing itself) from this new vantage point.

**KNS 1919 (The Idea of Philosophy and the Problem of Worldviews)**

KNS 1919 hits the ground running, so to speak; in this course the new, phenomenological, non-Catholic Heidegger takes the very question of philosophy itself head on. Heidegger is questioning the idea of philosophy: What is it? What should it do? The question of whether philosophy should provide us with worldviews was all the rage at the time. Heidegger, as one might expect from his break with Catholic philosophy and its attendant worldview, answers this question with a resounding “no.” Instead, philosophy is (by nature and in potentia) and must become (in practice): primordial science. Philosophy can and must become the science that undergirds all other sciences. Heidegger was giving this course at a time when many were calling for philosophy to

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341 Again, one must stress the interrelatedness of all of these changes. As Van Buren puts it, “His growing estrangement from Neo-Scholasticism was not only institutional, but involved a profound confessional, theological, and philosophical conversion in the wartime years after 1916.” Van Buren, *The Young Heidegger*, p. 133.
become truly scientific.\textsuperscript{342} Husserl in particular, in his \textit{Logos} essay of 1911, had called for a conception of philosophy as a rigorous science,\textsuperscript{343} and Heidegger’s course can and should be seen in light of this programmatic essay and call to arms by the founder of phenomenology.

Making philosophy scientific, however, did not mean importing or imitating the methods of the natural sciences. Following Dilthey, and, in fact, Catholic philosophical dogma,\textsuperscript{344} Heidegger insists that each particular science must develop its own distinctive


\textsuperscript{343} “From its earliest beginnings philosophy has claimed to be rigorous science. What is more, it has claimed to be the science that satisfies the loftiest theoretical needs and renders possible from an ethico-religious point of view a life regulated by pure rational norms. This claim has been pressed with sometimes more, sometimes less energy, but it has never been completely abandoned, not even during those times when interest in and capacity for pure theory were in danger of atrophying or when religious forces restricted freedom of theoretical investigation.
During no period of its development has philosophy been capable of living up to this claim of being rigorous science; not even in its most recent period, when – despite the multiplicity and contradictory character of its philosophical orientations – it has followed from the Renaissance up to the present an essentially unitary line of development. It is, in fact, the dominant characteristic of modern philosophy that, rather than surrender itself naively to the philosophical impulse, it will by means of critical reflection and by ever more profound methodological investigation constitute itself as rigorous science. But the only mature fruits of these efforts have been to secure first the foundation and then the independence of rigorous natural and humanistic sciences along with new purely mathematical disciplines. Philosophy itself, in the particular sense that only now has become distinguished, lacked as much as ever the character of rigorous science.” Husserl believed and asserted that Phenomenology had finally put philosophy onto the path of rigorous science and that it was the only method by which philosophy could attain this vital goal. Husserl, Edmund. “Philosophy as Rigorous Science.” \textit{In Phenomenology and the Crisis of Philosophy}. New York: Harper, 1965. Pp. 71-2.

\textsuperscript{344} “…a rightly constituted science derives its formal object, its principles, and its constructive method from its own resources, and that, this being so, it cannot borrow from any other science without compromising its own right to exist.” “Philosophy” In \textit{The Catholic Encyclopaedia} 1911 edition: URL: http://newadvent.org/cathen/12025c.htm
methodology corresponding to the specific needs of its particular domain of concern and subject matter. Each science must grow out of its own ground. To adopt the methodology of mathematical physics, seen as the paradigm of natural scientific methodology at the time, would be a grave and thoroughly counter-productive mistake for philosophy. Mathematical physics has matter in motion as its domain of concern and, insofar as philosophy is concerned with subject matter different than physical objects in motion, it makes no sense to apply a kind of imitation of the methodology of the science of matter in motion to questioning philosophical phenomena. In order to become truly scientific, philosophy must develop its own specific methodology appropriate to the exploration of its distinct domain of phenomena.

In order to determine what methodology is appropriate for a truly scientific philosophy then, one must first become clear about the specific domain of philosophical research; one must ask what is the proper subject matter of philosophy? Catholic philosophy had a specific answer to this question: “In its proper acceptation” philosophy, following Aristotle, is “‘the general science of things in the universe by their ultimate determinations and reasons’; or… ‘the intimate knowledge of the causes and reasons of things…’”\textsuperscript{345} Heidegger’s answer, though he has, by this point, broken with the system of Catholicism, is similar. He argues that philosophy is properly, and must become, the primordial science of origins.\textsuperscript{346} This is not just a traditional view though. Heidegger is speaking in light of Husserl’s work and already in line with his own particular conception of phenomenology.

\textsuperscript{345} “Philosophy” Catholic Encyclopaedia.
\textsuperscript{346} See Appendix 2 for a discussion of origins and grounds.
Husserl had argued “not that philosophy is an imperfect science” but “simply that it is not yet a science at all, that as science it has not yet begun.” He argued that it must become one. Phenomenology, the philosophical methodology he had created (carried on by Max Scheler and others, including Husserl’s students Edith Stein and, later, Heidegger), was the only way, according to Husserl, for philosophy to become a rigorous science. He saw phenomenology as an effective bulwark against scepticism and relativism, and as divorced from philosophy as a source or worldviews. For Husserl, the key tendencies leading to scepticism and relativism were the naturalistic and historicist trends of the nineteenth century. Husserl claims that phenomenology is scientific because it provides a solid ultimate ground and methodology that arise out of the proper domain of philosophy itself, that of timeless ideas. All objects we experience (in both prescientific and scientific cognition) are objects of consciousness.

To ground philosophy means then, at bottom, to ground our understanding of cognition.

The sense of the question concerning legitimacy, which is to be put to all cognitive acts, must admit of being understood, the essence of grounded legitimation and that of ideal groundableness or validity must admit of being fully

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347 Husserl, “Philosophy as Rigorous Science” p. 73.
348 Ibid. p. 77.
349 “Modern Weltanschauung philosophy is,” he asserts, “a child of historical scepticism.” Ibid. p. 130. See also Ibid. p. 136.
350 In fact, much of the essay is taken up by 2 historico-critical accounts, one of naturalistic philosophy, the other of historicism. In these potted critical histories Husserl demonstrates how each leads to a barren scepticism and relativism and how, contrary to their own claims, each falls short of its own scientific aspirations on a fundamental level.
351 See Ibid. p. 88.
clarified, in this manner – and with respect to all levels of cognition, including the highest, that of scientific cognition.  

Philosophy then, in order to attain its ground must focus here.

What it means, that objectivity is, and manifests itself cognitively as so being, must properly become evident purely from consciousness itself, and thereby it must become completely understandable. And for that is required a study of consciousness in its entirety, since according to all its forms it enters into possible cognitive functions.

What is needed for this is a “phenomenology of consciousness” – not of objective consciousness (the domain of psychology) but of pure consciousness – of the essential logical structures of consciousness. Against scepticism and relativism “there is only one remedy… a scientific critique and in addition a radical science, rising from below, based on sure foundations, and progressing according to the most rigorous methods…” this science is phenomenology.

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352 Ibid. p. 90.
353 Ibid.
354 Ibid. p. 91
355 Ibid. pp. 141-2
356 Dermot Moran presents an excellent, succinct account of the basic features of phenomenology in his introduction to The Phenomenology Reader: “Phenomenology may be characterised initially in a broad sense as the unprejudiced, descriptive study of whatever appears to consciousness, precisely in the manner in which it so appears. …[It] is usually characterised as a way of seeing rather than a set of doctrines. …Husserl …in his late work… presents phenomenology as approaching ‘whatever appears as such’, including everything meant or thought, in the manner of its appearing, in the ‘how’ (Wie) of its manifestation. …According to Husserl’s own slogan, phenomenology aimed to return to ‘the things themselves’, avoiding constructivist system-building so prevalent in traditional philosophy, or reasoning on the basis of some preconceived and uninterrogated starting-point (as traditional rationalisms and empiricisms were wont to do). Instead,
Husserl was a rationalist, and he wanted to determine a ground for scientific philosophy that was rationally unimpeachable. It needed to be proof against scepticism and relativism, whether of the historical or naturalistic variety. He was against abstract systematizing; phenomenology was a methodology, rather than a body of truths about the world. It was applicable to the entire range of philosophical questions, but its essence lay in the rigorous application of method, rather than the compilation of results.

The phenomenological method rests on the basic assertion that things are happening that I experience. In a semi-Cartesian fashion it begins with the certainty of my own experience. Phenomenology attempts, from a first person point of view, to discover the structures of experience itself (that is, the structural features of consciousness). Hence its subject matter, phenomena, are the phenomena of consciousness (again, as I experience them and therefore, in the first person). Phenomena are the things that appear in experience (or, as we abstract from the particular to the general, they are the ways we experience things). Phenomenology then completely brackets any fundamental philosophical issues are examined through attention to the manner in which things and meanings show themselves, come to self-evidence, or come to be ‘constituted’ for us, as Husserl put it, invoking a concept from the Kantian tradition. The phenomenological approach is primarily descriptive, seeking to illuminate issues in a radical, unprejudiced manner, paying close attention to the evidence that presents itself to our grasp or intuition. …Phenomenology aims to describe in all its complexity the manifold layers of the experience of objectivity as it emerges at the heart of subjectivity. It is critical of all forms of objectivism that attend only to what appears and not to the relation of the appearing to the subject.” Moran, D. & Moonkey, T. (Eds.) *The Phenomenology Reader*. London: Routledge, 2002. Pp. 1-2.

357 As Moran puts it, “…phenomenology means literally the science of phenomena, the science which studies appearances, and specifically the structure of appearing – the how of appearing – giving the phenomena or manifest appearances their due, remaining loyal to the modes of appearance of things in the world, whether they belong to the physical, mathematical, cultural, aesthetic, religious, or other domains. The phenomena of
questions of the reality of the external world or of objects in the sense of the traditional Cartesian subject/object relation as inessential extra baggage (which contaminate the certainty of phenomenological research).

Meaning becomes particularly important in phenomenological research in that, in consciousness we encounter not bare objects, but meaningful ideas. The phenomena of consciousness are meaning-laden from the ground up. Husserl is concerned only with ideas or essences, not the objects that they apply to. He can thus argue that phenomenology deals only with the timeless realm of certainty, rather than the contingency of the empirical world. By staying within consciousness, Husserl believes he is grounding philosophy in the most solid way, by a rationally unassailable methodology. One of the central tenants of phenomenology, derived from Brentano, is that all of our cognitions are cognitions of something; cognition is intentional, it always intends something, is directed toward something. And all intending is fundamentally

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358 Moran: “Phenomenology…does not stop with the appearance but seeks the essence of the appearance. It aims to be a science of essences, a science that makes the essences of things that appear visible to the enquirer, similar to the manner in which geometry, another eidetic science, studies the essential relations that hold in space. The claim of phenomenology is that the facts of the matter as disclosed to consciousness may be described in such a way that the essences of those facts and their intertwined laws can be exhibited, as well as the modes of our access thereto.” Ibid. p. 6.

359 Whether we believe that he has achieved this goal is another matter. As we will see, though he was extremely excited by Husserl’s phenomenology and accepted many of its methodological claims, Heidegger, as early as 1919, was already critical of some aspects of it, and he developed his own phenomenological methodology in response to what he saw as Husserl’s shortcomings.
meaningful. One can see the attraction of this philosophical movement for the young Heidegger, who was working on the question of meaning in his *Habilitationsschrift*.

Husserl then, in his call for philosophy to become a rigorous science, was recommending the phenomenological method, as a method of rationally justified certainty, that studied the intentional structures of consciousness, never leaving the realm of certainty by introducing the contingency encountered in empirical reality (the so-called “things in themselves” that are beyond the phenomena of consciousness in a posited “real world”). Husserl believed that only by the application of phenomenological method could philosophy become a rigorous science, and the ultimate or primordial science. And Heidegger develops this idea in the opening hours of the course.

He begins with some preliminary words about science and university reform. He boldly asserts that

the idea of science… and every element of its genuine realization – means a transforming intervention in the immediate consciousness of life; it involves a transition to a new attitude of consciousness, and thus its own form of the movement of spiritual life.\(^{360}\)

And furthermore,

only in philosophy as primordial science \([Urwissenschaflt]\) does this intervention of the idea of science into the context of natural life-consciousness occur in a primordial and radical sense.\(^{361}\)

\(^{361}\) Ibid.
Heidegger was speaking these words to a group of students, many of them newly returned from the Great War, during a time of massive upheaval in German society. Reform and progress were in the air, as were death and dissolution. His preliminary remarks on reform are brief and, as we jump into the course – as he had promised – they seem to be “incongruent and foreign.” But as the course progresses it becomes clear to the reader, as it must have to Heidegger’s students, that the radical reform of philosophy that he advocates is to be a template for university reform in general.

Heidegger begins the course proper by dismantling the then popular problem complex of philosophy and worldviews. Should philosophy provide a worldview (through whatever mechanism)? Heidegger answers in the negative. In the pages that follow Heidegger will show “that the construction of a worldview in no way belongs to philosophy, not even as a boundary task, and that it is a phenomenon foreign to philosophy…” He does this by setting

…the genuinely unphilosophical character of worldview… over against philosophy and then only through the methodological tools of philosophy itself. Worldview [then] becomes the problem of philosophy in quite a new sense. But the core of the problem lies in philosophy itself – it is itself a problem. The cardinal question concerns the nature and concept of philosophy. But the topic is formulated as ‘the idea of philosophy,’ more precisely, ‘the idea of philosophy as primordial science.’

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362 Ibid.
363 Ibid. p. 10.
364 Ibid.
Heidegger has begun with the problem of worldview only to show us that it is a false lead. The focus on worldview then in vogue is, in fact, a problem that is foreign to philosophy. Heidegger’s real goal for the course is not simply to show this, but to turn philosophy itself into a question, to take his students through a foundational questioning after the essence of philosophy and, *vis a vis* the preliminary remarks, to provide an example for university reform.

The topic of the course is “the idea of philosophy as primordial science.”

Heidegger begins – and Heidegger’s work is, in essence, a series of immensely important beginnings – his exploration of this topic with an explanation of the term “idea.” In language that will make us think forward to Bohr and quantum mechanics, Heidegger defines an idea (with reference to Kant) as an indeterminate determinable.

It is a determinate, essentially lawful possibility. Not its object, to be sure, but the idea itself is definitively determinable: in its meaning it leaves nothing open, it is a definitively determinable determinateness [*endgültig bestimmbare Bestimmtheit*]. This fullable, and, in the acquired idea, fulfilled determinateness, allows the necessary unfulfillable determinateness (i.e. indeterminateness) of the idea’s object to go over into a determinate indeterminateness… the object always remains indeterminate, but this indeterminateness is itself determinate, determined in respect of the essential methodological possibilities and forms of an

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365 Cameron McEwen calls “how to begin?” the “great question posed by Heidegger, a question which applies as much to the consideration of his own work as it does to any thinking and reading…” McEwen, Cameron. “On Formal Indication: Discussion of *Genesis*.” P. 226.
intrinsically unfulfillable determinability. The latter constitutes the essential structural content of the idea as such.\(^{366}\)

The specific object of an idea will always remain indeterminate to a certain extent – through any amount of attempted definition. What is determinable, however, is the idea’s own formal structure, manifest in the enactment of its definitional parameters. What we determine is “an unambiguously delimitable unitary contexture of meaning lawfully governed and motivated in its determinability by the never completely determined object.”\(^{367}\) We will not encounter the complete determination of “the idea of philosophy as primordial science” as a fully defined object (indeed, as we will come to see, this sort of conceptualisation sets us out on the wrong foot from the beginning); we will explore the topic in terms of its meaning, in its formal structural determinability. Indeed, part of the task will be to “obtain” the very “determinateness of the indeterminateness of the object.”\(^{368}\) How are we to arrive at this? What path are we to take?

These are serious questions for Heidegger from the outset. The young Catholic logician would have pointed to the material determination of meaning; and this is still at play. But the ground has been removed. If our determinations of \(\textit{ens}\) of the entities that are can no longer take their starting point in their being as \(\textit{esse creatum}\), as part of a rationally determinable cosmos of determinate entities with God as the ultimate guarantor of ultimate meaning (and thus any sort of totality of determinability), how are we to avoid the \textit{regressus ad infinitum}? Aquinas believed that God did not create a fundamentally

\[\begin{align*}
^{366} & \text{Ibid. p. 12.} \\
^{367} & \text{Ibid.} \\
^{368} & \text{Ibid.}
\end{align*}\]
unknowable world; instead, he believed that the world, and our knowledge of it were grounded in God as a first principle\textsuperscript{369} as did Duns Scotus.\textsuperscript{370} But Heidegger was now working without this support. What was his solution?

In effect, Heidegger’s solution was to embrace the groundlessness – and yet, this without abandoning the idea of grounding. He notes the need to “squarely face” the difficulty. “The idea of philosophy as primordial science can and must… itself be scientifically discovered and determined.”\textsuperscript{371} But herein lies a problem: “It must itself be scientifically demonstrated, and, as primordially scientific, only by means of primordial-scientific method.”\textsuperscript{372} Are we trapped in a circularity? Indeed we are. The method of primordial science can only properly arise from the object of primordial science but that very object is only determinable by the correct method (and even then not without indeterminacy):

By their nature, ultimate origins can only be grasped from and in themselves. One must forthrightly deliver oneself over to the circle which lies within the very idea of primordial science. There is no escape from this, unless from the start one wants to avoid the difficulty and make the problem illusory through a cunning trick of reason (i.e. through a hidden absurdity).\textsuperscript{373}

\textsuperscript{371} Heidegger, KNS, p. 13.
\textsuperscript{372} Ibid.
\textsuperscript{373} Ibid.
And yet, Heidegger does not give up on the idea of ground in philosophy. This circularity could be seen as a vicious circle, but Heidegger sees it differently:

The circularity of a self-presupposition and a self-grounding, of pulling oneself by one’s bootstraps out of the mire of natural life (the Münchhausen problem of the mind), is not an artificial, cleverly constructed difficulty, but is already the expression of an essential characteristic of philosophy, and of the distinctive nature of its method. This method must put us in a position to overcome the apparently unavoidable circularity, in such a way that this circularity can be immediately seen as necessary and as belonging to the essence of philosophy.  

A circular self-grounding is a strange concept, and it will not be immediately clear what this means, but Heidegger proceeds forward nonetheless, taking his students on a journey rather than merely laying out his ideas in a straightforward declamation.

And this issue of grounding, I argue, is the real heart of the course; the key theme is, in fact, the grounding of meaning in philosophy. Previous examinations of the course have overlooked this basic focus. All of Heidegger’s arguments in the course hinge on the question of the grounds of meaning. In the first half of the course he presents critiques of the major philosophical currents of the day – each is deemed unacceptable due to its inability to ultimately ground its assertions. Likewise, Heidegger’s own methodological

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recommendations and his conception of philosophy as primordial science are rooted in
the crucial problem of ground.

“The problem of philosophy as science,” Heidegger tells us, is already to be found
in “Plato’s time. The attempt to constitute philosophy as genuine science thereby
understands itself as a radical break from all previous philosophy.”375 Plato was
attempting to combat “the philosophers of nature who assumed various kinds of being”
[the Presocratics]:

Such a philosophy had to express itself in scepticism and relativism, as in
sophistry, whose leading doctrine states that man, indeed man in regard to his
sensory perception, is the measure of all things. For this reason knowledge is
impossible. There is only opinion (δοξα), which changes with time and
circumstances. Such a shattering denial of every possibility of the valid grounding
of truths, the deliverance of all knowledge over to arbitrariness and the mere
contingency of opinion, aroused the sharpest opposition, which climaxed in the
philosophical achievement of Socrates and above all of Plato. Plato seeks…
the stable element of spirit; dialectic returns to the ultimate ‘origins’ of all
presuppositions, of all propositions formulated in the sciences and also in the
speech of everyday life… Dialectic is… the scientific method of ‘turning
consciousness around’, of setting forth the valid ideas which provide the ultimate
grounding, formation and original meaning of terms.376

375 Ibid. p. 16.
376 Ibid. pp. 16-17.
But who is to say that Plato was right? “By what criterion” do we decide for “Plato rather than the sophistry against which he fought?” Rather, Plato’s own approach must be seen as equally ungrounded.

Heidegger believes that his own idea of philosophy as primordial science avoids this problem because it is grounded in a different way. Philosophy must become a problem for itself, as primordial science.

But we immediately recall the circularity in the concept of primordial science, more particularly in the latter’s grounding. In whatever way one initially takes the concept, it means something ultimate or, better, original, primordial, not in a temporal sense but substantively, first in relation to primary grounding and constitution: principium. In comparison with primordial science, every particular science is not principium but principatum, the derivative and not the originary, the sprung-from [Ent-sprungene] and not the primal spring [Ur-sprung], the origin. As primordial science it is not discoverable by induction from any other particular sciences. And here, Heidegger also defines theology as a particular science. Further establishing for us, the nature of his loss of the ultimate ground in the Living Spirit of God found in the Habilitationsschrift conclusion. As a particular science, Heidegger’s

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377 Ibid. p. 17.
378 Ibid. p. 20.
379 “It is meaningful to deduce the derivative from the origin; the reverse is nonsense.” Ibid.
380 “Theology also, which as the doctrine of God as the Absolute… is a particular science. That is evident from the role that the historical, which belongs to the essence of Christianity, plays within this science. I mention in passing that in neither Protestant nor Catholic theology has a methodologically clear concept of this science so far been achieved; indeed, apart from some incomplete attempts in recent Protestant theology,
comment about all particular sciences – found in his critique of psychology that immediately follows the discussion of theology – applies to this, his former source of certainty as well: “It is absurd… to want to ground absolute knowledge on a special…science which itself does not rest on absolutely valid knowledge…”

Heidegger needed new options.

Heidegger calls “the circularity of grounding” the “distinctive feature” of primordial science. In this course he is calling for a new conception of philosophy as rigorous science, in light of Husserl’s Logos essay, and he argues that philosophy can only be the rigorous primordial science that it must become as phenomenological. But already he has developed a new concept of phenomenology and what he sees as its proper methodology and it centres on this idea of “the circularity of grounding” or “self-grounding” that he claims is the distinctive feature of primordial science. His critique of alternate philosophical approaches (Rickert, Windelband, and philosophy as explored by psychology as an empirical science) and their failure to live up to the strict demands of the goal of achieving a primordial science (particularly in terms of their ultimate groundlessness) prepares his students for the new phenomenological method that he proposes, but it also sets forth the criteria for judging whether this method is a success or a failure. And it all boils down to the question of whether the given philosophical method

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there is not the slightest awareness that there is a profound problem here, a problem, however, which can only be rigorously taken up in the sphere of a problematic still to be developed.” Ibid. p. 22.

381 Ibid. p. 24.


is grounded or ultimately groundless or, to put it another way, *whether it provides an unassailable ground from which philosophy can proceed.*

Heidegger criticises theories of knowledge as, again, being inadequate to the task at hand. The problem here is their basic lack of true primordiality. And this is due, in large part, to their restriction to the theoretical realm (*a la* Descartes):

...preference for the theoretical is grounded in the conviction that this is the basic level that grounds all other spheres in a specific way and that is manifested when one speaks, for example, of moral, artistic, or religious ‘truth’. The theoretical, one says, colours all other domains of value, and it does this all the more obviously in so far as it is itself conceived as a value. The primacy of the theoretical must be broken, but not in order to proclaim the primacy of the practical, and not in order to introduce something that shows the problems from a new side, but because the theoretical itself and as such refers back to something pre-theoretical.\(^{384}\)

And this advance glance of what is to follow will lead Heidegger to the turning point of the course, the presentation, through crucial thought experiments, of his version of “Phenomenology as *Pre-Theoretical* Primordial Science.”\(^{385}\)

Heidegger opens Part II of the course with a dramatic claim, from the starting point in the simple, seemingly insignificant statement “there is something” he will proceed. “Everything depends on understanding and following this insignificance in its pure meaning,” he tells us.

\(^{384}\) Ibid. p. 50.
\(^{385}\) Ibid. p. 53, emphasis mine.
We are standing at the methodological cross-road which will decide on the very life or death of philosophy. We stand at an abyss: either into nothingness, that is, absolute reification, pure thingness, or we somehow leap into another world, more precisely, we manage for the first time to make the leap into the world as such.\textsuperscript{386}

These are big claims. But then Heidegger was never known for modesty.

Heidegger strips down all philosophical inquiry to a basic level. He devolves the interrogative philosophical act to a simple “is there something?”\textsuperscript{387} In the phenomenological process one describes. But “description itself is surely a psychic phenomenon and thus itself belongs to the sphere of the material thing,”\textsuperscript{388} as something that happens in the objective world (rather than an eidetic essence it is an occurring thing). “What is that supposed to mean,” however, “that one thing [Sache] describes another?”

Is description as such a form of connection between things?

Is there even a single thing when there are only things? Then there would be nothing at all; not even nothing, because with the sole supremacy of the sphere of things there is not even the ‘there is’ [es gibt]. Is there the ‘there is?’\textsuperscript{389} This most basic question, “is there something?” is the “insignificant and even miserly” turning point.\textsuperscript{390} It is the first proposition of the crucial second part of the course. And it

\textsuperscript{386} Ibid.
\textsuperscript{387} This first thought experiment will lead his students down the path of bare abstraction.
\textsuperscript{388} Ibid. p. 52.
\textsuperscript{389} Ibid.
\textsuperscript{390} Ibid. p. 53.
is the basis/ground/spot from which Heidegger will set out, taking his students on a philosophical journey through his own version of phenomenology, and from which he will set out on his own journey toward Being and Time.\textsuperscript{391}

For in the posing of the question, “is there something?” something is established. “Already in the opening of the question ‘is there…’ there is something.”\textsuperscript{392} Heidegger is beginning to sound Cartesian here, but this will soon pass, for he focuses not on the \textit{cogito}, but on the \textit{sum esse}, and, indeed, on a peculiar combination of the unexplored (by Descartes) but implied \textit{vivo} and a strangely impersonal \textit{vivit}. In the posing of the question, something is doing the posing. It is I myself, not an abstracted, thing-like “questioner,” but I myself – me. Thus, beyond the mere psychic events (as things), there is the psychic subject.\textsuperscript{393} But does merely positing a psychic subject in addition to psychic objects get us anywhere new? Certainly not:

The problem has only been shifted… Knowing as a psychic process is in no way explained when I acknowledge it as occurring in a psychic subject. One thing is put in relation to another thing… What is it supposed to mean that one psychic

\textsuperscript{391} As Kisiel puts it: “It is here that we find the zero point of Heidegger’s development towards BT. …For here he first clearly identifies and names his subject matter, his lifelong topic which, even in those early years, rapidly assumed a series of names: the primal something, life in and for itself, factic life, the historical I, the situated I, factic life experience, facticity, Dasein, being.” Kisiel, \textit{Genesis}. pp. 16-17.

\textsuperscript{392} Heidegger, KNS, p. 53.

\textsuperscript{393} Heidegger notes that though this might sound like a call for a soul for psychology, “It is by no means necessary that we should lose ourselves in metaphysics and think of the soul as substance…” Ibid. p. 54.
thing is in another, and establishes a connection with something external to it? We are thrown from one thing to another which like any thing remains mute.394

Here the Cartesian grappling onto the certainty of the cogito in an attempt to firmly ground philosophy is exposed as insufficient, and, indeed, misdirected. “We have made a hasty decision,” Heidegger notes,

hoping to find a saving anchor in the neglected subject matter …we have given in to a stubborn habit of thought, without it occurring to us to explore the simple sense of the trivial question ‘is there something?’ This question was deliberately chosen in order to minimize pre-judgements.395

We have to move away from object-oriented thinking if we are to get away from a world that “remains mute.”

Instead of looking at relations between things, in this simple question we need “to understand what it implies.” Here the vivo/vivit implications of the sum esse begin to emerge. When we consider the question:

It is a matter of hearing out the motives from which it lives. The question is lived is experienced [erlebt]. I experience. I experience something vitally. When we simply give ourselves over to this experience, we know nothing of a process passing before us [Vor-gang], or of an occurrence. Neither anything physical nor anything psychic is ‘given.’396

394 Ibid.
395 Ibid.
396 Ibid. p. 55.
Heidegger is focusing his/our attention on lived experience [erlebnis], a term that in his day was “so faded and worn thin that, if it were not so fitting, it would be best to leave it aside.” Since it is so fitting, however, Heidegger moves forward with it.

When I ask this, or any question, “I comport myself” toward something “as questionable.” In this act of “simple inspection” I in fact do “not discover anything like an ‘I.’” In fact, I am focussed on the thing in question, not any subject/object relation. Heidegger describes this with one of the German “impersonals” that Kisiel draws our attention to in his work. Here Heidegger introduces: es lebt, “It lives:”

What I see is just that “it lives” [es lebt], moreover that it lives towards something, that is directed toward something by way of questioning, something that is itself questionable… Let us therefore remain with the sense of the lived experience as such, keeping a firm hold on what it gives. It also gives that which, just on its own (in respect of questioning and questionability), cannot ultimately be understood. This is its ownmost meaning [Eigen-sinn] which it cannot explain by itself.

In this questioning we ask “whether there is something.” Heidegger is trying to get his questioning down to the simplest level here. “To say of something that it is something is the minimum assertion I can make about it.” Heidegger wants to keep the discussion at this most basic level for the moment. In this assertion, “I stand over against it without

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397 Ibid.
398 Kisiel draws particular attention to Heidegger’s use of German impersonals. Kisiel, Genesis. Pp. 23-5, 38, 41-7, etc.
399 Heidegger, KNS p. 56.
400 Ibid. p. 57.
presupposition.” And yet, we cannot ever conceive of a “something in general” without picturing some particular thing. “Something in general” is a hollow concept that we fill with particular things:

In attempting to grasp the meaning of ‘something in general’, we return to the individual objects with particular concrete content. Perhaps this reversion is necessary. In the final analysis it belongs to the meaning of ‘something in general’ to relate to something concrete, whereby the meaningful character of this ‘relating’ still remains problematic.401

Meaning is still with us at every stage of the discussion here. “Where can we find the meaningful motive for the meaning of ‘there is?’ Once again a new element of meaning refers the question and its content (there is) beyond itself.”402 In all of this questioning I question with and through meanings.

In all of this questioning it is I myself who comports myself in a questioning manner towards something in question. But, as Heidegger tells us “in immediate observation I do not find anything like an ‘I’ but only an ‘ex-perience [Er-leben] of something’ a ‘living towards something.’”403 This is not in and of itself an earth shattering revelation. When we question something (the interrogative experience) we are directed toward the thing we are questioning, rather than towards ourselves (unless we are questioning our own questioning in a reflexive manner, in which case we ourselves are the object under question… but in this case we have objectified ourselves through a

401 Ibid.
402 Ibid.
403 Ibid.
kind of abstraction). Heidegger wants to stick to the simple, first-order questioning comportment, before it is further developed into a second-order, I-question-myself-questioning.

Questioning at this basic level cannot be characterised as a subject/object relation without positing a subject and an object (and indeed, a subject as object). Instead it is an experience, an event that happens:

Yet the experience is, even when I avoid every kind of reification and insertion into a reifying context. It has a now, it is there – and is even somehow my experience. I am there with it, I experience it vitally, it belongs to my life, but it is still so detached from the ‘I’, so absolutely ‘I-remote’ [Ich-fern].

I ask: ‘is there something?’ the ‘is there’ is a ‘there is’ for an ‘I’, and yet it is not I to and for whom the question relates. A wealth of quite new problem-concentrations is loosened up: problems to be sure, but on the other hand matters of immediate intuition that point to new contextures of meaning. However simply and primitively the interrogative experience gives itself in respect of all its components it is peculiarly dependent. Nevertheless, from this experience a ground-laying and essential insight can now be achieved. (Characterization of the lived experience as event [Er-eignis] – meaningful, not thing-like.)

Experience is not thing-like (mute) but meaningful. Heidegger wants to direct our attention away from things and toward the fact that life happens. He wants to focus on

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404 Ibid. p. 58.
405 Kisiel draws attention to this mute/meaningful question throughout The Genesis of Being and Time. See pp. 42-5 in particular.
experience, which, he claims, is fundamentally meaningful. And he leads his students into this line of thinking with another thought experiment.

Heidegger begins this thought experiment by asking his students to picture the experience of walking into the classroom:

You come as usual into this lecture-room at the usual hour and go to your usual place. Focus on this experience of ‘seeing your place,’ or you can in turn put yourselves in my own position: coming into the lecture-room, I see the lectern. …What do ‘I’ see? Brown surfaces, at right angles to one another? No, I see something else. A largish box with another smaller one set upon it? Not at all. I see the lectern at which I am to speak. You see the lectern, from which you are to be addressed, and from where I have spoken to you previously. In pure experience there is no ‘founding’ interconnection, as if I first of all see intersecting brown surfaces, which then reveal themselves to me as a box, then as a desk, then as an academic lecturing desk, a lectern, so that I attach lecternhood like a label. All that is simply bad and misguided interpretation, diversion from a pure seeing into the experience. I see the lectern in one fell swoop, so to speak, and not in isolation, but as adjusted a bit too high for me. I see – and immediately so – a book lying upon it as annoying to me (a book, not a collection of layered pages with black marks strewn upon them), I see the lectern in an orientation, an illumination, a background.\footnote{Ibid. pp. 59-60.}
The basic way that we experience life, or the world, as we go about in it is this kind of direct dealing with already meaningful things – not a set of abstract sensations, but my desk, sitting there before me, with my pile of papers and books, a stack of books by and about Heidegger, Schliemann’s *Ilios*, a collected edition of Thomas Aquinas – a set of objects that are known to me, or, if I am confronted with something new to me, an unfamiliar object that I immediately begin to interpret in familiar terms.

Heidegger gets this last point across, in terms that are offensive to our ears today, by asking his class to imagine “a Senegal negro” approaching the lectern. Even someone who is completely unfamiliar with the object and its cultural meaning and uses does not see it as a series of abstract sensations: “What he would see… is difficult to say precisely: perhaps something to do with magic, or something behind which one could find good protection against arrows…”

Behind the unpalatable racial projection the point is valid: even someone completely unfamiliar sees a thing that they interpret in familiar terms. Even if he sees it as merely a thing that is there, this is an interpretation that presupposes a meaningfully structured world. Like the Senegalese person, a Black Forest peasant “sees the object as fraught with meaning.” But the meanings that he sees, and the meanings that the Senegalese person sees, and the meanings that Heidegger sees are independent: “…my seeing and that of a Senegal negro are fundamentally different.” This is because Heidegger and the Senegalese person have different contexts of meaning (interpretational frameworks) out of which they operate. And therefore, at this basic level, we encounter groundlessness. As Theaetetus once clumsily put it: “it seems to me that a

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407 Ibid. p. 60.
408 Ibid.
man who knows something perceives what he knows, and the way it appears at present, at
any rate, is that knowledge is simply perception.” In Heidegger’s words:

My seeing is to a high degree something individual, which I certainly may not –
without further ado – use to ground the analysis of experience. For this analysis is
supposed to yield universally valid scientific results in conjunction with the
elaboration of the problem.

Experience is fundamentally meaningful, but, it seems, the specific meaning content of
experience is relative. Is this ground-level semantic relativism unsurpassable? If so, this
would have fundamental implications for objectivity and truth.

Heidegger draws attention to the difference between this kind of basic seeing, of
the environmental world experience, and the abstraction of theory. In the theoretical
mode we introduce degrees of abstraction into the experience and, as we do this, we
move further and further from the primacy of this basic and more direct experience. In
the bare, “is there something?” in this extreme generalisation and abstraction of Cartesian
certainty, I am precisely what is missing. In the environmental experience where – as
Heidegger will say, introducing another German impersonal – “it worlds,” it worlds “for
me;” it is I who is experiencing.

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409 Plato. *Theaetetus* 151e. To which Socrates replied: “But look here, this is no ordinary
account of knowledge you’ve come out with: it’s what Protagoras used to maintain… For
he says, you know, that ‘Man is the measure of all things: of the things which are, that
they are, and of the things which are not, that they are not.’” 152a. In Plato, *Complete
Works*. Indianapolis: Hackett, 1997. The relativistic challenge of the groundlessness of
knowledge will prove crucial.

410 Ibid. pp. 60-1.
More precisely: only though the accord of this particular ‘I’ does it experience something environmental, where we can say that ‘it worlds’. Wherever and whenever ‘it worlds’ for me, I am somehow there. Now consider the experience of the question ‘Is there something?’ I do not find myself in this. The ‘anything whatsoever’, about whose ‘there is’ I ask, does not ‘world’. The worldly is here extinguished, and we grasp every potential environing world as ‘anything whatsoever’. This grasping, this firm fixing of the object as such, occurs at the cost of forcing back my own ‘I’. It belongs to the meaning of ‘anything whatsoever’ that in its determination I do not as such come into accord with it: this resonating, this going out of myself is prevented. The object, being an object as such does not touch me. The ‘I’ that firmly fixes is no longer I myself. The firm fixing as an experience is still only a rudiment of vital experience; it is a de-vivification [Ent-leben]. What is objectified, what is known, is as such re-moved [ent-fernt], lifted out of the actual experience. The objective occurrence, the happening as objectified and known, we describe as a process; it simply passes before my knowing ‘I’, to which it is related only by being-known, i.e. in a flaccid I-relatedness reduced to the minimum of life-experience.\textsuperscript{411}

In the barren thinking of theory, what is precisely lost is life lived, which is lived by I-myself. Heidegger is after the maximum, rather than the minimum of life experience. Thus it is the “mineness” of the environmental experience that Heidegger wants to latch on to, avoiding the de-vivification of theory:

\textsuperscript{411} Ibid. p. 62.
In seeing the lectern I am fully present in my ‘I’; it resonates with the experience… it is an experience proper to me and so do I see it. However it is not a process but rather an event of appropriation [Ereignis] (non-process, in the experience of the question a residue of this event). Lived experience does not pass in front of me like a thing, but I appropriate [er-eigne] it to myself, and it appropriates itself according to its essence. If I understand it in this way, then I understand it not as process, as thing, as object, but in a quite new way, as an event of appropriation.\footnote{Ibid. p. 63.}

The event of appropriation,” Ereignis, literally “event,” “incident,” or “occurrence,” is strictly mine, and this mineness will take on an increasing importance in the pages to follow.\footnote{Ereignis is linguistically related to eigen, “own,” as in “one’s own.”}

Heidegger is drawing a distinction between the theoretical and pre-theoretical experience. He will argue that if philosophy is to become primordial science, it must escape the theoretical (as abstraction, as further from the basic, as, in effect, non-primordial). Heidegger will argue that theoretical thinking already sets philosophy on the wrong path and is already removed from the primary. It would require a radically new philosophical approach in order to avoid this pitfall, and that is precisely what Heidegger will advocate. The domain of philosophy as primordial science will be in the pre-theoretical. In the last portion of the course Heidegger will attempt to give his students a glimpse of what this would look like.
“Primordial Science as Pre-Theoretical Science”

To sum up: The environmental experience, where we go about our dealings with the world, already experienced as meaningful, is primary. Theoretical thinking de-vivifies experience and moves us away from the primary, into abstraction. So we need to stay in the pre-theoretical in order to avoid this movement away from the primordial. But how can we philosophise about this, and then, scientifically? Phenomenology describes, from the first-person perspective, but is description itself not already a sort of theoretization? In using words, are we not already employing concepts? Here we encounter the twin problems of intuition and expression. How do we gain access to pre-theoretical immediacy? And then, how do we express what we find to others in a form that they can understand, without, at the same time, theoretizing our findings and thus moving out of the primordial realm? Heidegger’s methodological answer to these questions will focus

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414 This point lies at the core of Paul Natorp’s critical objections to phenomenology, which Heidegger explicitly outlines and then addresses in this course.

415 As Kisiel puts it: “The problem of a pretheoretical science thus ultimately becomes a problem of language: how to approach and articulate the dynamic, and thus elusive facticity of life?” Kisiel Genesis. p. 47. Heidegger will soon give a lecture course on just these issues under the title, “Phenomenology of Intuition and Expression” in SS 1920.

416 As Van Buren puts it: “The young Heidegger was preoccupied precisely with the ‘methodological problem’… of finding a type of non objectifying philosophical language that would allow one to speak about and yet precisely preserve the prereflective nonmasterable ‘mystery’ and movement of the subjectless, absence-permeated, incalculable, and anarchically differentiating Sache of his thought. It was to replace the hubris of traditional objectifying language that leads to the violent dehistoricizing, depersonalizing, technization, and ideologization of the Ereignis of being into statically present, calculable, and homogeneous metaphysical principles and worldviews… Religiously, Heidegger’s linguistic problem was the traditional mystical problem of saying the unsayable…” Van Buren, The Young Heidegger, p. 324.
on what he will soon call “formal indication.” And, as earlier in the course, the central issue will remain the ultimate grounding of meaning.

The central problem that we are pursuing at this point is the circular, self-grounding of meaning. Heidegger had pointed out this circular self-grounding as the central feature of the realm of primordial science. But now he tells us that this itself is a matter of perspective. “Circularity is a theoretical and a theoretically made difficulty.” He tells us. We must somehow escape this circularity then (or this perception of circularity conditioned by our standpoint and outlook). Heidegger points to the problematic nature of seeing this circularity, asserting that circularity is

...an essentially theoretical phenomenon arising through a process of de-vivification [as all theorizing is] from environmental experience. We now see also that the sphere in which there is circularity, precisely because it is

theoretical, de-vivified, and thus derivative, cannot be the sphere of primordiality.

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417 The term will arise in his WS 1919-20 course entitled “Basic Problems of Phenomenology.”
418 “This self-presupposition of primordial science (the circularity implicit in its idea) was even described as essential to philosophy and as the index of potential and genuine philosophical problems. It was also admitted that, as yet, we are not able to escape methodologically from this circularity. On the other hand there is the declaration that philosophy must intrinsically possess the aptitude for the ‘suppression’ [Aufhebung] of this apparently irremovable circularity.” Heidegger, KNS p. 80.
419 Heidegger, KNS p. 80.
420 “At this point it becomes clear that ‘circularity’ itself is also a kind of positing and presupposing, albeit of a very distinctive kind. Precisely that which first is to be posited must be pre-supposed. Circularity is an eminently theoretical phenomenon, it is really the most refined expression of a purely theoretical difficulty. The methodological sense of all our previous efforts was to arrive at the limit of presuppositionlessness, i.e. at the ‘primal leap’ [Ur-sprung] or origin, and to clear away everything that is laden with presuppositions. In this way we persisted in the theoretical. Circularity is a theoretical and a theoretically made difficulty.” Heidegger, KNS p. 80.
…If the circle is to be superseded, then there must be a science that is pre-theoretical or supra theoretical, at any rate non-theoretical, a genuinely primordial science from which the theoretical itself originates. This science of the origin is such that not only does it not need to make presuppositions, but because it is not theory, it cannot make them: it is prior to or beyond the sphere where talk of presuppositions makes sense.421

Again, Heidegger is making big claims. The pre-theoretical science that he is proposing sounds as though it may even be impossible, but Heidegger does not think so. And again, the core issue lies in grounding, in the seeming circularity of the self-grounding of meaning. This “circularity cannot be removed as long as primordial science is theoretical. Knowledge cannot get outside of itself.”422 The theoretical itself originates when we move from primary experience into any sort of epistemology, so this must be avoided. Yet how can we speak of such matters without falling into epistemology and theory more generally? Heidegger’s answer lies in the “Phenomenological Disclosure of the Sphere of Lived Experience,” through a method that he calls “formal indication” of a “pre-theoretical,” even “pre-worldly” something.

“Formal Indication”423 has its roots in Husserl, who used the term “indication”424 to refer to the kind of speech acts that express subjective, rather than objective truth contents. Van Buren points to the similarity between this division in Husserl and

421 Ibid. pp. 80-1.
422 Ibid. p. 81.
423 “Formale Anzeige,” “formal announcement,” “formal report.”
Kierkegaard’s notion of direct and indirect communication\textsuperscript{425}—methods for conveying objective and subjective truths respectively.\textsuperscript{426} Heidegger had been studying both Husserl and Kierkegaard intently in the years leading up to KNS 1919, and there is something of both of these sources in his concept. “Indication” points towards situational, or spatio-temporal particularity, rather than objective universality. The general statement: “twice two is four”\textsuperscript{427} is an objective, or universal statement based on the laws of mathematics. The indicative statement: “there are four dogs here,” however, is a subjective (depending on the situational particularity of the subject),\textsuperscript{428} or particular statement. “Twice two is four” is a true statement regardless of circumstances, while “there are four dogs here” is true only in particular circumstances (when there happen to be four dogs present).

Heidegger’s “indication” therefore refers to particularity, but what he is interested in indicating is, in fact, \textit{no particular content}, but the \textit{structural form}. This is why his method is “\textit{formal indication}.” Heidegger is interested in indicating structural features, without tying his discussion down to particular content. Steven Galt Crowell gives an

\textsuperscript{425} “In Chapter three of his first investigation, Husserl juxtaposes two types of expressive signs in speaking and writing, namely, the ‘objective expressions’ of science and the ‘essentially subjective and occasional expressions’ of ‘ordinary life,’ which are essentially “indicative” expressions. This distinction is very similar to the Kierkegaardian distinction between the modes of direct and indirect communication tat correspond to the two modes of objective and subjective situational truth.” In objective communication “the meaning-content is (1) nonsituational and atemporal; (2) always identical in different acts of intending it; and (3) fully present.” Whereas in indirect communication the situation is different: “This nonobjectifyable meaning-content (1) is bound up with the situation of the subject; (2) ‘fluctuates’ in the different situations of the speakers and writers; and (3) is thus never completely present in intuition.” Van Buren, \textit{The Young Heidegger}, 328-9.

\textsuperscript{426} See, for instance, Poole, Roger. \textit{Kierkegaard: The Indirect Communication}. Charlottesville: University of Virginia Press, 1993.

\textsuperscript{427} Dostoyevsky’s underground man obsesses over what he sees as the monstrosity of the oppressive totality and universality of this very statement.

\textsuperscript{428} Again we see foreshadowing of our later discussion of Quantum Mechanics here.
excellent account of formal indication that captures its features and method and looks forward to *Being and Time* as—quoting Kisiel in the beginning—both “the very fulcrum of *Being and Time*”… and the source of Heidegger’s ontological transformation of both hermeneutics and phenomenology:

For Kisiel, the ‘logic of philosophy’ consists not of objectifying categories but of formal indicating concepts. Terms such as care, guilt, death, and Dasein itself (to name just a few from the 1927 text) arise from life’s own self-interpretation but are ‘formalized,’ emptied of their everyday reference (their ‘what’) – a process that goes hand in hand with historical *Destruktion* – while retaining reference to their attitudinal motivation (their ‘how’) in life such that they can ‘indicate’ the immediate life situations out of which they arise and toward which the philosopher, thinking by means of them, comes to be directed… They thereby open up recollective access to the origins of meaning as lived. ‘Life’ itself is such a formal indication. Formalized, it no longer draws upon the ‘theoretical’ connotations explicit in the life sciences and still at work in *Lebensphilosophie*, but indicates the phenomenological field that precedes these derivative senses. The philosopher follows this indication to recover his own prephilosophical receptive submission (*Hingabe*) to primordial immediacy.429

Thus phenomenology seeks to describe the *structures* of experience rather than describing any *particular experiences*, and particularly, to keep these structures *empty*. But it *cannot* construct an objective systematic picture or blueprint of the structures of

experience; it can only point them out, or point toward them – indicate them – in a kind of indirect communication.  

Heidegger is working at the limits of philosophical reflection here. He is attempting to uncover philosophy at its absolute ground. And he posits this most basic primordial ground as the ground of all more-developed thinking, from the theoretical thinking of that which has, up until this point, gone under the name of philosophy, to theology and the sciences (natural and human), etc. He is trying to explore the most basic, simple, fundamental ground and essence of reflective thinking. Here Heidegger finds that language and our normal conceptuality begin to fail us. The usual methods of thinking, language, traditional ideas, etc. that have evolved out of and for use within normal experience are stretched to their limits at the limits of thought. As Van Buren notes, Heidegger is indeed encountering the problem of expressing the inexpressible here. Kierkegaard had grasped the scope of this problem and attempted to deal with it by employing his method of indirect communication. The mystics too had come up against this problem, from Eckhart— who Heidegger had studied along with Kierkegaard and Husserl and on whom he had proposed a new philosophical work in the conclusion to his

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430 There has been a great deal of debate over the meaning of Heidegger’s concept of formal indication. See especially, Kisiel’s The Genesis of Being and Time as well as the two articles in Research in Phenomenology 25 (1995), pp. 226-246, which include Cameron McEwen’s critique of Kisiel’s account and Kisiel’s reply. See Daniel O Dahlstrom’s “Heidegger’s Method: Philosophical Concepts as Formal Indications.” The Review of Metaphysics. 47.4 (June 1994), pp. 775-89, as well.  
Habilitationsschrift – to John of the Cross, whose attempts to express the inexpressible took the form of song and intensive self-reflexive commentary. The operational problems of thinking at the limits of thought and expressing what lies at or beyond the limits of expressibility are manifestations of the fundamental problems of transcendence. Because our normal operating modes are developed for the every day (plain language for our normal expression, but even advanced, developed technical language for theoretical work… these still deal with tasks within our experience), when we come to the limits we encounter transcendent problems; Heidegger is attempting to think back to the most basic fundamental ground of thinking itself and this is no easy task. Transcendent problems, problems of trans-latio, of carrying understanding trans-limes, lie at the core of any examination of grounds traced far enough back. As we approach the vanishing point of intuition and expression our tools begin to fail us, and increasingly so.

Heidegger tells his students that “the fundamental methodological problem of phenomenology” is “the question concerning this scientific disclosure of the sphere of lived experience.” How can we disclose this primordial sphere without slipping into theoretical thinking and thus moving out of the primordial? Natorp’s objections to phenomenology, that it objectifies through reflection and in language as it describes (for Natorp asserts that words, as signs for concepts are already theoretical), which Heidegger

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433 Heidegger, KNS, p. 92.
takes very seriously\textsuperscript{434} stand as an apparent barrier to any progress. As a solution to this problem, Heidegger refers to “phenomenology’s ‘principle of principles,’” which Husserl formulates as follows: “\textit{everything} that presents itself… originally in ‘intuition’ is to be taken simply… as it gives itself.” And again, quoting Husserl, he tells us that “this is the principle of principles in regard to which ‘no conceivable theory can lead us astray.’”\textsuperscript{435} Heidegger argues that this principle is no “theoretical proposition” but a methodological ground (or better, a methodological ground of grounds):

That Husserl speaks of a \textit{principle} of principles in regard to which no theory can lead us astray, already shows… that it does not have a theoretical character. It is the primordial intention of genuine life, the primordial bearing of life-experience and life as such, the absolute \textit{sympathy with life} that is identical with life experience.\textsuperscript{436}

It is something like a rule for an attitude.\textsuperscript{437} It proposes nothing about the world, rather it acts as a sort of commandment (arguably however, with a theoretical edifice behind it, but Heidegger does not see this as so here): “Thou shalt take everything that presents

\textsuperscript{434} “Until now Natorp is the only person to have brought scientifically noteworthy objections against phenomenology.” KNS 85
\textsuperscript{436} Ibid.
\textsuperscript{437} Franz-Josef Brecht’s transcript of the course records Heidegger as saying the following at this point: “The principle of principles pertaining to the phenomenological \textit{attitude}: [emphasis mine] …No theory as such can change anything here, for the principle of principles is itself no longer theoretical; it expresses the fundamental life-stance of phenomenology: the sympathy of experience with life! This is the basic intention. It has nothing to do with irrationalism or the philosophy of feeling. Rather, this fundamental stance is itself clear, like life itself at its basic level.” Heidegger, KNS, p. 184.
itself in intuition as it gives itself.” Maintaining this stance, Heidegger tells his students, is what the “‘rigour’ of the scientificity awakened in phenomenology” refers to.\textsuperscript{438} All other scientific rigour in the “derivative non-primordial sciences” is “incomparable” to this phenomenological rigour.\textsuperscript{439} This phenomenological stance towards the phenomena demands rigour because it is so very difficult to maintain; it is so very easy to slip into theoretical thinking.\textsuperscript{440}

The problems still stand before us however. How can we view the primordial realm without conceptualising or theorizing and how can we describe it without using objectifying language? The conceptual and linguistic problems (two sides of the same coin) rest on the question of meaning:

This objection rests on the opinion that all language is itself already objectifying, i.e. that living in meaning implies a theoretical grasping of what is meant, that the fulfilment of meaning is without further ado only object-giving.\textsuperscript{441}

But, Heidegger tells us, this is in fact an “undemonstrated prejudice.”\textsuperscript{442} It already presupposes a theory of the subject/object relation that is based on an inside/outside

\textsuperscript{438} From Brecht’s transcript again: “The fundamental phenomenological stance is not a routine – it cannot be mechanically acquired, which would make phenomenology a farce. It is nothing readily at hand, but must be slowly and strenuously acquired.” Heidegger, KNS, p. 184.

\textsuperscript{439} Heidegger, KNS, p. 93.

\textsuperscript{440} “At the same time it becomes clear why the problem of method is more central in phenomenology than in any other science. (For this reason, this whole lecture-course has actually pivoted around the problem of method.) For our problem, the basic bearing of phenomenology yields a decisive directive: not to construct a method from outside or from above, not to contrive a new theoretical path by exercises in dialectic. Such phenomenology can prove itself only through itself, every taking-up of a standpoint is a sin against its ownmost spirit. And the original sin would be the opinion that it is itself a standpoint.” Heidegger, KNS, p. 93.

\textsuperscript{441} Ibid.
picture of the world, wherein a viewing subject views an object outside of itself and then conceptualizes. This, Heidegger argues, is already too theory-laden, too much of a presupposition for the philosophical realm he is attempting to bring to light.

In light of this revelation, Heidegger returns (though a description of the “levels of de-vivification,” or some of the structures of theoretization) to the something. Is it correct to say that when we say of something that “it is something” that this is the highest level of theoretization (as the greatest level of abstraction)? Or might we see the something differently? Might there be different ways of seeing something (different differentiations of something even)? Heidegger returns to the lectern thought experiment, now pointing out that, no matter which way we describe it (environmentally, as the lectern at which he is to speak, or in any number of theoretical permutations – a mass of matter, a collection of atoms, flat objects meeting at right angles, a wooden box, sensory data in the form of colours and shapes, etc.) we can say that it is something. The term “something” applies at any level of immediacy or abstraction (whereas, for instance: “lectern” or “sense data” do not apply at any level, but only at particular levels).

Something then, actually seems to belong to no particular level of abstraction or de-
vivification at all. Nor does it particularly belong to the environmental experience either. It is a kind of hollow signifier that can pertain to and be filled by any sort of specific content: “anything that can be experienced.” The something, strictly as something, does not strictly belong to the environmental world or the theoretical world, or the social, religious, aesthetic, or any other kind of world; it is the something in general: the pre-worldly something.  

This empty something, as Heidegger had already shown, has a tendency toward specific content. It is part of its nature to refer to specific things in the world. This tendency towards content is part of the reason that the de-vivification process of theoretization occurs. Phenomenology, as non-objectifying pre-theoretical science most somehow “deflect” –as Heidegger puts it - this tendency into specific worlds; it must attempt to remain in the pre-worldly.

Figure 2, Heidegger’s KNS Schema, Follows:

\footnote{Ibid. p. 97}
### KNS SCHEMA

#### The Pre-theoretical Something
- **pre-worldly something**
- (fundamental moment of life as such)
- primal something

#### The Theoretical Something
- **worldly something**
- (fundamental moment of definite experiential spheres; aesthetic)
- genuine experiential world

- **objective formal-logical something**
- (motivated in the primal-something)
- (motivated in the genuine experiential world)
- **object-like something**
Staying with the *something* in general is Heidegger’s way of avoiding the pitfalls of theorization/de-vivification and remaining in the primordial realm. He continues:

The meaning of ‘something’ is just ‘the experiencable as such’. The indifference of the ‘anything whatsoever’ in regard to every genuine world character and every particular species of object is in no way identical with de-vivification, or even with the latter’s highest level, the most sublime theorization. It does not mean an absolute interruption of the life-relation, no easing of de-vivification, no theoretical fixing and freezing of what can be experienced. It is much more the index for the highest potentiality of life. Its meaning resides in the fullness of life itself, and implies that this still has no genuine worldly characterisation, but that the motivation for such quite probably is living in life. It is the ‘not-yet’, i.e. not yet broken out into genuine life, it is the essentially pre-worldly. But this means that the sense of the something as the experiencable implies the movement of ‘out towards’ [*aus zu*], of ‘direction towards’, ‘into a (particular) world’, and indeed in its undiminished ‘vital impetus’.446

We must, Heidegger again reminds us, not conceive of this pre-worldly something theoretically – and he does realise the difficulty of this – but exactly how this is to be done is not expressly worked out by the end of KNS 1919 (and perhaps, if our only way of communicating knowledge about the primal realm is indirect communication, an explicit procedural outline may not be possible, as such, or in such a form).

446Heidegger, KNS, p. 97
But have we lost sight of our own topic here? Are we drifting away from the question meaning and its ground? Decidedly not, and this is precisely the place in our discussion – before we finish off KNS 1919 and move on to Heidegger’s further development of formal indication, the problems of intuition and expression, and then on to the religion courses and his confrontation with Aristotle – to illuminate some of our findings in light of our central theme. Thus we return to the question of meaning. What is meaning? Meaning’s are the *relata* of the relatirolity upon which our thinking, communicating, organizing, understanding, theorizing, interacting and, indeed, all our forms of going about the world, depends. Meaning is the blood in the veins of the world as it is for us. Meaning can be seen as a structural term for all of the content of experience as we experience it. Now what of Heidegger’s developments in KNS 1919?

In his description of the environmental experience (the lectern thought experiment), Heidegger showed meaning at work in the way that we primarily experience the world (in just going about our daily business). Meaning is, of course, also equally at play in theoretical thinking and all other forms of comportment towards the world (religious, aesthetic, ethical, etc.). In his description of the simple environmental experience Heidegger pointed to a “moment of signification”\(^\text{447}\) or “meaning fixing moment”\(^\text{448}\) that occurs when we encounter anything whatsoever (everything is

\(^\text{447}\) KNS p. 61.

encountered as something; everything is encountered in some way\(^{449}\).

Meaning/significance is at play in all of our dealings with the world and ourselves, but meaning itself is only seen when we reflect on our experience of experiencing. *Meaning itself* then is a reflexive category, a phenomenon *only* viewable through reflexivity (through reflecting on the experience of experience). Otherwise we see only meanings, that is, the specific contents of the things we encounter in the world (the lecterns, desks, people, ideas, etc.). Without reflexivity, meaning itself, rather than the infinite multitude of meanings, is inaccessible. Meaning is, I argue, the formal-empty *par excellence*.

Reflexivity is absolutely necessary then. But it tends immediately toward theoretical conceptualization. As we reflect on our experience of experience we immediately tend to objectify it. This lies at the heart of Natorp’s objection, which Heidegger takes so seriously (that all reflection is objectifying). How to reflect on our experience of experience and then meaning itself without this objectifying movement? Heidegger argues that we must deflect our reflection away from any specific content/worlds/concepts etc. and remain somehow in the formal empty.

This is Heidegger’s solution in KNS 1919 to the problem of reflexivity without objectification: we stick to the formal-empty. We must not look to content, but to *structural features*. We look to tendency and motivation (directionality toward worlds and back to motivation), but again, only in an empty, formal sense. This structuralism

\(^{449}\) As Galt Crowell puts it: “the moment of significance… can be noted as such only if, while attending to what presents itself, I simultaneously attend to the way it presents itself. As Husserl would say, significance pertains to the mode of givenness of environmental things and becomes perspicuous as such only in reflection upon the experiencing of the experienced.” Galt Crowell, *Husserl, Heidegger, and the Space of Meaning*. p. 134.
before structuralism – if I may – is a crucial development that arose directly out of Heidegger’s engagement with and interpretation of (both positive and negative) Husserlian phenomenology.

At the close of KNS 1919 Heidegger will argue that our access to the primordial realm, which, as Kisiel puts it, is not mute but meaningful, in its empty formality comes through “hermeneutical intuition.” This modification of Husserl’s idea of phenomenological intuition in light of Heidegger’s own research into Dilthey and life philosophy (as well as his religious reading, in particular Schliermacher, who’s development of hermeneutics in the nineteenth century influenced both Dilthey and, later, Heidegger) is indeed a crucial step along the road to Beining and Time. But it is also a vastly important moment in the conceptual history of meaning (and ideas about our access to it), which is, of course, what concerns us here.

Heidegger does not, we must again note, present a complete account of his new method of hermeneutic phenomenology by the end of KNS 1919. It will remain for him to further elaborate (and indeed, to further develop) his ideas in the courses that follow as well as in the pages of Being and Time itself and beyond. And yet, a great step is made here. And a cluster of extremely evocative and promising ideas are presented in what Kisiel refers to as “the climactic last hour” of the course. Here Heidegger hurriedly draws together may of the various threads of the course into a conclusion that is as tantalizingly interesting as it is frustratingly rushed.

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451 Heidegger, KNS, p. 98.
452 Kisiel, Genesis. p. 48.
The twin questions of intuition and expression are fundamentally questions of grounds. We can see and say whatever we want about any phenomena whatsoever. The question for serious philosophical endeavour, however, is that of the grounds of our pictures of the phenomena and our statements about them. How can we avoid the relativistic impasse of Theaetetus and Protagoras and guarantee for ourselves that our intuitions and expressions of them are in any sense “true” to the phenomena themselves? Upon what base can we rest our certainty, however conditional and partial that may be? How can we find a degree of necessity behind the host of potential contingent views of the phenomena at which we may arrive? If we are to avoid the ultimate pitfall of relativism we must find a ground for our endeavours. If we analyse Heidegger’s problem-situation in this course structurally, we see that the problems of intuition and expression, of primordial science, and of the phenomenological approach, are indeed problems of securing necessary grounds in the face of relativistic contingency. And again, as problems in the realm of understanding, problems of intuition and expression, the domain in which this structural problem of ground operates is that of meaning. Given this structural orientation, my account here differs from others, though it does not necessarily contradict them. This comes from my ultimate orientation not towards understanding Heidegger in and for himself, but towards tracing the conceptual history of the problem of meaning, and thus towards the structural features and moments of Heidegger’s thought on this topic.
Heidegger’s solutions lie in the directional impulses of tendency and motivation, and in the phenomenological “something” that we have now encountered. Heidegger begins his conclusions with the something:

Everything experiencable contains the characteristic of ‘something.’ In other words, the character of ‘something’ belongs in an absolute way to life as such: this is the phenomenological something. It extends to the sphere of life, in which nothing is yet differentiated, nothing is yet worldly: the phenomenological character of ‘something’ is pre-worldly. The primal character of ‘something in general’ is the basic character of life as such. Life is in itself motivated and tendential: motivating tendency, tending motivation. The basic character of life is to live toward something in determinate experiential worlds. The mark of this is given in the ‘something.’

We have encountered this set of arguments already. The something always tends toward being filled with determinate content. But a pre-theoretical, pre-worldly primal something \([Ur-etwas]\) lies beneath this; it is the basic experience of life itself. And Heidegger sees this basic experience of life itself (before any determinate content) in terms of movement.

There is a kind of philosophical physics at play in Heidegger’s ideas here (which will continue through *Being and Time* and beyond). He sees the basic primal experience of life in terms of directionality and movement: motivation and tendency. Life tends toward definite worlds, that is, towards determinate content, filling the something with particular somethings. Or, to put it another way, life tends toward assigning particular

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454 Heidegger, KNS, p. 186, from Brecht’s transcript.
meanings to phenomena, the determinate worlds being structural contextures of meaning. And life also tends back from these determinate worlds to its motivation. It tends Vorwärts und Rückwärts, manifesting moments of meaning in terms of Vorgriffs and Rückgriffs (pre-cepts and re-cepts in the standard English translation).

If we are to achieve a primordial science (phenomenology in actuality as it is in potential) we must get to this basic primordial something that is the basic moment of life as such. “This primal sense of the ‘something’ must be seen in pure phenomenological intuition. This is difficult, but despite objections it is necessary.” The formal-logical something, in its empty universality, which we can apply to every level of theorization, finds its ground in the primordial phenomenological something that is the basic moment (and movement) of life itself:

This pre-theoretical, pre-worldly ‘something’ is as such the grounding motive for the formal-logical ‘something’ of objectivity. The latter’s universality is grounded in the universality of the pre-theoretical primal-something [Ur-etwas].

The theoretical something then only exists, Heidegger tells us, if we step into the theoretical realm. This is how concepts come to exist: “if de-vivified, then concepts exist.” Thus, to avoid the theoretical ossification of concepts we must stick to the realm of movement, to pre-cepts and re-cepts.

In the basic moment/movement of life, “the experienced ‘something’ is not a concept but is identical with the motivational process of life and its tendency; therefore

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455 Heidegger, KNS, p. 186, Brecht’s transcript.
456 Ibid. Emphasis mine.
457 Heidegger, KNS, pp. 186-7
458 Ibid.
not a concept [Begriff] but a recept [Rückgriff]." We must focus on movement and directionality rather than static pictures. We need to focus on “the experience of experience, which is the understanding of experience from its motivation.” How can we do this? Heidegger proposes his own version of phenomenology as the answer.

Heidegger’s conception of phenomenological method here is of a certain comportment. He thinks that we need to relate to life in a certain way, and through this relation we will find the way into the primordial realm:

If one stands in a phenomenologically intuitive relation to life as such, to its motivation and tendency, then the possibility arises of understanding life as such. Then the absolute comprehensibility of life as such will emerge. Life as such is not irrational (which has nothing whatsoever to do with ‘rationalism’!).

Heidegger will go on, in the courses that follow, to describe this “phenomenologically intuitive relation” as a sort of heightened state of vivacity, a kind of throwing oneself into the deep-end of life with one’s whole self. It is hard not to think about Heidegger’s interest in mysticism here, “kindling with love in flame of yearning keen.” But Heidegger is trying to present a non-religious philosophical option here and we must keep this in mind. There are obvious connections here to his study of mysticism, but equating

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459 Ibid. p. 187
460 Ibid.
461 Ibid.
the one with the other would be misleading. The religious, in Heidegger’s account, is already itself a world. Heidegger is here seeking the *pre*-worldly, and thus religious methodologies are as inappropriate for his task as are those of logic or aesthetics.

Heidegger describes our mode of access in this phenomenological intuition as *hermeneutical*. And here we are reminded that the question at hand is, ultimately, one of *meaning*:

Phenomenological intuition is the experience of experience. The understanding of life is *hermeneutical* intuition (making intelligible, giving meaning).

The immanent historicity of life as such constitutes hermeneutical intuition. Once these insights are obtained, it emerges that the meaningfulness of language does *not* have to be theoretical.

To the extent that meaningfulness is not as such theoretical there arises the possibility of phenomenological intuition, directed toward the *eidetic*, not toward generalisations. Since that which possesses meaning does not have to be theoretical, expressions of meaning are not tied to generalisations.

If one grasps the un-theoretical character of the meaningful, what follows is the possibility of a communicative science of phenomenology. Our phenomenological exploration of the primordial realm – *dealing in meaning* as its content and *through meaning* as its medium – is to be achieved through constant new beginnings and constant difficult effort: “*philosophy* can progress only through an

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*463* Indeed, Heidegger speaks *against* a mystical interpretation.

*464* “*Aim of phenomenology: the investigation of life as such.*” KNS p. 187. Heidegger is addressing Natorp’s objections here.
absolute sinking into life as such, for *phenomenology* is never concluded, only *preliminary*, it always sinks itself into the preliminary.\textsuperscript{465}

And in the end all of this relies on the heightened stance towards life, the immersion in life that Heidegger does not adequately describe here but will further explore in the courses that follow. As he rather dramatically puts it:

The science of absolute honesty has no pretensions. It contains no chatter but only *evident steps*; theories do not struggle with one another here, but only genuine with un­genuine insights. The genuine insights, however, can only be arrived at through honest and uncompromising sinking into the genuineness of life as such, in the final event only through the genuineness of *personal life* as such.\textsuperscript{466}

How exactly this is to work must remain unexplored here and instead stand as a basic *indication* of the direction in which Heidegger is moving.

In the following course on “Phenomenology and Transcendental Philosophy of Value” (SS1919) Heidegger attempts to pick up where he left off, using the methods he arrived at in the closing hours of KNS1919 in order to explore the genuine problems that lie under the then current transcendental value philosophy (and to see, indeed, if there are any genuinely original scientific problems at its root at all).\textsuperscript{467} It should not surprise us by this point that Heidegger finds transcendental value philosophy inadequate to the task of genuine primordial questioning. Here he criticises Windelband and Rickert’s work, again,

\textsuperscript{465} Heidegger, KNS, p. 188 Brecht’s transcript.
\textsuperscript{466} Ibid.
\textsuperscript{467} Heidegger, Martin. “Phenomenology and Transcendental Philosophy of Value” (SS1919), In *Towards the Definition of Philosophy*, p. 106.
focussing on their inability to ground their philosophy.\textsuperscript{468} Heidegger’s critiques however fail to live up to the promise of KNS1919 and, indeed, of the introduction to this course, which he seems to have written but not actually delivered in class. As Kisiel puts it:

In this first of many courses on the history of philosophy, he outlines a new and powerful method of ‘critique’ which promises to go more deeply into intellectual history than the old-fashioned factual history of surface ‘influences’, and then by and large gives us precisely that.\textsuperscript{469}

However, as Kisiel also points out, we do see the beginnings of Heideggerian concepts (the hermeneutic situation as a living contexture of meaning) and methods (destruction as historico-phenomenological critique that searches back tracing preconceptions to the origins of ideas).\textsuperscript{470}

The “situation” is explored further in Heidegger’s course “On the Nature of the University and Academic Study” (also SS1919), where he further explores the implications touched on in his introductory remarks to KNS1919. Heidegger argues for the kind of thinking and intense life-relation to scientific research that phenomenology offers. Differentiating between sciences of explanation and sciences of understanding (a la Dilthey), he argues that the explanatory sciences, through their employment of a maximum of theorization, lead to the greatest degree of what he called “de-vivification”

\textsuperscript{468} See Heidegger, SS1919, pp. 124-5, 130-3, 148, 158, 161-9, etc. Rickert in particular fails (according to Heidegger’s account) to secure the foundation for all meaning that he had sought) p. 169.
\textsuperscript{469} Kisiel, Genesis. p. 60.
\textsuperscript{470} In Heidegger’s words: “The universal, methodological at the beginning! Phenomenology and historical method; their absolute unity in the purity of the understanding of life in and for itself…” Heidegger, SS1919, p. 106.
in KNS1919 (here “the greatest extinction of the situation”) and, conversely that the understanding sciences incur the minimum amount of this theoretical de-vivification.

“The intuitive, inductive phenomenology, the philosophical primordial science,” he tells us, “is a science of understanding.” The situation, when it is not “extinguished” in theory is a living “event,” a contexture of meaning, whereas theoretical thinking can only describe “processes.” This differentiation between living events that involve the I, and the “extinguished” “processes” of theoretical description will remain a vital theme for Heidegger’s development throughout the period under study here and, again, points forward to issues that will arise in our discussion of Bohr.

Basic Problems of Phenomenology (WS 1919-20)

Heidegger’s WS 1919-20 course, on the “Basic Problems of Phenomenology” [Grundprobleme der Phänomenologie – literally “Ground-problems of Phenomenology”] picks up where KNS 1919 left off in a much more effective way than the two summer courses that preceded it. This course presents a systematic examination of phenomenology as primordial science. It begins with the findings of KNS 1919 and expands greatly upon them, providing much more detail and explanation and delving far deeper into the problems. Methodology lies at the centre of the course’s concerns and all of our familiar terms (meaning, ground, understanding, necessity and contingency, etc.) are key components here in a methodological discussion of access to the primordial realm that phenomenology is to explore. Heidegger opens the course by saying that “the most

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471 Heidegger, SS1919, p. 175.
472 “Theoretical comportment is a process first because it flows through a chain of grounding, but second because it tears itself from the contexture of life with ever novel spontaneity.” Heidegger, SS1919, p. 179.
burning, most original and ultimate basic problem of phenomenology, one which is never to be effaced, is it itself for itself.”\textsuperscript{473} Phenomenology, as the primal science of origins is the science of constant beginnings; it will always remain problematic for itself, and the methodological problem is one that must always be taken up anew in all genuine phenomenological research.\textsuperscript{474}

Heidegger’s vision of phenomenology as primordial science is of a science of origins. Phenomenology is to study the original primordial something of life itself, before any differentiating determination of the phenomena of the manifold. Phenomenology’s subject matter (or, in more Heideggerian terminology: its “object-region”) is what Heidegger calls “the original region of philosophy.”\textsuperscript{475} This original region is, according to Heidegger, no first principle or axiom, nothing mystical,\textsuperscript{476} not the “idea of pure thinking,” not given in life itself; it is only accessible through primordial science (phenomenology), it must be brought nearer methodologically, can only be reached through “pure scientific method,” and must always be apprehended anew.\textsuperscript{477} It is the raw, undifferentiated that of life. But again, the problem of access confronts us: how is such a

\begin{thebibliography}{9}
\bibitem{473} Heidegger, Martin, Basic Problems of Phenomenology (WS1919/20). London: Bloomsbury, 2013. p.2
\bibitem{474} “In the idea of original science and its genuine actualization lies the demand of absolute radicalism of questioning and critique. Namely genuine historical understanding, which grows out of phenomenology and makes possible for it a new assessment and evaluation of intellectual history, a new seeing of it. It must make phenomenology uncompromising over its achievements, in the sense that it lets itself profess (suggest) nothing unmediated and unexamined. This applies even more to the philosophy of the current, ‘accidental’ present. …the radicalism of phenomenology needs to operate in the most radical way against phenomenology itself and against everything that speaks out as phenomenological cognition.” Heidegger, Basic Problems p. 5.
\bibitem{475} Ibid. p. 153.
\bibitem{476} Again, \textit{contra} mysticism here.
\bibitem{477} Heidegger, Basic Problems, pp. 2-6.
\end{thebibliography}
thing accessible at all, let alone as the object-region (subject matter) of a science? “Basic Problems of Phenomenology” is an attempt to explore this problem and to answer it (note that the two tasks are not identical).

Having moved through the preceding courses we know that we cannot seek a theoretical solution to this problem. The solution must be found in the vitality of lived life itself. But this is problematic. In what Heidegger will call the “self-sufficiency of life itself” we have a potential road-block. Life itself is concerned with life itself. Its concerns, questions, and answers come from within life itself, already in progress, already differentiated into an infinite array of determined meanings and contexts. Heidegger’s question, however, is about the origin of this meaning-differentiated moving, living life. His question is ultimately about the ground of meaning, though he does not formulate it as such.478 Life is concerned with its own contents, but Heidegger is not interested in the internal what-contents of life in itself, rather, he is concerned with life arising from its origin.479

Access to the original region seems not to be available from within life, but we are always within life; where else can we start? The answer is: nowhere. We must start within life; we have no other option. This, Heidegger notes, is “a basic problem of

478 Heidegger, in seeking the origin of already meaning-differentiated life, which is, as Kisiel put it “not mute but meaningful,” which is permeated, articulated, understood, enacted, and expressed in meanings, is seeking nothing other than the ground of meaning, which he will, in these early lecture courses, discover in the primordial something of pre-differentiated life. This will become more clear as my explication of this course (and those that follow) proceeds, as will the inherent difficulties with Heidegger’s early answer to this problem of the ground of meaning.

479 Heidegger, Basic Problems, p. 65.
phenomenology: the accessibility of the original region from out of factical life.” The goal and “guiding tendency” is “the understanding of life out of its origin.” We cannot access this origin from within life, as life is focused on things in life. The solution to the problem lies in directionality. It will turn out that the original realm is accessible from out of factical life (not from within it). In order to understand and explicate this distinction we need to go back to the idea of phenomenology as primordial science, and we need to revisit the problem of ground.

**Grounding Science**

“Basic Problems of Phenomenology” contains a new, structural definition of science that clarifies many of Heidegger’s ideas in this period. He defines science as “the concrete logic of a subject area” and “a context of manifestation of a factical life-region.” A factical life-region can be any differentiated region of the phenomenal manifold: living organisms (represented by the science of biology), matter in motion (represented by the science of physics), events in the past (represented by the science of historiology), moral decisions (represented by the science of ethics), artistic creations (represented by the science of aesthetics) and so on. Of course, not every differentiated region has a developed science, and not every science has the same degree of

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480 Ibid. “Factual” becomes an important word in these courses, it refers to life just as it is, as we find it, in its concrete reality.
481 Ibid.
482 Ibid. p. 54.
483 NB the German word “Wissenschaft” (any organised system or body of knowledge) has a much broader meaning than the current meaning of the English “science” (though in the roots of the English word we find the same broad meanings, hence ethics in the Nineteenth century as “the moral science”).
development, but all sciences are sciences of differentiated regions of the phenomenal manifold.

Heidegger’s other definition of science, as “a context of manifestation” means that, in addition to covering a particular determined region of subject matter, science determines this subject matter in a certain way, in a certain context of ideas, assumptions, rules, modes of viewing, verification, acceptance, etc.

A context of manifestation manifests, ‘in’ its own content, something. In every science, something, a particular region, comes to be treated and portrayed. That which science is supposed to express is that which can be encountered in some way that is not yet scientifically expressed. (Meaningful for original science.)

Science “expresses” its subject matter in a certain way. If it is good science, according to Heidegger’s criteria, it expresses it in a way that is appropriate to that subject matter, according to rules that arise out of study of that subject matter. This, he notes, has implications for phenomenology as the primordial science of origins.

Heidegger also describes science as “the concrete logic of its subject-area.” And this refers to the rules, laws, norms of explanation, verification, etc. of a particular science, which, once again, must arise out of that subject matter itself if they are to be genuine:

The forms of the object and the structures themselves are concrete, growing only out of the subject-area itself. They are motivated by it, so much so that even the actual basic tendency of the sciences derives from a basic motive of the relevant

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484 Ibid. p. 54.
485 Ibid.
subject-area. The concrete logic of a subject-area is the scientific-theoretical expression of a ground of experience, objectively bound as such. The mode and structure of concept-formation are predetermined by the meaning of the subject-area. This also predetermines the mode of justification and proof, the forms in which states-of-affairs of the region generally identify themselves, in which they become knowable – the style and type of concrete knowability are as such predetermined.  

The “concrete” logic of a subject-area arises out of it. Its solidity derives from its appropriateness. Scientific logics, as those which govern the ways of knowability of subject-areas, must be appropriate to those subject-areas if our knowledge of them is to attain any degree of genuineness, according to Heidegger. This also points to further difficulties for phenomenology as primordial science. But what of the “ground of experience” that Heidegger mentions here?

“The sciences,” Heidegger says, “grow out of a factical life-world and the living multiplicity of the encounters of factical life in it.” Factual life, actual life as we live it, constantly looks toward life’s contents and doings. Factual life is always “running towards the life-world” and tends toward scientific organisation (remember the broader German sense of science as organised knowledge). Heidegger says that factual life “is taken into the tendency of becoming scientifically cognized.” We naturally tend toward seeing, toward knowing the world in an organised manner. To put it in the terms I

486 Ibid. p. 60.
487 Ibid. p. 53, emphasis mine.
488 Ibid.
introduced in the introduction, we sort, organise, and otherwise differentiate the
phenomenal manifold. This is not a special argument that Heidegger has created here;
rather, it is a simple fact of human existence. We organise the phenomena that constantly
present themselves to us. We think; and the matter of this thinking is meaning. The
meanings that we assign to things are the matter of our thinking. When we think, we
think about things, but we think with and through meanings (again, as the very relata of
relationality). Heidegger continues:

From the perspective of the sciences, that [the tendency of life toward becoming
scientifically cognized] means: they allow themselves to provide a certain ground
for the approach, entrance, actualization and mode of actualization of its
methodologically cognitive comportment and achievement. They grow out of a
factical life-world and the living multiplicity of the encounters of factical life in
it. 489

Sciences, as the concrete logics and contexts of manifestation of subject-areas grow out
of our life experience. Each science grows out of the ground of experience, 490 finding its
own particular ground in a particular range of phenomena that becomes its subject
area. 491

489 Ibid. p. 53.
490 “A concrete ground of experience, which constantly accrues to factical life, is there.
‘Is there,’ that means factical life does not first establish the being-there [Dasein], but
rather that it is and lives experientially in a world.” Ibid. p. 54.
491 “Science is the concrete logic of its subject-area, which grows out of a particular
ground of experience in a particular way and in a particular gradation. Subject-area –
this way initially pre-given to itself in purity from out of the particular formation of a life-
world encountered in factical life and perhaps made prominent in its own forms.” Ibid. p.
54.
The ground of experience is “the factual context of experience of a factual life.”

As Heidegger explains:

In order to arrive at its naked homogeneity… a context needs to be prepared which, in terms of contents, defines itself from out of the belonging together of what has been experienced as such, so that from out of this ground of experience a unified character-of-subject-matter [Sacharakter] can be lifted out. Through this what lets itself be defined is a subject-area [Sachgebiet] for a science. This process of preparing the matter-unified ground of experience is highly involved, and for every science and every foray into a factual life-region, it has a different structure and a different sequence of theoretical steps.

This preparation of the ground of experience, the process of making a possible subject-area available, can only actualize itself in the tendency of the science to be established itself. And again this tendency in its what and how is itself only possible as genuinely motivated out of the life-world, from which the pure subject area makes itself prominent in its own perspective.

Ground of experience means: the availabilities striped of their connections to the self-world and prepared for the involvement of new tendencies.

By doing this, the formation of what is experienced as proper subject area is initiated…[^492]

This structural, schematic account of science, is an account of the ground of meaning of a science; it is an account of how the meaning contents of a science are grounded, but also the rules that apply to their relations.

Figure 3, Schema of the Ground of Sciences, Follows:
Ground of Sciences

The Body of Scientific Knowledge

Concrete Logic

Particular Science [e.g. Physics]

Its Subject=Area [e.g. matter in motion]

GROUND

Region of phenomena becomes the subject-area through the birth of the science (determination of the subject-area & creation & development of its concrete logic out of this subject-area)

A Region of Phenomena [e.g. matter in motion]

Experience of Factual Life (thinking, sorting, organizing, differentiating, relating)

Phenomenal Manifold
But where does this come from? Ultimately, each science is grounded in a region of phenomena (its ground of experience), which, in turn comes from the broader ground of experience that we find in factual life in general (arising out of differentiation of the phenomenal manifold). It comes from what Heidegger calls a particular “life-region” and then enters “into its own context of expression” (as a formed science). But, “this life world must in some way be pre-given to science itself.” 493 So we arrive again at the pre-givenness of the phenomenal manifold and of life itself, the pre-givenness of the ground of experience.

How do these findings complicate the task of phenomenology, as the primordial science of origins? The question obviously takes us back to the ground of experience and the origin out of the phenomenal manifold, but answers are more difficult here. Again we return to the problem of access, a problem that will not leave us through the rest of our discussions of Heidegger and will become a central problem in our discussions of quantum mechanics. What remain for us to discuss at the moment are the problems of the ground of primordial science (phenomenology) – is the ground-structure of the primordial science of origins the same as that of the other, non-primordial sciences? – and the question of access to the original region (phenomenology’s own subject-area that lies, problematically, beneath all other subject areas) – it is the problem, in other words, of the ground of grounds, of the ultimate ground of meaning. Heidegger the young

493 “Because science only gives itself the characterization as ground of experience, as subject-area. This characterization involves a factual life-world. Science can never give this to itself as such. What does this mean? It must be pre-given to it. …questions are here being touched on (ground of experience) that reach beyond any factual contingency.” Indeed, they reach to questions of ultimate contingency and necessity. Heidegger, Basic Problems, p. 57-8
Catholic philosopher found his ultimate ground of meaning in God. Heidegger the young phenomenologist – though still a believer of sorts at this time (what sort ultimately remains unknowable) – denies himself this answer. What answer does he arrive at?

**Ground and Access: Primordial Science and The Ultimate Ground of Meaning**

The origin and ground of the sciences are problems for phenomenology, as the primordial science of origins, as is the origin of theorization in general. Heidegger has similar things to say about theoretical thinking and de-vivification here as he does in KNS 1919 and “On the Nature of the University,” and, indeed, he devotes time here to a more detailed investigation of de-vivification and its relation to science in a section on “science and its relation to the situations of the self-world as the tendency of the life-world’s devivification.”

Here life’s tendency toward theorization and the subsequent distancing from the primordial contribute greatly to the growing sense that phenomenology, as conceived by Heidegger, as the primordial science of origins, may face an impossible task. The most basic problem for phenomenology is not the examination of these grounds of the sciences; it is the more fundamental problem of its own, primordial ground.

How do we access the primordial realm? And what is the ground of phenomenology, as the primordial science of origins? In the sciences, because of their

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494 Ibid. pp. 60-63. One of Heidegger’s arguments in this section is that the need for objective validity in the sciences causes the self to be withdrawn from the process of scientific thinking to greater or lesser degrees (i.e. de-vivification); science moves away from *my* experience of phenomena to an objective account where the personal *I* has no place. Ibid. p. 62
tendency to ever greater degrees of theoretization and their desire for objective validity
the tendency is always away from the primordial:

Factual life-worlds and their abundance have an influence on the scientific
context of expression, yet what they lose is precisely their specific-vitality, and
they step out of the possibilities of becoming accessible to the environing world
and to the self-world. Through science, life-worlds are taken into a
tendency of de-vivification, and thereby factual life is robed of the actual living
personality of its factically vital actualisation.

We now have an understanding of the problem of scientific access to the original region
of life and, in general, the sense of science as a context of expression, and the aspect of
factual life. ⁴⁹⁵

The problem for phenomenology becomes acute here:

Phenomenology is to be the original science of life in itself, thus not of this or that
factual slice of a life-world, but rather of life in itself. How should the ground of
ting experience be prepared for that when it is always the case that only particular
slices of factual life can be experienced, only particular phases of it, and all of
those again only in particular factual aspects?

How do we attain the ground of experience for original science out of it? ⁴⁹⁶

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⁴⁹⁵ Ibid. p. 62.
⁴⁹⁶ Ibid. pp. 63-64. “The ground of experience is always such ‘for’ a science. The mode
of its preparation determines itself out of this idea and this, for its part, should still be
motivated from out of the basic-sense of the region to be treated. Once again, go back to
the problem of givenness – the possibility of preparing the ground of experience only in
the tendency of a science, its idea, which once again must be drawn from what is
unscientifically experienced.” Ibid. p. 64.
Heidegger’s answers will focus on the *how* of experience, rather than the *what*. And they will revolve around a process of intensifying the relation to the self-world, in processes Heidegger will call taking-notice and making-prominent. He will ground phenomenology in the primordial region, accessed through the experience of the self, the key issue being *how* I experience myself. And all of this will bring up the problem of meaning in a new and significant way.

The “basic problem” is “the accessibility of the original region from out of factical life.” The “guiding tendency” that leads to Heidegger’s solution to this problem is “the understanding of life out of its origin.” Heidegger wants to examine the *ground,* “life as arising, as emerging out of an origin.” But “the ground of experience and the object-region also cannot be attained *out* of factical life *and* it cannot be taken *in* its characterisation.” “Life should be understood in the way of original science as arising from the origin.” And yet, we must start from within factical life, because we are

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497 “The idea of phenomenology is: the original science of life. Factual life itself and the infinite fullness of the worlds that are lived in it are not supposed to be researched. What is to be researched, rather, is life *as arising,* as emerging out of an origin. Thus what is central is the tendency to understand life *out of* its origin, and this tendency is decisive for the mode of preparation of the ground of experience and the formation of the evident object-region and subject-area. It is thus *not* the goal of original science simply to apprehend factical life and its worlds and its world-content according to its what-determinations and contexts. Standing in the direction of factical life, going along with its flow by moving into its worlds in a scientific and cognitive way, original science does not come into conflict with the individual sciences. It does not get involved in their business.” Ibid. p. 65.

498 Ibid.
always in factical life.\textsuperscript{499} The way into the original region from out of factical life is to focus on “the specific how-content of factical life.”\textsuperscript{500}

Life always manifests itself in a particular how. We always experience life (whatever phenomena we may focus on at a given moment) in a certain way. We can be annoyed or captivated by what we experience – even indifference is a particular way of relating to phenomena. In the terms from our introduction, this pertains to the nature or manner rather than to the contents of relations. Heidegger points to particularly “intensifying relations” to the how and what of life experience (those of “artists, saints, but also in the conduct of each individual in the experiencable life-world, in history, in literary artistic portrayal,” etc.\textsuperscript{501}). This intensification of our relation to life comes out of a certain taking-notice of life and our own participation in it. That which we take notice of in this way becomes prominent for us, it stands out in the manner of significance. This kind of heightening highlighting is the entry way into the original region according to Heidegger – or, better, it is the mode of ingress… what then is the specific point of ingress; where is the door?

\textsuperscript{499} “Thus, in order to be able to see life at all ‘as’ arising out of the origin and in order both to attain and in a systematic way to prepare for this scientific tendency and the object-field that is to be elaborated in it, the origin itself must be available. It must in some such way be accessible – accessible and, to be sure, from out of factical life, which we ourselves are and live. So, even if the ground of experience itself is not giving itself over, factical life still plays a role in the construction of original science. The problem is: accessibility of the original region from out of factical life.” Ibid. p. 66.

\textsuperscript{500} Ibid. P. 66.

\textsuperscript{501} Ibid. p. 68.
Upon what do we need to focus our taking-notice that makes prominent? For Heidegger it is the self experiencing its world, or the self experiencing itself.\textsuperscript{502} Pre-theoretical experiences of the self-world are what we need to seek:

A ground of experience is attainable from out of the experiences of the self, so that the subject-area formed from it encompasses determinations and characters of the self-world – [but] is this accessible for scientific cognition? The question concerns the motivation for the idea of the absolute, original \textit{science} of life – to be sure out of factual life.\textsuperscript{503}

Heidegger will argue that this particular way of experiencing the self gives us access to the original realm that, as demarcated as a subject-area becomes the ground for phenomenology.

In order to proceed though, Heidegger feels it necessary to clarify this particular mode of taking notice that makes prominent, particularly in relation to our experience of our self. And this brings us, once again, to the problem of meaning:

…we want to understand the meaning of self-world-experiencing, of \textit{prominent} experiencing in general – a question of \textit{meaning}. There is thus also the question of how it comes to prominence, which is a sense-genetical question. Which possibilities of the meaning of prominences and of particular modes of experience lie in the meaning of the factically still improminent life-experience, \textit{which is}

\textsuperscript{502} It is hard not to notice the Kierkegaardian influence here.
\textsuperscript{503} Ibid. pp. 68-69.
available to us immediately, which we ourselves are and which we ourselves live factically.  

This “sense-genetical” question, this question of the origin and ground of meaning, brings us again to the core of our concerns here.

Heidegger defines meaningfulness as “the reality character of factical life.”

Everything that we experience, we experience as and through meanings: “…even the most trivial is meaningful, even the plainly trivial. Even that which is most worthless is meaningful.” Heidegger continues:

‘My cup, out of which I drink’ – its reality fulfils itself in meaningfulness, the cup is meaningfulness itself. I live factically always caught in meaningfulness, and every meaningfulness has its encirclement of new meaningfulnesses: horizons of occupation, sharing, application, and fate. I life in the factical as in a wholly particular context of meaningfulness, which are continually permeating one another, i.e. every meaningfulness is meaningfulness for and in a context of tendency and a context of expectation, which constructs itself ever anew in factical life [proper form: situation – opened]. In this improminent character of meaningfulness, what is experienced factically stands in factical life-contexts.

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504 Ibid. p. 81.
505 Ibid. p. 83.
506 Ibid. p. 83.
Meaningfulness is the way in which the world is there for us. No world for us without meaning; no meaning for us without world.\textsuperscript{507}

The “experience of existence” Heidegger tells us “terminates in and is satisfied in the characteristic of meaningfulness.”\textsuperscript{508} And we experience, through meaning, in different temporal modes: we look ahead to the future in expectation, we look back at the past in memory, and we look to the current situation in the present:

The meaning of ‘existence’ lies in factical life in the currently experienced, remembered, or expected meaningfulnesses, so that memory-wise, experience-wise, or expectation-wise, experiencing, determined in such and such a way, actualizes itself in a full, concrete unity (opened situation).\textsuperscript{509}

All experiencing stands in this characterization and requires therefore only this way of experiencing. Even the ‘something’ that I experience as such, that I experience as undetermined, without determination, \textit{I experience in the indeterminacy of a particular context of meaningfulness} – an ‘obscure’ noise in the room (‘something is not right,’ ‘something is giving me the creeps’).\textsuperscript{510}

\textsuperscript{507} “That means that for this experiencing there are no bounds, no barriers. Questions such as: whether the world exists in itself independently of my thoughts, are senseless. There are no thoughts which merely exist somewhere and of which an existing world is supposed to be independent…” Ibid. p. 84.

\textsuperscript{508} Ibid.

\textsuperscript{509} Ibid. Heidegger is stressing here that there is a certain degree of wholeness to existence when we notice these temporal modes; we notice, not just the particular moment, but life stretching along backwards and forwards.

\textsuperscript{510} Ibid. p. 85. Heidegger stresses the uncanniness of the pre-theoretical something – the undetermined is uncanny; it is disturbing.
Even that which is experienced indeterminately is experienced through its indeterminate meaningfulness – in the very indeterminacy of its meaning. "Existence without meaningfulness does not at all have the possibility of motivation." But, on the other hand, “existence, as that which is ‘fully determined,’ in which ‘nothing is undetermined’ …can never occur in factical life.” Heidegger is positing the world, as we experience it, as fundamentally indeterminate. We experience the world through determinations, in ever shifting configurations and contexts of meaning, and this shifting, moving world of meaning is never completely determined, or indeed, completely determinable.

“Taking-notice,” which we have already encountered, is a “basic phenomenon,” it is a basic way in which we experience phenomena in the world. Taking-notice is the way we highlight phenomena, the way we focus on certain clusters of meaning. And this broad, general, even vague movement of “taking-notice” is, according to Heidegger, a non-theoretical comportment. Indeed, the phenomenon he describes says nothing yet about kinds of content. Rather, it is a how of our going about in the world:

I can in factical experience, in the context of expectation, living unreflectively, still mindfully experience and thereby be thoughtful of the full web of motivation. I can recall what I have experienced by way of memory, and indeed in reminiscing, I thoroughly savour it again factically. What I experience can weigh

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511 “On the other hand, the something as undetermined is conceivably fulfilled in a context of meaning, laden with life, so that it can assume a threatening, frightening character. – Factual life-experience thus becomes engrossed in contexts of meaningfulness.” Ibid. p. 163 (Addendum 8).
512 Ibid.
513 Ibid.
514 Again we look forward to issues in the interpretation of quantum mechanics here.
515 Ibid. p. 87.
on me, occupy me, or I can, in taking interest in that experience, take notice of it, especially bear it in mind. I can ‘relate’ what I experience and indeed in its factically vital movements or ‘pulls.’ People engage in discussion about common, shared life-experience and mutually relate everything to one another again. Factically experienced contexts of meaningfulness will indeed be explicated, but still left in their vital facticity. The explication takes-notice, narrates, but in the basic style of factical experiencing, of fully going-along with life.\(^{516}\)

This is the non-theoretical mode of access we need in order to catch a glimpse of the primordial realm. But we need to take notice of the right phenomenon.

What we take notice of is the experience of the self experiencing life, thus getting at the whole picture, in a non-theoretical, non-content-related manner. We look to the how of life experiencing itself, rather than the what of what is experienced. But we do not look to the self as an “I,” to be sure; this would be an objectification of the self. Rather, we take notice of the self as a particular “rhythm” of life, as a certain, ever-shifting “form of expression.”\(^{517}\) The self is found in a certain basic understanding of myself that I always have, and it is always found in particular situations:

Now, what is the ‘self?’ Indeed, do we not come to an object here, the self and its sense? But when we presently consider the whole phenomenological process of understanding, we can only say that the self has a certain form of expression. One should not be disappointed at not finding an ‘I’ in the brightness of consciousness, but rather only finding the rhythm of experiencing itself. – The self is present to

\(^{516}\) Ibid. p. 88.
\(^{517}\) Ibid. p. 195.
us in the expression of the *situation*. I am concrete to myself in a particular life-experience. I am in a *situation*.\(^{518}\)

The self is always expressed in some form, and always in some situation. And the basic, primordial situation of the self is in the world, *in* concrete factual situations, in history, living life, interpreting, understanding, dealing with things, feeling things, *relating*.

“The self is always expressed in some form, and always in some situation. And the basic, primordial situation of the self is in the world, in concrete factual situations, in history, living life, interpreting, understanding, dealing with things, feeling things, relating. “Situation is just the peculiar character in which I have me myself, not the content of what is experienced.”\(^{519}\) “I myself” am a context of meaningfulness in which I live.”\(^{520}\)

The “origin” in this sense then *is* in fact “life-in-and-for-itself.”\(^{521}\)

This may sound like a cheap answer after all of this methodological plodding, but we must remember that for Heidegger the most important thing is *how* we take cognisance of this. Phenomenology is a *method of basic research* through which we attempt to understand. Heidegger’s answer, that the origin is life-in-and-for-itself should not actually be surprising at this point:

The *origin* is expressed through this ultimate context of expression itself.

Phenomenological understanding is nothing other than an intuited going along with, running along with the sense.\(^{522}\)

What is important according to Heidegger, is a constant return, through methodologically rigorous research, to this origin, an ever-grasping-anew of the primordial and then starting over again in order to gain ever-deeper levels of insight. It is in this sense that:

\(^{518}\) Ibid. p. 195.

\(^{519}\) “The circle of the intelligible […] the having-oneself, that is a process of winning and losing familiarity with life.” Ibid. p 196.

\(^{520}\) Ibid. p. 187.

\(^{521}\) Ibid. p. 197.

\(^{522}\) Ibid.
One cannot ‘objectively’ investigate what is ‘right’ or ‘wrong’ in the statements of a philosopher. It depends on how far or near his forms of expression are to the origin. – The concepts of philosophy have a different structure than the object-concepts of order. All concepts have the formal function of determining. But determining through expression is not determining through schemata of order.

The dialectic in philosophy, as a form of expression, is not dialectic in the sense of the synthetic confrontation of concepts. Rather, philosophical dialectic is ‘diahermeneutics.’

This hermeneutical dialectics, or “diahermeneutics,” is a constant process of interpreting and deconstructing that favours rigour over completeness to an absolute and total degree.

The ground of meaning that Heidegger describes here is then precisely in the form illustrated in KNS 1919: it is a self-grounding, an ultimate ground that is itself a circular grounding. The essence of our life is relating; that is the most basic experience that we enact. And the ground of that relating is to be found nowhere else than in that very relating that is life in and for itself. In our terms, the ground for determining, out of the phenomenal manifold, the ground of all our concrete determinations, is to be found in the sheer thatness [quod esse] of our standing-before the phenomenal manifold itself. This is a fundamental insight for the young Heidegger and it represents a massive leap away from his previous position, the worldview of his youth and the “faith of his birth.”

The religious shift here is even more palpable than in the preceding courses. Not only does this position give up on the solid ground of God as axiom and first principle

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523 Ibid. p. 198.
upon which a philosophy can be built, it gives up on any such certainty, other than the certainty to be found in the sheer *thatness* of lived life. Throughout the course, Heidegger seems at pains to make clear to his students that religious answers are not only not an option for primordial science, but that they are as contingent as any other type of specific-content-based answer:

> With this survey of factical life, we must proceed without presuppositions as much as possible, i.e. we may not approach it with particular theories about it. We must avoid every judgemental statement about it. Personally, I may perhaps have a very particular worldview, wherein the various life-worlds are brought into a hierarchy according to particular evaluative standpoints, so that I understand life as ultimately interpreted from the point of view of the aesthetic or the ethical or religious\(^{524}\) or that I consider all natural science as an illusion. Another person has a different worldview and convictions about the meaning of the world and life, attained on the basis of wholly personal experiences and fortunes. No principle that explicatively expresses such convictions is now possible, not even as a foundation upon which we establish subsequent insights with respect to their validity.\(^{525}\)

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\(^{524}\) Kierkegaard’s influence is undeniable here. To his three levels of existence (the aesthetic, the ethical, and the religious) Heidegger here adds the natural scientific.

\(^{525}\) Heidegger, *Basic Problems* p. 66, see also pp. 29-30, 35, 66-7, 121, 129, 133, 134, 153, etc. And yet, Heidegger also argues that Christianity (particularly the *primal* Christianity of the earliest days) created a positive shift in focus toward the kind of noticing of the self-world that he describes; unfortunately, he argues, this was lost when Christians incorporated Greek philosophy into their outlook and theorized their religion, this is an line of inquiry he will pursue further in his religion courses that follow. Ibid. pp. 47-9, 155-6.
Soon Heidegger will go further than saying that specific worldviews (the religious being just one of them) are inappropriate for primordial science. He will argue that philosophy must be atheistic. Again we must note that this does not give us an answer to his own personal religious beliefs, rather it shows that Heidegger the philosopher has ruled religious answers out as grounds for philosophy. Philosophy may study religion, as

526 Religions are certainly grounds for their own sciences, as are all delimited object realms, but they cannot be the ultimate ground for philosophy: “…Without upholding any scientific aspirations, without retaining any kind of theory or explanation or hypothesis in the background of our thinking, we must listen in on these trivialities, we must savour them thoroughly, intensively, until these most trivial trivialities become absolutely problematic. …questionabilites everywhere… They lie in life itself and are overcome by it in its own way. – Problematic, questionable for what and to what extent? In the sense of its being a question of phenomenological origin, what does problematic mean? Problematic in the sense of a genuine, radical problem for the original science of life. Then we see: even religious beliefs, ideological convictions, convictions about interpreting world and life, which reach for life and its fullness, only offer comprehensive views of life that are particular and confusing. By believing in a personal God; by having pantheistic, biologist, ideological convictions; by having an aesthetic worldview, I see life in its fullness, I see life in a particular rhythm and colouring. I live in it accordingly, as a religious person, an artistic person, as a person with this or that worldview that is appropriate to me – even here, life in a world. Also then, when I am examining origins for this life, precisely then, yes, the entire irrelevance and impossibility of an original science becomes clear to me.

In religious faith I have the religious evidence of the dependence of God, from which all life proceeds, and to which it returns. Or in a worldview I am convinced of the particular quality of the ground of the world and of life. Perhaps all of that does not admit of strict scientific proof, but roughly it does. And perhaps scientific insight is not at all the highest insight, and when I am striving for scientific knowledge, then I am striving nonetheless for genuine, critical knowledge, which always maintains its own boundaries and remains genuine; and there is absolutely no reasonable imperative for science or a primal science to have the last word.” Heidegger, Basic Problems, pp. 29-30.

“Thus every questionability (not just theoretical-scientific) receives its answer in the structural form of life in itself. …Because in religion and in worldview, the ultimate questionabilities are alive and, in some way, are answered. Better worldviews, a more vital religion fundamentally change nothing. They place life as a whole in question and give it an ultimate meaning – and precisely because the ultimate questioning is simply given in a religious answer, in an ideological interpretation, but not in a strictly scientific way.” Ibid. p. 35.
Heidegger shows in his courses that follow, but religion may not stand as the ground for philosophy.

Heidegger’s specific answer to the question of what implications this primordial science has for religious thought is simply that religious thought is its own realm with its own questions and answers, its own concrete logic etc., that apply in that realm, just like art or physics. Within these realms, “there is absolutely no reasonable imperative for science or a primal science to have the last word.” Along with this question of religious implications, Heidegger is also aware that broader questions of necessity and contingency arise, and that his students will make the connecting steps to questions about scepticism and relativism. Indeed, if the ultimate ground of meaning lies merely in the relating of lived life itself, then it follows that we can not speak of necessary meanings – that all meanings are ultimately contingent (based as they are on intuitive relating of ourselves to phenomena in an historical world with others), and thus relativism rules the world.

Heidegger’s answer to this problem, as we might expect, is that this very way of conceiving the problem is, in fact, a theoretical imposition. Questions of relativism and scepticism are theoretical problems and thus not appropriate to the pre-theoretical realm. In the chapters that follow, I will continue to explore Heidegger’s developing concepts of meaning and ultimate ground. And I will argue that this answer to the question of relativism proved (and still proves) so unsatisfying that Heidegger made another (unsuccessful) attempt to answer it in Being and Time. For now we will let the

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527 Ibid. p. 30.
spectre of relativism loom darkly in the background as we wrap up this first period of Heidegger’s development toward *Being and Time*.

**Meaning, Indeterminacy, & Ground, The Absolute & The Relative**

(*Phenomenology of Intuition and Expression*)

In his SS1920 course “Phenomenology of Intuition and Expression: Theory of Philosophical Concept Formation,” Heidegger not only explores – as the title indicates – the twin problems of access and expression that arose in KNS 1919, but also the idea of philosophical concepts. He is not interested in taking concepts as they are, but in tracing them back to their roots. And, once again, the issue of method comes to the fore. Here Heidegger further explains and effectively employs his “phenomenological-critical” method of “destruction,” a clarifying tracing-back of concepts to their roots, contexts, and motivations. Phenomenological destruction is employed against concepts that have become ossified, detached from their vital motivating roots, whose real contexts and meanings have faded and been forgotten. “It comes into play with the experience of life which has become diluted, and seeks to place meanings back into their proper contexts.”

As Heidegger puts it:

> From the outside, its activity at first looks like a critical poking-around at individual concepts and meanings. One points out ambiguities, contradictions, obscurities, confusions, deficiency in tidiness and astuteness of the conceptual work. Wherever such work is performed in isolation, and this happens not infrequently, it easily gives the impression that phenomenology is word

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explanation, detection and elimination of equivocations, determination and marking-off of fixed meanings. This conception of phenomenology as a not entirely unproductive cleaning-up in the field of ambiguity and laxity in philosophical and pre-philosophical concepts is fostered by the fact that phenomenology is posited and claimed as the fundamental science of philosophy. In this sense, namely as clarification of the fundamental concepts of logic it also had its first impact.  

But the destruction is more than this “negative” function of correcting errors. For, in the process of tidying up, clarifying, and tracing back to origins – if it is successful – we also gain positive indications of original contexts, motivations, and tendencies. These indications provide new areas and new impetus for interpretation. Thus destruction plays a vital positive role in the diahermeneutics Heidegger described as the essence of philosophical endeavour at the close of the previous semester.  

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531 “This questionable business of word explanation does not concern any arbitrary ones but those which express so-called fundamental concepts, e.g. ‘representation’; and the meanings are clarified because they are unclear, because different meanings run confusedly through one another, that is because the word itself is ‘ambiguous’. In the ‘ambiguity’, which is always at the same time also afflicted with an indistinctness of the meanings, a multiplicity of meaning-directions is indicated, different meaning-complexes within different logical structure complications are pointed out. The latter themselves carry within them an expressive sense-relation to object areas which, according to their what-character, are more or less genuinely experienced and comprehended. Already the pursuit of the ambiguity alone is therefore the understanding tracing into diverging directions of meaning. With their differentiation and division a possible characterization of them and of the ‘underlying’ thing or object domain is given. In the clarification of such words is thus implied, provided that it is genuinely enacted, the unitary over-viewing and co-viewing having-present of different situations from which the meaning-directions depart and in which they become genuinely pursuable. From this
In this course Heidegger carries out two destructions that together lead to a positive phenomenological insight. And the two concepts he singles out are related to the fundamental question of ground and its relation to scepticism and relativism. Heidegger begins with the idea of the *a priori* and the desire, particularly in transcendental philosophy “to go beyond the factic historical” – that is, the relative – “to the suprahistorical, absolute norms or ‘ideas’ of science, morality, art, and religion.” In this philosophy, “life is not considered as such, but instead in relation to ultimate values.”  

Heidegger had already criticized transcendental value philosophy for its inability to find the ultimate ground that it sought for its absolute values, now he will explore, through phenomenological destruction, one of its primary stumbling blocks: the problem of history. The historical – as the relative and contingent – and our suspension in it, poses a great problem for transcendental value philosophy: if all of our cognition occurs within the relative, how can we gain any access to the absolute? This is the problem of transcendence, the same problem that confronted Plato, Kant, the Romantics, Hegel, and the young Heidegger of his crisis years.

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still entirely initial understanding of the sense of the clarification we have to go back to the philosophically primordial basis of enactment from which such clarifying and determining must grow.”

“Phenomenological destruction – as a fundamental part of phenomenological philosophizing – is therefore not without direction; it does not fortuitously take up meanings of words in order to explain them by means of other taken up meanings. It is not mere shattering but a directed deconstruction [*Ab-bau*]. It leads into the situation of the pursuit of the pre-delineations, of the enactment of the preconception and thereby of the fundamental experience.” Heidegger, *Phenomenology of Intuition and Expression*, pp. 23-5.


533 Kant, of course saw the acuity of this problem.
Heidegger traces the idea of history through conceptions of history as the past, as a particular science (historiology), etc., to the core issue of our own personal historical situatedness – the relativity and contingency of our life. We are always within a history, always in a world of relations, pre-existing and ever shifting. For the *a priori* this means:

1) The concept of the *a priori* is subject to contrary tendencies, first by coming to a head in the human being and his cultural achievements, and then by reducing the human being to an instance of an abstract historical process. 2) More positively, it has yielded the clue that the origin is to be situated in the facticity of the concrete Dasein, in its self-world. It is an initial insight into a new sense of the old contrast between fact and sense.\(^{534}\)

History is not the past or something that just happens; it “does not sink down to mere occurring, but is an occurring in the character of meaningfulness.”\(^{535}\) History is not just brute facts in the sense of mere things, objects, rather, its “facts” are replete with meaning, bounded in contexts of meaning, indeed, *composed of meanings.*\(^{536}\) History is relation, and the history that we live is our own particular contingent situated existence.\(^{537}\)

The second concept toward which Heidegger directs his destruction comes from the polar opposite of the school of transcendental value philosophy, that of life philosophy, apparently the philosophy of the “irrational” and contingent.\(^{538}\) The problem of “life as irrational experience… must be subjected to an analogous destruction and

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\(^{535}\) Heidegger, *Phenomenology of Intuition and Expression*, p. 45.

\(^{536}\) Heidegger, *Phenomenology of Intuition and Expression*, p. 66.

\(^{537}\) Ibid. p. 46

\(^{538}\) Ibid. p. 70.
understood from the origin.” In the process of this destruction Heidegger focuses on the work of Natorp and Dilthey, tracing the problem of life as irrational experience back beyond their theoretical ossifications (Dilthey, Heidegger finds, is closer to the vital origin than Natorp). Ultimately he arrives at the same contingent situatedness of our own Dasein, which both Natorp and Dilthey try to get beyond in order to find security, in order to find a solid ground.

What is the overall positive indication that arises from both of these destructions? It is the issue of insecurity, of ultimate groundlessness. Both contrary directions (life philosophy and transcendental philosophy) seek a secure ground for philosophy (the former out of life, the latter out of a transcendent a priori), and yet both philosophical movements fail to achieve this. The positive discovery that this points to is the contingent, situated, ever moving and shifting factual life in which we exist, as involved, that defies attempts to still it in any secure absolute. Our constant attempts to find philosophical security point, through tracing their motivation, to the fact that our existence is fundamentally insecure. And this very insecurity is, Heidegger argues, the driving motive for philosophy. This is why:

Every attempt at a radical ‘laying of the ground’ of philosophy – and in earnest, philosophy always remains within the giving of the ground, the calling attention

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539 Kisiel, Genesis. p. 130
540 Heidegger, Phenomenology of Intuition and Expression, p. 130.
541 The self in the actual enactment of life experience, the self in the experiencing of itself is the primal reality. Experience is not taking note but the vital being involved, the being worried so that the self is co-determined by this worry… All reality receives its primordial sense through the worry of the self. Heidegger, Phenomenology of Intuition and Expression, pp. 132-3.
to the ground – mostly presses in some form towards securing philosophy as absolute knowledge…\textsuperscript{542}

It is directed by the fundamental insecurity of our existence. Phenomenology, as truly vital philosophy, Heidegger argues, must \textit{heighten} this insecurity, must make us take notice of it, must probe it and encounter it ever anew, rather than trying to cover it over and secure it.\textsuperscript{543} Indeed, the thing that philosophy needs to “secure” is the access to this insecurity.\textsuperscript{544} “Destruction: to intensify the concern [\textit{Sorge}] and to concentrate it on existence…”

Heidegger points to the motivation behind the philosophy of his day’s desire for security. Both life philosophy and transcendental philosophy make attempts to secure an ultimate ground, but in doing so they move out of the proper sphere of philosophy:

Provided that the philosopher wants to stabilize the whole of life he moves onto the same level as the religious prophet and the poet. They all stand in a region detached from life from which they seek to be \textit{normative} for life.\textsuperscript{545}

And for Heidegger to do this is to mistake the very nature of philosophy. Philosophy must be within life, within the distress and worry.

\begin{footnotes}
\item[542] Ibid. p. 6.
\item[543] Ibid. p. 131.
\item[544] “The questions of intuition and expression are to be understood in this original context of insecurity. Intuition queries the how of philosophical experience, and expression the manner of explicating whatever is given in the how. The problem of philosophical concept formation is thus not a secondary supplemental problem. It is the problem of arriving at the philosophical experience. It is the task of the ways and means of approaching the origin, of securing it so as to bring the motive and tendency of the philosophical experience to expression in genuine philosophical concepts.” Kisiel, \textit{Genesis}. p. 136.
\item[545] Heidegger, \textit{Phenomenology of Intuition and Expression}, p. 119.
\end{footnotes}
Of the two contemporary options he examines, Heidegger finds that the life philosophy of Dilthey comes closest to the origin, closest to what he sees as genuine philosophy, and thus points the way towards phenomenology without actually getting there:

Life philosophy is for us a station on the way to philosophy, in contrast to empty formal transcendental philosophy. One subsumes Dilthey under the concept of historicism and fears in him the spectre of relativism; but we must lose the fear of this spectre.\footnote{546}

To speak of relativism and scepticism may be to impose theoretical outlooks and normative rules onto the primordial realm, where they do not apply. But Heidegger still retains a healthy sense that these questions lurk in the darkness. Does he mean here that we must lose fear of the spectre of relativism in the sense that it is a question that does not apply? Or does he mean that we must lose our fear of it and delve into relativism? I would suggest both.

We arrive then, at the end of this period with a new understanding of philosophy and its task. We have moved a great distance from the Habilitationsschrift, but many of the core issues are the same, though encountered in radically new ways. As Heidegger puts it:

Philosophy has the task of preserving the facticity of life and strengthening the facticity of Dasein. Philosophy as factual life experience requires a motive in which the worry about factual life experience remains. We call this philosophical

\footnote{546} Ibid.
fundamental experience. ...The rigour of philosophy is more primordial than every scientific rigour. It is an explication which goes beyond every scientific rigour to raise the being worried in its constant renewal into the facticity of Dasein and to make actual Dasein ultimately insecure.  

In the courses that follow, Heidegger’s religion courses, the courses that encounter the ancient Greek tradition through confrontations with Aristotle and Plato, and finally in the existential analytic of Being and Time, Heidegger will attempt to do this. Ideas will change along the way as he constantly re-thinks his own ideas and re-encounters his basic topic in new interpretations. Our main interests here, the question of meaning, the question of ground, issues of necessity and contingency, will remain central in his work. The problem of security will arise again and again. And the spectre of relativism will continue to haunt us.

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547 Ibid. p. 133.
Chapter 3 – Heidegger’s Concept of Meaning:

From The Phenomenology of Religious Life to the Crux in the Confrontation with Aristotel

Heidegger next turned his attention to an examination of the phenomenology of religious life. Husserl, who wanted his students and assistants to put his own methodological work into practice and put all of the phenomena of consciousness to the question, wanted Heidegger to become his phenomenologist of religion. Though he was uncomfortable with the pigeon-holing, Heidegger was indeed still very interested in religion. He had planned to give a course on medieval mysticism in WS 1919-20 but cancelled it because he felt he was not adequately prepared. His two early religion courses, “Introduction to the Phenomenology of Religious Life” in WS 1920-1, and “Augustine and Neo-Platonism” SS 1921 show not only a Heidegger with a vastly different religious outlook from the one we encountered in his Habilitationsschrift; they

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548 “For certainty is found when doubt and deception are excluded.” (Translation mine.) Kisieli, The Genesis of Heidegger’s Being and Time, p. 75.
549 In a 1920 letter to his student Karl Löwith, Heidegger wrote: “I myself am no longer even regarded as a ‘philosopher’ [by Husserl, ‘der Alte’], I am ‘still really a theologian’” (October 20). Kisieli, The Genesis of Heidegger’s Being and Time, p. 150.
551 He instead gave his course on “Basic Problems of Phenomenology” (WS 1919-20).
also show a continuing philosophical movement, both into his own new territory and away from Husserl’s idea of philosophy as a strict “science.”

Heidegger opens his WS 1920-1 course on the “Introduction to the Phenomenology of Religion” with the now familiar themes of philosophical concept formation, philosophical basic questioning – focusing on the how of experience rather than the content – and factical life. He expressly differentiates between philosophy and science, stating starkly: “We defend the thesis that science is different in principle from philosophy.”\(^{552}\) Science works toward concrete goals within a material context, further and further differentiating and explaining its subject area, making things more and more certain. Philosophy, on the other hand, constantly begins anew, constantly questions its own foundations, constantly puts its very essence into question, is, indeed, constantly uncertain:

In the specific scientific disciplines, concepts are determined through their integration into a material complex; and the more familiar this context is, the more exactly its concepts can be fixed. Philosophical concepts, on the contrary, are vacillating, vague, manifold, and fluctuating, as is shown in the alteration of philosophical standpoints. This uncertainty of philosophical concepts is not, however, exclusively founded upon this alteration of standpoints. It belongs,

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rather, to the sense of philosophical concepts themselves that they always remain uncertain.553

Though this is a course specifically on the phenomenology of religion, Heidegger proceeds in his now familiar methodological fashion through most of the first part of the course, continuing his fundamental examination of the essence of philosophy. He unpacks each of the terms in the course title, telling his students that, in fact, the most important term is actually “introduction.” Philosophical introduction, a process that, in Heidegger’s conception, constantly begins anew, making problematic and uncertain the seemingly stable, is a process of making philosophy itself questionable and holding it in that questionability. Drawing towards the Christmas break however, the non philosophy students in the class actually complained to the dean about the lack of religious material in this course on the philosophy of religion and Heidegger was forced to stop his methodological considerations and plunge (in a rather rushed matter) into the analysis of particular biblical texts.554

This interruption is particularly unfortunate because Heidegger was in the middle of the most sustained explanation of the formal indication that he would ever provide. Kisiel speculates that Heidegger had planned to break the course in half, devoting the

553 “The possibility of access to philosophical concepts is fundamentally different from the possibility of access to scientific concepts. Philosophy does not have at its disposal an objectively and thoroughly formed material context into which concepts can be integrated in order to receive their determination. There is thus a difference in principle between science and philosophy.” Heidegger, The Phenomenology of Religious Life, p. 3.
554 The course is literally interrupted mid-sentence: “We thereby take into account whether... Oscar Becker’s transcript, in its terse way the most dramatic, concludes with this unfinished sentence. In brackets he adds the following nonphilosophical commentary by way of concluding the First Part of the course: ‘Broken off on November 30, 1920, owing to the objections of nonmajors...’” Kisiel, Genesis. p. 171.
period before the Christmas break to methodological preparation and the second half, after the break, to exploring particular religious texts. The interruption meant that Heidegger was unable to finish his methodological introduction, and that he was forced to insert some new material to placate the non-majors before the break.\textsuperscript{555}

From the point of view of our topic here Heidegger’s argument that “Historical thinking… disturbs our culture”\textsuperscript{556} is something to bear in mind for later examination. History disturbs us; it points away from the timeless and universal, it points to contingency. Heidegger speaks here of “the struggle of life against the historical” and he points to our tendency to try to secure ourselves (our culture, values, ideas, meanings) against history. Heidegger argues that we attempt to secure ourselves against history by objectifying it. Instead of seeing the historical as an immensely important, determinative, and, indeed, dominating part of our lives, we objectify it by thinking of history as a mere sequence of things that have happened, available to us like things. And behind the disturbing problem of the historical lurks the spectre of relativism, as Heidegger points out:

\begin{quote}
The present-day confrontation with history testifies, in essence, to the struggle against scepticism and relativism. With this, history appears in a more popular sense, and the basic point of its argumentation is that every scepticism cancels itself out. But logical deduction is no match for historical forces, and the question
\end{quote}

\textsuperscript{555} This interpretation of the events explains why Heidegger’s textual analysis before the break is rather pedestrian, uninspired, and seemingly without much direction, whereas the textual analysis after the break is deeply insightful and has a keen sense of direction and purpose. See Kisiel, \textit{Genesis}, pp. 149-191 for a thorough analysis.

\textsuperscript{556} Heidegger, \textit{Introduction to the Phenomenology of Religion}, p. 23.
of scepticism is in this way not to be done away with – for this argumentation was already used by the ancient Greeks.\

Regardless of our attempts to avoid the disturbing problem of the historical by objectifying history, it waits for us, constantly.

In his analysis of Paul’s letters after the break, Heidegger will go on to argue that the early Christians (before what Heidegger sees as the contamination of their unique view by Greek philosophy) developed a particular religiosity that was rooted in the historical in a more direct and fundamental way. In their sense of living on the very cusp of the immanent yet indeterminate Parousia the early Christians lived in a mode of temporality that kept the disturbing nature of the historical alive. They lived in a state of heightened uncertainty that reflected their particular religious outlook, which, at the same time, reflected Heidegger’s own conception of the necessarily heightened uncertainty of the philosopher.

The intense uncertainty of the early Christians’ outlook was also, according to Heidegger, no mere theoretical fact. It was tied to their deepest ideas about the universe and their own fate. History is disturbing not in regard to theoretical speculation, but in regard to our own lives. Heidegger highlights this by pointing to a concept that will become central to his thought from this point on: concern or care. What is disturbed is our own concern over the security of our lives (whether in a physical, moral, spiritual, or

557 Heidegger, Introduction to the Phenomenology of Religion, p. 32.
even rational sense). “That which is disturbed [is] the reality of life, the human existence in its concern about its own security…”\textsuperscript{558}

In the next course, “Augustine and Neo-Platonism,” Heidegger will pursue this question much further. For the moment he asks: “What genuinely wants to secure itself against history?” And he answers: “the human historical reality, elevates itself as that which is supposed to have a meaning.”\textsuperscript{559} And more than that, “present Dasein demands not only a meaning at all, but a concrete meaning: namely, a meaning other than past cultures had, a new meaning that exceeds the one of earlier life.”\textsuperscript{560} But the very problem of new meanings, meanings for us, points again to contingency and beyond that to the desire for necessity.

In the following course on “Augustine and Neo-Platonism” (SS 1921), Heidegger again performs a phenomenological analysis of particular religious texts (predominately Book X of Augustine’s \textit{Confessions}). Similar themes continue from the previous course, hence Heidegger’s comments on history:

History hits us, and we are history itself; and precisely in our not seeing this today, when we think we have it and control it in a heretofore unattained objective study of history, precisely in thinking this and continuing to think and construct on this opinion culture and philosophies and systems, history gives us, every hour, the heaviest blow.\textsuperscript{561}

\begin{footnotes}
\footnote{\textsuperscript{558} Heidegger, \textit{Introduction to the Phenomenology of Religion}, p. 34.}
\footnote{\textsuperscript{559} Ibid. p, 36.}
\footnote{\textsuperscript{560} Ibid, p. 35.}
\footnote{\textsuperscript{561} Heidegger, \textit{Introduction to the Phenomenology of Religion}, p. 124.}
\end{footnotes}
In addition to this continued stress on the historical, Heidegger further explores the concept of concern or care, this time, specifically in terms of Augustine’s discussion of *curare*. Augustine’s “*Oneri mihi sum*” becomes, in Heidegger’s hands, a religious manifestation of a fundamental phenomenon of life. And in particular, Augustine’s “*Molestia*: a burden of life, something which pulls life down” is, in Heidegger’s hands, “a certain *How* of the being of life” that is “the endangerment of having-of-oneself.” It is a way of living out life in full view of our contingency and vulnerability in our concern over ourselves.

The religion courses stand as an important breakthrough moment between the Heidegger of 1919 and the Heidegger of *Being and Time* in 1927. With the analysis of Augustine’s *cura*, Heidegger is on his way to the all important account of *care* in *Being and Time*, and he is only moments away from his declaration of the inherent atheism of philosophy, though he is deeply involved in a phenomenological examination of religious ideas that he takes absolutely seriously. Kisiel perhaps sums up the liminal nature of these courses best:

Heidegger will never again publicly venture so deeply into things religious as he did in these two courses, at first reluctantly and then with gusto, accompanied by pedagogical fireworks. In Marburg, of course, he held joint seminars with Blutmann on Paul and Luther, but by then, he had also developed the measure of reserve toward religion which he had acquired from Nietzsche’s friend, Franz Overbeck. This reverse first manifested itself in his pronouncement in October

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1922 of the inherent scepticism and ‘atheism’ of philosophy. But this was already latent in the deep philosophical need to make questioning into a virtue that Heidegger began with in WS 1920-21, then explored in its biblical roots in the sense of life as trouble and trial, affliction, care, and restless quest: ‘I have become a question to myself.’ [Augustine’s ‘Questio mihi factus sum’] The insistence that ‘life in itself’ be regarded in its full disquiet and distress rather than treated as an object is reflected in the difference in emphasis in the historical sense of religion which thereby emerges.\(^{563}\)

And yet, for all the importance of this religious issue in Heidegger’s thought and development, Kisiel notes that “the real contribution of this academic year to Heidegger’s development is not this religious content, but rather the abstrusely formal elaboration of his hermeneutic phenomenology which inaugurates the year.”\(^{564}\) The methodological, once again, is both front and centre.

**Hermeneutic Phenomenology, Ontology, and the Greeks (1921-6)**

After his two courses on religious themes Heidegger turned in a new direction. In the religion courses he had pointed to a kind of primal religiosity that the earliest Christians had before their outlook became – as he saw it – contaminated by Greek

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\(^{563}\) Kisiel, *Genesis*, p. 218 (additional note on Augustine mine).

\(^{564}\) Ibid. “It is a new kind of formality seeking to go beyond the static subject-object schematism governing the traditional *mathesis universalis*. It is a formality seeking to accommodate itself to the intentional dynamics of the phenomena that phenomenology wishes to articulate, which Heidegger here ideally identifies as the *logos* given by the phenomena themselves and not by any sort of ideal-theoretical attitude. Formality always emphasizes the relational aspect of phenomena. And phenomenological formality carries the warning, against the ever-present tendency of lapsing to the level of objects which is built into experience, that all relations, and especially the subject-object relation, be held in suspense.” Ibid. pp. 218-19.
philosophy. In the years that followed, Heidegger moved on to a deep engagement with Greek philosophy itself, which would push him in new directions. In this final period before *Being and Time*, the themes that we have been tracing came together in significant ways. Heidegger himself became more explicit about the issues we are interested in and eventually this blossomed into the existential analytic of *Being and Time* with its refined and penetrating account of meaning. In this period Heidegger provided impressive new foundations, historical explanations, and phenomenological investigations of our themes. We could fruitfully look at the various courses in this period as pre-drafts of *Being and Time*, as Kisiel does, but our concerns here are different; as such, I will avoid the temptation to look forward (as much as possible) and continue to follow the themes of meaning, ground, and necessity and contingency through their historical development in Heidegger’s thought.

Kisiel quotes a letter that Heidegger wrote to Karl Löwith on April 2, 1921, just as he was beginning his first course on Aristotle, in which Heidegger says “that he is under way in a ‘self-destruction’ toward a ‘new explication of life.’” Turning his own method of phenomenological destruction upon himself at this moment allowed Heidegger to break free from further restraints from the tradition (Husserl included) and break new ground in his philosophical explorations. He was attempting to embrace his own philosophical uncertainty, to question the foundations of his own outlook, just as he had encouraged his students to do.

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565 Perhaps these issues were becoming more clear to Heidegger himself at this time?
In Heidegger’s WS 1921-2 course, “Phenomenological Interpretations to Aristotle: Introduction to Phenomenological Research” we can see this deconstruction at work. The text of the course that we have is messy; unfortunately it includes many later additions that Heidegger added to the text in the following years as he was planning on turning this text into a published book, an *Einleitung*, or introduction to a phenomenological interpretation of Aristotle. As Kisiel puts it:

This is a course caught up in the turmoil of transition, complicated even in its actual delivery by frequent interjections from a separate Appendix, as well as by … emendations pursuant to later drafts of the *Einleitung*. In fact, the period initiated by this course is characterized by a further degeneration of style, a loss of the simplicity of expression in which some of the discoveries of the prior two years had been cast, a kind of scholasticizing of older insights. Heidegger’s acute awareness of this problem of style will contribute to his hesitation to put his work into print.\(^{567}\)

And yet, this is a crucial text for our study, not only because it is here that Heidegger altered his “‘fundamental definition of philosophy’ in the direction of a phenomenological ontology,”\(^{568}\) but, because Heidegger further develops his thought on all of our central concerns: meaning, ground, necessity and contingency. And it is here too that we can note a marked change in his thoughts on the lurking spectre of relativism and scepticism.

\(^{567}\) Ibid. p. 235.
\(^{568}\) Ibid. p. 233.
Heidegger opened the course with an introduction that posed the question of the relation between history and philosophy, arguing that the historical can only be properly grasped in philosophizing (as an activity and basic stance toward the world, rather than “philosophy” as a body of knowledge). He followed this with a brief account of the history of the reception of Aristotle from the Middle Ages to his own present day. After this short history however, Aristotle seems to recede into the background – in fact, he seems nearly to disappear, resurfacing again only as the course draws to a close. Instead of speaking about Aristotle, Heidegger then posed the now familiar question, What is philosophy?

The first issue that Heidegger took on in the pursuit of the question of the meaning of philosophy was that of definition. Heidegger argues that there are three ways we can approach definition: We can overestimate it, seeking a universal and absolute definition, perfectly verifiable and absolutely valid, and then crash our ships against that rocky shore. We can underestimate it and get lost in concrete experience alone. Or, we can take the middle road, the difficult path that neither overestimates nor underestimates the importance of definition; echoes of Aristotle’s *Nicomachean Ethics* can be heard here. But we must be careful not to see this middle path as a sort of compromise between the other two; it is, rather, its own path that rejects the errors of both mistaken approaches. Heidegger associates this middle path of definition with his practice of formal indication,

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now further fleshed out as a definitory practice that embraces questionability and is,

Heidegger stresses “the original sense of definition,” which, he claims, quoting

Luther without mentioning the source, is a *decision* about something that must be held.\(^{571}\)

The more common sense of “definition” – saying what a word means or determining a

\(^{570}\)“Indeed, in a far cry from the academic tones which led to its demise in the classes of
WS 1920-1, formal indication, which seeks a middle ground between abstractly strict
universal definition (its overestimation) and concrete experience (underestimation of
definition), is now charged with the scepticism of radical questioning; it is thus situated in
a fundamental experience which ‘is not the saving coastline but the leap into the tossing
boat, where everything hangs upon getting hold of the sail line and looking to the wind…
Solid ground lies in questionability’.” Kisiel, *Genesis*, p. 233.

\(^{571}\)“*Definitio: decisio, determinatio alicuius dicitur, quod tenendum et credendum
declaratur, manifestatur et indicatur.*” Heidegger, *Phenomenological Interpretations of
Aristotle*, p. 15. The quote is from Luther’s *Vorlesung über den Römerbrief (1515/1516)*,
(1,8.4 11). Luther points back to the Greek word ορισυντος; he is criticising the
scholastics for translating it as “predestination” (*predestinatus*) and argues (from a
theological rather than an etymological standpoint) that it should instead be rendered as
definition or designation (*definitus*). The sense of definition that Heidegger invokes here
then is a theological rather than an etymological or secular-philosophical sense. There are
many different ways to read this statement (more on this later). For the moment it is
sufficient to note the connection with the previous religion courses, the continued
distance from his scholastic origins (there are, for instance, countless discussions of
definitio in Aquinas (recall the Thomistic philosophical standpoint Heidegger had
pledged himself to in his student years) from his commentaries on: *APo, Met, De Anima,
De Interpretatione, to his Exposition on the Trinity*, and the oddness of using Luther,
who was so sharply critical of Aristotle as a reference point on such an issue (I believe
Heidegger is making a strong point against scholastic interpretations here).

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vu.txt

Aquinas, St. Thomas. *Commentary on Aristotle’s Metaphysics*. Notre Dame: Dumb Ox

Aquinas, St. Thomas. *Commentary on Aristotle’s Posterior Analytics*. Notre Dame:

ETC.
thing – is, Heidegger says, derivative of this original sense of “decision.” If this sense of definition as decision, as a way of grasping an object, is determinate, then the task of offering a definition of philosophy – of answering the question: “What is philosophy?” – must not merely focus on the content, but on the mode of grasping as well. The question of the definition of philosophy is a question, not just about the “what” but also about the “how:”

…the ‘what’ of the object in the ‘how’ of its being possessed. This task, that of claiming the object in such and such a way and of bringing it into a possession determined by discourse, is the task of definition: pre-possession. The formal sense of definition is therefore: a determination of the object in its ‘what’ and its ‘how,’ in a way appropriate to the situation and to the preconception of it, in a way, furthermore, that grasps the object out of the basic experience that is to be acquired, and in a way that claims the object in speech.

Heidegger further argues that this formal sense of definition is, itself, derived from a philosophical sense of definition (“i.e. the idea of the definition of philosophical objects”).

The discussion becomes even more interesting when Heidegger begins to discuss issues of certainty and questionableness. The formal indication does not give certain, determinate content, rather, it “indicates,” in a direction, merely toward an indeterminate content, toward the question of determination. Philosophical definition, as formal

572 “The genuine bearing of definition! The full definition is not merely its content, the proposition!” Heidegger, Phenomenological Interpretations of Aristotle, p. 15.
573 Ibid. p. 16.
574 Ibid.
indication, does not point toward final, definitive content that stands for all time, for which one can amass evidence to support its validity. Rather, philosophical definition indicates, formally, the “how” of determination, in concert with a particular “what” that is situationally relative. Philosophy is “absolutely questionable,” to paraphrase Heidegger slightly here. And it is precisely the questionable that we must seize if we are to philosophize authentically:

The authentic foundation of philosophy is a radical, existentiell grasp of and maturation of questionableness; to pose in questionableness oneself and life and the decisive actualizations is the basic stance of all – including the most radical – clarification. Scepticism, so understood, is the beginning of philosophy, and as the genuine beginning it is also the end of philosophy. (This implies no romantically tragic self-conceit or self-indulgence!) Here Heidegger’s position, vis-à-vis scepticism and certainty has now changed so radically from his Catholic student years that it is easy to overlook the longer-term continuities. And yet the Heidegger of 1921-2 is essentially still following the same trail

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575 “It is further implied here that the evidence with regard to the appropriateness of the definition, i.e., its appropriateness to the object, is not authentic and original; rather, this appropriateness is absolutely questionable, and the definition must be understood precisely within this questionableness and lack of evidence. But that means that just as it is a misunderstanding of the definitory content to make it the theme and to demonstrate it in a comprehensive way, instead of following up its indication, so it is wrongheaded to take the questionableness of the approach as a basis for demonstrating the meaninglessness and arbitrariness of the definition.” Heidegger, Phenomenological Interpretations of Aristotle, p. 28.

576 “Fundament” in the original.

577 Heidegger, Phenomenological Interpretations of Aristotle, p. 28.
as the Heidegger of 1916; the difference lies in what he picked up along the way, and what he was forced to leave behind.

We can see this difference in sharp perspective if we look at two nautical metaphors that Heidegger employed in 1916 and in this course of 1921-2. In his 1916 conclusion to his Habilitationsschrift, Heidegger praised the outlook of the middle ages, “anchored in the transcendent, primal relation of the soul to God.” (383, alt 254) God was the ultimate ground of meaning, and the philosopher, potentially adrift on a sea of questions could anchor herself to this ground through the transcendental relationship betwixt God and man. In the 1921-2 course Heidegger again employs a nautical metaphor, but now the anchor is gone. For the philosopher: “The situation in question does not correspond to a safe harbour but to a leap into a drifting boat, and it all depends on getting the mainsheet in hand and looking to the wind.”578 The philosopher is adrift, but she can play her role in directing the boat; and yet, she must realise that the winds and the currents each have their say as well, and that no real motion will occur without them.

Real philosophizing for Heidegger, involves taking up the sail and working with the winds and currents. The only ground is to be found in the questioning itself:

If genuine science is always questionable and indeed problematic, should philosophy have it any easier? …To grasp philosophy authentically means to encounter absolute questionability and to possess this questionability in full awareness. The fixed ground (ground is something that always needs to mature, just as appropriation does) lies in grasping the questionability; i.e., it lies in the

578 Ibid. p. 29.
radical maturation of questioning. ‘Grasping’ is being concerned: to bring oneself radically and concretely to a decision within an explicit acceptance of the task of research.\footnote{Ibid.}

Again Heidegger returns to the “how” of philosophical questioning. Philosophizing is a way of radically approaching questioning. It involves real passion, and this, Heidegger feels, is thoroughly lacking in his own time: “The (actual) ‘passion’ as the unique way of philosophizing is no longer known. We believe we have accomplished something if we represent and interpret the world ‘deeply’ and stand in some sort of relation to this idol.”\footnote{Ibid.}

Philosophy is a way of approaching thought, it is a cognitive comportment toward beings in their being. “There remains only the one way: to examine relentlessly and with a level gaze; to ‘examine’: problem of interpretation – to be in philosophy!” Heidegger stresses that this radical and relentless examination, this radical questioning that is philosophy – or better, “philosophizing” – cannot be taken up as a content, but is instead a stance: “The question cannot be pursued in a doctrinaire way and with methodological purity, which is but a dream and does not perceive the ground (facticity)…”\footnote{Heidegger, \textit{Phenomenological Interpretations of Aristotle}, p. 31.} Facticity then is the ground out of which genuine questioning arises, the actual reality of lived life.

\footnote{\textsuperscript{579} Ibid.} \footnote{\textsuperscript{580} Ibid. And for Heidegger, following Kierkegaard, there is no access to the genuine level of principle without passion: “The genuine principle is to be acquired existentially-philosophically only in the basic experience of passion. There it is unclarified [i.e. not given determinate content, which would focus too much on the “what” and leave out the “how”] ‘Away from principles’ means from the outside, ‘without suffering,’ having become lost. In principle, no ‘retention.’ ‘Away from principles,’ we can be and have everything (Kierkegaard).” Ibid. p. 20.}
Philosophy, as comportment is a relation. It is, in particular, a circular, self-grounding relation that undermines itself as it establishes itself (or establishes itself just as it undermines itself). It is a directional relation (as formal indication), toward indeterminate content. And it diminishes itself to the point of parody and non-existence if it stops and remains settled with some specific content, taking it as an absolute and universal answer. Indeed, philosophy is not about answers; it is about questioning. The only absolute lies in absolute questionability.

Through these considerations of relation, comportment, questionability and definition, Heidegger arrives at a provisional definition of philosophy itself, which is a formally indicative definition at the level of principle:

philosophy is cognitive comportment, at the level of principle, toward beings in terms of Being (sense of Being), specifically such that what is decisively at issue in the comportment and for it is the respective Being (sense of Being) of the possessing of the comportment. Philosophy is ‘ontology,’ indeed, is radical ontology, and as such is phenomenological (existentiell, historiological, spiritual-historical) ontology or ontological phenomenology (with the emphasis falling on one side or the other depending on the polemical orientation).

Let us pause for a moment to unpack this definition. Doing so will open up some new insights into Heidegger’s development at this time and put this course into broader perspective in terms of our concerns here.

582 Ibid. pp. 38-42.
583 Ibid. p. 46.
“Philosophy is cognitive comportment,” indicates what Heidegger had already stated in different terms earlier: that philosophy proper is philosophizing; it is a “how” of relating to content, not a specific content itself. In particular, philosophy is a kind of cognitive comportment, a directing one’s thoughts toward, it is a way; it is carried out in formal indications (directions, rather than specific content). That this cognitive comportment is “at the level of principle” is a crucial statement for us. It not only points toward the question of ground, but also indicates why Aristotle and ontology became so important for Heidegger in this period. And indeed suggests that Aristotle might not be as absent from this course as a first reading might suggest.

A “principle” is “that from which something originates or is derived; a source, an origin; the root (of a word, etc.)… In a generalized sense” a principle is a fundamental source from which something proceeds; a primary element, force, or law which produces or determines particular results; the ultimate basis upon which the existence of something depends; cause (in the widest sense)… A fundamental truth or proposition on which others depend; a general statement or tenet forming the (or a) basis of a system of belief, etc.; a primary assumption forming the basis of a chain of reasoning. A general law or rule adopted or professed as a guide to action; a settled ground or basis of conduct or practice… A fundamental quality or attribute determining the nature of something; an essential characteristic or character; essence.\textsuperscript{584}

\textsuperscript{584} Oxford English Dictionary
The term Heidegger uses is “Prinzipal,” which has the same Latin root (*principium*) as the English “Principle.”

“A philosophical definition is one of principle,” Heidegger argues.\(^{585}\) “Principle” itself, however, is a term that requires some explanation in general, and, as is often the case in Heidegger, he uses the term in his own unique way. The words Heidegger uses, “Prinzip” and “prinzipielle” (translated as “principle,” “on the level of principle,”), are Latin-derived terms, which are heavily laden with historical baggage. I believe Heidegger is using these terms somewhat ironically (we can see from the context that there is a certain mocking of these weighty terms, which, of course, is fairly common for Heidegger in his lectures). Heidegger wants his students to see beyond and behind ossified philosophical terms in order to arrive at a more direct understanding of the problems themselves.

Principles are grounds; they are origins. A principle is that from whence something arises. A principle is “a fundamental source from which something proceeds; a primary element, force, or law which produces or determines particular results; the ultimate basis upon which the existence of something depends; cause (in the widest sense).”\(^{586}\) The Latin word *principium* means beginning and foundation. Why does Heidegger not use the German word *Grund* here? In speaking of principles, Heidegger is

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\(^{585}\) Heidegger, *Phenomenological Interpretations of Aristotle*, p. 46.
\(^{586}\) *Oxford English Dictionary*
pointing to the concept of *Arche* in Aristotle (for which “principle” is has long been the standard translation).\(^{587}\)

In this lecture course on Aristotle Heidegger makes much of the concept of principle. And here, if we consider the lecture course in its proper context (as a confrontation with Aristotle), we can see that even this first “introductory” portion, which seems not to deal with Aristotle at all, is, in fact, a direct conversation with him. In order for this to become clear we need to take another path that may seem like a bit of a diversion, a path that leads through Aristotle, back to this crucial stage in Heidegger’s development. This may seem like a digression, but the rewards will be great.

Heidegger looks at a number of Aristotle’s texts in this course and the various courses on Aristotle that follow. He examines the *Nicomachean Ethics*, the *Rhetoric*, the *Physics* and certain portions of the *Metaphysics*. But there is a crucial text that he does not mention at all, a text with which, I believe, he is actually in a sustained dialogue in the first “introductory” portion of this course.\(^{588}\) This text is the *Posterior Analytics*, the text where Aristotle discusses the nature of demonstrative science. This course occurs during a period where Heidegger’s relation to science is fraught. The tension in his

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\(^{587}\) These terms would have been familiar to Heidegger’s students as common philosophical terms pointing back, through scholasticism, to Aristotle. Here, and in what follows, it may be useful to consult the lexical glossary in Appendix 2, which I have provided as a touchstone or reference point particularly for this discussion. There is some repetition between passages here and in the Appendix, but much that is different, and a presentation that is intentionally different with the aim of providing a second way into the issues surrounding these terms.

\(^{588}\) Commentators (Kisiel, Van Buren, Ruin, etc.) have noted that in this course about Aristotle there is, in fact, very little actual discussion of Aristotle. I would argue instead that the entire course is a discussion about and *with* Aristotle and that this content is in fact there from the beginning.
thought over the issue of science, palpable from KNS 1919 onward, has not disappeared. In order to understand this turning point in Heidegger’s development, we need to spend a little bit of time with Aristotle, and particularly with his conception of demonstrative science.

**Aristotle**

In potted, caricature accounts of ancient philosophy, Aristotle is presented as the empirical scientist in contrast to Plato, who is depicted as the poetic idealist. If someone knows one thing about Aristotle, it is usually this. Reality is, of course, far more complicated and, indeed, far more interesting. Aristotle’s thought represents an encompassing project dedicated to understanding the totality of what can be understood. And, though observation plays a key role in this project, Aristotle’s guiding assumptions, working methods, and actual conclusions, are poorly characterised by this simplified picture, particularly when we all too often project an anachronistic conception of what it means to be “scientific” and “empirical” back upon the past.

Aristotle’s most basic assumption is that the world in which we live, and we ourselves, are intelligible. He also assumes that we have an innate desire to understand.\(^{589}\) What it means to understand, however, is not itself an uncomplicated problem. One of the chief goals of this dissertation can be framed in terms of the attempt to explore what it means to understand. We have encountered Heidegger’s early thoughts on this matter already. Aristotle has a particular notion of what it means to understand, and Heidegger’s

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\(^{589}\) Lear makes this desire to understand the central theme of his introduction to Aristotle, opening with the famous first lines of the metaphysics: “All men by nature desire to know.” Lear, Jonathan, *Aristotle: The Desire to Understand*. Cambridge: Cambridge University Press, 1999, p. 1.
thought in this period stands in an awkward and complicated relation to this notion.

Aristotle says that we understand something when we grasp the why of it. And this, as we shall see, ties Aristotle’s concept of understanding to our discussion of meaning and ground.

“The why” translates the Greek “to dia ti,” and requires some further explanation. As Lear puts it:

The expression ‘the why’ is awkward even if it is a literal translation, but this is one of those cases where awkwardness is of value. For it is often thought that Aristotle is saying that a cause is anything which answers a why-question. This is anachronistic. It looks as though Aristotle is relativizing causes to our interests and curiosities. In fact the situation is the reverse. ‘The why’ is an objective feature of the world: it is that about which we ought to be curious if we wish to understand a thing. The expression ‘the why’ is suggestive of the intimate link Aristotle saw between man and world. Man is by nature a questioner of the world: he seeks to understand why the world is the way it is. The world for its part reciprocates: it ‘answers’ man’s questions. ‘The why’ performs a curious double duty, as interrogative and indicative, suggesting both question and answer. And the world’s ‘answers’ are not merely responses to man’s probings: they manifest

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590 Physics II.3 194b18-19 “Knowledge is the object of our inquiry, and men do not think that they know a thing till they have grasped the ‘why’ of it (which is to grasp its primary cause).” Aristotle, Complete Works. Princeton: Princeton University Press, 1984. Vol. 1, p. 332; Also: APo I.2 71b8-12 (see below).
the ultimate intelligibility of the world. ‘The why,’ therefore, penetrates to the world’s most basic reality.\footnote{Lear, Aristotle, p. 26.}

We understand something when we understand the reason why; and reasons are grounds. Understanding, I want to argue here, in Aristotle’s conception, is essentially a process of grounding. In order to see how this is the case, some further explanation and unpacking are necessary, but the basic structure is this: We understand something when we know the why. We know the why when we “grasp its primary cause”\footnote{As the revised Oxford translation renders it. Aristotle, Complete Works Vol. 1, p. 332.} as the ground of the thing being what and that it is. Therefore, understanding is a process of grounding.

Aristotle divides knowledge into three basic forms, productive (how to make something), practical (how to get about in life), and theoretical (knowledge for its own sake). In his lecture courses of the 1920’s Heidegger focuses on the practical and the productive, placing the most emphasis on the practical even though Aristotle himself asserts that the theoretical is the highest.\footnote{See Metaphysics Epsilon I.} This betrays a crucial difference in the outlooks of the two thinkers, and it goes a long way towards explaining why Heidegger does not focus on certain texts (\textit{APo} being one of them). But it also helps to situate Heidegger’s discussion of principles and understanding in this first Aristotle course.

For Aristotle the pursuit of the theoretical is philosophy in its most proper sense: the love of wisdom for its own sake.\footnote{In Met II.1 993b20 he says that “philosophy should be called knowledge of the truth.”} The product of this pursuit is orderly systematic knowledge (of the cosmos, of ourselves, etc.) that is rooted in necessity. Our true knowledge will be necessary, rational, and systematic because the cosmos is rational and
systematic and is imbued with necessity at it most basic level (again, Aristotle’s most basic assumption). What we would call “scientific” knowledge in Aristotle’s sense – that is episteme – is systematic, rational knowledge. The Posterior Analytics is devoted to explaining how we can have episteme, how “science” as we call it, works; and for Aristotle, science works by demonstration.

In Aristotle’s conception we can know how to make things, we can know how to go about in the world, and we can know the truth about phenomena strictly for its own sake. But what is the nature of this knowledge? Aristotle says that we have epistasthai of something when we know its grounds in their necessity. This is my paraphrase of APo I.2 71b9-12. And much of the argument that follows here depends on how we read this crucial passage. The revised Oxford translation renders it as:

We think we understand a thing simpliciter (and not in the sophistic fashion accidentally) whenever we think we are aware both that the explanation because of which the object is is its explanation, and that it is not possible for this to be otherwise.

But there are important reasons for translating the passage differently. I began to feel the need for an alternate translation due to structural connections within Aristotle’s thought that I felt could be better expressed in the sort of terms I have been using to talk about

595 Lear argues that the species of knowing that Aristotle calls ‘’epistasthai’ (literally, to be in a state of having episteme) which has often been translated as ‘to know’ or ‘to have scientific knowledge,’ …ought to be translated as ‘to understand.’ For Aristotle says that we have episteme of a thing when we know its cause. To have episteme one must not only know a thing, one must also grasp its cause or explanation [we can read ‘ground’ here]. This is to understand it: to know in a deep sense what it is and how it has come to be. Philosophy, says Aristotle, is episteme of the truth.” Ibid. p. 6.
596 Aristotle, Complete Works Vol. 1 p. 115.
Heidegger, Kant, and others (using a coherent set of terms for structurally similar phenomena [though, of course, with variation implied]). It was a great relief to find commentators who proposed alternate translations with sound arguments behind them that made sense within the framework of my own discussion.\footnote{Some of the most useful have been Lear, Irwin, Hanley, and especially Richard McKirahan’s excellent book on the *Posterior Analytics*. Again, see the lexical glossary in Appendix 2 for further reference.}

McKirahan translates the passage in terms that seem tailor fit for understanding what Aristotle means in terms of our discussion:

We think we have scientific knowledge [\textit{epistasthai}] without qualification of each thing… when we think we know \textit{ginoskein} the grounds \textit{aitia} of the thing \textit{pragma} as being its grounds, and that this cannot be otherwise.\footnote{McKirahan, Richard. *Principles and Proofs: Aristotle’s Theory of Demonstrative Science*. Princeton: Princeton University Press p. 22.}

The crucial word for our discussion here is \textit{aitia}, which is most commonly translated as “causes.” This translation however is extremely problematic. And McKirahan does an excellent job of explaining his reasons for translating \textit{aitia} as “grounds” rather than “causes.”

To translate \textit{aition} as “cause” is to drag all of the modern connotations of that word (to which, as Alan Code notes, “the Greek term overlaps with, but is not coextensive with”)\footnote{Code, Alan. “Aristotle’s Logic and Metaphysics.” In *The Routledge History of Philosophy Vol. 2: From Aristotle to Augustine*. London: Routledge p. 49.} into the world of Aristotle’s thought. Causes are, of course, grounds, but the connections of the word with modern conceptions, and particularly the cause/effect relation, impoverish the term by making it too narrow and thus, ironically,
less accurate. McKirahan argues that “cause” (and the alternate “explanation”’) do not capture “the sense of *aitia* required by the theory of demonstration” as explained in the *Posterior Analytics*. He goes on:

I have preferred to translate *aitia* and *aition* as “grounds” or “explanatory grounds,” partly to avoid the inappropriate translation “cause,” and partly to avoid the word “explanation,” since even through demonstrations are explanations, they are explanations of a special kind, and it seemed a good idea to find a somewhat different term. Moreover, “explanation’ is more squarely in the realm of language than is desirable. An explanation is a series of propositions whose truth accounts for a fact. But Aristotle’s premises and conclusions are simultaneously or indifferently facts and propositions. He moves back and forth between the two ways of looking at them, sometimes saying that the principles and conclusions must be true (so that they are propositions) and sometimes treating them materially (e.g., “the conclusion belongs per se to a genus,” I.7 75a40-41).

“Grounds” and “explanatory grounds” can be used on both levels, since we may say that the premises (propositions) are the grounds of a conclusion (another proposition) and that certain facts are grounds of others. “Explanatory grounds” is clumsier, but conveys the idea that premises are grounds of conclusions by being the grounds (both as facts and as propositions) on which demonstrations are based, since demonstrations provide a certain sort of explanation of their
conclusions and show that one proposition follows from others and also that one fact is necessitated by others.\textsuperscript{600}

The *Posterior Analytics* is a text that describes the nature of demonstrative science, and the core of demonstrative science in the *Posterior Analytics* lies in the task of grounding. This is what the act of demonstration does: it grounds.

I read the *Posterior Analytics* as a text about the grounds of necessary and certain knowledge, and thus, essentially, as a text on grounding in understanding. Aristotle says that we understand something when we know “the why” and we know “the why” when we know its “cause” or ground (*the reason why*). On this same topic, Lear notes that:

The Greek word which is translated as ‘cause’ does not mean cause in the modern sense: namely, an antecedent event sufficient to produce an effect. Rather, it means the basis or ground of something. Aristotle later says that we do not understand something until we know why it is what it is: and the cause gives us ‘the why.’\textsuperscript{601}

Understanding in this sense is grounding. And this brings us back to our ongoing discussion of grounding, the question of ultimate grounds or the dreaded *regressus ad infinitum*, and this, in turn, brings us to the question of *principles*.

*Archai*, the Greek word that “principles” translates, are beginnings (Irwin suggests “origins”\textsuperscript{602}). They are the un-provable first components of a demonstrative science, upon which all demonstration is based and from which all demonstration

\textsuperscript{600} McKirahan, *Principles and Proofs*, pp. 231-2.

\textsuperscript{601} Lear, *Aristotle* p. 15.

proceeds. What is demonstration though? Demonstrations are the proofs of scientific knowledge; they are, in a sense, the individual groundings of what we might call scientific facts. McKirahan sums up the overall structure of demonstrative science expertly:

The subject of *Apo* is *episteme*: science or scientific knowledge… Aristotle’s theory can be stated briefly. Each science (including branches of natural science and mathematics, and perhaps other fields as well) treats a limited range of phenomena, its subject genus, as arithmetic studies numbers and geometry spatial magnitudes… the task of a science is to explicate the network of relations in its subject genus.

A science proceeds by proving conclusions. Using unprovable principles as a basis, it forms proofs of their consequences. The relations in its subject genus are the body of unprovable principles and provable conclusions that constitute a science. To prove that a conclusion holds is simultaneously to show why it holds.

Thus, proofs do more than indicate logical relations among propositions; they also

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603 The connection between knowledge and first principles is expressed in Aristotle’s account of a first principle (in one sense) as ‘the first basis from which something is known.’ (*Met.* 1013a14-15).” Here it is already apparent that principles are, themselves, grounds. Ibid.

604 “The proper way to transmit truth, necessity, and explanation is demonstration. In a demonstrative syllogism, as in an ordinary syllogism, the premises and conclusion are universal, and the conclusion follows necessarily from the premises; but the premises of a demonstration must also be true, necessary, and explanatory of the conclusion. The demonstrative syllogism is intended to satisfy the demand for explanation, and to display the appropriate relations between essential properties and coincidents. The premises of a demonstrative syllogism must also be prior to their conclusion, since a science is supposed to state the first principles and to derive other truths from them. …The premises must be prior and better known by nature; demonstrative sciences makes them better known to us.” Irwin Aristotle’s First Principles pp. 122-3.
reveal real relations among facts, and scientific knowledge involves knowing not only that but also why.⁶⁰⁵

These proofs take the form of demonstrations that ground the facts of the science.⁶⁰⁶ “A demonstration of a fact is a syllogistic argument with that fact as a conclusion and unprovable principles as premises.”⁶⁰⁷ For example: “Every triangle has angles equal to two right angles.”⁶⁰⁸ Episteme, scientific knowledge, begins then with principles. What is the nature of these first building blocks?

In APo I.2 71b20-22 Aristotle argues that “Demonstrative scientific knowledge must depend on things that are true, primary, immediate, better known than, prior to, and grounds of the conclusion.”⁶⁰⁹ These things are principles. By “primary” Aristotle means that the principles must be the ultimate grounds of their science. They cannot be provable by still more basic principles because Aristotle denies the possibility of a regressus ad infinitum… the process has to start somewhere.⁶¹⁰ The term “‘immediate’ gets its sense from the syllogistic: a proposition that is amesis [immediate] is, literally, ‘lacking a

⁶⁰⁵ McKirahan, Principles and Proofs pp. 3-4.
⁶⁰⁶ The Analytics in general are about knowledge and grounding. In the Prior Analytics Aristotle states that “First we must state the subject of the enquiry and what it is about: the subject is demonstration, and it is about demonstrative understanding.” Apr I.1 24a10-11.
⁶⁰⁷ Ibid. p. 4 See APo I.2 71b17-19: “By demonstration I mean a scientific deduction; and by scientific I mean one in virtue of which, by having it, we understand something.” Aristotle, Complete Works Vol. 1 p. 115.
⁶⁰⁸ APo I.1 71a19-20. (In the general form of “All X have A.”)
⁶⁰⁹ This is McKirahan’s translation. Ibid. p. 24. The revised Oxford translation has: “If, then, understanding is as we posited, it is necessary for demonstrative understanding in particular to depend on things which are true and primitive and immediate and more familiar than and prior to and explanatory of the conclusion (for in this way the principles will also be appropriate to what is being proved).” Aristotle, Complete Works Vol. 1 p. 115.
⁶¹⁰ He reiterates this point in Met II.
middle term \{meson\},’ a term that can serve as a middle term in a syllogistic proof of the proposition.”¹¹¹ That principles are prior to and grounds of the conclusion refers to their role within demonstrative science as a process of grounding (that presents grounding statements in syllogistic form).

“Better known than”¹¹² is related to priority. Aristotle distinguishes between what is better known “to us” and what is better known per se, or “by nature.”¹¹³ As Irwin sums it up:

He suggests that the first principles are known and clearer ‘by nature’ or ‘unconditionally’, even if they are less well-known and less clear to us. Aristotle explains the point by analogy. Someone may be a ‘natural musician’, because he is naturally suited for it, even if he never learns music, and so never becomes a musician… First principles are known unconditionally because they are naturally appropriate for being known… the principles we find will be ‘prior by nature’, and when we have found them they will also be ‘prior to us’; for then we will recognize that they are more basic and primary than the principles we began from [which were better known ‘to us’ rather than ‘by nature’ or ‘unconditionally’]¹¹⁴

It is all a question of discovering the true and appropriate grounds for each science.¹¹⁵

And this brings us back, once again, to our topic.

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¹¹¹ McKirahan. *Principles and Proofs*, p. 25 He also suggests “unmiddled” as a more direct and literal term.
¹¹³ See, for instance, *APo* I.2 71b29-34 to 72a6.
¹¹⁵ See *APo* I.2 72b6-9.
Key for our discussion is Aristotle’s claim that principles must be grounds. In the revised Oxford translation:

They must be both explanatory and more familiar and prior – explanatory because we only understand when we know the explanation; and prior, if they are explanatory, and we are already aware of them not only in the sense of grasping them but also of knowing that they are.\(^{616}\)

McKirahan’s translation however puts things in terms that make more sense in our discussion:

[The principles] must be grounds, better known, and prior: they must be grounds because we have scientific knowledge precisely in cases when we know the grounds; they must be prior if they are grounds; and they must be previously known not only in that we understand them, but also in that we know that they are the case.\(^{617}\)

Demonstrative science, begins with indemonstrable principles that are the grounds of the knowledge that follows. And it operates through a process of grounding, tying facts back to principles.

There are different sorts of *archai*, or principles. Some principles are existence postulates: that there are such things as physical bodies is a principle of physics. Other

\(^{616}\) \textit{APo I.2} 71b29-33.

\(^{617}\) McKirahan, \textit{Principles and Proofs}. P. 29: “[Aristotle’s] goal was a wholly general theory that can apply both to abstract mathematical branches of knowledge and also to concrete natural ones. These features are reflected in the kinds of principles Aristotle requires, the kinds of scientific demonstration he recognizes, the role of different principles in them, and the notion of *aitia*, ‘cause,’ explanation, or grounds.” Ibid. p. 19

See also pp. 104-5 & 209.
principles are qualitative pronouncements, or laws about the nature and behaviour of phenomena: that physical objects can move, for instance, is likewise a principle of physics. Both of these kinds of principles are grounds for further knowledge. Scientific knowledge begins with these “first grounds” (if you will) and proceeds to make propositional statements that tie phenomena back to these grounds.

This is how Aristotle sees episteme working, as a process of grounding.\(^{618}\) “Two requirements of having scientific knowledge of something are that (1) we know its aitia and (2) we know that its aitia is its aitia.”\(^{619}\) Scientific knowledge is not a mere knowledge of facts; it includes a crucial reflexive element. We must know the grounds and we must know that these grounds are the grounds.\(^{620}\) All this talk of grounds, however, brings us back to the question of ultimate grounds. The questions of whether there is an ultimate ground, whether we can know it, and how much we can know of it, were all as important for Aristotle as they were for Heidegger. The principles of each science are the ultimate grounds of that science, but they must be grasped intuitively, they must simply be known, rather than themselves proved or grounded. But are they merely groundless? Aristotle did not think so.

\(^{618}\) Hanley, whose assessment of Aristotle is largely consonant with my own refers to Aristotle’s “Aetiology,” which would be the science of grounds, but as demonstrative science is a process of grounding the term is almost redundant. Hanley, Catriona, Being and God in Aristotle and Heidegger: The Role of Method in Thinking the Infinite. Lanham: Rowman & Littlefield, 2000. P. 37.

\(^{619}\) McKirahan Principles and Proofs, p. 209.

\(^{620}\) “The importance of knowing the grounds is often emphasized, as in the following passages, which all contain the key word dihoti, ‘the reason why’: ‘the most important thing in knowledge is considering the reason why’ (I.14 79a23-24); ‘to have scientific knowledge of the reason why is to have scientific knowledge through the grounds’ (I.6 75a35); ‘scientific knowledge of the reason why is in virtue of the primary grounds’ (I.13 78a25-26).” All citations are from APo. McKirahan Principles and Proofs p. 209.
Aristotle believed that the cosmos is rationally understandable. He was neither a sceptic nor a relativist. But the question of ultimate grounds presented a problem for his philosophy as it did for Heidegger centuries later. Aristotle sketches out the nature of the problem, particularly as it pertains to his theory of demonstrative science in the beginning of *APo* I.3. He says;

Now some think that because one must understand the primitives [and recall from I.2 72a7-8 that Aristotle “call[s] the same thing primitive and a principle”] there is no understanding at all; others that there is, but that there are demonstrations of everything. Neither of these views is either true or necessary.

He continues, outlining the problem in further detail:

For the one party, supposing that one cannot understand in another way, claim that we are led back *ad infinitum* on the grounds that we would not understand what is posterior because of what is prior if there are no primitives; and they argue correctly, for it is impossible to go through infinitely many things. And if it comes to a stop and there are principles, they say that these are unknowable since there is no *demonstration* of them, which alone they say is understanding; but if one cannot know the primitives, neither can what depends on them be understood *simpliciter* or properly, but only on the supposition that they are the case.⁶²¹

If we can only understand by demonstration, then we are faced with the problem either of an infinite regress of demonstrations and demonstrations of demonstrations of

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⁶²¹ *APo* I.3 72b5-14.
demonstrations... (an answer which Aristotle finds unacceptable because it would mean that no knowledge was ever actually final or secured\textsuperscript{622}) or with principles that cannot themselves be demonstrated (and thus, \textit{if we can only understand by demonstration}, with an absence of understanding). This is why Aristotle argues that understanding first principles is a matter of “grasping” them\textsuperscript{623} rather than demonstrating them.

Aristotle next takes on the circular process of grounding that we have already encountered in our discussion of Heidegger:

The other party agrees about understanding; for it, they say, occurs only through demonstration. But they argue that nothing prevents there being demonstration of everything; for it is possible for the demonstration to come about in a circle and reciprocally.

Aristotle disagrees with this approach however, for he demands fixity; his \textit{aetiology}, his conception of science, is as a process of grounding, and Aristotle conceives of grounds as solid and fixed, certain and necessary. He continues:

But \textit{we} say that neither is all understanding demonstrative, but in the case of the immediates it is non-demonstrable – and that this is necessary is evident; for if it is necessary to understand the things which are prior and on which the demonstration depends, and it comes to a stop at some time, it is necessary for these immediates to be non-demonstrable. So as to that we argue thus; and we

\textsuperscript{622} See \textit{Met} II.2 994b9-31 for Aristotle’s explanation and justification.

\textsuperscript{623} See, for example, \textit{APo} I.2 71b29-33. We grasp the principles through \textit{nous}, rather than know them through \textit{epistasthai} (See Appendix 2 for more).
also say that there is not only understanding but also some principle of
understanding by which we become familiar with the definitions.

And that it is impossible to demonstrate simpliciter in a circle is clear, if
demonstration must depend on what is prior and more familiar; for it is
impossible for the same things at the same time to be prior and posterior to the
same things… Hence it results that those who assert that demonstration is circular
say nothing but that if $A$ is the case $A$ is the case. And it is easy to prove
everything in this way.\footnote{Aristotle’s rejection of circular grounding in $APo$ suggests a reason why Heidegger would be less interested in this text, but, in actual fact, it lies at the core of his confrontation with Aristotle.}

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would be less interested in this text, but, in actual fact, it lies at the core of his
confrontation with Aristotle.

Aristotle believed we can only have understanding of what is necessary; the
contingent, or “accidental” in his terms, was not something about which we could have
episteme.\footnote{He agrees with Heidegger that we cannot take the principles of one science

\footnote{Aristotle never convincingly argues against the possibility of a regressus ad infinitum because he never gives a satisfying justification of his guiding assumption that the world is knowable in terms of necessary and certain knowledge (see $APo$ I.4 73a21-27 for instance, followed by I.6 74b5-12 and so on for further implications). If one denies this then Aristotle’s arguments against the regressus collapse.}

\footnote{As accidentals they do not fit within the process of necessary grounding (or grounding through necessity to put it another way) that is science. “Of accidentals which do not belong to things in themselves… there is no demonstrative understanding. For one cannot prove the conclusion from necessity…” $APo$ I.6 75a18-20. “Since in each kind what belongs to something in itself and as such belongs to it from necessity, it is evident that scientific demonstrations are about what belongs to things in themselves and depend on such things. For what is accidental is not necessary, so that you do not necessarily know why the conclusion holds… (To understand why is to understand through the explanation.)” $APo$ I.6 75a 29-36. And: “There is no understanding through demonstration of which holds by chance.” $APo$ I.30 87b19-20.}
and attempt to apply them in another (principles must be appropriate).\textsuperscript{626} And he also believes that there can be no universal science that underlies each individual science (each must have its own unique proper principles, though, with some shared axioms).\textsuperscript{627}

The opening paragraph of \textit{APo} I.10 sums up the issues:

\begin{quote}
I call principles in each genus those which it is not possible to prove to be. Now both what the primitives and what the things dependent on them signify is assumed; but that they are must be assumed for the principles and proved for the rest – e.g. we must assume what a unit or what straight and triangle signify, and that the unit and magnitude are [existence postulates and determinations of meaning (that the thing is and what the thing is)]; but we must prove that the others are.
\end{quote}

And a little later:

\begin{quote}
For every demonstrative science has to do with three things: what it posits to be (these form the genus of what it considers the attributes that belong to it in itself); and what are called the common axioms, the primitives from which it demonstrates, and thirdly the attributes, of which it assumes what each signifies… there are by nature these three things, that about which the science proves, what it proves, and the things from which it proves.\textsuperscript{628}
\end{quote}

\textsuperscript{626} See \textit{APo} I.7.
\textsuperscript{627} See \textit{APo} I.9. And \textit{APO} I.32 88a36 to 88b1: "Nor is it possible for there to be some of the common principles from which everything will be proved... For the genera of the things there are different..."
\textsuperscript{628} \textit{APo} I. 10 76a31 to 76b23.
The principles are the ultimate grounds of each science; they are the principles for the syllogistic demonstrations that form the activity of the science.\footnote{629 \textit{APo} I.22 offers a good summing up at this point.} Scientific understanding, as grounding, is certain and necessary, “because understanding is universal and through necessities, and what is necessary cannot be otherwise.”\footnote{630 \textit{APo} I.33 88b 31-2.} But what guarantees the necessity of the primitives? What guarantees the principles and the whole project if they are not grounded through demonstrative science? We must grasp them Aristotle says, but what is the guarantor of our grasping? To answer these questions we must turn to the \textit{Metaphysics}.

It may not, in the end, be surprising that our search for ultimate ground has led us here. As Joseph Owens put it, “any philosophical discussion, if continued with sufficient penetration, leads sooner or later to recognizable roots in the soil so carefully cultivated by the fourth century Greek thinker.”\footnote{631 In his forward to: Reale, Giovanni. \textit{The Concept of First Philosophy and the Unity of the Metaphysics of Aristotle}. Albany: State University of New York Press, 1980, p. XV.} Any exploration into some of the ultimate questions of Western philosophy inevitably leads back to Aristotle’s \textit{Metaphysics}. And in our attempt to understand the historical evolution of Heidegger’s thought (as well as to further understand the underlying questions of meaning and ground that we are pursuing through Heidegger) we encounter the \textit{Metaphysics} of necessity. Exploring this text will allow us to understand the stakes involved in Heidegger’s encounter with Aristotle as well as the deeper implications for his own understanding of the borrowings, re-interpretations and rejections he makes of portions of the Aristotelian corpus. The \textit{Metaphysics} is, however, a notoriously difficult text. It seems to allow for nearly as many
readings as readers. We will have to tread carefully. The most sensible way to proceed seems to me to sketch out the four corners of the vast world of interpretations, situate my own reading within this world, showing the points of consonance and contrast, and then return to the question of Heidegger with a sounder sense of geography.

The *Metaphysics* is comprised of fourteen books. Most agree that it was compiled out of disparate parts by Andronicus of Rhodes, but there is little overall agreement on much else. The primary disagreement is over whether the *Metaphysics* represents a unified work (regardless of its nature as an assemblage) or, on the contrary, whether it is in fact a collection of unrelated works. Scholars disagree over whether there is a single topic with which the *Metaphysics* deals; they disagree over whether the individual books are complementary or contradictory, and they disagree over the relative worth and importance of the individual books.

Barnes argues that the books that comprise the *Metaphysics* represent disparate topics and, while he recognises attempts by Aristotle within the text to connect the different threads, he finds that the arguments Aristotle and others make for unity do not stand up to more rigorous logical scrutiny. He argues that “a close reading of the *Metaphysics* does not reveal any subtle or underlying unity: the work is a collection of essays rather than a connected treatise,” and that it “has no consecutive story to narrate.”632 Kosman, on the other hand treats the *Metaphysics* as “mostly a single work,  

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with an agenda and with a connected set of arguments." Irwin “assume[s] that the Met. is doctrinally fairly unified… as Ross thinks.” Lear, though he has a slightly Platonizing interpretation of Aristotle and follows, in part, a developmental account, treats the Metaphysics as, basically, a single inquiry. Natorp argues against the unity of the Metaphysics as a whole. Reale, in turn, argues extensively and fervently for the “profound unity and speculative homogeneity of the Metaphysics.” My own reading is not identical with any of the above, but more on that in a moment.

Barnes breaks the Metaphysics down into explorations of four basic topics that “give only a specious and superficial appearance of unity”:

1) The study of causes or grounds of things (or aetiology) and, in particular, of first causes
2) The study of “being qua being” (or ontology)
3) The study of the divine (or theology)
4) The study of “substance” (or ousiologia)

Barnes sees Aristotle’s explorations of these four topics in the work we call the Metaphysics as separate investigations that come to results that at times contradict each other, at others have nothing to do with one another, and at some, show some sort of consonance. As he puts it: “The four characterisations [of the topic of the Metaphysics] do not cohere: there is no one science which they all describe, and hence there is (in a

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sense) no such thing as Aristotelian metaphysics."\textsuperscript{637} Reale, Kosman, and others, however, argue just as convincingly for the opposite view. Reale, in particular, argues against the sort of contradictions that Barnes and others see, arguing for “the non-existence of those contradictions simply \textit{on the basis of the content}” and attempts to “document the substantial unity and homogeneity of the doctrine contained in the \textit{Metaphysics}.”\textsuperscript{638}

My own view is that the \textit{Metaphysics} represents a \textit{basically coherent set of inquiries}; that is, I see the \textit{Metaphysics} as a set of inquiries into a basically coherent object domain, from different angles, using different approaches, and coming to conclusions that are sometimes complementary and sometimes contradictory. I do not see the contradictoriness found within the results to be grounds for divorcing the individual books however. That their results do not form a monolithic logically defensible unity is not grounds for dissection, but rather, arises from the very nature of the coherent but incredibly difficult, nebulous, and problematic subject matter of the researches. It is a result of their object domain, rather than proof that the object domain does not exist.\textsuperscript{639}

\text\textsuperscript{637} Ibid. p. 108.
\text\textsuperscript{638} Reale, \textit{The Concept of First Philosophy}. P. 14.
\text\textsuperscript{639} I must note here that I do not believe that my interpretation is more defensible than any of those listed above. Nor do I think that there is one, single, ultimately true interpretation amongst them. The distance is too great, the material too open to alternate readings. These are the ground-level problems of philosophical hermeneutics. I merely argue that my position is defensible based on the material, as are the others. And, ultimately, what matters here is the light that this reading will shed on Heidegger’s encounter with Aristotle, which, in turn, serves the greater purpose of attempting to come to a better understanding of the questions of meaning and ground through historical inquiry.
I am essentially arguing that Andronicus of Rhodes made a sensible decision when he put the books of the \textit{Metaphysics} together, rather than arguing that they were ever intended as
What then is this object domain that the books of the *Metaphysics* explore? How do the three topics Barnes lays out hang together?

The four subject areas that Barnes outlines (a science of first principles and grounds [aetiology], a science of being *qua* being [ontology], a science of substance [ousiology], and a science of the divine [theology]) seem disparate, but there are important connections. Barnes notes the arguments within the *Metaphysics* for their connection, though he dismisses them as inadequate. Reale however argues convincingly for the unity of the four disciplines. His argument is exhaustive, but he sums the main issues up in particular in his discussion of the question of theology\(^{640}\) in book E:\(^{641}\)

Finally why can ‘theology’ be said to be ‘ontology’? It is easy to reply to this question. Ontology means the inquiry concerning the \(\eta\ ον\), the inquiry concerning the \(\eta\ ον\) means the inquiry concerning the \(\alphaιτια\ χαι\ αρχαι\ τον\ \οντος\ η\ ον\), that is, the inquiry concerning the causes and principles of being

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\(^{640}\) For many modern commentators the connection between Aristotle’s theology and the science of being as being is the most tenuous. Jaeger and those who follow his line of thought (including Heidegger as we shall see) dismiss the theological content as representing a view that Aristotle rejected (others however argue for exactly the opposite line of development [that is *towards* the theological view]). See Reale’s introduction for a good overview of the various positions. Reale, *The Concept of First Philosophy*. Pp. XI-17.

\(^{641}\) This he does after demonstrating that the science of first principles is the science of first principles of being *qua* being (rather than any specific domain of being) and that “the science of being qua being and that which belongs to it coincides with the science of \(\ονσια\) and that which belongs to it.” Reale, *The Concept of First Philosophy*. P. 125.
(aetiology); now “theology” studies the first cause and principle of being; therefore it is an aetiology, and it is therefore, due to the relations expressed above, an ontology.\textsuperscript{642}

We can frame these arguments in our own terms as follows: Aristotle’s conception of science is as aetiology, as a process of determining grounds and grounding determinates. But Aristotle rejects both the idea of an infinite series of grounds and the idea of a circle of grounds. There must, therefore, be an ultimate ground, upon which the whole of determinate reality is based (and of the indeterminate, in Aristotle’s conception, there can be no science). This ultimate ground will be a transcendent, ungrounded ground. Here the connection between the science of principles and grounds and theology seems clear (as it has to many before). But the other connections are perhaps less clear. And yet, perhaps not.

The ultimate science, which Aristotle proposes in the \textit{Metaphysics} is posed initially as a question, in terms of: “is there such a science?” Aristotle believes that there is. If there is such a science it would be first philosophy, a science of the ultimate ground and it would be, as such, a theology. But as a science of ultimate ground it would not be a science of particular grounds, of particular kinds of being; rather, it would be a science of

\textsuperscript{642} He goes on: “We can also reply to the same question in another way which is substantially in agreement with the first. Being is substance or that which refers to it; to study being (ontology) means essentially to study substance (ousiology); since there is not a single genus of substance, the nature of being will be revealed by that kind of substance which more than any other is ‘being’; therefore we can say with Ross: ‘By studying the primary kind of being, metaphysics studies being as such. The true nature of being is shown not in that which can only exist as an element in a concrete whole, nor in that which is involved in potentiality and change, but only in that which is substantial and invariable.’” Reale, \textit{The Concept of First Philosophy}. P. 172.
all being that is, and not in terms of this or that aspect (in terms of motion, or change, or quantity, etc.), but in terms of existence itself; it would be a science of being as being.

And as a science of being as being, first philosophy would not study this or that particular kind of being, but that which is, undifferentiated in its very undifferentiatedness… that is, substance, “that which is substantial and invariable” as Reale, quoting Ross, puts it.  

First philosophy studies being as substance rather than as matter, or as animal, or as quantity, etc.

Aristotle’s *Metaphysics* becomes, on my reading then, a science of ultimate ground and of the basic question of the ultimate ground for scientific knowledge of that which is. And knowledge, as I have argued, is expressed in and through meaning. This is not, of course, a statement that Aristotle makes, but from the point of view of our inquiry it is vital for understanding the importance of the place of the *Metaphysics* in our discussion. In Aristotle’s world the universe is rational and its knowability derives form its rational nature. The grounds of being of the universe are, for Aristotle, the grounds for our correct understanding of it; or, to put it another way, they are the grounds of its meaning X and Y to us:

Now Aristotle’s *αἰτια* includes both of these meanings: *αἰτια* is the reason for the being of the reality and also the reason that explains the reality; and further it is the explicative reason precisely because it is the proper reason of the being.

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643 Ibid.
644 There have been attempts to discover a semantic theory in Aristotle. See Charles, David. *Aristotle on Meaning and Essence*. Oxford: Oxford University Press, 2000, for an excellent example.
645 Aristotle does say that “the first principles and the causes are most knowable; for by reason of these, and from these, all other things are known…” Met A 982b.1-3.
Therefore the primary causes and principles of beings are the highest conditions of being, the supreme reasons, the ultimate foundations. Σοφία is thus a knowledge of the conditions, of the foundations, of the highest reasons of reality. To explain reality means to discover the foundations and the conditions that make it to be a being.  

Aristotle’s *Metaphysics* is a collection of texts that attempt to describe “wisdom” or “first philosophy” or “the science of being *qua* being” or “theology,” it is, in the terms of our discussion, a collection of texts that attempt to describe a science of the ultimate ground of meaning. And herein lies the difficulty. The subject matter of this science lies at the very edge of our ability to understand (quite literally). It deals with the ungrounded ground, the very ground of understanding itself. The impossibility of the subject matter itself explains the inconsistencies within the collection known as the *Metaphysics*. It explains the difficult aporiae, the relentlessly hard material, the openness to multiple readings, etc. As Aristotle puts it: “these things, the most universal, are on the whole the hardest for men to know; for they are furthest from the senses.”  

It also explains the variety of different approaches and methods. One of the young Heidegger’s most important insights was that, when approaching philosophy on its most basic level, we must begin ever anew.

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646 Reale, *The Concept of First Philosophy*. P. 32. This is also the primary argument of Lear, *Aristotle: The Desire to Understand*.

647 Met A 982a.24-5.
“All men by nature desire to know” Aristotle begins. And we know, we truly understand, when we know the why. “Wisdom,” Aristotle says, “is knowledge about certain [grounds] and principles.” The knowledge of the first grounds and principles will be a divine science, “for God is thought to be among the causes of all things and to be a first principle, and such a science either God alone can have, or God above all others.” Such a science would be the highest science, for “all the sciences, indeed are more necessary than this, but none is better.” “It is right also that philosophy should be called knowledge of the truth. For the end of theoretical knowledge is truth… Now we do not know a truth without its cause…” “Evidently there is a first principle, and the causes of things are neither an infinite series nor infinitely various in kind.” Wisdom, as first philosophy, seeks the ultimate grounds of being as being:

There is a science which investigates being as being and the attributes which belong to this in virtue of its own nature. Now this is not the same as any of the so-called special sciences; for none of these deals generally with being as being. They cut off a particular part and investigate the attributes of this part… Now since we are seeking the first principles and the highest causes, clearly there must

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648 Met A 980a.22.
650 Met A 983a.8-10.
651 Met A 993b.20-24.
652 Met α 994a.1-2. “Further, the final cause is an end, and that sort of end which is not for the sake of something else, but for whose sake everything else is; so that if there is to be a last term of this sort, the process will not be infinite; but if there is no such term there will be no final cause. But those who maintain the infinite series destroy the good without knowing it. Yet no one would try to do anything if he were not going to come to a limit. Nor would there be reason in the world; the reasonable man, at least, always acts for a purpose; and this is a limit, for the end is a limit.” Met α 994b.9-15.
be some thing to which these belong in virtue of its own nature. If then our predecessors who sought the elements of existing things were seeking the same principles, it is necessary that the elements must be elements of being not by accident but just because it is being. Therefore it is of being as being that we also must grasp the first causes.\textsuperscript{653}

And this first philosophy, that must be ontology, must also be ousiology:

It is clear then that it is the work of one science also to study all things that are, \textit{qua} being. – But everywhere science deals chiefly with that which is primary, and on which the other things depend, and in virtue of which they get their names [the reader may recall my earlier assertion about meaning here]. If then, this is substance, it is of substances that the philosopher must grasp the principles and the causes.\textsuperscript{654}

In Book Γ Aristotle specifically ties the concept of substance to that of essence and to denotation, that is, he ties substance, the study of which is first philosophy, which is the science of being \textit{qua} being, and theology, to meaning. He discusses what the word “man” means, and concludes that the meaning of the referent can be nothing other than the essence of man, which is the substance of man, for the essence will be the “one thing which it meant, and this was the substance… And denoting the substance of a thing means the essence of the thing is nothing else.”\textsuperscript{655}

\textsuperscript{653} Met Γ 1003a.17-31.
\textsuperscript{654} Met Γ 1003b.15-8.
\textsuperscript{655} Met Γ 1007a.25-7.
Heidegger’s Phenomenological Interpretation to Aristotle, is an introductory portion of an Aristotelian metaphysical project. Or, rather, it is precisely not this. It is, instead, a radical re-envisioning and new attempt at such a project. Heidegger is working within the object-domain of Aristotle’s *Metaphysics* and presenting a (radically) alternative approach. The methods, indications, provisional findings, etc. are different, but the question is the same: the question of the ultimate ground of knowledge of that which is, the ultimate ground of meaning. I want to argue here that, in this course and those that follow, as well as the planned Aristotle book that Heidegger never completed, he is offering a modern alternative to the *Metaphysics* for his own particular historical situation. Indeed, if we look at the various “Aristotle texts” in this period of Heidegger’s career together, a striking similarity to the *Metaphysics* becomes visible. We could almost be tempted to become our own Andronicus of Rhodes and assemble them together. What we have is a set of inquiries into a basically coherent object domain: the domain of the *Metaphysics*. But Heidegger’s results are not Aristotle’s. Indeed, as Heidegger reminds us, they are not results so much as indications, indications that point in the direction of the science of the *Metaphysics*.

Like Aristotle, Heidegger begins with a question. In the *Metaphysics* Aristotle asks if there is such a science. Heidegger, following his earlier insights, asks: “What is philosophy?” but conceives of this question precisely as one of the possibility of access and expression. (In essence, we could reformulate Heidegger’s question as: “Is there philosophy?” and not lose his intrinsic meaning.) Both questions (Aristotle’s and Heidegger’s) are rhetorical. They are doors that open into the realm of further
questioning, indeed, of the most difficult and basic (pertaining to the base, *ground* level) questioning.

In the *Metaphysics* Aristotle inquires into the most basic realm of questionability. He inquires into the possibility and features of a science of the ultimate ground for scientific understanding of that which is. This is directly related to his account of demonstrative scientific knowing in *APo*. The science of ultimate ground is the science of the ultimate guarantor of theoretical knowledge, which, for Aristotle, is the highest form of knowledge, rooted in necessity, which permeates the world through aetiological chains that inhere in all that is. Heidegger’s conception, we already know, is different. But the “science” he is pursuing (though at this point he would not take kindly to the term) is still the science of ultimate ground.

For the Heidegger of this period the ultimate ground is in factical life itself (and in the particular way in which we can relate to factical life in the cognitive comportment of philosophizing). But, for Heidegger, this relation is one of absolute questionability. And factical life, as that which confronts us, is not necessary, like Aristotle’s unmoved mover, or the God of Heidegger’s student years; instead, it is radically historically contingent. The world in which I find myself and the understandings available to me, the very modes of access itself even, are conditioned by historicality. The factical, which Heidegger posits as ultimate ground, is contingent through and through, and Aristotle believed that we can have no knowledge of the contingent. Heidegger instead, asserts that we can have no knowledge of that which is not contingent. The core of his re-interpretation of the metaphysical project lies in this radical reversal. Necessity and contingency have changed
places; our knowledge is grounded in the contingent (facticity) and we can have no knowledge of the necessary.

Heidegger’s concerns, like Aristotle’s, are aetiological. But he substitutes a contingent aetiology for Aristotle’s universe of necessary aetiological chains. The vital question that now arises, however, is the very question of relativism and scepticism that Aristotle meant to do away with. If the grounds of our knowledge (grounds of meaning) are ultimately contingent (based on facticity), then there is no real knowledge (in Aristotle’s sense), just an endless host of opinions, beliefs, and assertions. Aristotle recoils from this possibility in horror. But Heidegger embraces it. He tells us that we must embrace ultimate questionability, that scepticism is the beginning and end of philosophy, that we must jump into the drifting boat, etc. And yet… And yet Heidegger is perhaps not so thoroughly bold as all of that might make him seem. He is bold, certainly, but he does not reject ultimate meaning entirely, and embrace a thoroughly relative universe of relative meaning; he holds onto an ultimate ground for meaning of a sort. Instead of a source, Heidegger poses a way to have ultimate ground. Ultimate ground is not to be found in a source but a relation.656 There is, according to Heidegger, a particular way of philosophizing that gets out of the relativistic trap, but, paradoxically, it involves fully embracing and plunging into that very relativism. Ground, for Heidegger here, is a how; it is a grounding. It is a particular way of relating to the contingency of factical existence. This is an idea that Heidegger will develop further in the years to come, and it will

656 The echoes of Kierkegaard can be heard resoundingly here.
become codified (and eventually ossified) in the account of “authenticity” in Being and Time.

In the Phenomenological Interpretations to Aristotle Heidegger’s account of this relation is as follows. The definition of philosophy that Heidegger eventually arrives at is that:

Philosophy is cognitive comportment, at the level of principle, toward beings in terms of being (sense of being), specifically such that what is decisively at issue in the comportment and for it is the respective being (sense of being) of the possessing of the comportment. …philosophy is ‘ontology,’ indeed, is radical ontology… or ontological phenomenology.\(^{657}\)

Philosophy is a particular comportment to the ground-level of understanding of being (we are in the territory of the Metaphysics here). This is a formally indicative definition; it says nothing about content. At issue is the sense of being, the ground of our understanding of what is, the ground of meaning.

Heidegger indicates that we must appropriate the situation in which understanding is rooted.\(^{658}\) The situation, in its crucial how and toward-which must be appropriated properly. The situation is conditioned by historically contingent factual life. It is not just any situation, but my situation here and now. And it is grounded in my factual life. The situation is contingent.

Heidegger then proceeds to explore the basic categories of factual life, to examine its structural features, emptied of any specific content, by way of formal

\(^{657}\) Heidegger, Phenomenological Interpretations of Aristotle, p. 46.
\(^{658}\) Ibid. p. 32.
indication. The basic categories of factical life will be largely familiar to us now from previous courses. Factical life exists in a world and has different worlds in different ways. Factical life, as life lived, is relational. As living, I relate to the world, to others, to myself, and to the very living of my life itself. Heidegger describes the fundamental relational sense of life as caring. As the kind of beings that we are, we are as caring. Living life is caring, always and at all times, whether we reflexively pay attention to this, or just do it, caring is always what we are doing.

Heidegger unpacks care in this course, delving into the basic categories of this relational sense of life. Of particular importance for us here is our avoidant, fearful care over care itself, over the groundlessness and contingency of our factical existence. This concept has its roots in Heidegger’s Augustinian discussion of Cura and will eventually turn into the Angst over being-in-the-world itself that prompts inauthentic fleeing into The They in Being and Time. But for now, all we need to know is that our existence, as care, means that we also care about our existence, our understanding, and our own caring, and this makes the contingency of facticity feel troubling. (Aristotle, I think, would have no difficulty seeing what was troubling about this account!)

We should particularly note our worry over our understanding here, both because it lies at the root of Aristotle’s researches in the Metaphysics and their relations to APo, but also because Heidegger specifically ties the issue of care to understanding through our core concern: meaning. According to Heidegger the relational sense of life is caring. And the character of the world in caring is meaningfulness:
Living, in its verbal meaning, is to be interpreted according to its relational sense as *caring*: to care for and about something; to live from [and on the basis of] something, caring for it. The character of caring does not imply that life is one long woebegone affair. In unrestrained rapture, in indifference, in stagnation—here, as everywhere, ‘to live’ means to care. What we care for and about, what caring adheres to, is equivalent to what is meaningful. *Meaningfulness* is a categorial determination of the world; the objects of a world, worldly, world-some objects, are lived inasmuch as they embody the character of meaningfulness.\(^659\)

Meaningfulness is a categorial determination of the world. We experience the world as, in, and through meaningfulness; what we care about is encountered as meaningful and, indeed, is equivalent to what is meaningful. Indeed, *what is*, as it is experienced by us, is experienced as meaningful. Even an entirely new phenomenon is experienced in terms of meaning, in terms of a “I don’t know what that is,” “It does not fit into my categories,” etc. which is to say that even the privation of assigned meaning, is a meaning relation, precisely as a lack or a not-yet of meaning assignment.

Heidegger asserts that the meaning-character of the objects in the world is “a character that is in no way founded.” And he goes on to say that this “means that we must keep at arm’s length an especially intrusive theory of objectivity as such.”\(^660\)

\(^{659}\) Heidegger, *Phenomenological Interpretations of Aristotle.* P. 68.

\(^{660}\) “Every experience is in itself an encounter and indeed an encounter in and for an act of caring. The basic character of the object is therefore always this: it stands with, on the path of care; it is experienced as meaningful.” And, “Self-sure objectivity is insecure flight from facticity, and this objectivity mistakes itself precisely in believing that this
meaningful character of the world, the meaningfulness operative in our experience as we live our lives is not something that has a ground such that it can be explored aetiologically through the methods of demonstrative science (in the mode of *APO*). And thus, importing the particular modes and conceptions of objectivity from the demonstrative sciences is inappropriate here. Meaningfulness is, in fact, a principle, a starting-point and base-categorial determination rather than something for which a ground can be determined.

And yet, because of the very nature of our caring comportment to the world of meaningfulness, because the world, as meaningful, is of concern to us, this very groundlessness of meaning is troubling. We may think of this another way by posing a question to Aristotle: “If all men, by nature, desire to know, and we know through the grounds, then what happens to our desire when we reach the grounds? Do we not then desire to know the grounds of the grounds, and so on, *ad infinitum*?” Aristotle recognises this as a problem and is at pains to argue that we stop our process of knowing through grounds when we reach them (no infinite regress and no circle of grounding) and that, rather than knowing the grounds themselves aetiologically, we instead know them through noematic grasping, which, as the kind of knowing proper to the principles themselves, is a methodological starting point for the aetiological knowledge that can then follow. Here Heidegger and Aristotle are remarkably close to one another, and yet very far away. Heidegger too believes that noematic grasping rather than aetiological determining is at play when we come to know principles and grounds. But whereas, for

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flight increases objectivity, whereas it is precisely in facticity that objectivity is most radically appropriated.” Ibid.
Aristotle, these principles are eternal, for Heidegger they are historically conditioned. For Aristotle, we can come to the correct understanding of the universe; for Heidegger, we are always trapped within modes of understanding and pre-conceptions that are historically determined. We live within a horizon of options. And again, this relativity is troubling.

The distressing nature of the groundlessness of our grounds seems psychologically intuitive; insecurity is generally troubling. In the nineteenth century Kierkegaard had already produced one of the most penetrating accounts of existential angst ever written. For Kierkegaard this angst is anxiety in the face of the vast groundless abyss. And Kierkegaard is not far from Heidegger’s thoughts in this period. In the loose pages for the course he includes 2 “mottos,” either for the course itself or for the proposed book that Heidegger was to attempt to make out of the course.661 Heidegger’s own notes indicate that these are to give the student/reader an impression of his goals: “In order to characterize the intention of the interpretation, I cite a motto, which is prefixed to this introduction to phenomenological research.”662 The mottoes are:

“All of modern philosophy is based on something which both ethics and Christianity would consider a frivolity. Instead of deterring people and calling them to order by speaking of despair and exasperation, it has winked at people and invited them to pride themselves on doubting and on having doubted. For the rest, philosophy, as abstract, floats in the indeterminateness of the metaphysical.

661 Van Buren indicates that the course itself opened with the mottoes. Van Buren, The Young Heidegger. p. 223.
662 The heading in Heidegger’s notes reads: “Motto, along with a grateful indication of the source.” Heidegger, Phenomenological Interpretations of Aristotle. P. 137.
Instead of admitting this to itself and then pointing people (individuals) to the ethical, the religious, and the existential, philosophy has given rise to the pretence that humans could, as is said prosaically, speculate themselves out of their own skin and into pure appearance.” [From *Exercises in Christianity*]

And:

“On the contrary, what both Philosophy and the philosopher find difficult is stopping.” [From *Either Or*]^{663}

To these two mottoes form Kierkegaard, Heidegger adds a third and fourth from Luther, that harsh critic of Aristotle (“that damned blind pagan, that three headed Cerberus” etc.)^{664}. “For we no sooner leave our mother’s womb than we begin to die.” [From the *Narrations on the first Book of Moses*] And: “Therefore see to it that you do not drink wine, if you are still a suckling. Every doctrine has its measure, its time, and its age.” [From the *Preface to the letter of St. Paul to the Romans*] Citing Luther and Kierkegaard as inspiration for a course on Aristotle must have seemed like a strange move for his students. And yet these mottoes make a great deal of sense in terms of Heidegger’s own development and his primary concerns. He was not interested in the scholastic Aristotle, nor in the Aristotle of the modern “realist” response to neo-Kantian idealism. Heidegger was interested in a philosophical engagement with Aristotle that promised the potential

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^{663} Ibid.

^{664} “For Luther, Aristotle was that damned blind pagan, that three headed Cerberus. Luther’s attitude is clear enough from his 1517 Disputation against Scholastic Theology, which argues, amid much else, that the whole of Aristotle is to theology as darkness is to light and that no syllogistic form is valid in theology.” Donnelly, J. P. “Italian Influences on the Development of Calvinist Scholasticism.” *The Sixteenth Century Journal*. Vol. 7, No. 1, (Apr. 1976), pp. 81-101.
for much more and much less than that. His ground-level concerns not only lay beyond and before scholasticism, but beyond and before the realism/idealism distinction as well.665

The four mottoes that Heidegger proposes plot out the four corners of his intentions in this Aristotle interpretation. Our usual, comfortable sense and practice in modern philosophy covers over the true difficulty of the primal questionableness of real philosophy, as a cognitive comportment. It makes category mistakes in its proclamation of its ability to provide answers within all realms of inquiry (the ethical, the religious, for instance… just as these realms must not provide the answers for philosophy so too philosophy must not provide the answers for these domains). And philosophy, by its very questioning/questionable nature has great difficulty in stopping. Reaching limits goes against its nature and inappropriate relations with limits are what prompts philosophy to go astray in unfruitful directions. There is a relation between this difficulty of philosophy in regard to limits, and especially to our ultimate limit, our own deaths, which will become an increasingly important indicative phenomenon for Heidegger, leading up to and in Being and Time. And, finally, historical contingency plays a powerful role in the processes of life and of philosophy. We exist within a horizon of interpretive possibilities, within a realm of open and closed problem situations, alive or dead questions, and

665 “To interpret what is meant by saying that the world ‘is there’ (i.e. to interpret the character of the actuality of the world of factical life) is neither as easy as transcendental theory of knowledge imagines nor so self-evident and unproblematic as realism believes. From this objective, primary sense of content, we can first determine, in any particular case, the character and sense of existence, actuality, and reality.” Heidegger, *Phenomenological Interpretations of Aristotle*. Pp. 68-9.
frameworks both for inquiry and for answering. “Every doctrine has its measure, its time, and its age.”

The ground is already prepared for Heidegger’s account of this troubling aspect of life. His account of the phenomenon of “ruinance” has its roots in Augustine’s notions of molestia, the lust of the eye, and the oneri mihi sum and its avoidance. Now Heidegger will chart, structurally, the way we tend to flee the questionable groundlessness or groundless questionability of our grounds. This will eventually transform into the existential account of falling in Being and Time. In this course, it will act as a focal point for Heidegger’s exploration of the whole nexus of our concerns: meaning, ground, understanding, necessity, and contingency.

Heidegger argues that the “ordinary theories reverse the nexus of grounding,” believing that they can provide grounds for factical life, as experienced, when, in fact, factical life is the only staring-point, origin, and ground for our understanding. Universal validity, as an ultimate end of aetiological determining, Heidegger adds, is a vain dream that, again, misunderstands the understanding’s relation to factical life. Life, Heidegger asserts, “mistakes itself,” “mis-mesures itself.” Interpretation quails at the difficulty (ultimate impossibility) of its task and eludes the problem by giving itself answers and “making things easy.” Life, concerned about itself, tends to conceal “the

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667 Heidegger specifically ties this discussion to Aristotle’s concept of the middle path in the Nicomachean Ethics. Ibid, pp. 77-81.
insecurity announced in factical life.” Heidegger calls this overall tendency of life, “ruinance” and “collapse.”

Factical life, Heidegger argues, has a particular movedness. We are always moving in life. In our concernful going about in factical life we are constantly directing our thoughts, our concerns, our actions, our lives as we live them. This directed movement, according to Heidegger, is an auto-motion. We ourselves do the moving. “Life, in its caring, ‘is’ this movement.” Understanding itself cannot be understood without this sense of movement:

This indicates, negatively, that knowledge, i.e., cognition and its various formations, such as the sciences and philosophy, cannot be interpreted in isolation. Yet that does not mean that we have grasped these connections adequately if we simply see and proclaim that knowledge has practical significance (its goal is practical) and that knowledge arises out of a practical context, from practical motives. That is merely an extrinsic annex, built front and back from the same bricks as earlier ‘housing.’

“Let this be a warning,” Heidegger says, “against the notion that we could resolve these things with some sort of dialectical pleasantry.” Instead, Heidegger aims to further develop his formal indication of movedness (which itself has various categorial divisions and moments), and focuses particularly on the modes of movement that he distinguishes as “relucence” and “prestruction” (die Reluzenz “reflection of light,” which he derives

668 Ibid. p. VIII.
669 Ibid. p. 94.
670 Ibid. p. 95.
671 Ibid.
from the Latin *reluceo*; and *die Praestruktion*, literally “pre-struction”… both words are as unusual in German as the English equivalents).

“Relucence” indicates a categorial determination of life’s movement in its *inclination*. “In itself,” Heidegger says, “life possesses a particular weight… What life encounters in its inclined caring, and how it encounters this is life itself.”

Our inclined movement in life is out of, from, and towards factual life itself. Inasmuch as life itself is what caring cares for and about, life matters to itself; it has weight. “Inclination is thus reflexive and in that way comes back toward caring life itself.”

In this reflexivity, with its strong echoes of Kierkegaard, life “casts light upon itself:”

Life, caring for itself in this relationality reflects light back on itself, which produces a clarification of the surroundings of the currently immediate nexus of care. As so characterized, the *movement of life toward itself within every encounter* is what we call *relucence.*

“Prestruction” indicates life’s tendency to build interpretations, within which it then functions:

Through its world and with it, life is relucent in itself, i.e., relucent of itself as a life of caring. From the mode in which things offer themselves to be encountered, the life of care fulfils its need for directives to guide the care; from the relucent world life makes its claims and measures itself. Life begins to build out from this world and for it. Life establishes itself following the sense of its projection and of

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672 Ibid. p. 88.
673 Ibid.
674 Ibid. p. 89.
its appropriated *pre-possession*. It assures itself with a pre-possession and cares for itself in explicit or implicit reference to it. In caring, life is always projecting, beginning to build; in being relucent, life is at the same time *prestructive*. Life has a “tendency to security in this prestruction (which is itself grounded in reluence)” that can be more or less suppressed or allowed to run amok. Life can become self-satisfied in its pre-structured (and pre-structuring) interpretations and cover over its basic questionability, though both tendencies (reluence and prestruction) are always at play, to a more or less noticed and cognitively acknowledged sense at all times. It is life’s self-satisfied tendency to cover over its groundlessness and questionability that Heidegger calls *ruinance* (*die Ruinanz*, from the Latin *ruo*, “to collapse”).

In ruinance we lose an explicit cognitive grasp of the “insecurity resident in factical life,” This leads, according to Heidegger, to our mistaken belief that factical life can itself be grounded, that we can possess knowledge of absolutes, etc. Ruinance

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675 Ibid.

676 The tendency to security in this prestruction… can be quite suppressed, so much so that cultural activity and cultural life (active comportment toward values) are interpreted on the basis of self-satisfied life as closed off in themselves, autonomous and positive. This means that the tendency to security, which has elevated reluently to the mode of a positively creative work, can, as such, become lost (whereby a basic peculiarity of the movedness of life expresses itself: ruinance, ossification). Along with it is lost the possibility of a vital encounter with that against which the tendency to security sets itself, namely an *insecurity* resident in factical life. From here, the philosophical interpretation is one step away form determining life itself, in its entirety, encompassing its worlds, as something Objective and, in that sense, the fundamental reality.” Ibid. p. 89.

677 The problem with this is that the false sense of objective reality that it creates “would build out from itself (and flow into) all forms of life, and the sense of these forms would be seen in the working of such infinite processes of building and producing. Then what is encountered in the experience of life and in the preconception of the grasp of life is nothing that could specifically lead the grasping intention toward facticity.” Ibid. pp. 89-90. Thus, *toward* this presumed universal objectivity leads *away* from factical life, the sheer *thatness* in which we find ourselves.
leads to the mistaken conception of objectivity that we project onto factual life; it leads to our projecting necessity onto that which is fundamentally contingent. It leads to a mistaken belief in a necessary ultimate ground of meaning, rather than, as Heidegger proposes in this course and will develop further in the courses that follow, a fundamentally contingent ultimate ground in facticity itself.

Heidegger’s preliminary account of ruinance sounds slightly mystifying, but he is attempting to describe a difficult structure within factual life for which adequate language is lacking. He introduces his account as follows:

This movedness of factual life (a movedness which as such is produced by the world of factual life), as it develops itself in the way and as it thereby intensifies, in procuring itself for itself, can be called ‘collapse’; it is a movement which by itself forms itself – and yet not by itself but by the emptiness in which it moves; its emptiness is its possibility of movement. Thereby we acquire a basic sense of the movedness of factual life, a sense we can fix in the term ‘ruinance’ (*ruina* – collapse).

A formally indicative definition would therefore determine ruinance as follows: the movedness of factual life which ‘actualizes’ and ‘is’ factual life in itself, as itself, for itself, out of itself, and, in all this, against itself.\(^ {678}\)

Ruinance occurs because of factual life’s prestructive tendency, which can lead to the false attempt to ground factual life in some sort of necessary absolute, the very concept of which, itself, can only arise out of contingent factual life. This pre-struction builds

\(^ {678}\) Heidegger, *Phenomenological Interpretations of Aristotle*. P. 98.
itself out of itself\textsuperscript{679} and yet, ultimately, its true ground is in contingent factual life, even though the self-satisfied pre-strection pays no heed to this and, in its desire for the solidity and security of necessity, covers it over.\textsuperscript{680}

This is the problem of access to the primordial realm that we already encountered in the earlier courses, but the focus has now shifted from the immediate access that we \textit{can} have, to that which stands in the way. As Kisiel put it in 1988:

Contrary to the earliest semesters, which underscored the spontaneous self-understanding inherent in life, WS 1921-22 explores the movements which work against the understanding of life in its fullness, all of which amount to the movement of ‘ruination’ (\textit{Ruinanz})…\textsuperscript{681} Accordingly, the actualization of philosophizing first calls for a ‘counter-ruinant movement’ through questioning, if its is eventually to move along with life in the way it lays itself out and articulates itself in its fullness. In short, the earlier courses asserted the possibility of this

\textsuperscript{679} Ibid. p. 95.

\textsuperscript{680} In the course as delivered Heidegger had barely begun his section on ruinance when he interrupted it by inserting the first portion of a separate text (included in the published version of the course as an appendix), entitled: “Presupposition.” This text argues that all philosophical explorations begin with presuppositions and that authentic philosophizing must begin with a presupposition that is sufficiently radical and explicit (a degree of self-awareness about one’s presuppositions, which are always present, is necessary). Heidegger ties the discussion to issues of grounding, arguing against grounding in a \textit{what}, and for true grounding in philosophizing in the \textit{how} of comportment, in seizing genuine questionability. Philosophy has its grounds differently than the sciences, and Heidegger argues that philosophy, when it is done right (by his standards) is counter-ruinant. As Kisiel puts it: “The true having of philosophy is not in the cognition but in the comporting, the persistent bearing toward inchoate being.” Kisiel. \textit{Genesis}, P. 235.

intensified co-movement with the self-interpretation of life which the phenomenological goal of getting ‘back to the things themselves’ calls for, whereas WS 1921-22 explores the obstacles inherent in life itself which prevent this ‘reflective’ return to an authentic understanding of life. And, from the very beginning, this co-movement with the way life understands itself, and articulates itself, a movement which itself is inherent in life, was called history.\textsuperscript{682}

Our historical contingency poses the great problem for philosophical exploration… it is the contingency in the face of which we wreck our ship if we take necessity as our guiding star.

The concept of ruinance is difficult; the text that describes it is difficult,\textsuperscript{683} and Heidegger eventually transforms this concept into that of “falling,” which means that ruinance is often overlooked or given only a glancing notice by scholars, and then often only as a precursor to falling. But it is a crucial moment in our story, so we need to look at its actual significance in its context. The few people who have paid the concept particular attention on its own terms and in its own right are to be commended, but I do not think that they have got it exactly right.

\textsuperscript{682}Ibid.
\textsuperscript{683}In one of the few studies devoted to the concept, Hans Ruin notes that “The section on \textit{Ruinanz} constitutes one of the most dense and difficult text from this period.” Ruin, Hans. “Thinking in Ruins: Life, Death, and Destruction in Heidegger’s Early Writings.” In \textit{Comparative and Continental Philosophy}. Vol. 4 No. 1 (2012), pp. 15-33. P. 16. My account agrees in part with Ruin’s, but differs significantly as well. I agree that “The year 1920-21 signifies an important turning point in Heidegger’s philosophical orientation, in some ways more decisive than the famous ‘turning’ a decade later” (p. 15), and with his basic characterisation of Ruinance as “a designation for life which relates in profound ways to the very possibility of life’s self-explication, to the nature of philosophical language, and to philosophical critique.” (p. 16). But I find some of his more detailed arguments less convincing.
Morecambe Bay in Northwest England is a large, flat, tidal expanse that lies along an ancient foot route to the Furness peninsula. Travellers can cross the ever-shifting sands at low tide, but they run many risks. Pools, deep mud, and quicksand are constant problems, and the path across solid ground shifts constantly. The low, flat nature of the bay means that the tide rushes in at an alarming rate and many lives have been lost to the sea in this place. The Crown has supported an official “sand pilot” to guide travellers safely over the sands for centuries. Heidegger’s early terminological landscape is strikingly similar. The ground is unsure, terms shift constantly, they come and go with great rapidity and the consequences for a traveller can be disastrous. It is easy to lose one’s way here. And the instructions from any one guide never represent a permanent map. We are travelling along a particular route through the sands of Heidegger’s early thinking, and it is easy to lose one’s way, to get lost in another set of concerns, to be lead along a branching path that may leave our own concerns behind.

The intellectual-historical moment of Heidegger’s Aristotle course represents such a place where many paths intersect on the ever-shifting sands of his engagement with a host of philosophical, religious, and cultural issues and problems. From this point we can be led down the teleological road to *Being and Time*, we can delve deeper in to Heidegger’s religious explorations, his deep and fundamental engagement with Luther, which is directly tied to his engagement with Aristotle. Likewise, we can chart his continuing phenomenological-methodological evolution, his continued dialogue with Husserl, in which Heidegger will move further and further away from the master. Heidegger’s cultural criticism, his developing thoughts on language, and so forth,
represent further tracks that we can follow. But we must stick to our own path, and pay particular heed to our own concerns, so that we may avoid being led along a road that leaves them behind. This is all a rather long-winded way of indicating that, at this point, much must be left out of the discussion that may interest Heidegger scholars in particular, but that is not the primary concern of this study: tracking the development of an intellectual-historical engagement with the problem of meaning. The following description of the crux-moment of Heidegger’s Aristotle engagement for our story thus focuses on the particular issues of meaning and understanding, necessity and contingency, and ground; and it leaves out many other important issues, such as a deeper exploration of the religious aspect of Heidegger’s engagement with Aristotle. With that said, we return to the narrative.

The Crux

Heidegger dives into the concept of ruinance following the momentum of his analysis of life’s movedness. But it may help here for us to step back and look at the concept in terms of the earlier discussions and assertions that it presupposes. Heidegger had already proposed a concept of philosophy as primordial questioning. In the Aristotle course he refined this position and developed a definition of philosophy as “cognitive comportment, at the level of principle, towards beings in terms of being (sense of being) specifically such that what is decisively at issue in the comportment and for it is the respective being (sense of being) of the possessing of the comportment.”684 Philosophy is a particular how of questioning that keeps questioning open in its questionability. The

twin problems of access and expression were crucial for Heidegger. Philosophy, as a questioning about the sense of being, runs into problems with ruinance. “Ruinance can be understood as a categorial moment of a sense of being,” he tells us. As such, it is an obstacle for philosophy. But it is also inescapable. How does it arise?

The basic essence of factical life is care. Caring is what we are always doing; we fundamentally are care. We care about the things in the world we deal with, but we also care about ourselves, and, in a reflexive way, care about that caring. We encounter things in the world through meaning. We relate to everything through meaning. Therefore, we relate to ourselves and to being (we still have not lost track of Aristotle’s *Metaphysics*) through meaning. Thus, in our caring about ourselves we care in terms of meaning (in an interpretation). The same applies to our relation to being itself.

Now, the standard Heidegger story goes that our concern about ourselves leads to anxiety over our groundlessness, and thus we ender directly into the problem of *Angst*, relations to Kierkegaard, existentialism, and so forth. But for our story it makes sense to make reference to Aristotle again here. “We all desire to know,” says Aristotle. In Heidegger’s terms we can say that, as caring, when we encounter things we take them into our understanding (in terms of and through meaning) by interpreting them (or taking up an interpretation of them) in and as an act of our caring (which, again is what we are always doing; it is the most basic description of human living). “We know things when we know the why,” says Aristotle; we know things when we know the ground. This, of

\[685\] Ibid. p. 100.
course, leads to the questions of the ground of grounds and the possible guarantor of
grounds. Heidegger, however, sees the problem differently.

For Aristotle there is a harmony between the universe as it is and the universe as
knowable.\textsuperscript{686} Heidegger, however, comes after the great crisis of historicism.\textsuperscript{687} The
problem of historical contingency, of historical relativism looms large in his intellectual
life. Speaking about history and European consciousness in 1922 Musil said that, “from
our present perspective, there is a sense of contingency in everything that happened.”\textsuperscript{688}
We have known many truths in our past, and these truths have been supplanted time and
again by other truths.\textsuperscript{689} One could view this as a process whereby mere \textit{claimants} to the

\textsuperscript{686} One could argue that indeed, this is an identity, but we do not need to here.
\textsuperscript{687} What I am calling the crisis of historicism has many roots. The higher criticism, of
Strauss, which no longer treated the biblical texts as the timeless word of God, but rather,
as created human artefacts with their own histories is one such root. The re-thinking of
human history in terms of the long time scale of nineteenth century uniformitarian
geology and Darwinian evolution is another. Dilthey’s historical researches were rooted
in historical relativity. The basic account involves a growing consciousness in the course
of the nineteenth century of the historicality of human experience; our ideas are creations
of particular historical situations; all things human have their histories, and so forth. By
the end of the century the “historicist” idea was quite widespread. See Hughes, H. Stuart.
Franklin. \textit{Modern European Thought: Continuity and Change in Ideas: 1600-1950}.
Feyerabend, Paul. \textit{Conquest of Abundance: A Tale of Abstraction versus the Richness of
\textsuperscript{688} Musil, Robert. “Helpless Europe.” In \textit{Precision and Soul: Essays and Addresses}.
\textsuperscript{689} Benjamin described this wreck of ideas upon the shores of history thusly: “A Klee
painting… shows an angel looking as though he is about to move away from something
he is fixedly contemplating. His eyes are staring, his mouth is open, his wings are spread.
This is how one pictures the angel of history. His face is turned toward the past. Where
title of truth have been “found out” and dethroned, but Heidegger does not. Instead, he
looks at the problem itself, at the process of understanding and truth claiming. Each
historical period exists within a given horizon of knowables, of available interpretations,
understandings, avenues for access, and meanings, which is conditioned and provided by
history; the horizon is historically contingent.

Whereas Aristotle looks out at the universe as a place governed by necessity that
we can know, Heidegger starts with the process of knowing and notes the fundamental
constraints that contingency places upon it. We always start from and are bound by a
fundamental contingency. But, Heidegger does believe that, for the most part, we think
that we know a thing when we have grasped the why, when we know the ground. This is
not, however, a great truth about the universe, but an observed feature of how we still
basically believe understanding works, of the way we believe we understand the world; it
is an observed aspect of human understanding as it functions, rather than a statement
about a necessary relation to the world. Aetiological thinking is a particular mode of
theoretical comportment that Heidegger partly wants to dethrone. I say “partly” because it
is clear that Heidegger believes that this mode of relating to the world has its role to play
in particular contexts, and in much of our lives, i.e., in the particular sciences where it is
applicable, and in much of our general dealings with the world. It should not however,

we perceive a chain of events, he sees one single catastrophe which keeps piling
wreckage upon wreckage and hurls it in front of his feet. The angel would like to stay,
awaken the dead, and make whole what has been smashed. But a storm is blowing from
Paradise; it has got caught in his wings with such violence that the angel can no longer
close them. This storm irresistibly propels him into the future to which his back is turned,
while the pile of debris before him grows skyward. This storm is what we call progress.”
Heidegger argues, be transplanted from its proper theoretical realm into philosophy, which must have its own proper mode of inquiry and explanation.

Still, all men desire to know, and we think we know something when we possess its ground. We are, as caring, and in our caring we interpret the meaning of being and of ourselves. The crucial moment of this problem situation is the conflict between our caring knowing and the grounding-function of that knowing (or of typical modes of it). That is, the problem lies in the groundlessness, the fundamental contingency that lies beneath our knowing. Our desire to know and knowing through grounds seem to face an impossibility of fulfilment. Our ship seems to falter against the rocks of contingency and sink into the abyss beneath. This is the fall or “collapse” of ruinance (“ruinance” again, is literally “collapse” as Heidegger is using the term).

Heidegger says that in our caring we care about ourselves, and as caring, we therefore care about our caring (again, there are strong Kierkegaardian echoes in this argument about reflexivity). Caring, in its actualization, aims at itself. Heidegger describes this reflexive caring as “apprehension,” as a “heightened care.” In this heightened caring we attempt to understand ourselves (caring not only involves understanding as a relation, but is impossible without it, and this relation is a meaning-relation). But, again, our understandings are bounded by the historically contingent horizon of possibility, rather than grounded in necessity. So we take up the terms of our understanding from factual life, from the world around us, the world of our experience in

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690 Ibid. p. 101.
691 Even not understanding something is merely a privative case of understanding.
this particular time and place, in this particular now. The same goes for the ontological 
question, the question of being.

Thus, even when we ask the question about ourselves, or about being, we answer 
in terms of the world. Answers are, of course, readily available; explanations abound in 
the social-intellectual world. Heidegger argues that when we take these up in a 
straightforward manner we lose connection with the problem itself. This, again, is 
ruinance. “Factual life, as ruinant, covers itself up, so to speak, in apprehension!”

Heidegger says with apparent gusto. He continues:

The involvement with the world of care is apparently, in apprehension, a seriously 
adopted task, one which allows no rest, day or night, and to which life has 
supposedly committed itself in full, and yet actually (for apprehension itself, ‘still 
at times’) is a mere letting oneself be pulled along, letting oneself be transported, 
such that thereby every clarification is renounced in the manner of ruinance and 
consigned to ruinance itself.

In taking up answers to the questions of self and being, we take them up from the world 
around us and thus cover over the very questions themselves, whereby we actually get 
further and further away from clarity about these fundamental issues; instead, we cover 
them over.

The desire to know through grounding seems to be a basic impulse of human life, 
a basic mode or feature of the actualization of caring. But the fulfilment of this desire is

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693 Ibid.
ultimately denied us. This, Heidegger argues, leads to a certain “torment” in the apprehension that is the reflexivity of heightened care. This “torment” is not so much a “feeling” as it is a realization of a lack that announces itself. Torment has a “special ability to announce,” Heidegger says, “although this ability does not mediate or even intend any cognition.” It is a

mode… of the desire to claim factual life from out of itself. In torment,

something announces itself as eating away at life. Therefore torment announces an occurrence in facticity (the ‘eating away,’ rankling) in which the object of the eating away also comes into the fore: ‘life itself.’

Life desires to claim itself, Heidegger says. That is, our understanding of ourselves desires to find its ground, but tries to find this ground from out of factual, contingent, historical life (the only place it is actually able to look, as the only place it actually experiences), which, as such, can provide no necessary ground. In this process, time is a crucial factor.

Time, as the historical, which is the contingent context of our life (and understanding), is the obstacle. And the timeless, as the absolute and necessary for all time, is the misleading goal. When we seek an ultimate ground (the fundamental, necessity that Aristotle believed lay beneath the structure of the universe and allowed our understanding of it) we seek the infinite, an answer outside of time, not bounded by time’s historical horizons and the contingency that they contain. The Metaphysics and

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694 Ibid. pp. 102-3.
695 Ibid. p. 103.
696 Ibid.
sections of the *Physics* devote a great deal of intellectual energy to this timeless, necessary, ultimate ground. Heidegger’s work, from here to *Being and Time*, is a work dealing with the same problem, but from the point of view of the acknowledged *impossibility of access* to any such ground.

When we take up answers from the world of factical life – that is, when we take up interpretations of the meaning of ourselves and being as final answers – we avoid the question of this impossibility and cover over the historicality of all human answers (and, we might add, questions). Again, for Heidegger this is perfectly acceptable and even necessary in other modes and realms of thinking (in the individual sciences, in most of our daily dealings with the world, etc.), but when we try to interpret ourselves or being, it is inappropriate and therefore, it is inappropriate for philosophy.

In ruinance, time itself is covered over. “Factual, ruinant life, ‘has no time,’” Heidegger says, “because its basic movedness, ruinance itself, takes away ‘time.’” 697 “All answers have their time,” to paraphrase one of Heidegger’s mottoes for the course from Luther. To miss this point is disastrous for philosophy:

In apprehension, whereby factical caring takes itself into care, ruinant life becomes caught up in itself. Care, understood in terms of its actualization, devotes itself to life more and more and ultimately reposes on it; i.e., factical life desires to bear itself – in its factically ruinant way – and becomes in the end, openly or not, frantic over itself and confused. 698

697 Ibid. p. 104.
698 Ibid.
Ruinance is the collapse of philosophical questioning. True philosophical questioning is ruined by taking up answers inappropriately. Indeed, it is ruined by “content answers” of any kind – hence Heidegger’s insistence on the content-empty structural pointing of formal indication. Ruinance is the collapse and ruin of fundamental questioning, but, as all men have the desire to know as a basic aspect of their being, as philosophical questioning is a kind of movement of care, which we always are, it is also collapse in a much more general and fundamental sense.

Now that we know why and how collapse happens, another question arises, which Heidegger answers in this course: if there is a “collapse,” a fall, where does the collapse lead? Where does it land? 

In general terms, we now ask with respect to the character of factual life as collapse: where does ‘the collapsing’ (or, we can also say, for the object characterized as collapsing, ‘the collapse’) ultimately arrive? Upon what does it crash down; where is its bedrock?

Heidegger’s answer should not be surprising at this point:

Collapse, as the movedness of factual life, does not arrive just anywhere, in a receptive domain or container that would be foreign to its own mode of being, regionally different from it. The collapse cannot fall down upon something foreign to the collapse itself and to its movedness; in other words, there is here, as a matter of principle, nothing that could possibly receive the collapse, which means that the collapse is purely and simply collapse. This movedness as such

699 What is the directionality of the movement of ruinance? Ibid. p. 106.
cannot come to rest in anything which is objective or ontological character would be different from its own… the ‘whereto of the collapse is not something foreign to it but is itself of the character of factical life and indeed is ‘the nothingness of factical life.’”

The answer is, of course, that the collapse arrives nowhere, because there is no ultimate ground for our understanding.

“The nothingness of factical life” is a particular kind of nothingness; it is “the ‘no’ in the factically ruinant, inexplicit discourse of the self-understanding of factically caring life…” We should not, Heidegger argues, conceive of the particular kind of nothingness of factical life in spatial terms; we should not think of it as a kind of emptiness, like a container that can be filled (which is, of course, what we try to do when we take up interpretations from the world in a vain attempt to “fill the gap”):

Originally, the ‘nothingness’ here in question, the ‘nothingness’ of factical life, does not in the least share the sense of the ‘empty,’ since that nothingness is a possibility which precisely does not give a place for something to stand, does not offer accommodation and shelter, does not break the fall of the collapse, does not bring it to an end. On the contrary, the nothingness of factical life is something that factically contributes to the maturation of the collapse…

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701 Heidegger argues that there are as many different kinds of nothingness and no-saying as there are kinds of beings negated: “We see thus that ‘nothingness’ must be interpreted in every case on the very basis of the respective sense of being it negates.” Ibid. p. 109. See Aristotle on the question of negation in Met.
703 Ibid.
This contributing to the collapse Heidegger dubs “nullification” and “nihilation,” and he offers a formal definition as follows:

The nothingness of factical life is life’s own proper non-occurrence of itself in ruinant existence, a non-occurrence brought to maturation by and for factical life itself, within life and within the surrounding world (facticity.)

…The more factical life lives in its ruinant mode of caring, the more urgently and yet at the same time less explicitly does it care about the non-occurrence of itself for itself.704

And yet, in this nothingness, factical life is still there. And, furthermore, it still exists as meaningful (or, as Heidegger would put it at this time: in the character of meaningfulness).

Life is still encountered in, though, and as meaningfulness, even if it is ultimately ungrounded and meaning is thus, ultimately, a contingent phenomenon.705 For Heidegger,

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704 “The ‘non-occurrence’ is not thereby equivalent to its absence at its proper place in an order, such that this place is now empty and the non-existence in it could be observed in Objective cognition. On the contrary, this ‘non-occurrence’ has to do with movement and expresses a mode in which life, within the surrounding world ‘still exists.’ In this way, it is factically ‘still’ there; the ‘still’ is, once again, a characteristic determination of the temporality operative here. Life in the surrounding world announces itself, even in its potentiality for non-occurrence, indeed in such a way that it does not expressly bring itself to the fore but is nevertheless encountered, precisely as unobtrusive, along with the lived world and as such a world. The result is that the world thereby acquires the character of opacity and, despite all its immediacy, remains an enigma, at least in its existence itself and in the way it is encountered.” Ibid. p. 110.

705 The quote in the previous footnote is followed immediately by: “The aforementioned potentiality for the non-occurrence of life in the surrounding world, as a mode in which it is still there to be encountered, indeed, in a worldly way, is constitutive of the specific character of resistance experienced in the objectivity (reality) of the lived world. More particularly, the aforementioned character of life in the surrounding world, that it exists still, a character fused into the modes in which the world is encountered, is constitutive of
the ultimate ground of meaning is to be found in factual life (or, to put it another way, it is factual life), but this is ultimately groundless and contingent. Being in time is the groundless ground in contingency without ultimate necessity.

However, Heidegger’s alternative to the Metaphysics is not a mere anti-metaphysics that simply aims to argue against ontology and for its impossibility. For the Heidegger of this period believes ontology is indeed possible. His negative destruction of Aristotle’s metaphysical project (and the particular connection between the Metaphysics and the Posterior Analytics) is paired with a positive alternative. We can have no ultimate ground in an aetiological that or a what. But, Heidegger argues, there is another avenue, which is to focus on the oft neglected “how.”
Philosophy is still moving too much in a straight line;  
It’s not yet cyclical enough.  
Friedrich Schlegel, Athenaeum Fragment #43

Chapter 4 – Heidegger’s Positive Alternate Ontology and the Refined Account of Meaning in Being and Time

The closing chapter of Heidegger’s first Aristotle course deals with a phenomenon that he refers to as “ruinance” or “collapse.” “Ruinance” describes factual life’s tendency to collapse into itself through our caring concern about our own caring. This reflexive movement within life occurs because we seek to ground our knowledge through interpretation. Another way to look at it is to say, in Aristotelian terms, that we desire to know, and knowledge comes from grounds, yet, in our desire to know ourselves we cannot access the ground. Our inability to access our own grounds, combined with our desire to know leads us to take up interpretations and answers from the world around us (as the only source to which we have access), yet, as this source is from within our own life-experience it cannot, ultimately, provide a ground for that life. The ground is not a ground, and concernful life collapses into the void when it makes the attempt. In our desire for security, permanence, and certainty, Heidegger says, we tend to cover over this basic fact about our life experience (we cover over the void into which the collapse
collapses). And yet it remains as a constant, as a barrier that is no barrier, as a
groundlessness where we search for the most basic ground. The collapse (Ruinanz) that
ensues is, Heidegger tells us, the collapse into the ultimate nothingness of factual life
itself. And yet, Heidegger does not believe that this is a mark of futility that means we
should give up. Rather, he believes that ruinance itself is the entry point for a primordial
and fundamental questioning that we should attempt not only to keep alive and vibrant,
but to heighten in our philosophical seeking. Heidegger’s positive alternative to
Aristotle’s attempts at ontology in the Metaphysics begins and ends with this questioning;
it begins and ends in the freefall of collapse.

In ruinance, in our falling into groundlessness just as we import grounds from our
life experience,

ruinant life becomes caught up in itself. Care, understood in terms of its
actualization, devotes itself to life more and more and ultimately reposes on it;
i.e., factual life desires to bear itself – in its factically ruinant way – and becomes
in the end, openly or not, frantic over itself and confused.706

Aristotle had encountered this problem in terms of our desire to ground the grounds, to
try to provide grounds for grounds through infinite or circular grounding (both of which
he rejected). It is the desire, and then the demand for necessity, for the absolute, for
permanence, in the fact of the historical contingency, the indeterminateness, and the
impermanence of the world that confronts us.

The groundless “nothingness of factical life is something that factically contributes to the maturation of the collapse” Heidegger tells us. And “thus it is an emptiness which is precisely disastrous for the collapse itself.”\footnote{707} And the nothingness, or the “not” of factical life “resides in the very structure of facticity” itself.\footnote{708} Life itself creates the collapse; our desire to avoid it, far from relieving us, in fact merely heightens it. How are we to find a way out? Heidegger’s answer is that we do not. Heidegger argues that authentic philosophy will seize the contingent and unceasing questionability of our existence, keeping this questioning itself alive, rather than stifling it by attempting to fill the void with content. He calls for an embrace of “the proper immediacy of a quite genuine questionability”\footnote{709} as the “how” of philosophizing (which, properly understood is a comportment toward beings in terms of their being – a how of relating, rather than a content).

This authentic relation to questioning, rather than taking up content, this “cognitive comportment to beings in terms of their being,” is a kind of self-grounding movement that recalls Heidegger’s description of the circular grounding of primordial philosophy in the earlier courses. This is an explicit break with one of Aristotle’s central beliefs (that there can be no such thing as circular grounding), and it occurs because Heidegger also rejects another of Aristotle’s central beliefs (that we can have no knowledge of the contingent). For Heidegger, all of our knowing is a relational action, and it is ultimately contingent. The ultimate ground is factical life itself, because that is

\footnote{707} Ibid. p. 109.  
\footnote{708} Ibid. p. 110.  
\footnote{709} Ibid. p. 112.
all we experience; and factual life is ultimately contingent. Here we find the core
difference between Heidegger and Aristotle. And though they examine the same subject
domain, their fundamental disagreement on this key notion regarding necessity and
contingency, means that, in the end they are worlds apart.

For Heidegger at this point, philosophy is not the theoretical search for necessary
knowledge that it was for Aristotle. Rather, “insofar as it claims to be authentic
philosophy” it puts itself “all the more into question…” Heidegger expands on the
consequences of this notion as follows:

This now means, however, that our interpretation of the immediacy of the
encountering world, namely, that it is an immediacy brought to maturation in the
ruinance of caring (in other words, our disruption of the tendency to take this
immediacy as the paradigm case of the self-giving of an object), is for its part
grounded in the fact that this ruinant maturation itself – i.e., the specific
movedness of caring; i.e., this basic aspect of the relationality of life; i.e., this
approach to life as the fundamental phenomenon (with the directionalities of the
relation to, actualization of, and maturation of the object) – does come to be
experienced, specifically in such a way that these concrete experiences serve at
the same time to motivate the preconception for a knowledge of principles.

We need to begin within an observation of our ruinant comportment, within an
observation of fundamental contingency. The ultimate ground, contingent though it may
be, is factual life itself:
Can we not see, and do we not factically see today, in the immediacy of life in the world, the beginning and end of vital comportment? Does factical life not thereby have precisely its well-rounded closure as well as a vitality which is unsurpassable in its ever newly filled abundance of structures that can be developed and carried out?\footnote{Ibid. p. 112.}

Factual life is the abundant source-ground, the font of the meanings that we can explore. And yet, it is fundamentally contingent; and this is not a satisfying ultimate ground by Aristotle’s standards.

Factual life is always, in a sense, “derived,” because in factual life we are always already operating within an interpretation of that life and of ourselves. \footnote{“From where, however, does such surging life acquire the proof that its immediacy is not in some way derivative? In other words, does not such immediate life also live in an understanding of itself, even if factical life is only incidentally aware of it?” Ibid.} And this interpretation is always something that we have taken up from factical life (again as the only possible source). We can avoid thinking about this, as we do in ruinance, or, we can delve into the collapse by self-reflexively heightening our awareness of ruinance itself. This is the particular how that Heidegger proposes for philosophical questioning. He frames it in terms of an either/or decision:

Precisely insofar as it is factual, the factically interpretive dialogue residing within the factical actualization of life is a breach in the coherence of immediate life. Thereby ‘life’ is not a momentarily clarified thing but an objectivity whose temporality is extended factically [that is, precisely, not infinitely]. The dialogue carried out by factical life can be a flight from confrontation and can be actualized...
in the mode of a superior unconcern for strains of questioning and understanding that might hamper enjoyment [lead to insecurity and “torment”]. Immediate life itself, however *can* (but does not need to) question the insular and uncontested certainty of its immediacy and can inquire into the possible guarantee [or lack thereof] of that certainty.\textsuperscript{712}

Heidegger continues:

The certainty is questionable by reason of principle, inasmuch as factical life in a surrounding world possesses, as such, a general tendency toward clarification [we desire to know] and even demands such clarification. The philosophical interpretation of facticity puts this *questionability* into effect, indeed not in such a way that it pretends to be able to find, from its own resources, an absolute and eternal decision, but simply such that it concretely brings the questionability to maturation and maintains it in concretely available directions. Thereby, however, it precisely keeps alive the actualization of the access to factical life.\textsuperscript{713}

If the ultimate ground for meaning lies in factical life, which is contingent, then the only appropriate access to this ground of grounds, is through strict adherence to the contingency and indeterminacy itself; that is, the only appropriate mode of access is questioning that follows the traces we find in life without settling on a final and definite content, rather than attempting to fill the box with content as a sort of knowledge-stuff.

The proper philosophical interpretation of facticity (an unending affair that is “performed” but never completed) puts questionability into effect.

\textsuperscript{712} Ibid. pp. 112-13.
\textsuperscript{713} Ibid. p. 113.
It is the interpretation of ruinance itself that is the key insofar as ruinance reveals the groundlessness of factical life, which itself is the ultimate ground of meaning (or the source and domain of meaningfulness to use terms closer to Heidegger’s own in this period). Paying attention to, and questioning the nature of ruinance reveals the nature of the ultimate ground of meaning (which, again, for Heidegger, is a contingent ground of the thatness of factical life that we are always already experiencing and always already interpreting). “The validity claimed by philosophical interpretation is then already satisfied, and already in a proper and decisive way,” Heidegger tells us, “when such factical, immediate life becomes questionable in itself… as long as the motives for that can be brought alive in factical dialogue.” In the questioning itself lies the way. The link between *APo* and the *Met*, that ultimate question of the guarantor of grounds, is to be found, for the Heidegger of this period, in the very lack of a guarantor, in the very questionability of the Aetiological project. As he puts it: “Wherever these motives are lacking, there is no incentive to question the demonstrability of the proffered philosophical interpretations.” When we fail to keep this questioning alive, we end up filling the void with contingent interpretations that merely claim to be eternally valid. Not only then do we proffer contingent interpretations but we delude ourselves by not recognizing them as such and therefore rob ourselves of a vital potential relation to the ontological.

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In the philosophical interpretation of ruinance itself, by keeping questionability open and pursuing it as a comportment, we achieve and exploit what Heidegger refers to as a “counter-ruinant movedness.”

In this way, the interpretation of the directionality of ruinance leads to the interpretation of the objectivity and of the ontological sense of the world, and only thereby does the nexus of movedness become more precisely determinate as one in which something like a counter-movement possesses its sense of actualization as a movement.\(^\text{715}\)

Aristotle would have found these arguments ultimately unconvincing, but Heidegger was operating in a different time and place, after the crisis of historicism – indeed, if confronted on this point, Heidegger could, and I believe would, have pointed to this very feature: the very historical contingency of his own situation and the historical contingency of Aristotle’s situation determined different possibilities for questions and answers.

The counter-ruinant movement is where the particular how of philosophy is to be found. And the how is where we find the ultimate ground for meaning according to the Heidegger of this period. It is a question of a mode of access to the contingent ground of meaning that is factical life, as we live it rather than an external/eternal necessary what that ultimately grounds the merely contingent grounds within factical life. “A counter-ruinant movedness is the one of the actualization of philosophical interpretation, and

\(^\text{715}\) Ibid.
indeed it is actualized in the appropriation of the mode of access to questionability.”716

But this mode of access is difficult to maintain. It is not something that we can have, and then have had once and for all; rather, this particular how is something that must be enacted, in the face of the constant tendency of life to try to fill the void with content, to put an end to the questioning with answers. It is, Heidegger says, “the constant struggle of factual, philosophical interpretation against its own factual ruinance, a struggle that always accompanies the process of the actualization of philosophizing.”717

Heidegger insists here that he is not recommending a mere scepticism. Genuine questioning is also a kind of responding to our own particular factual situation:

This means that maintaining oneself in genuine questioning does not consist in reacting mechanically, as it were, according to an empty maxim that requires nothing but questioning at all times, on every possible occasion, and in any way whatsoever. On the contrary, genuine questioning arises from motives that have been clarified in the respective factual situation and that receive direction from factual life…

The ruinant character of the negative consists precisely in bringing to maturation the nothingness of factual life as the proper factual possibility of ruinance itself, with the result that this matured possibility, in its very maturation, is relucent toward the collapse which its approaching in itself. That is an aggravation of the collapse, which occurs in such a way that it is actualized in the collapse itself, in the proper counter-direction of the collapse, and, in passing through the

716 Ibid.
717 Ibid. p. 114.
movedness of the collapse, constantly encounters nothingness and thereby takes form in the collapse.\textsuperscript{718}

This must have been a lot for Heidegger’s students to take in. Here he is mere paragraphs away from ending the course. The concept is difficult. The task that Heidegger sets for the future philosophers attending his course is difficult. The anchor is gone and the boat is drifting.

Scepticism is important for Heidegger’s formulations here, and he takes what he conceives as genuine scepticism seriously, but he has no time either for the naïve scepticism that merely questions everything or for its easy logical refutations (in which the younger Heidegger took part). Doubting that the world exists, or that we can have knowledge is both stupid and banal for Heidegger; questioning the nature of our knowing is not the same as questioning its existence. As Heidegger puts it:

That there is insight, that I can have cognizance, is to be conceded. The skeptic is the genuine absolutist; he takes formal lawfulness in a radically serious way; i.e., he does not play with it and make out of it a beautiful and convenient world… Skepticism is precisely a matter of knowledge! and, ultimately, of the knowledge of what is decisive.\textsuperscript{719}

\textsuperscript{718} Ibid.
\textsuperscript{719} “And what is decisive? The acquisition and appropriation of the genuine pre-possession and the actualisation of the genuine preconception. Is it guaranteed on the basis of the validity of a formal, objective relation that man has even the mere possibility of access to a region of knowledge? In what could a trust in this possibility be grounded? If it is not a trust based on revelation, then what?” From the loose pages attached to Heidegger’s manuscript (which means that it may date as late as 1924, which, for our purposes, is not a problem). Ibid. p. 147.
Aristotle’s substantive answer to this sort of scepticism, to the question of ultimate
ground, or the guarantor of grounds, is linked with what has come to be called his
“theology” (though Aristotle’s conception of “God” is foreign to many later
interpretations). Heidegger however now rejects any sort of interjection of a religious
ground in God (quite contrary to his position in the Habilitationsschrift) and proclaims
the inherent atheism of philosophy. The use of God as an ultimate ground for meaning is
exactly the sort of answering that Heidegger’s insistence on ultimate questionability seeks
to avoid. The one-time seminarian now writes: “Philosophy itself is, as such, atheistic, if
it understands itself radically; cf. concept of life.” In the schematic alternative to the
researches of the Metaphysics Heidegger has closed that door while he opened another.\footnote{720}

In addition to his “theological” argument, Aristotle has another answer to the
challenge of relativism and scepticism. He argues that the Principle of Non-Contradiction
provides a solid axiological basis for all acts of understanding the world and their
expression in predicative statements (i.e. in science). In Met \(\Gamma\), after arguing that there is

\footnote{720}{Ibid. p. 149. The question of “the religious Heidegger” and “the atheistic Heidegger”
is too big to do justice to here. But it is important not to construe Heidegger’s statements
in an unambiguous way in one direction or the other. In another loose page he expands
more fully: “Questionability is not religious, although it alone might lead to a situation of
religious decision \textit{[strong echoes of Kierkegaard here]}. My comportment to
philosophizing is not religious, even if as a philosopher I can also be a religious person.
‘The Art resides precisely in that’: to philosophize and, in so doing, to be genuinely
religious; i.e., to take up factically one’s worldly, historiological-historical task in
philosophy, in action and in a concrete world of action, though not in religious ideology
and fantasy. Philosophy, in its radical, self-posing questionability, must be \textit{a-theistic} as a
matter of principle. Precisely on account of its basic intention, philosophy must not
presume to possess or determine God. The more radical philosophy is, the more
determinately is it on a path away from God; yet, precisely in the radical actualization of
the ‘away,’ it has its own difficult proximity to God. For the rest, philosophy must not
overly speculate because of that but has, instead, its own task to fulfil.” Ibid. p. 148.}
a science that studies being *qua* being, and that this science will be first philosophy, above natural science and all of the other special sciences, Aristotle tells us that it is the task of the philosopher to examine all things. First philosophy will not only examine substance, but also the axioms (those principles that hold true regardless, which are not principles of the individual specific sciences, but are principles of understanding itself). He tells us that the axioms “belong to the science of the philosopher for they hold good for everything that is and all men use them for they are true of being *qua* being…”

“Evidently then the philosopher,” he tells us “must inquire also into the principles of deduction.” This is just the sort of argument that Heidegger suggests draws us away from the vital questioning of philosophy. Indeed, what Aristotle suggests here is precisely the desire for security and certainty that Heidegger argues we must abandon. And again, the fault-line runs through the connecting ground between *APo* and *Met*, between ontology and demonstrative science. As Aristotle puts it:

But he who knows best about each genus must be able to state the most certain principles of his subject, so that he whose subject is being *qua* being must be able to state the most certain principles of all things. This is the philosopher, and the most certain principle of all is that regarding which it is impossible to be mistaken; for such a principle must be both the best known (for all men may be mistaken about things which they do not know), and non-hypothetical. For a principle which every one must have who knows anything about being is not a

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721 *Met* Γ’ 1 & 2.
723 *Met* Γ’ 1005b 6-7.
hypothesis; and that which everyone must know who knows anything, he must already have when he comes to a special study. Evidently then such a principle is the most certain of all; which principle this is, we proceed to say. It is, that the same attribute cannot at the same time belong and not belong to the same object in the same respect; we must presuppose, in face of dialectical objections, any further qualifications which might be added. This, then, is the most certain of all principles, since it answers to the definition given above. For it is impossible for anyone to believe the same thing to be and not to be…

This is, Aristotle tells us “an ultimate belief; for this is naturally the starting-point even for all the other axioms.” It is also “the most indisputable of all principles.” And Aristotle uses it as a sort of club to strike down the lurking spectre of relativism. He does this in several ways: through a discussion of the meaning of words, arguing that if words could mean their contraries then there would be no meaning, arguing that if things could both be and not be at the same time then there would be no necessity, and arguing ad hominem through the “idiots paradox” that if one were to assert that the Principle of Non-Contradiction were untrue, then one would undercut and invalidate one’s own argument. Aristotle is particularly concerned with the relativistic “consequences of

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724 Met Γ 1005b 9-25 [Emphasis mine].
725 Met Γ 1005b 32-3.
726 Met Γ 1006a 4-5.
727 Met K, a summary book, which may have not been written by Aristotle rehashes and summarises the above arguments in the same basic order as Γ with some additions from other works, including the Physics. “There is a principle in things, about which we cannot be deceived, but must always, on the contrary, recognize the truth, - viz. that the same thing cannot at one and the same time be and not be, or admit any other similar pair of opposites…” Met K 1061b 34-1062a 1.
this” “most indisputable of all beliefs” as they endanger his conception of the universe as inherently knowable through necessary aetiological demonstration. Heidegger, having abandoned this kind of ultimate necessity, likewise rejects this train of arguments.

In his first Aristotle course, Heidegger made several insertions into his main text from a separate section that he labelled “presupposition.” The basic underlying argument of this separate section is that all thinking begins with and operates within a presupposition that we are more or less aware of. Aristotle’s presupposition about the rational necessity of a knowable universe is not an option for Heidegger, living in a very different spatio-temporal historical horizon. Presuppositions are always historically contingent in this way, and they are also conditional; they should not be taken dogmatically, but rather, should be reflexively related to, questioned, and examined.

And here Heidegger too is led to the problems of scepticism and relativism.

This kind of thinking, though, Heidegger argues, comes from within a certain presupposition about knowledge:

Labels such as relativism and scepticism, as well as their opposite, absolutism, are ones that concern knowledge, its possibility and validity and so they are labels that involve, in the first place, a previous consideration of knowledge and, furthermore, the positing of a determinate ideal of knowledge and truth, as well as an ensuing characterization of other determinations with regard to knowledge.

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728 Met 1011b 13-15.
729 We always already exist within a presupposition. And philosophy is counter-ruinant in that it factically appropriates the presupposition in such a way that it becomes visible. Heidegger. Phenomenological Interpretations of Aristotle. P. 121.
730 Ibid. p. 122.
This presupposition is that all knowledge is “knowledge of the Objective order,” which becomes further and further formalised. Heidegger rejects this connection between fundamental philosophical thinking (as cognitive comportment to beings in their being, or *ontology*) and demonstrative science (as in *APo*). Philosophy here is presupposed to be about securing “absolutely valid truth.” From whence comes this presupposition? And why should we unquestioningly accept it? Heidegger suggests that this is an improper importation of a goal and motive from the demonstrative sciences into ontology and he criticizes Aristotle’s use of the Principle of Non-Contradiction as a defence against relativism and scepticism.

There is no such thing as absolute knowledge according to the Heidegger of this period. All knowledge is knowledge as known by a living human subject, who operates within an historical horizon, which conditions her possibilities for knowing. And, one should add, each living human thinks and knows for only a finite amount of time, until they know no more. All knowledge is conditional, contingent, and temporally bounded. Contrary to Aristotle, Heidegger states that “absolute knowledge is but a dream.” “As historiological knowledge,” he continues, “philosophy not only can not, but also must

731 Ibid.
732 “We must then pursue a further consideration at the level of principles: has it been determined, and can it be determined, that philosophy itself, in every field of its knowledge, is supposed to attain… absolutely valid truth? Indeed, that could appear to be so only if we ourselves foist upon philosophy its object, do not at all see its proper and fundamental object, and then attempt to speak of knowledge and even of philosophical knowledge. As long as philosophy cannot provide this certification, as long as we do not childishly close our eyes to the changes to which even the strongest philosophical positions are subject… then we have, as a matter of principle, no right to assign philosophy the standard of absolute truth. In other words, there is, as a matter of principle, no justification for characterizing philosophical knowledge in general as sceptical or relativistic.” Ibid. p. 123.
not, entertain any such dream.”

He calls the idea of absolute truth a “lulling narcotic.” And, in regard to Aristotle’s arguments in *Met* I he says:

We would certainly not be willing to believe seriously that that old chestnut, the law of non-contradiction (according to which, whoever denies absolute truth contradicts himself), determines anything about the possibility of philosophical knowledge, provided we see clearly that here we have a formal-logical argument which in itself is completely empty of determinations of the sense of the actualization of philosophical knowledge and empty of determinations of the sense of the relation of this knowledge to its object. Furthermore, this formal-logical argument, which draws upon the law of non-contradiction for a normative principle, has its own conditioned origination (as can be fully demonstrated) in a logic of a determinate order.

Heidegger’s own forays into ontology must do without such certainties as the Principle of Non-Contradiction. They require a radical re-thinking of what philosophizing, as radical questioning, must be. He begins with the question: What can and do we actually prepossess? And he answers: *not* objective demonstrability through necessity, but an *experience of* and *within* contingent factual life.

The rest of the “Presupposition” reinforces arguments we have already encountered. Factual life is the real objectivity, life is temporal, contingent, historical, and always exists within an ongoing interpretation. There is no absolute for philosophy to

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733 Ibid.
734 Ibid. p. 124.
discover and then build its grand edifice upon. There is no ultimate ground to be found in God, or any other absolute. Instead, there is only the contingent, temporal, and finite ultimate ground of factical life itself. “Life exists precisely as factical; it lives in its world and encounters itself as world…”

Life exists; life is; life is existing… Heidegger is attempting to express life as an ongoing process, that is always in motion. And his solution to the problem of the ultimate contingency of philosophizing is to say that what is important is not the “what” that philosophy grasps, but the “how” of its grasping; that is, there is a particular way of thinking-relating (philosophy as cognitive comportment) that has a particular “binding force,” which binds us to the radicality of fundamental questioning, that provides the “freedom of the possibility of an ever new access within the progress of the maturation of factical life.”

Questioning of the groundless ultimate ground is, in the Aristotelian sense, metaphysical. This kind of fundamental questioning (as cognitive comportment to beings in terms of their being), is ontological. But philosophy easily goes astray. It is hard to keep to the counter-ruinant path of genuine questioning. In the “Presupposition” Heidegger offers an historical explanation for why this happens (in additional to the more strictly ontological explanation already expressed) that introduces a theme he will develop further and further in the coming years: that of a destruction of the history of ontology. In the “Presupposition” Heidegger points to the historical moment of Descartes’ cogito ergo sum as providing a rather disastrous fork in the road. For, instead

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736 It is life’s very “indeterminacy” Heidegger says, that allows from the possibility of genuinely encountering factical life “since this indeterminateness points out the object and yet does not predetermine it.” Ibid. p. 131.

737 Ibid. p. 132.
of focusing on the crucial and deeply problematic *sum*, Descartes (and all of modern philosophy after him) made the mistake of focusing on the *cogito* – hence, the turn in modern philosophy after Descartes towards epistemology, and hence, the turn away from ontology. In the “Presupposition” Heidegger suggests that the *sum* be pursued in all its fundamental questionability, not as a statement of fact (*sum*), but as a deeply problematic question (*sum?*) that cannot be unequivocally answered in the affirmative. There is no eternally valid affirmative in the “*sum?*” I once was not, and I will be not again. The *sum* is a particular, contingent and fundamentally historical being that exists “for a while.”

And in a radically different version of Aristotle’s opening line of the *Met* – that man, by nature desires to know – Heidegger argues that it is *the questioning itself*, that is, *the desire*, or better, the desiring to know itself that is crucial, rather than the data that comes from the pursuit of this desire. What is important is not arriving at “a nexus of theoretical grounding but a nexus of actualization, the *adfectus* – being-to-me!” as Heidegger puts it.

This account represents the tentative but essential beginning of the refined formulations of Heidegger’s ontological/hermeneutical philosophy as expressed in *Being and Time*. It represents the crux moment for our study where, albeit in a rough and unfinished form, Heidegger arrives at a coherent account of the nexus of problems in

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738 Indeed, that man, by nature, desires to know, is a *fundamental* presupposition that Heidegger holds and it informs his work from KNS 1919, through to *Being and Time*, and beyond. This Aristotelian first principle is crucial for understanding Heidegger. Our desire to know itself is a philosophical ground.

739 “Mode of actualization toward (concrete) caring, and in it concern, concernful grasping of something factual as already ‘dispositionally situated’ in an implicit possession, something factual in its genuineness – existence.” Ibid. p. 135.
which we are interested. In September and October of 1922, Heidegger worked on an introduction and prospectus for a book he was planning to write on Aristotle (based on the work he had been doing in his lecture classes).\footnote{He submitted this Aristotle Introduction to two prospective searches for a faculty position at Marburg and Göttingen respectively (this was requested because, although Heidegger had attained a great reputation as a teacher, his lack of publications since 1916, when his Habilitationsschrift was published gave reason for pause). The Introduction was sufficiently impressive for Heidegger to obtain the post at Marburg.} In this Aristotle Introduction Heidegger further refines and polishes the ontological arguments he makes in the first Aristotle course. Summing up his arguments concisely and offering a new, more refined definition of philosophy, Heidegger writes:

The object of philosophical research is human Dasein as it is interrogated with respect to its Being-character. This basic direction of philosophical questioning is not added on and attached to the questioned object, factical life, externally; rather it is to be understood as the explicit grasping of a basic movement of factical life; factical life is in such a way that in the concrete temporalizing \([\textit{Zeitigung}]\) of its Being it is concerned about its Being, even when it avoids itself. Factual life has a character of Being such that it finds its own self difficult to bear. The most unmistakable manifestation of this is factical life’s tendency towards making things easy for itself. In this difficulty of bearing itself, life (according to the basic sense of its Being) \textit{is} difficult, but not in the sense of an accidental quality. When factical life authentically is what it is in this Being-heavy and Being-difficult, then the genuinely appropriate way of access to it and way of truthfully safe-keeping it
[Verwahrungsweise] can only consist in making it difficult. Philosophical research must fulfill this duty, if it does not want to miss its object completely. I quote this passage at such length because here we can see Heidegger’s ideas coming together in a far more direct, concise, and coherent manner than in the first Aristotle course, and it is here as well, though this is not our primary concern, that we can see ideas and connections that point forward to the account in *Being and Time*.

Heidegger speaks of the *object* of philosophical research here, rather than *philosophizing* as an activity (as a cognitive comportment). He still believes that philosophizing is cognitive comportment to beings in terms of their being, but now he shifts the focus. Here he has now determined the point of access, the place of ingress, as our own human Dasein (that is, literally, our “being-there”, Heidegger will later hyphenate this as “Da-sein” in order to call attention precisely to this literal meaning). The point Heidegger is making, is that the point of entry into ontological exploration is properly through the being that we ourselves are, that is, it is through the being for whom its own being is an issue, the being that has access to being as part of its being. But this mystifying Heideggerian language, common now as it has become, is not necessary to understand the point Heidegger is making, and we can, in fact, make the point in our own, more Aristotelian terms without doing any damage to Heidegger’s intentions.

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742 In fact, the famous Heideggerian language, which sounds so obscure and mystical, in fact, arises from Heidegger’s desire to speak precisely about a field for which language beings to fail us. He faces the same problem Aristotle faced in the *Met*, the difficulty of exploring this realm of ultimate philosophical questioning, where our everyday language,
philosophy, the kind of primordial ontological philosophy in which Heidegger is interested included, *is a human activity*; it is something that *we do*. Heidegger is arguing that, if we are to understand this most basic realm of philosophizing, we must begin with that fact. Philosophizing is a way in which the human being relates to what is. Ontology is the human being’s relation to beings in terms of their being. This is first philosophy in the Aristotelian sense; but we must remember that it is still a human activity, or, better, a human *relation*. Heidegger is proposing that the best way to pursue ontology is to *begin by examining that very relation*.

“The basic direction of philosophical questioning” Heidegger tells us, is nothing foreign to us. Man, by nature, desires to know. And this desire to know, if pursued far enough, leads to the fundamental questioning of the ultimate ground that is ontology (here I am presupposing the unity of Aristotle’s aetiological, theological, ontological, and ousiological pursuits in the *Met*[^743]). But neither is the difficulty of this task foreign to us, because we tend toward what Heidegger called “ruinance” in the first Aristotle course. We tend to seek the certainty of necessary grounding and, not finding this at the ultimate ends of our thinking, we tend to flee from this lack and try to cover it over by taking up interpretations and answers from the world around us, ignoring their contingency and temporal particularity, and taking them as timeless, absolute answers. Philosophy, however, must pursue a counter-ruinant direction by making this difficult for us, by plunging into the abyss of contingency and keeping questioning open.

[^743]: See Chapter 3 for arguments for this approach.

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which developed to deal with ordinary everyday concerns, comes us against a subject domain beyond its scope.
In the rest of the Introduction Heidegger rehearses many of the now familiar insights from the previous years, but with new insight into their connections. “The Basic sense of the movement of factual life is caring…” “What is objective exists [ist da ("is there")]] in the character of significance [Bedeutsamkeit ("meaningfulness")].” In our caring dealings with the world (encountered as meaningful, or: in, as, and through meaningfulness) we can self-consciously relate to the beings that we encounter, or we can operate in a sort of auto-pilot mode and do things just as “one” does things without reflexively thinking about the choices we make in this regard. We can either own our choices [“eigen,” self-owning, and thus “eigentlichkeit” which could be translated as “self-ownedness” – accurately but somewhat misleadingly translated as “authentic”] or we can operate automatically and not own them, in which case, our decisions become not our own, but theirs.

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746 This is the introduction of Heidegger’s famous concept of das Man, or “the they” as it is usually translated (though “one” is often more appropriate: as in “that’s just what one does,” “one does not speak in such a manner,” etc.). Heidegger’s point is that, for the most part, we are not entirely self-conscious/reflective in our choices of actions and, more importantly, interpretations; we take these up from the world around us without consciously deciding when we make the choice – we just do what one does. This comes from his studies of Augustine, the concept of ruinance, and it is intended to be an ontological observation without an attendant value-judgement… however, in practice, Heidegger is unable to avoid including a value judgement and often slips into a social/cultural criticism that owes much to Kierkegaard’s critique of inauthentic modern society (see Kierkegaard, Søren. The Present Age. New York: Harper Torchbooks, 1962, for instance).
747 The English word “authentic” has the same literal meaning of “self-owned” but its modern connotations, though they equate to some of the German word’s own modern connotations [eigentlich is commonly used to mean “real”] pose problems.
Factical life always moves “within a determinate interpretedness which has been handed down, or revised, or re-worked anew.” This conditions how we see the world, but also the kind of questions we ask, and, particularly, our expectations. And usually we do not take up our interpretations consciously and self-reflectively, but, rather, slip into them. We take up interpretations from the social world around us. This is because we are bound up in the world, not as a thing in a container, but rather, being in the world is a fundamental part of our existing (is a part of our how and not just our what). And because of this, intimately coupled with our being as care, we tend to become absorbed into the world. Heidegger calls this “tendency towards absorption in the world, a tendency towards letting-on oneself-be-taken-along by the world. This tendency of concern” he tells us, “is the expression of a basic factical tendency of life, a tendency towards the falling away from one’s own self,” which Heidegger also characterises as a “falling prey to the world,” which leads to a “falling apart of oneself.” This new characterisation of the movement of ruinance in terms of “falling” maintains Heidegger’s ontological focus on the how (on modes of being) rather than the what (in specific content, or beings). And though he borrows language from the Christian notion of sin, he argues that “this character of movement is not a bad quality which surfaces from time to time…”

Rather, it is a non value-laden, primordial feature of human life. The tension present, however, between this statement of Heidegger’s (repeated again and again, into Being and Time and beyond) continually contrasts with the seemingly value-laden language in which, time and again, he describes “falling.”

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749 Ibid. p. 364.
We can fruitfully think of falling as a de-theologized account of sin as a basic structure of human being – that we have a tendency to let go of responsibility and take things easy (as a theologised version of the account of virtue in the *Nicomachean Ethics*). And likewise, it is fruitful to attempt to bear in mind the value-neutrality that Heidegger claims belongs to this structure (unlike sin and unlike the virtue of the *NE*), as something that precedes the formation of values. Yet, again, it is both difficult to divorce this from the value-laden language Heidegger uses and to believe that his use of this language and the ambiguity it causes is not intentional.

Delving further into loaded language, Heidegger tells us that “factual life in its inclination towards falling, arrives at such a world-laden interpretation of itself” because the “movement is tempting for life itself.” Falling is “comforting.” It is factual life’s tendency towards “taking-it-easy” in the desire for “unworried security…” The alternative is “taking-a-stance” in the “situation.” “Factual life,” Heidegger tells us, “is actually always the factual life of the individual”; it is always ours to take a stance on, even if we do not make this decision and fall prey to the world instead. Then we do things “just as one does,” as “they do things.” In this way “factual life gets lived by the ‘nobody,’ to which all life sacrifices its concern.” “The tendency towards falling,” he argues, “is life’s evasion of itself.” And this is most clear in the way we relate to life’s

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750 We take the easy paths of excess or deficiency rather than the more difficult third path of appropriate balance.
751 Ibid.
inescapable end. “Factual life itself provides the keenest manifestation of this basic movement through the manner in which it stands towards death.”

Heidegger points to the phenomenon of death, not as a mere moment in time, as a cessation of a sequence that is a life. Rather, as he describes it, death is an immanent possibility that always stands before life; death is always a part of life, which is fundamentally finite. “Life is in such a way that its death is always somehow there before it.” Our death is, in this sense, always an object of our care. It is a constant that is always with us, a necessity in all the contingencies of our existence. As Heidegger puts it:

In the having of certain death (a having which takes hold [of life]), life becomes visible in itself. Death which exists in this way gives to life a [kind of] sight, and continually brings life before its ownmost present and past, a past which comes from within life itself, burgeoning behind life.

Heidegger now argues that attempting to determine the being character of life “without mentioning the fundamental co-constituent of death and the ‘having of death’…” is futile and leads the questioning astray. Likewise, framing the question in terms of a “what next?” is equally misdirected.

Death, as a phenomenon, highlights “the specific ‘temporality’ of human Dasein.” The fear of death lies at the root of falling. The alternative is a questioning that is rooted in our finitude, in our temporal contingency (finitude and particularity)

752 Ibid. p. 365.
753 Ibid.
754 Ibid.
756 Ibid. p. 366.
itself. This finitude is, for Heidegger, a necessity that always accompanies and, indeed, defines and determines our contingency. This, Heidegger argues, is the questioning that philosophy must pursue “as research, simply as the genuine, explicit actualisation of the tendency towards interpretation which belongs to life’s own basic movements…” Here again, Heidegger makes the argument that this philosophy is “fundamentally atheistic” and that “if it understands this about itself… then it has decisively chosen [finite] factical life in its facticity and has made this an object for itself.”

Heidegger’s alternative to the explorations of the Metaphysics is an ontology rooted in the necessity of finitude, in a how-ground rather than a necessary what-ground:

The problematic of philosophy has to do with the being of factical life. In this regard, philosophy is principal ontology, and it is so in such a way that the determinate, singular, world-laden regional ontologies receive the ground and sense of their own problems from the ontology of facticity. [It is first philosophy.]

The problematic of philosophy has to do with the being of factical life in the how of its being-claimed and being-interpreted at any given time. This means that philosophy, as the ontology of facticity, is at the same time the categorial interpretation of the claiming and interpreting; that is, it is logic.

In Heidegger’s approach “ontology and logic are to be brought back into the primordial unity of the problematic of facticity.”

757 Ibid. p. 367.
758 Ibid.
759 Ibid. p. 368.
760 Ibid.
In the “*phenomenological hermeneutics of facticity*” philosophical research carries out primordial questioning as “interpretations of caring circumspection and of concrete insight…” It “has to make these interpretations transparent with respect to their plans… and in relation to their preconceptions.”\(^7\)\(^6\)\(^1\) The formulations that Heidegger puts forward in this introduction effectively sum-up what came before, while developing and refining his ideas further, and showing the total structure much more fully in a way that prefigures much of *Being and Time* (but without *Being and Time*’s more Kantian aspects). The certainty of death, as an ever present necessary ground of our contingent factual life has stepped forward as the locus of concerns about access and interpretation in ontology. With this methodological portion of the introduction in place, Heidegger turns to the reasons why a discussion of Aristotle is not only fruitful, but fundamental for the kind of questioning philosophical research he advocates.

If, as Heidegger proceeds to tell us, “the very idea of facticity implies that only *authentic [eigentlich] facticity* – understood in the literal sense of the word: one’s *own [eigen] facticity* – that is, the facticity of one’s own time and generation is the genuine object of research”\(^7\)\(^6\)\(^2\) then why would studying Aristotle play any role at all? The answer lies in Heidegger’s own factual situation itself: his generation, in Germany, in the universities, at that exact historical moment. Our possible interpretations come from (are conditioned by) our historical horizon. The moment of authenticity comes from the *how*, the way in (through) which we grasp them. Heidegger argues that the basic ways of interpreting factual life in which his generation of philosophers stand and operate are

\(^7\)\(^6\)\(^1\) Ibid.
\(^7\)\(^6\)\(^2\) Ibid.
derived from Aristotle, through a complicated history of transmission, interpretation, and re-interpretation.

In recommending research into Aristotle, Heidegger is recommending research into the root-moment of his own day’s conceptuality, into the origin (the historical-ground) of the modes of interpretation of his own factual world. This is an historical-hermeneutic claim as much as an ontological-philosophical claim. Heidegger is arguing that we need to self-consciously and self-reflexively dig to the roots of the interpretive horizon of our own factual situation in order that we might take a self-reflexive stand on it and take up our own particular interpretations in such a way that we own them. He explains his historical point as follows:

For the most part, the philosophy of today’s situation moves inauthentically within the Greek conceptuality, and indeed within a conceptuality which has been pervaded by a chain of diverse interpretations. The basic concepts have lost their primordial functions of expression, functions which are particularly suited to particularly experienced regions of objects. But in all the analogizing and formalizing which have penetrated these basic concepts, there remains a particular character of origin; these basic concepts still carry with them a part of the genuine tradition of their primordial meaning, insofar as there is still detectable in them the meaning-direction which goes back to their objective source. By beginning with the idea of the human being, the ideals of life, and representations of the being of human life, the philosophy of today’s situation moves within off-shoots of basic experiences which have been temporalized by Greek ethics and above all
by the Christian idea of the human being and of human Dasein. Even anti-Greek and anti-Christian tendencies persist fundamentally within the same visual directions and ways of interpreting.\footnote{Ibid. pp. 370-1. One can begin to see how and why Heidegger finds it appropriate to combine the language of Christian sin with the Aristotelian concept of virtue in \textit{NE}.}

What we need to do is to engage with the sources and the original meanings and concerns that they represent in a sort of ontological \textit{ad fontes}!

Thus the phenomenological hermeneutic of facticity sees itself as called upon to loosen up the handed-down and dominating interpretedness in its hidden motives, unexpressed tendencies, and ways of interpreting; and to push forward by way of a \textit{dismantling return}… towards the primordial motive sources of explication… towards a radical possibility of appropriation… The destruction is… the authentic path upon which the present must encounter [\textit{begegnen}] itself in its own basic movements; and it must encounter itself in such a way that through this encounter the continual question springs forth from history to face the present: to what extent is it (the present) itself worried about the appropriations of radical possibilities of basic experiences and about their interpretations? The tendencies towards a radical logic of origins and the approaches to ontologies thereby gain a principal critical elucidation. Thus the critique which simply and already arises from the concrete actualization of the destruction does not apply to the bare fact \textit{that} we stand within a tradition, but applies rather to the \textit{How}.\footnote{Ibid. p. 371.}
Again, it is not a matter of the that/what of the tradition, but how we relate to it. “What we do not interpret and express primordially is what we do not possess in authentic truthful safe-keeping” as Heidegger puts it.\textsuperscript{765}

Through the medieval inheritance, a certain focus and interpretation within the Aristotelian soil has been handed down. The “philosophical anthropology of Kant as well as that of German Idealism” and all that follows from those traditions “start from theology and borrow from it the basic impulses for their speculation.” And this theology, in particular, is based on Luther’s, which arose out of “Luther’s primordially appropriated interpretations of Paul and of Augustine; and from his simultaneous confrontation with late scholastic theology…” And this late scholastic theology, “is based upon the Aristotelian ‘Physics’, ‘Psychology’, ‘Ethics’, and ‘Ontology’, and thus the basic Aristotelian doctrines are treated according to a particular selection and interpretation.”\textsuperscript{766} In what remains of this introduction and in his further Aristotle courses that follow, Heidegger will offer up a different selection and interpretation. “What is missing” he tells us, “is an authentic interpretation with its central foundation in the basic philosophical problematic of facticity…”\textsuperscript{767}

Heidegger’s new Aristotle selection and interpretation will not be theologically focussed. Instead, he will focus on a concept now very familiar to us: that of movement; he will lay particular stress on the \textit{Physics}. The \textit{Physics} has handed down to us an

\textsuperscript{765} Ibid.
\textsuperscript{766} Ibid. p. 372.
\textsuperscript{767} Ibid.
ontology of “Being in the how of its beingmoved.” Heidegger asks “what does being
mean for Aristotle in general”? and answers that “Being means being-produced” and as
being-produced it means being-available for our dealings with it. “As something
produced, it means something which is significant relative to some tendency of dealings,
it means being available.” The original sense of ousia as “household goods” captures
this. “Being” in the sense handed down to us from Aristotle, means presence, being as
being-produced (and production is a form of movement in Aristotle’s sense).

Heidegger argues that we must not blindly accept but come into an authentic
relation to this tradition. “The researches… must mediate the possible access to the
authentic motive source of Aristotelian ontology. Such research is present in the
Physics…” But we must not focus solely on Aristotle’s research itself; we also need to
understand what he meant by research itself, what he thought research was for. For this
we must look at portions of the Metaphysics. “But,” Heidegger continues, “understanding
which observes and defines… is only one way in which beings come into truthful safe-
keeping…” “Another possible way of dealings” is in relation to the contingent, rather
than the necessary – in Heideggerian/Aristotelian terms: “beings which can also be other
than what they are at the moment, the beings which are managed, handled, or produced
first of all within the dealings themselves.” To illuminate this Heidegger points us to
Book Z of the Nicomachean Ethics. And thus, his interpretation proper will focus on:

768 Ibid. p. 373.
769 Ibid. p. 375.
770 Ibid.
771 Ibid. p. 376.
772 Ibid.
1) *Nicomachean Ethics*, Book Ζ

2) *Metaphysics*, Book A, Chapters 1 & 2

3) *Physics*, Books Α & Β; & Book Γ, Chapters 1-3

Heidegger’s selections achieve his purpose in an incredibly economical manner. Between the *Met* and the *NE* he addresses Aristotle’s compelling accounts of two fundamental aspects of our understanding: our understanding of the necessary, through aetiological *sophia*, arriving at *episteme* and our understanding of the contingent through *phronesis* or “practical wisdom.”

The meaningful world that we encounter, in which we live (understood through meanings, in the manner of meaningfulness), in Aristotle’s conception, is understood in the manner of the demonstrative sciences (in *episteme*) as we have already described. But the understanding of the necessary, through grounds, of things that cannot be otherwise, which leads to knowledge (for we can have no knowledge of things that can be otherwise), is not the only way in which we understand the phenomena of the world. For we understand the contingent phenomena of the world, even if we cannot have *episteme* of them in the sense laid out in *APo*. *NE* book Ζ addresses the way in which we understand the contingent. And it is particularly important for two reasons: first, because, in our daily lives (even in Aristotle’s world) most of the meanings we deal with will be, by nature, contingent rather than necessary. And second, if we have doubts about ultimate ground in the sense outlined in the *Met*, as Heidegger does, then our understanding of the contingent takes centre stage.
NE book Z deals with *phroneis* or “practical wisdom” (as opposed to *sophia*, or “wisdom as such”). Practical wisdom is about making the right selection at the right time. In Heidegger’s terms it is a *how* of decision in the *situation*. Practical wisdom does not produce knowledge (as *episteme*, knowing the ground or “why”) but is a determinate “how,” a mode of acting. Aristotle begins his discussion of practical wisdom by arguing for a division within the rational portion of the soul. The rational portion of the soul has a scientific portion, which deals with the necessary, and a calculative portion, which deals with the contingent. One part, “by which we contemplate the kind of things which cannot be otherwise, and one by which we contemplate variable things.”

Practical wisdom is the mode of the calculative in its excellence (not mere cleverness, which can be put to ill use, but a calculative faculty that aims at what is best, which is the truly appropriate thing in the situation). Practical wisdom is deliberative. It is a mode of action, a way, and not knowledge or an art (for it aims not at production and deals with things that can be other than they are). The *goal* of practical wisdom is not knowledge or production, but action. Heidegger’s focus on *ways* and taking a stance in a moment of decision comes to rest on these features of practical wisdom.

Practical wisdom does not deal with universals; it has nothing to say about the timeless necessary knowledge of either natural science or first philosophy (the ultimate pursuit of wisdom in an unqualified sense). Likewise, practical wisdom does not deal with abstractions. Practical wisdom is concerned instead with *particulars*, with the

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773 *NE* Z 1139a 6-9.
contingent individualities that could be other than they are, which science (in Aristotle’s sense) cannot know. As Aristotle puts it:

That practical wisdom is not knowledge is evident; for it is, as has been said, concerned with the ultimate particular fact, since the thing to be done is of this nature. It is opposed, then, to comprehension; for comprehension is of the definitions, for which no reason can be given, while practical wisdom is concerned with the ultimate particular, which is the object not of knowledge but of perception – not the perception of qualities peculiar to one sense but a perception akin to that by which we perceive that the particular figure before us is a triangle; for in that direction too there will be a limit.\(^774\)

Practical wisdom is a kind of correctness, but it is neither correctness of knowledge, nor of opinion. Instead, it is correctness of thinking.

Practical wisdom issues commands.\(^775\) Again, it is a deliberative relating, rather than an aetiological knowledge producing; it leads to action, not production. Our comprehension deals with both knowledge and action:

And comprehension is concerned with the ultimates in both directions; for both the primary definitions and the ultimates are objects of comprehension and not of argument, and in demonstrations comprehension grasps the unchangeable and

\(^774\) Ibid. 1142a 23-9.
\(^775\) “…issues commands, since its end is what ought to be done or not to be done.” Ibid. 1143a 8-9.
primary definitions, while in practical reasoning it grasps the last and contingent fact.\textsuperscript{776}

Indeed, the universal is reached through particulars and “of these therefore we must have perception, and this is comprehension.”\textsuperscript{777}

*Phronesis* and *Sophia*, Practical wisdom and wisdom (unqualified), are each excellences of different parts of the soul. But for Aristotle there is a definite hierarchy. “The function of man” is not achieved without practical wisdom, but “moral excellence is also required.”\textsuperscript{778} But wisdom (unqualified) is the higher, as health itself is to the healing art.\textsuperscript{779} Practical wisdom “is not *supreme* over wisdom, i.e. the superior part of us… it issues orders… for its sake, but not to it. Further, to maintain its supremacy would be like saying that the art of politics rules the gods because it issues orders about all the affairs of the state.”\textsuperscript{780}

Heidegger takes his reading of *NE Z* further. For Heidegger, “the interpretation of this treatise makes the ‘dianoetic virtues’ understandable as ways of having at one’s disposal the possibility of actualizing the genuine *truthful safe-keeping of Being*.”\textsuperscript{781} This focus on the “truthful safe-keeping of being” comes from Heidegger’s unusual translation of 1139b 15-18, which he renders as:

Thus let it be assumed that the ways in which the soul takes and brings beings, as uncovered, into truthful safe-keeping – and this in the manner of both affirming

\textsuperscript{776} Ibid. 1143a 35-1143b 3.
\textsuperscript{777} Ibid. 1143b 5-6.
\textsuperscript{778} Ibid. 1144a 7-8.
\textsuperscript{779} Ibid. 1145a 2-11.
\textsuperscript{780} Ibid. 1145a 7-11.
\textsuperscript{781} Heidegger. “Phenomenological Interpretations with Respect to Aristotle” p. 377.
and denying explication – are five in number: routine-directive-productive operating, observing-discussing-revealing determination, solicitous circumspecting circumspection, authentic-seeing understanding, pure beholding. (only these come into question); for it belongs to the sense of taking-something-for and the sense of “having-an-opinion” that these do not necessarily give the being as uncovered [unverhüllt], but rather give it such that what is intended only looks-as-if, such that what is intended puts itself in from of being and thus deceives. 782

Aristotle is talking about the states of excellence of the parts of the rational portion of the soul. “The function of both the intellectual parts” Aristotle tells us, “is truth; therefore the states that are most strictly those in respect of which each of these parts will reach truth are the excellences of the two parts.” 783 Both sophia and phronesis aim at truth. The excellences of each of these hows, are the dianoetic virtues (excellences). In the revised Oxford translation:

Let it be assumed that the states by virtue of which the soul possesses truth by way of affirmation or denial are five in number; i.e. art, knowledge, practical wisdom, philosophic wisdom, comprehension; for belief and opinion may be mistaken. 784

Heidegger’s crucial discovery in his Aristotle translation centres on his translation of αλθεια, the Greek word for truth.

782 Ibid.
783 NE Z 1139b 11-3.
784 Ibid. 1139b 15-8.
Heidegger argues that it is important to retain the literal meaning of the Greek word in our translations and not to use “truth,” which contains centuries upon centuries of baggage and gives us the wrong idea about what Aristotle meant. He argues against the sense of “truth” normally attributed to Aristotle as “something that occurs in judgement; more specifically, the ‘agreement’ of thought with the object.”\textsuperscript{785} Heidegger argues that this interpretation is patently wrong and it assigns to Aristotle ideas that he did not hold. Instead, he argues, “truth” meant “unconcealment” for Aristotle (“αλθεια” is a privative term, literally “un-concealment”). And he stresses the importance of the fact that the Greeks described truth privatively (“and this according to its meaning, and not just grammatically”).\textsuperscript{786}

For Heidegger, “Aristotle sees being-concealed as something positive in itself”; it is the basic condition in which we find phenomena. And in our interactions with them we wrest them out of their concealment.\textsuperscript{787} We can say that meanings arise from this wrestling from concealment of phenomena. Heidegger continues: “The being in the how of its possible ‘as-what-determinations’ is not simply there; it is a ‘task,’ and the being in the how of its being-uncovered, ον ως αληθες, is that which must be taken into truthful safe-keeping against possible loss.”\textsuperscript{788}

\textsuperscript{785} Heidegger. “Phenomenological Interpretations with Respect to Aristotle” p. 378.
\textsuperscript{786} Ibid. p. 379.
\textsuperscript{787} Ibid. p. 379. As his sources for this interpretation Heidegger cites: \textit{De Anima} Γ5; \textit{De Interpretatione}; \textit{Met} E4, Δ29, Θ10. Ibid.
\textsuperscript{788} Ibid. “The sense of αληθες: Being-there [\textit{da-sein}] as unconcealed, i.e. as Being-intended in itself, is in no way taken explicatively from judgement and thus also not primordially at home in and related to judgement. Αληθευειν does not mean: ‘to seize hold of the truth’; it means rather to take the being which is intended, and which is intended as such, as uncovered in truthful safe-keeping.” Ibid. p. 378.
Philosophy (as a shorthand term for *sophia*, or wisdom in an unqualified sense) and practical wisdom then are two ways of wresting phenomena from concealment. Each has its own particular proper domain of phenomena. And the excellence of each is its correct wrestling from concealment into truthful safe-keeping against possible loss, of each proper domain of phenomena: the necessary and contingent respectively. These are meaning-bound and meaning-bearing phenomena. The wrestling out of concealment is a grasping and holding of the phenomena as, in, and through meanings. The dianoetic virtues, these moral excellences aimed at truth, in this conception of Heidegger’s, are functional phenomena of meaning-holding, of understanding in the sense in which we are interested.

Heidegger stresses that the important meaning function in the exercise of these ways of taking into truthful safe-keeping (both wisdom and practical wisdom) is one of use; that is, it is a meaning function that is tied to relationality, and specifically tied to *us*. Meaning functions here, not as an isolated “what,” but as a relational “what for” – “not as things which are isolated for themselves, but rather *as such*, i.e. in their ownmost sense as *αρχαι* for.”789 Purpose and end are crucial. “What is a pen?” “A pen is a writing instrument; it is for writing.” The connection is less apparent with beings such as the sun and planets, but the distinction still holds up. The meaning of “sun” is not (as no object is) an object in splendid isolation, but rather a phenomenon that we explain and understand in terms of what it *does* (and in the Aristotelian world, what things do is attain their natural end). Heidegger’s discussion here, however, seems to conflate the two

789 Ibid. p. 381.
modes (wisdom and practical wisdom) or, at the least, to subordinate wisdom to a kind of practical wisdom.

He begins his “what for” discussion by speaking of “both ways of truthful safe-keeping,” but ends with the dealings of one’s own self, which one could argue apply more to practical wisdom than philosophic.\textsuperscript{790} In fact, Heidegger will go on to privilege practical wisdom over \textit{sophia}, in contradiction with Aristotle’s statements to the contrary. He expresses Aristotle’s “the why” as a “towards-what-end, in apprehending the ‘now,’ and in sketching out the how.”\textsuperscript{791} In Heidegger’s refiguring of the metaphysical project, practical wisdom will take centre stage.

“The \textit{αληθεια πρακτικη}” he tells us, “is noting other than the uncovered, full moment-of-insight into factical life in the how of its decisive readiness for dealing with its own self, and it is such within a factical relationship of concern with respect to the world which is thus encountered.”\textsuperscript{792} In this moment of insight of practical wisdom (related to and rooted in our own factical life) we maintain the “why” of the action “within truly genuine safe-keeping.”\textsuperscript{793} Meaning, in this moment of insight, is “significance for, of the capacity-to-be-an-object-of-concern, of that-which-is-now-to-be-dealt-with.”\textsuperscript{794} The particular how of practical wisdom grants us access to this moment of insight, again, rooted in the relationality of factical life.

\begin{itemize}
\item \textsuperscript{790} Ibid.
\item \textsuperscript{791} Ibid.
\item \textsuperscript{792} Ibid. p. 382.
\item \textsuperscript{793} Ibid.
\item \textsuperscript{794} Ibid.
\end{itemize}
Heidegger says that ϕρνησις is “a how of having-at-one’s-disposal the truthful safe-keeping of being.” And the crucial aspect is the very contingency of this mode of truthful safe-keeping. It does not posit a timeless necessity and ultimate groundedness. Instead, when “life is there in the concrete how of a with-what of dealings… the being of this with what – and this is decisive – is not thereby characterized ontologically in a positive manner; rather it is characterized only formally as that which can also be otherwise that which is not necessarily and always what it is.”

In an historical horizon that has lost ultimate ground and necessity as an “anchor” Heidegger finds in phronesis a way of grasping, within contingency, that he believes provides a kind of positive hold.

In contrast to the vital hold of phronesis, Heidegger claims that sophia, as a movement that ends in a kind of timeless pure beholding, of “being as ‘being-finished,’ being within which the movement has come to its end.” Here “the movement of production is brought into the plan as exemplary.”

Factical life is the only possible ground and starting point for Heidegger. And life is contingent. Life, Heidegger notes, is “precisely insofar as it can be otherwise.” Thus, if our only available ground and starting point is contingent life, which can be otherwise, then the true mode of access, the how that aims at truth, must be phronesis and not sophia.

Compared to his extended discussion of NE Z, Heidegger’s discussion of Met A is brief. The Metaphysics famously opens by declaring that “all men by nature desire to know.” In regard to Chapters 1 and 2 of Met A, Heidegger says: “with respect to the

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795 Ibid. p. 383.
796 Ibid.
797 Ibid.
798 Ibid.
guiding problem of facticity, the interpretation of these two chapters brings to light a triad.

He demarcates the aetiological problem nexus in terms of a phenomenological account of “observing dealings which determine the why-connections…” Determining “the why,” determining the causes, is, Heidegger is claiming, a kind of observational dealing with phenomena; it is a kind of “brining-into-truthful-safe-keeping.” This conception of sophia is based on “the idea of pure understanding… done according to the starting-point of the specifically critical laying-of-foundations… and according to the method of categorial explication.”

The second part of the triad is “the way in which Aristotle in general gains access to the phenomena of pure understanding, and the manner of interpreting this phenomena…” “Both of these” he tells us, “are characteristic for the basic sense of philosophy.”

The third part is “the being-character of σοφία as such and the constitutive achievement of σοφία for the being of human life.” Heidegger argues that the three parts are “connected amongst themselves, and in such a way that the structure of pure understanding becomes understandable precisely only on the basis of its rootedness in factical life and on the basis of the manner of its genesis in factical life.”

And further, that “thus the actual weight of the interpretation resides in” the second part of the triad: the way in which Aristotle gains access to the phenomenon of pure understanding.

Heidegger argues that Aristotle takes his comparative manner of explaining from factical life: “more,” “better,” “less,” etc., are all relational ways of describing that come

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799 Ibid. p. 384.
800 Ibid.
801 Ibid.
802 Ibid. p. 385.
(to use our terms) from within the phenomenal manifold (from amongst contingent beings). Thus, as Aristotle begins to introduce first philosophy, the science of the Metaphysics, which is supposed to be of the ultimate first principles, he is using language from the world of contingent experience. Heidegger ties this to a basic phenomenon of factical life: “Factual life is concerned with developing its dealings… into a kind of dealings which for its own self… always has available a more of observing.”

Heidegger points to the motivation behind this as being crucial.

The issue for Heidegger here is not that sophia seeks the why, but the question of why we might do so in any specific case. In each case it comes from a motivation in our dealings with the world. Aristotle often uses the example of health, if we know the principles of medicine, we can cure, teach medicine, etc. Heidegger points out that we learn this in order to heal. “The why has a primordially ‘practical’ sense.” The abstracted desire for ever more universal whys (i.e. toward ultimate ground) comes from the basic impulse to be better in all of our dealings, which are rooted in our care. Heidegger is attempting to invert the Aristotelian hierarchy of wisdom, or, better, he is shifting the focus from the top to the bottom (i.e. focusing on the base).

Heidegger argues that we fall away from the reasons for our own specific dealings in this desire for more and more capable and powerful understanding, entwined with our desire for necessity that releases our knowledge from the bounds of contingency:

In its tendency towards the more of observing, or seeing more, factical life comes to the point of giving up the care of routine-directing. The with-what of the

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803 Ibid.
804 Ibid.
routine-directive dealings becomes the that-with-respect-to-which of bare observing. The appearance becomes viewed and explicated according to its why-relations, which determine the what of the object in its own self. The tendency of care has displaced itself into observing for its own sake. This observing becomes an independent form of dealings, and as such it becomes the that-with-respect-to-which of a separate kind of concern.\(^\text{805}\)

Heidegger is drawing our attention back from the grounds of “the why” to a different kind of ground: a motivation, a reason-why, a different kind of “the why,” not as a necessary ground but as an ultimately contingent motivational-ground. All of our motivations are from and exist within our finite, contingent, factical life.

Movement, as we have already seen, is crucial for Heidegger. He finds this focus on movement in Aristotle as well, describing Aristotle’s view of the world as rooted in the “being-character” of “being-that-is-moved.” Hence Heidegger’s focus on the Physics, and his insistence that, for Aristotle, the \(\theta\varepsilon\nu\varepsilon\) is “the expression for the highest being-character which arises in the ontological radicalization of the idea of being-that-is-moved.”\(^\text{806}\) It is the highest form of contemplation linked with the highest form of movement in circular regularity and eternity.\(^\text{807}\) Heidegger finishes his Aristotle introduction with a discussion of \(\text{Phys} A\) and \(B\) and \(\Gamma\) 1-3.

\(^{805}\) Ibid.
\(^{806}\) Ibid. p. 386.
\(^{807}\) It is “the purest movement which life has available to it. Because of this, it is something ‘god-like.’ But for Aristotle the idea of the god-like did not arise in the explication of something objective which was made accessible in a basic religious experience [it] is rather the expression for the highest being-character which arises in the ontological radicalization of the idea of being-that-is-moved.” Ibid.
He is interested in the Physics not as a set of theories, but as an activity, as a kind of research, a way of relating to the phenomena of the world. He begins by noting that the research that is the Physics is arche-research. It seeks to bring the principles (Heidegger translates them as the “from whences”) or origins, into “truthful safe-keeping.” But, Heidegger notes, these principles (grounds) are derived from experience; they “must be drawn from the phenomenal content of that which is objective.”\(^808\) In our dealings with things in the world we do not normally encounter their “from whences,” instead we engage with the objects themselves. Their “from whences” are concealed. Thus, what the Physics seeks in its basic movement (as arche-research), is to wrest a rage of phenomena (archai) from concealment.\(^809\)

This arche-research, Heidegger argues, “is access-research [Zugangsforschung].”\(^810\) Its categories must not be imported but must arise out of the phenomenon under question itself (in this case, movement).\(^811\) The crucial critical question is: “To what extent is movement seen and genuinely explicated from its own self at any given time?”\(^812\) The “possibilities of theoretical being-interrogated” lead to the four causes. And Heidegger notes that Aristotle’s focus in book B on “that which daily happens, and can happen to someone” displays the way in which “Aristotle ontologically

\(^{808}\) Ibid. p. 387.

\(^{809}\) Thus “the primordial sense of the ‘concept of truth’ shows itself as effective in the Physics… and in general within the problem-approach of physics as research.” Ibid.

\(^{810}\) “The approach of the research is critique, and in fact principal critique. The interpretation makes understandable why such access-research necessarily has to take a critical approach: all research moves within a particular level of some pre-given interpretedness of life and of some pre-given ways of discussing the world…” Ibid. pp. 387-8.

\(^{811}\) Ibid. pp. 389-90.

\(^{812}\) Ibid. p. 389.
explicates the ‘historical’ movement of factual life.”\textsuperscript{813} \textquotedblleft Today” he says, “these ontological analyses are not only unsurpassed; they have not even been understood as such.”\textsuperscript{814} Instead, philosophers of Heidegger’s day see them as providing an antiquated account of causes, which has been supplanted. Heidegger focuses instead on the mode of research present, which, he argues, arises out of an ontological analysis of life.

Heidegger then ties the discussion back to the \textit{NE} by noting that the \textit{Ethics}, as an “explication of the being which is being-human, human life” and \textit{De Anima} as well as \textit{De Motu Animalium} are also discussions of movement; life is movement.\textsuperscript{815} The ontology of movement then, according to Heidegger, became the framework upon which Aristotle built his over-arching ontology in the \textit{Metaphysics} (philosophy as the highest form of movement, perfect and unending as the revolution of the heavens). And upon this Aristotelian foundation, the edifice of subsequent western philosophy was built.\textsuperscript{816}

This is the basic structure of Heidegger’s Aristotle interpretation of the 1920’s. In subsequent courses he will hang more flesh on the bones provided here. He will explore further portions of the Aristotelian corpus, pursuing the issue of being-with-others underlying the \textit{Rhetoric}, delve further into the \textit{Metaphysics, Ethics, and Physics}, and further refine his account of truth as unconcealment, but the basic structure is already here. In the years that follow, Heidegger will also further develop and refine his own

\textsuperscript{813} Ibid. p. 390.
\textsuperscript{814} Ibid.
\textsuperscript{815} Ibid. p. 391.
\textsuperscript{816} “From this it becomes clear to what extent the particular ontology of a particular field of being, and the logic of a particular claiming, become (following the tendency towards falling which belongs to interpreting) the ontology and the logic which has decisively pervaded not only its own history, but also the history of spirit itself…” Ibid.
approach to phenomenology as an hermeneutics of facticity, with its attendant illuminative ontological use. He will further work through what Kisiel characterises as several drafts of his grand project, which will eventually be published in 1927 as the incomplete *Being and Time*.

**The Hermeneutics of Facticity**

In his next lecture course, *Ontology: The Hermeneutics of Facticity* (SS 1923) Heidegger leaves Aristotle behind for the moment, focusing instead on his own developments of phenomenology. This is a crucial text for understanding Heidegger’s development toward *Being and Time*, but it may be that it is less important for our own concerns than the previous Aristotle engagement. It is in this course “for the first time” that “Heidegger formally names his topic Dasein.”

“Dasein,” “existence,” or, as Heidegger intends it, literally “being-there” (“Da-sein”) is his new term for the human being taken from an ontological standpoint, as the central focus of an ontology that must begin with factical life. Instead of saying “the human being” or even “factual life,” Heidegger points to the ontological sense of human existence: we are here, now, within this particular historical/temporal horizon. “Dasein” names the structures we have seen evolving in the course of our study: the contingent, finite, historical particularity, but also the fact that we are never merely there like a thing, but we are always doing, acting.

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we are *being*-there, *living* in this historical horizon with all of the contingency, particularity and *activity* that this entails.

SS 1923 explores the access question in terms of “paths of interpreting the being-there of Dasein in the awhileness of temporal particularity.”¹⁸²⁰ Heidegger’s evolving terminology becomes more and more uniquely his own here, but the basic structure is the same: philosophy, as ontology, needs a point of access, a starting point in the contingent ground that is factical life. Heidegger describes an interpretive approach here that will persist into *Being and Time*. Hermeneutics, in the sense Heidegger intends here, is “the self-interpretation of facticity.”¹⁸²¹ That is, our own self-interpretation is the point of ingress into ontology. The structure is the same here as in the Aristotle *Einleitung*, though the terms are shifting.

In this course Heidegger ties his Aristotelian insights back to the problem of meaning in a more explicit manner than in the *Einleitung*. Access to the contingent ground that is facticity is characterised as an interpretive process (with the added degrees of contingency that interpretation implies). “The expression ‘Hermeneutics’ is used here to indicate the unified manner of the engaging, approaching, accessing, interrogating, and explicating of facticity.”¹⁸²² “Hermeneutics” is the science or art of interpretation. Heidegger characterises it as a mode of uncovering, or wresting beings from concealment.¹⁸²³ He points to Aristotle’s *De Interpretatione*, as a text about discourse, which uncovers, giving the possibility of being true, and the subsequent historical relation

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¹⁸²¹ Ibid. p. 11.
¹⁸²² Ibid. p. 6.
¹⁸²³ Ibid. pp. 6-8.
of the word ερµηνευς (interpretation) to meaning. He ties his interpretation of hermeneutics to this early sense in Aristotle as “a definite unity of actualizing of ερµηνευς (of communicating), i.e., of the interpreting of facticity in which facticity is being encountered, seen, grasped, and expressed in concepts.”

Heidegger’s hermeneutic analysis in this course focuses on an ontological account of our contingent particularity and situatedness. As Dasein, we are never merely there in splendid isolation (as no other being is for us). Instead we are always within a world. Aristotle saw man as situated within a rationally understandable cosmos grounded by necessity. Heidegger sees us as living within an interpretive and already interpreted world grounded in contingent spatio-temporal/historical particularity. Being-there is being in a world; and it is a particular world, in which we are, for a while. In the concluding portion of the course Heidegger examines the nature of world.

“World” for Heidegger is a structure of meaning. We exist in a world not as a physical thing in a container, but as an active, living being within an ever-shifting network of meanings and interpretations. Heidegger asks “what does the world as the ‘wherein’ of being mean?” His answer is that:

The world is something being encountered as what we are concerned about and attend to, and the latter, as having the character of initial givens now and soon to

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824 Heidegger lays out a brief history of hermeneutics from Aristotle, through Augustine and the middle ages, to its more modern sense in Schliermacher, and, most importantly for Heidegger, in Dilthey. Ibid. pp. 8-11.

825 “Hermeneutics has the task of making the Dasein which is in each case our own accessible to this Dasein itself in this regard, hunting down the alienation from itself with which it is smitten. In hermeneutics what is developed for Dasein is a possibility of its becoming and being for itself in the manner of an understanding of itself.” Ibid. p. 11.

826 Ibid. p. 66.
come which are closest to us, gives the world of everydayness the character of an en-
vironing world, a world round-about. Interpreted on the basis of their significance, these environs open up an understanding of the factical spatiality from out of which and on the basis of which the space of nature and geometrical space originally arise by means of a certain shift in our way of looking at it. It is on the basis of factical spatiality that we can define the ontological meaning of being ‘in’ the environs of the world.827

The most important part of this discussion, for our concerns, is Heidegger’s analysis of “significance as the character of the world’s being-encountered.”828

Heidegger describes the “character of the world’s being-encountered” as “significance” or “meaningfulness.” The German word is “Bedeutsamkeit,” which, following early translations of Being and Time was translated as “significance” in the English edition of the course. Later translators (particularly of the earlier lecture courses we have already encountered use the more literal “meaningfulness,” which makes sense in our context [as long as we bear in mind that Heidegger intends some of the connotations of “weight” and “importance” that “meaningfulness” carries and “significance” perhaps better conveys in English]). “Meaningfulness” or “significance” is an ontological category, a category of being. It is the term Heidegger uses for “the as-what and how” of “the being-encountered of ‘things.’”829

827 Ibid.
828 Ibid. p. 71.
In his further exploration of the nature of world (in the ontological sense), Heidegger asks, in what way do we usually encounter things within the world? The answer is that we encounter them as significant, as meaning this or that; we are familiar with them (even being unfamiliar with something is merely a privative instance of the basic ontological structure of familiarity). Heidegger here continues to privilege *phronesis* over theoretical seeing/knowing. And he continues to stress that what things are for us is what they do. What something is, is its “in order to…” and its “used for…” Ordinarily and primarily we do not regard things in isolation, but in a worldly context: “What is it for?” “What does it do?” And the answers to these questions come from our own finite, contingent, temporal/historical particularity: “‘Significance’ means: being, being-there, in the how of a definite signifying and pointing…”

Heidegger continues to develop the temporal theme, which will become the key to interpreting the meaning of being itself in *Being and Time*. At his point, he says that the past and future define horizons that each define the present. That is, our *historical particularity*, the particular historical horizon in which we find ourselves is not the only form of temporality that defines the situation; the future also plays its role. As he moves towards *Being and Time* the future will become more and more important as the primary determinative temporal form (or at least the primary authentic ground), but at the moment Heidegger is merely expanding his temporal framework by adding this futural focus. The present is determined by the past through our historical particularity. It is determined by the future by our projects, our goals, what we plan to do, what we are out for, etc. We are

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830 Ibid.
831 Ibid. p. 72.
constantly projecting into the future in this regard, from long-term projects to the end purpose of an action I am engaged in which will conclude a second from now.

Heidegger’s concern here is to explore how we deal with things for the most part, most of the time in our daily lives. We can make the leap out of this usual mode of dealings into other modes of dealings (into the theoretical, for instance\(^832\)). But Heidegger wants to focus on this “everydayness” where “the beings-which-are-there do not stand in the definiteness of definitions, but rather within that of everydayness and its historicality,”\(^833\) where the “what for” is demarcated by the concern of care. In this regard significance or meaningfulness points to the “there” of being-there, to the situation.\(^834\)

Heidegger’s account of significance or meaningfulness in SS 1923 concludes with his basic formulation of Dasein’s being: care. In order to understand the phenomenal context of meaningfulness (significance), Heidegger says, it is necessary to see that its disclosedness stands in care, which is temporally particular.\(^835\) The structure of the world, as significance is rooted in our Dasein, as factical life, which is care. Caring takes place in our going about of dealings. And significance must then be defined ontologically as the with-which of dealings. The spatiality of the world is the round-about of dealings, in which we are with others. And we tend to immerse ourselves in the world of others, falling away from owning our care in what Heidegger once called “ruinance.” In Being

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\(^832\) And, indeed, in this course Heidegger re-engages with the question of the birth of the theoretical, which had occupied some of his earliest post-Habilitation work.

\(^833\) Heidegger. *Ontology*. P. 72.

\(^834\) Ibid. p. 73.

\(^835\) Ibid. p. 78.
and Time these relations will come together in a more refined and coherent account, but the basic structural relations are the same.

I close my discussion of this course with a section from one of Heidegger’s loose notes and insertions to the course. Here he links together his basic philosophical movements at the time: his philosophical concern with ontological phenomenology and an historical engagement/destruction-and-re-interpretation of the Greek roots of the present philosophical situation. The Greek “doctrine of being” and its historical-hermeneutic legacy sets the stage for philosophy in his day:

Hence at first calling on ontology for the task of destructive interpretation – and the reverse, i.e., a multifaceted possibility. And this means: facticity is what is primordial, and what is already equiprimordially found in it is a multiplicity of different movements and interpretations and objects. Reaching this primordial dimension right away and understanding it in its historical character.836

This project will occupy Heidegger for years. In Being and Time Heidegger will introduce a project that includes a structural analytic followed by an historical “destruction” of the history of ontology. He will eventually finish only the first portion.

Time and Logic

In his SS 1925 course on The History of the Concept of Time Heidegger ties the overall structure of the how of the world’s being-encountered, i.e. meaningfulness (or significance) with a much more unified and coherent account of understanding (Verstehen). Understanding is now directly tied to meaning. Heidegger now calls “the

836 Ibid. p. 84,
basic structure of the world” “meaningfulness.” As with the ontology course, Heidegger begins with the things in our environment:

…environmental things are encountered in references in the character of ‘serving to,’ ‘useful for,’ ‘conductive to,’ and the like; worldhood is constituted in references, and these references themselves stand in referential correlations, referential totalities, which ultimately refer back to the presence of the work-world. It is not things but references which have the primary function in the structure of encounter belonging to the world, not substances but functions...

“The structure of encounter thus specified in references as meaning we shall call ‘meaningfulness.’”

Heidegger wants to be very clear that meaningfulness is not a quality of things. The things we encounter are not “natural things [that] also have a meaning…” Meaning is not something extra that we add to objects. Rather, it is the basic way through which we encounter objects at all. Meaningfulness is also not the values we may assign to a natural object. But it is connected with language, logic, and truth:

Meaningfulness, as we use the term, understood negatively to begin with says nothing about meaning in the sense of value and rank. In another sense, meaning also signifies the meaning of a word, meaning as something which word-combinations can have. Even this sense of meaning is in a certain way connected

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838 Ibid. p. 201.
839 Ibid.
with what we call meaningfulness, in fact much more properly than the first sense of meaning and meaningfulness in terms of value.\textsuperscript{840}

Heidegger is here bringing together the phenomena of encounter, understanding, and language in a way that will become distinctive of his work from this point on.

Meaningfulness (significance) is a complex, it is the ever-shifting relational world that we experience. We experience the world in, as, and through meanings; they are the blood in the veins of our understanding of the world:

When we say that the basic structure of worldhood, the being of the entity which we call world, lies in meaningfulness, this amounts to saying that the structure as we have characterized it thus far, the references and the referential contexts, are basically \textit{correlations of meaning, meaningful contexts}.\textsuperscript{841}

Heidegger argues that “only the progressive explication of [the structure of being-in-the-world] can ensure an understanding of meaningfulness.”\textsuperscript{842} “The kindred phenomena” he continues, “\textit{reference, sign, relation}, point back to meaningfulness as the root of their phenomenal genesis.”\textsuperscript{843}

\textsuperscript{840} “That such delimitations, which we are making here quite formally in regard to bare words, already become necessary itself points to a certain embarrassment in the choice of the right expression for the complex phenomenon which we want to call meaningfulness. And I frankly admit that this expression is not the best, but for years I have found nothing better, in particular nothing witch gives voice to an essential connection of the phenomenon with what we designate as meaning in the sense of the meaning of words, inasmuch as the phenomenon possesses just such an intrinsic connection with verbal meaning, discourse. This connection between \textit{discourse and world} will now perhaps still be totally obscure.” Ibid. p. 202.

\textsuperscript{841} Ibid. p. 203.
\textsuperscript{842} Ibid. p. 204.
\textsuperscript{843} Ibid.
Heidegger characterises the relations between these phenomena (reference, sign, relation, and meaning) as follows:

*Relation is the most universal formal character* of these phenomena, Sign, reference, meaning are all relations. But just because the phenomenon of relation is the most universal, it is *not* the origin of these phenomena, \(^{844}\) that out of which the relationships which organize their particular structures can in turn be understood. \(^{845}\)

Instead we must understand relation itself though meaning, which is the more *basic* rather than *general* phenomenon (i.e. *it is the basic experience*). The ground of these phenomena lies in our factical lives in the world, as care, and it occurs in the relation of understanding.

“It belongs to the being of Dasein” Heidegger says, “inasmuch as it is being-in-the-world, to let its world be encountered.”\(^{846}\) And our encounter with the world is in and through understanding, which is our relation to meaning. “The kind of being belonging to letting the world be encountered in the primary mode of concern is itself one of understanding.”\(^{847}\) The links between this “understanding”\(^ {848}\) and *phronesis* should be clear:

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\(^{844}\) I.e. the origin is in the *particular* phenomenal experience, through meaning; the most general is a generalisation.

\(^{845}\) Ibid. p. 204-5.

\(^{846}\) Ibid. p. 209.

\(^{847}\) Ibid.

\(^{848}\) “In German, *Verstehen* is a ‘Heimat’ word: to be so intimately familiar with something that one ‘is at home’ with it and in it, like a native to a land or to a language, that ‘second nature.’” Kisiel, *Genesis*, p. 377.
The correlate of this understanding which guides all concern is that with which care dwells and which always shows itself in understanding, even though in an ever so indefinite familiarity. This primary state of knowing one’s way about belongs essentially to in-being; it belongs to its sense of being and is not just something that is thrown into the bargain. But this implies that understanding primarily does not mean a mode of knowing at all, unless knowing itself has been seen as a constitutive state of being for being-in-the-world. But even then it must be said that the sense of understanding is not merged with having knowledge of something, but involves a being toward something, that is, the being of Dasein. In-being as self-understanding in understanding its world discloses the understanding of its world.849

This basic phenomenon of understanding is the source of more specific or derivative modes of understanding.850

Heidegger now brings the various threads together with themes other now familiar to us:

Worldhood is the specific presence and encounter for an understanding concern. Understanding absorption in the world discovers the world, the referential connections in what they uniquely are, in their meaning. An understanding concern thus encounters what is understood – meaning.

850 “Formulated in another way, it is only because understanding is the primary being-relationship of Dasein to the world and to itself that there can be something like an independent understanding and an independent cultivation and appropriation of understanding as in historical knowledge and its exegesis.” Ibid.
The references and referential connections are primarily meaning. The meanings are, according to our earlier considerations, the structure of being in the world.

The referential whole of the world is a whole of meaningful connections, meaningfulness.\(^{851}\)

And further:

*Meaningfulness is first of all a mode of presence* in virtue of which every entity of the world is discovered. Concern as constantly oriented, defined by insight and understanding, already lives in primary contexts of meaning disclosed by its concern in interpretive circumspection. Since Dasein is moreover essentially determined by the fact that it *speaks*,\(^{852}\) expresses itself, discourses, and as *speaker discloses, discovers, and lets things be seen*, it is thereby understandable that there are such things as words which have meanings.

Concerned understanding, being in the world, “being in the context of meanings” is what is primary according to Heidegger.\(^{853}\) Meaningfulness is the way in which we encounter the world;\(^ {854}\) language is the way we express meaning, and not the other way around.

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\(^{851}\) Ibid. pp. 209-10.

\(^{852}\) Heidegger takes Aristotle’s “Man is a political animal” to mean “man is an animal who speaks/discourses.”

\(^{853}\) “It is not as if there were first verbal sounds which in time were furnished with meanings. On the contrary, what is primary is being in the world, that is, concerned understanding and being in the context of meanings. Only then do sounds, pronunciation, and phonetic communication accrue to such meanings from Dasein itself. Sounds do not acquire meaning; rather, it is the other way around: meanings are expressed in sounds.” Ibid. p. 210.

\(^{854}\) “Some things should be said about meaningfulness by way of summary. Being-in-the-world as concerned understanding lets us encounter something self-signifying in self-meaning. This self-signifying meaning constitutes meaningfulness and is the presence of the world, insofar as it is discovered in understanding concern. *Presence of the world is*
The question of “how can a word have meaning… is contrived, totally uprooted from the phenomenal composition of speaking and language.” The problems of linguistic meaning and expression are rooted in the basic experience of Dasein. And this realisation brings Heidegger back to where he started, to logic:

…it is clear that linguistic meanings and generally meaning-contextures, structures, conceptuality, the entire context of problems with which logic in the strict sense would have to deal, can be understood only in reference to an actual fundamental analysis of Dasein itself, which has meanings in the primary sense.

In WS 1925-6 Heidegger will devote an entire course to explaining logic from the basis of the phenomenology of Dasein.

Heidegger’s logic at this time is still the kind of general, “philosophical logic” we encountered earlier. He is not interested in any of the specialised “logic disciplines,” as it were, but in a more primordial logic of logic. And he is particularly interested in the question of the relation of logic to truth. The WS 1925-6 course, Logic: The Question of Truth, which attempts to explain logic from the phenomenological basis of Dasein’s being in the world, culminates in a discussion of the problem of time in Kant that leads Heidegger to a crucial formulation of the ground problem in one of its most definite

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*the worldhood of the world as meaningfulness.* The correlations of meaning which we now take as references are not a subjective view of the world, which in addition and to begin with would still be something else, for instance, an initially immediate world, which then would refer to something else for the preoccupation with it. Rather, concern itself is the being of the entity, which is only in this way and has no other being.” Ibid. p. 213.

855 Ibid. p. 211.
856 Ibid. p. 211.
versions before *Being and Time*. Heidegger had already rejected the necessary ultimate ground of aetiology and replaced it with an ultimately contingent ground in factual life. Factual life had then been re-characterised as Dasein. Now, Dasein’s temporality is directly posited as the contingent ground.

Dasein is determined by its temporality, both the historical particularity of its past-conditioned-ness, and its projection into the future. Future and past come together in a temporal structure that determines the situation of Dasein’s present. This temporality lies at the basis of our existence, our Dasein, our being-here. Without our temporality we would not be the beings that we are. As temporal beings determined by care, our temporal situation is the situation of our caring; “care is determined by time…” Thus:

Temporality is the ground of the possibility of these structures of care itself. The ‘ahead-of-itself’ is a mode of time, but not in the sense of mere presence within time. Thus time is not the kind of being that befits some entity that is merely-present. It simply ‘is’ not; its being is not a determinate kind of being, it is not the being of some entity. Rather, it is the condition of possibility of the fact that there is being (not entities) [that is, not mere things that are just physically there and meaningless]. Time does not have the kind of being of any other thing; rather, time [constantly] unfolds [*zeitigt*, this unusual German verb literally means “times” as in the action of time, “time times”]. And this unfolding constitutes the temporality of time. The ‘ahead of itself’ is the mode in which time unfolds.\(^{857}\)

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Temporality, Heidegger will come to argue, is transcendental; it is not merely there, but crosses outside of the now. The situation of the present is always one in which Dasein is projecting into the future and determined by the past. With this formulation we are ready for *Being and Time*.

*Being and Time*

*Being and Time* is Heidegger’s magnum opus. It is arguably the most important work of 20th century western philosophy, both in terms of its own fundamental research and the massive reverberating influence it has had on other thinkers. It is also a notoriously difficult text. Its legendary resistance to translation has become a cliché; but this cliché mingles the misleading with the true. *Being and Time* is also an incredibly difficult text in German. Its language is as odd, perplexing, and seemingly impenetrable in German as it is in English (much like some of the earlier Heideggerian terms we have already encountered). This difficulty of language results from the subject matter, as with Aristotle’s *Metaphysics*; in both texts we encounter thinking at the very limits of philosophy. We are at the extremes of exploratory thinking where our ordinary language, born and bred to deal with our ordinary experience begins to fail us. Heidegger himself was well aware of this problem. “With regard to the awkwardness and ‘inelegance’ of expression” he says, “we may remark that it is one thing to give a report in which we tell about entities, but another to grasp entities in their being.” Aristotle faced the same
problem. Faced with this difficulty Heidegger remarks, “for the latter task [talking about
being itself] we lack not only most of the words but, above all, the ‘grammar.’”

*Being and Time* is also difficult for us today for another reason. It presupposes a
vast amount of knowledge of the history of philosophy (but also of theology and even
literature), which most today no longer have. The preceding chapters should provide
much of what is required, at least for as much of *Being and Time* as we need for our
discussion. The temptation to dive into *Being and Time* and explore its myriad pathways,
clearings, and dark places is exceptionally great. But we approach this forest with a
purpose, and we have the map provided by our earlier researches. We must stick to the
task at hand and avoid the urge to stray form the path, tempting though it may be.

*Being and Time* was written as a self-standing treatise, but it is, in fact, a
continuation of Heidegger’s earlier work displayed in his lecture courses. The project is
characterised differently; we are introduced to the question of the meaning of being, its
neglect in the history of philosophy since Aristotle, and Heidegger’s aim to re-awaken it.

When asked for a quick summary of the book I usually answer that Heidegger is trying to
determine the meaning of the word “is,” which, like all such statements, is both true and
misleading. Heidegger argues that the question of the meaning of being (Aristotle’s
question in the *Metaphysics*) is the most fundamental question of philosophy. He argues
that this question has been neglected as a topic of explicit philosophical research. But he
also argues that, even though we do not ordinarily pursue this question explicitly, we all –

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(Page numbers refer to the German edition, which are present in both English
translations.)
philosophers and ordinary people alike – operate within a basic pre-theoretical understanding of it. We have a presupposed and assumed answer to what it means for something to be, even if this is entirely hazy, inexplicit, unformulated, and unrealised.859

When presented with the question it seems self-evident, silly even. It seems "the most universal and emptiest of questions."860 This is, Heidegger believes, because it is the most fundamental, the most basic (as in "pertaining to the base"), it is the ground question. In *Being and Time* Heidegger attempts to re-introduce the question of the meaning of being as a topic for explicit philosophical research (our characterisation of Heidegger’s earlier Aristotle engagement as producing a sort of alternate *Metaphysics* comes to full fruition here). He sees the way forward in dealing with this most difficult question in Hermeneutics. The approach is interpretive (as earlier, with all of the contingency that this implies fully intended). It is phenomenological (in Heidegger’s unique sense). And it begins its interpretations by focusing on a single being within the phenomenal manifold: us.

Being, for Heidegger as for Aristotle, is *always* the being of beings (or “entities” to differentiate a bit). There is no such thing as being *eo ipse*, being that is not the being of beings. And there is one sort of being that has a particular relation to the world of beings, the phenomenal manifold; this is the human being. Human beings, as Dasein, as entities who are being-there, *relate* to beings (themselves included). And as thinking

859 "We do not know what ‘Being’ means. But even if we ask ‘What is ‘Being’?’, we keep within an understanding of the ‘is,’ though we are unable to fix conceptually what that ‘is’ signifies. We do not even know the horizon in terms of which that meaning is to be grasped and fixed. But this vague average understanding of Being is still a Fact." Ibid. p. 5.
860 Ibid. p. 39.
beings we are the being that can and does relate to beings insofar as they \textit{are}, in terms of their being. Dasein is the being that has a fundamental relation to being. It is also, most importantly, the being that we ourselves are. The “meaning of being” only exists because Dasein exists, meaning is only meaning for us. Heidegger absolutely does \textit{not} however, argue for any sort of subjectivism here. The world is really there, as are all of the beings in it. But what these beings mean is part of \textit{our relation to them}. No humans \textit{=} no meaning. This is an empty, formal, structural relation that says nothing about content. It is \textit{ontological} in Heidegger’s sense (pertaining to the \textit{structures} of our being), rather than \textit{ontic} (the actual lives we live, the content). This is Heidegger’s famous ontological distinction, the difference between ontic beings and their ontological being.

Heidegger argues that, by exploring Dasein’s being, and trying to get at its root, we will be able to catch a glimpse of the meaning of being itself. But this will only be a glimpse, a contingent interpretation and manifestly \textit{not} a necessary, timeless definition. Heidegger’s sense of the ultimate contingent temporal ground is still entirely active here. The entire project of \textit{Being and Time} will only give us a sort of preliminary indication. It will point in a direction, but will not, and cannot, provide a necessary definition for all time. Philosophy for Heidegger, here as much as in his early courses, must be a constant, awake, alive, beginning ever anew.

The project of \textit{Being and Time} itself, however, is not a new start from a clean slate, as \textit{no} philosophical project or any type of thinking can be. It, like our factical lives

\footnote{“The very asking of this question is an entity’s mode of \textit{Being}; and as such it gets its essential character from what is inquired about – namely, \textit{Being}. This entity which each of us is himself and which includes inquiring as one of the possibilities of its \textit{Being}, we shall denote by the term ‘\textit{Dasein}.’” Ibid. p. 7.}
in general, is conditioned by the past. *Being and Time* is a new iteration, a new beginning of Heidegger’s fundamental project born out of its own philosophical past. The project is couched in different terms but it is the same basic project of philosophy, now further refined and recast in a new light (that of time, introduced in the *Logic* course): it is the question of the ground of meaning, the ontological question, Aristotle’s question in the *Metaphysics*; it is the question of philosophy: that of being itself. As we might expect then, all of our major themes are covered in this text, and they are presented in more refined forms for publication, as well as with new connections highlighted and articulated.

In *Being and Time* Heidegger says that “meaning is that wherein the understanding [*Verstehbarkeit*] of something maintains itself.” We understand in and through meaning. This is so even in the case of “something which does not come into view explicitly and thematically.” In *Being and Time* meaning is now tied explicitly to temporality, both in the past-conditioned “as” of entities and in the future of projection:

‘Meaning’ signifies the ‘upon-which’ [*das Woraufhin*] of a primary projection in terms of which something can be conceived in its possibility as that which it is. Projecting discloses possibilities – that is to say, it discloses the sort of thing that makes possible.

Our futural projection is tied to meaning in terms of possibilities. This is a re-casting of Heidegger’s previous account of the meaning of a thing as its “what is it for.” But now the “what is it for” of meaning (placing the thing within a relational nexus of use) is re-

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862 Ibid. p. 324.
863 Ibid.
conceived in terms of temporality; the “what is it for” is still there, but now it is seen in
terms of a nexus of possibilities (i.e. as tied to futural projection).

“Taken strictly” Heidegger says, “‘meaning’ signifies the ‘upon-which’ of the
primary projection of the understanding of being.”864 That is, we, Dasein, are always
operating within an understanding of what it means for things to exist; we are always
operating within an understanding of being, whether we explicitly make this a topic of
systematic research or not (and just go about our daily lives). This understanding is
something that we are constantly doing, and it is a temporal act; we are constantly
employing this understanding (operating within it) in our futural projection. But what we
(ontically) deal with in our lives are the things within the world (taken broadly: physical
things, ideas, other people, etc.). And we deal with these things within the world in terms
of (through) their meanings. Thus meaning is that upon which our primary projection of
the understanding of being rests.

Meaning is the life-blood of all of our relational interactions with the world, with
the past and future, and with ourselves. Heidegger continues:

When Being-in-the-world has been disclosed to itself and understands the Being
of that entity which it itself is, it understands equiprimordially the Being of
entities discovered within-the-world, even if such Being has not been made a
theme, and has not yet even been differentiated into its primary modes of
existence and Reality. All ontical experience of entities – both circumspective
calculation of the ready-to-hand, and positive scientific cognition of the present-

864 Ibid.
at-hand – is based upon projections of the Being of the corresponding entities – projections which in every case are more or less transparent. But in these projections there lies hidden the ‘upon-which’ of the projection; and on this, as it were, the understanding of being nourishes itself.\textsuperscript{865}

Meaning is that through which all of our interactions with beings takes place.

Meaning is that through which our relations are enacted; meanings are the relata of relationality:

If we say that entities ‘have meaning’, this signifies that they have become accessible \textit{in their Being}; and this Being, as projected upon its ‘upon-which’, is what ‘really’ ‘has meaning’ first of all. Entities ‘have’ meaning only because, as Being which has been disclosed beforehand, they become intelligible in the projection of that Being – that is to say, in terms of the ‘upon which’ of that projection. The primary projection of the understanding of Being ‘gives’ the meaning. The question about the meaning of the Being of an entity takes as its theme the ‘upon-which’ of that understanding of Being which underlies all \textit{Being} of entities.\textsuperscript{866}

The entire project of \textit{Being and Time} is grounded in the problem of meaning. This is something that is often forgotten. \textit{Being and Time} does not pursue the question of being, but the question of the meaning of being.

In the account of \textit{Being and Time} meaning is an “existentiale.” In this text Heidegger makes a categorial distinction between modes of being of Dasein and

\textsuperscript{865} Ibid.
\textsuperscript{866} Ibid. pp. 324-5.
categorial determinations of other entities within the world that are not like Dasein. The existentialeae are primary modes of being of Dasein, while the categories (presumably Aristotelian with modifications, but Heidegger does not spell out the whole list as these are not the concern of the treatise) pertain to entities in the world other than Dasein.

Figure 4, Primary Division of Phenomena in Heidegger’s Account of 1927 Follows:
Meaning, in *Being and Time* is not something that things within the world have, or that accrues to or is assigned to things, rather, it is part of the fundamental way in which Dasein exists. Meaning is that through which we understand, and understanding is one of the fundamental modes of our being:

Meaning is that wherein the intelligibility [*Verständlichkeit*, “understanding”] of something maintains itself. That which can be articulated in a disclosure by which we understand, we call ‘meaning’. The concept of meaning embraces the formal existential framework of what necessarily belongs to that which an understanding interpretation articulates. *Meaning is the ‘upon-which’ of a projection in terms of which something becomes intelligible as something...* In so far as understanding and interpretation make up the existential state of Being of the ‘there’, ‘meaning’ must be conceived as the formal-existential framework of the disclosedness which belongs to understanding. Meaning is an *existentiale* of Dasein, not a property attaching to entities, lying ‘behind’ them, or floating somewhere as an ‘intermediate domain’. Dasein only ‘has’ meaning, so far as the disclosedness of Being-in-the-world can be ‘filled in’ by the entities discoverable in that disclosedness. *Hence only Dasein can be meaningful [sinnvoll] or meaningless [sinloss].* That is to say, its own Being and the entities disclosed with its Being can be appropriated in understanding, or can remain relegated to non-understanding.

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867 Ibid. p. 151.
The entities that we encounter in the world are then “unmeaning [unsinniges]” for it is only Dasein, in the way it relates to the world that has meaning. The things in the world would still be there without us, but they would not mean anything.

Meaning is thus, as we have already stated, something utterly contingent in the conception of *Being and Time*, it is finite, temporal, and dependent on Dasein for existence. The “meaning of Being” then cannot be a necessary ground of the sort that demonstrative sciences demand. Being cannot be “the ‘ground’ which gives entities support; for a ‘ground’ becomes accessible only as meaning, even if it is itself the abyss of meaninglessness.” And yet, again, Heidegger is not proposing an “everything goes” relativism; meanings are historically determined. Dasein’s understanding comes from its futural projection and its place within history, the wealth of meaning-assignments, networks of understanding, etc., that it grows up into and inherits. Thus there is a kind of necessity up to a point in Heidegger’s conception at this time (we might call it “historical necessity”); but it rests on an ultimate contingency.

Meaning is tied to use in *Being and Time* as it was in the earlier courses. Here however, Heidegger develops this idea further in terms of our involvement with things in the world and with the world itself. Dasein, as the kind of being that it is, is fundamentally involved; Dasein is implicated in the world. It is as doing, as being, rather than just as a static thing within a physical space. Involvement is the key to Heidegger’s account of understanding in *Being and Time*. As earlier, what things are is what they are for. But here Heidegger develops this idea in terms of an account of equipment.

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868 Ibid. p. 152.
869 Ibid.
Equipment is used to do things (a hammer is for driving nails, which is for fastening objects… a pen is for writing or drawing, which is for conveying information in non-verbal form, etc.). And Heidegger argues here that we see things within the world primarily as equipment (within equipmental complexes). It is easy, of course, to see how we understand a hammer as equipment, but what about something completely foreign to us? Or what about something like a rock? Or the ground? Heidegger argues that even in these cases the equipmental way of understanding things (what is it for?) is primary. We see the rock in its potential uses, or we see the ground as that upon which we live, etc. Or, we see these things divorced from the context of use, which, Heidegger argues, is merely a deficient mode of seeing them as equipment. Seeing objects in the world as “mere things” that we do not understand, is a particular (deficient) way of seeing them in/through their meaning (through their “what is it for”).

We are familiar with the things within the world (through meaning) and we are familiar with the world (as a totality of meanings). Intelligibility comes from our involvement with the world, with things within the world, and with our own selves (our projects, our concerns, our understandings beings, of world, and of self). “This familiarity with the world does not necessarily require that the relations which are constitutive for the world as world should be theoretically transparent.” But this familiarity (pre-theoretical though it may be) is the basis for any sort of theoretical understanding of the world. Any ontological understanding of the world begins with our basic world-familiarity, as does any demonstrative scientific understanding (the origin of theory from

870 Ibid. p. 86.
the pre-theoretical here). This “familiarity, in turn, is constitutive for Dasein, and goes to make up Dasein’s understanding of Being.”

Understanding assigns relations to entities within the world. These assignments are individual meanings; they are expressions of the “for which” or “in order to” of the things we encounter. And these arise though our involvement with the things in the world as we live our lives. “The relational character which these relationships of assigning possess,” Heidegger says, “we take as one of signifying” [“be-deuten” interpreting, pointing, signifying):

The relational totality of this signifying we call ‘significance’ [meaningfulness].

This is what makes up the structure of the world – the structure of that wherein Dasein as such already is. *Dasein, in its familiarity with significance, is the ontical condition for the possibility of discovering entities which are encountered in a world with involvement (readiness-to-hand [the mode in which we encounter equipment]) as their kind of Being, and which can thus make themselves known as they are in themselves.*

Words and language follow from meaning. Sounds and signs accrue to meanings as ways of expressing them, rather than the other way around.

Like the positive results of Heidegger’s Aristotle encounter, *Being and Time* can be fruitfully viewed as a sort of alternate approach to the subject matter of the *Metaphysics*. Its concern is ontology; it examines substance; it looks at the question of

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871 Ibid.
872 “The significance thus disclosed is an existential state of Dasein – of its Being-in-the-world; and as such it is the ontical condition for the possibility that a totality of involvements can be discovered. Ibid. p. 87.
ultimate ground, etc. But Heidegger’s book operates under a fundamentally different assumption about necessity and contingency. For Heidegger the contingent ground within our finite, temporal existence is the only possible starting point. We can think our way to the essentially theological question of a timeless necessary ultimate ground, but we always do so from within our own contingent, finite, temporal lives. Heidegger attempts to produce a work of *fundamental ontology* that begins from this inescapable realisation. The strange formulations for which *Being and Time* is famous are the results of a chain of re-configurations of ontological findings and approaches that become necessary once one takes facticity as a necessarily contingent ultimate *aition* (and, indeed, *arche*).

**Being and Time: Introduction**

Our discussion of Heidegger’s earlier Aristotle engagement has allowed me to present *Being and Time* in a slightly unusual manner: that is, backwards. Through an early encounter with some of the key issues, approaches, and findings of Heidegger’s magnum opus we were able to begin with the more complete and coherent formulations later in the book and work our way back. I would like to continue this odd approach by concluding my Heidegger account with a discussion of *Being and Time*’s introduction. This will help not only to put some of the previous discussion in greater perspective but it will situate us well for what is to come.

Heidegger opens with a quote from the *Sophist* about the manifold perplexities that the term “being” represents for those who question it.\(^{873}\) He then goes on to explain

\(^{873}\) Heidegger’s translation of the Greek is “For manifestly you have long been aware of what you mean when you use the expression ‘being’. We, however, who used to think we understood it, have now become perplexed.” Ibid. p. 1.
the importance of the question of the meaning of being, its historical neglect, and his aim to re-awaken it, taking “the interpretation of time as the possible horizon for any understanding whatsoever of Being.” He describes the nature of the project, the existential analytic of Dasein as the starting point for ontology (as Dasein is the kind of being that has knowledge about being as part of its being). He briefly describes the Hermeneutic Circle, which begins with Dasein’s pre-theoretical understanding and moves to ever-greater levels of interpretation without ever stepping outside of Dasein’s own temporal contingency to any sort of necessary ground (indeed, “the issue is not one of grounding something by… a derivation; it is rather one of laying bare the [contingent] grounds for it and exhibiting them.”

Heidegger argues that the question of the meaning of Being is ontologically primary to other research questions (of anthropology, epistemology, the demonstrative sciences, etc.). This “question is a peculiar one, in that a series of fundamental considerations is required for working it out, not to mention for solving it” hence, again, the almost torturous nature of Being and Time. Heidegger argues that the question of the meaning of being is “of all questions, both the most basic and the most concrete.” It lies at the (ontological) ground of any other inquiry. All of the sciences

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874 Ibid.
875 The Kierkegaardian reflexivity is palpable here, though Heidegger only mentions him in Being and Time once, in relation to anxiety.
876 Heidegger, Being and Time. P. 8.
877 “In the question of the meaning of Being there is no ‘circular reasoning’ but rather a remarkable ‘relatedness backward or forward’ which what we are asking about (Being) bears to the inquiry itself as a mode of Being of an entity.” Ibid.
878 Ibid.
879 Ibid. p. 9.
rely on an understanding of what it means for things to be (even if this is not made an explicit object of research).

The sciences deal with entities within the world, whereas ontology deals with being. But “Being is always the Being of an entity” (Heidegger aggress with Aristotle on this point). The sciences, according to Heidegger, work within their demarcated regions of being according to established basic (grund) concepts. The day to day workings of the sciences presuppose their ground-concepts and “go about the business” of physics or biology, etc. But, Heidegger says in a statement that may sound oddly familiar to historians of science:

The real ‘movement’ of the sciences takes place when their basic concepts undergo a more or less radical revision which is transparent to itself. The level which a science has reached is determined by how far it is capable of a crisis in its basic [grund] concepts. In such immanent crises the very relationship between positively investigative inquiry and those things themselves that are under investigation comes to a point where it begins to totter. Among the various disciplines everywhere today there are freshly awakened tendencies to put research on new foundations.  

Heidegger then points to some of the “foundational” crises of his day: in mathematics “in the controversy between the formalists and the institutionalists,” in biology in “awakening tendency to inquire beyond the definitions which mechanism and vitalism have given for ‘life,’” in theology, which “is seeking a more primordial interpretation of

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880 Ibid.
881 Ibid.
man’s Being towards God,” and in physics where “the relativity theory… arises from the tendency to exhibit the interconnectedness of nature as it is ‘in itself.’” Heidegger continues on relativity: “As a theory of the conditions under which we have access to nature itself, it seeks to preserve the changelessness of the laws of motion by ascertaining all relativities, and thus comes up against the question of the structure of its own given area of study – the problem of motion.”

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Heidegger’s conception of the demonstrative sciences is still basically Aristotelian.883 He sees their methodology as predominately aetiological.

Basic [grund] concepts [we could substitute ‘principles’, or even simply: ‘grounds’] determine the way in which we get an understanding beforehand of the area of subject-matter underlying all the objects a science takes as its theme, and all positive investigation is guided by this understanding. Only after the area itself has been explored beforehand in a corresponding manner do these concepts become genuinely demonstrated and ‘grounded.’ But since every such area is itself obtained from the domain of entities themselves, this preliminary research, from which the basic concepts are drawn, signifies nothing else than an

882 Ibid. pp. 9-10.
883 “Science in general may be defined as the totality established through an interconnection of true propositions. This definition is not complete, nor does it reach the meaning of science.” Ibid. p. 11. Instead, for Heidegger “Sciences are ways of Being in which Dasein comports itself towards entities which it need not be itself.” Ibid. p. 13. Science is a “how,” a way of interacting with entities, rather than a body of knowledge… it is the process of grounding as described in APo, rather than the information that arises from this process.
interpretation of those entities with regard to their basic state of Being. Such research must run ahead of the positive sciences, and it can.”

Underneath even these basic concepts is our pre-theoretical understanding of the world and, beneath that, of being.

We operate within an understanding of the meaning of being (which is always a contingent interpretation rather than a necessary answer) and this understanding lies beneath all other foundational understandings. And therefore, from Heidegger’s point of view here, the question of the meaning of being has ontological priority:

The question of Being aims therefore at ascertaining the a priori conditions not only for the possibility of the sciences which examine entities as entities of such and such a type, and, in so doing, already operate within an understanding of Being, but also for the possibility of those ontologies themselves which are prior to the ontical sciences and which provide their foundations. Basically, all ontology, no matter how rich and firmly compacted a system of categories it has at its disposal, remains blind and perverted from its ownmost aim, if it has not first adequately clarified the meaning of Being, and conceived this clarification as its fundamental task.

884 “Here the work of Plato and Aristotle is evidence enough. Laying the foundations for the sciences in this way is different in principle from the kind of ‘logic’ which limps along after, investigating the status of some science as it chances to find it, in order to discover its ‘method.’ Laying the foundations, as we have described it, is rather a productive logic – in the sense that it leaps ahead, as it were, into some area of Being, discloses it for the first time in the constitution of its Being, and, after thus arriving at the structures within it, makes these available to the positive sciences as transparent assignments for their inquiry.” Ibid. p. 10.

885 Ibid. p. 11.
This task became Heidegger’s lifelong pursuit. We can see why it was both so compelling and important for him, and, at the same time, why it was so difficult and withholding of culmination.
...as for proof – How can a man ever be certain?

Certainty, surely, is beyond human grasp.

Herodotus, *The Histories*

Chapter 5: Preliminary Conclusions

(Derived from Analysis of the Structural Dynamics of the Problem Situation)

We have now reached the part in this experiment where preliminary conclusions may be drawn. We have traversed an immense stretch of time and addressed a vast array of difficult philosophical issues. The methodological goal of this project has been to use historical analysis as a sort of empirical observational approach to philosophical questioning. Ideas are human products, but they are strange and complex creatures. Ideas are relational entities that unite semantic content, in fundamental relation to the world, language, and their own internal and logical dynamics and external entanglements. Ideas, concepts, problems, all of these terms refer to an indeterminate domain of entities that can be described, in basic fashion, as *philosophical phenomena*. These phenomena – relational to their core – always exist in a web of the above relations.

Philosophical phenomena are dynamic entities that change over time, between contexts, cultures and even individuals. The precise semantic content, index of understanding, network of relations, internal logic, and external entanglements of any
philosophical phenomenon is thus fundamentally indeterminate. If we want to understand the *meaning* of such a philosophical phenomenon as meaning itself, we need to unpack a vast amount of related philosophical baggage, whilst always bearing in mind that our conclusions will be of the nature of statistical conglomerations. The fluid nature of philosophical phenomena necessitates a methodological approach that arises out of the appropriate object domain (i.e. the subject matter\textsuperscript{886}) and that allows for a degree of flexibility and responsiveness to the vicissitudes of these indeterminate phenomena. Hence the unusual methodological approach we have used.

What I have tried to do here is to track the history of a particular philosophical phenomenon – meaning – within a firmly delimited time and philosophical space. The particular area of observation, or philosophical situation, examined thus far – Heidegger’s early philosophy from his *Habilitationsschrift* in 1915 to *Being and Time* in 1927 – was specifically chosen because it was a philosophico-historical situation in which the problem of meaning was engaged in a particularly penetrating and fundamental manner, significant not only for its own findings, but for its deep and far-reaching influence on the history of subsequent western philosophy. In the process of our examination several other important and related problem-complexes came to light. We tracked these philosophical phenomena through our observational range as well, paying particular attention to their connections to the phenomenon of our primary concern: meaning. In the experimental

\textsuperscript{886} The terminologically awkward nature of the subject/object relation ultimately relates both to the linguistic sloppiness with which we often use the word “subject” (“object” is less of a problem) and to the problems of fixing the respective positions of subject and object themselves. This second issue will come up again in our discussion of quantum mechanics, and, particularly in Bohr’s thought.
context of Heidegger’s philosophy we watched constellations of these philosophical phenomena change and shift as the individual phenomena themselves changed. As Heidegger engaged with these phenomena we were able to observe the micro-histories of these phenomena within our delimited range (*philosophia in motu*).

In this chapter I will attempt to analyse the observational data presented in the previous chapters and draw some preliminary conclusions. In the chapters that follow I will then test these conclusions in a second iteration of the experiment within a different philosophico-historical situation: Niels Bohr’s thought in the context of the development of quantum theory. The experimental situation will be within a different field – that of physics – which deals with a different range of phenomena. We could say that we are moving from a consideration of the metaphysical to the physical, if Heidegger had not also been concerned with physics in his own way. The idea behind this second iteration of the experiment is to test our findings – which will be structural, rather than content-specific – in a different content-situation to see if they stand or fall.

We began with a rough, hazy, and schematic description of our primary quarry, the phenomenon of meaning. In our initial analysis of the phenomenon we identified a number of related philosophical phenomena, primarily: ground, necessity and contingency, and the related phenomena of understanding and truth. With this collection of philosophical phenomena in hand – their connections and exact natures only roughly discerned – we proceeded to trace their changing and evolving manifestations in Heidegger’s early philosophy from his *Habilitationsschrift* to *Being and Time*. Heidegger began his philosophical career within a Catholic philosophical tradition heavily
influenced by the scholastic inheritance. His early focus on philosophical logic (rather than logic as a strict methodology for right reasoning) brought him to the problem of meaning, both in terms of the meaning of propositions and their constituent terms, and the entities within the world to which they refer.

In his *Habilitationsschrift*, Heidegger combined the ideas of Duns Scotus with those of Husserl, Rickert, Lotze, and, especially, Lask, creating a sort of medieval/modern hybrid that addressed the categorial determination of entities and a theory of meaning that focussed on the idea of the material determination of form. Meanings, on this account, are grounded in the “real world” of existing things; they are determined by the things that they represent. Categorial determination is itself a meaning-assigning act of differentiation. A category theory aims to explain the systematic clarification of the ultimate domains of reality (which can be conceived as the various categorial forms of meaning in general). The categories lay the foundation for the understanding of the theory of meaning in Heidegger’s theory. His category theory attempts to determine the divisions and bounds of what can be known.

Truth relations come from the objects they pertain to, as, for the Heidegger of this period, *meaning* is the matter of truth, and meaning is determined by the object. Indeed, meanings are not on this account; only entities are. Meanings – following Lask here – are either valid or invalid; they either hold or do not hold of entities. And the domain of meaning, the domain of validity (or holding), is within the domain of logic. Logic is the science of holding on this account. The Heidegger of this period provides a theory of
meaning as a division of the theory of logic. And the overall goal of his *Habilitationsschrift* is to put logic on a solid foundation.

Barely a year after completing his *Habilitationsschrift*, however, Heidegger added a conclusion to the published version that introduced a new set of problems, concerns, assertions, and plans for future work. There is an assertive tone to the added conclusion, but there are also hints that something is amiss in Heidegger’s philosophical world, that there are nagging problems beneath the surface waiting to come into fruition.

In the main body of the *Habilitationsschrift* there is a coherent set of relations that ultimately depend upon the rational organisation and understandability of the world. Meanings are determined by their objects, which stand within possible logical relations in a web-like complex of understandings of the phenomena of experience, which is divisible into primary domains of understanding (the categories), which are themselves determined by the objects of experience. The nagging concern that the conclusion attempts to address is the further question of just what it is that underlies the coherent system that the *Habilitationsschrift* describes. The young Catholic Heidegger ascribes this ultimate grounding role to the *Living Spirit* of the loving God. Thus, like Duns Scotus, Heidegger posits God as first principle or ultimate ground. The system of relations of meaning, understanding, and truth described in the *Habilitationsschrift* rests upon a necessary, timeless, ultimate ground in the Christian God.

In the years between his *Habilitationsschrift* and the beginning of his extant course notes, Heidegger underwent an extreme and fundamental philosophical and religious crisis, after which he was no longer able to believe God could be employed as a
first principle in philosophy. He then embarked upon a series of lecture courses that addressed the nature of philosophy itself. He described philosophy as a primordial science of origins that must, according to its nature, begin ever anew. Instead of positing God as an ultimate ground, Heidegger argued that philosophy, as primordial thinking, involved a sort of circular, self-grounding. Philosophy is *philosophising*, not a body of knowledge but an activity. It is thinking at the origins, a constant engagement with the most basic questions that begins ever anew and finds its ground not in an external entity, but in the intensity of the relation itself.

The twin problems of access, or intuition, and expression then arose. How are we to gain access to the realm of primordial questioning? And how are we to convey what we find there to others? Heidegger claimed that access was only available through a particular comportment towards relentless questioning that lives in the uncertainty of ultimate groundlessness. “Philosophy must become a problem for itself,” he said. We must embrace and even heighten the difficulty of primordial questioning, which must never arrive at a fixed answer but must question and question again.

According to the Heidegger of this period, everything we experience in the world is encountered as already meaningful; that is, meaningfulness is the basic way through which all of our encounters happen. But meanings are not independent. The meanings that things have are dependent on their relation to us; indeed, it is incorrect to say that things *have* meanings, rather, the meanings are the matter of the relations themselves. What something means is what it means to me: that is, not as a semantic-content assignment to some abstract sensory data, but *my desk*. We encounter things in terms of
contexts of meaning or interpretive frameworks. But each of us has our own interpretive frameworks and thus the question of relativism arises. Experience is fundamentally meaningful, but specific content (meanings) is relative. This relative relation to I myself is constitutive of our basic relation to and experience of the world.

Theoretical thinking, which sees things in generalised terms rather than the specific relational frame (that is, my own frame), is a derivative abstraction from the more basic way we usually relate. Heidegger says that theoretical thinking “de-vivifies” thinking as it abstracts (as it moves away from the I). He argues that philosophy must escape theory and stick to the more basic, direct, primordial questioning that is always related to I myself. Philosophy, as primordial science, must be pre-theoretical. Philosophy cannot provide definitive answers; it can only formally indicate; it can only point in a direction. But this is extremely difficult to do, as we tend to turn towards specific content in our questioning, which tends towards completion; keeping it open is difficult.

We are at the limits of philosophy here; and as we approach the vanishing point of intuition and expression our tools begin to fail us, and increasingly so. Language becomes a stumbling block, both in terms of communicating our thinking to others and the very exploration of our thinking itself. For instance: we must explore meaning without being caught up in meanings. And meaning is the primary realm we must explore. Meaning is the formal empty. It is a reflexive category. And the sort of circular grounding that Heidegger prescribes for philosophy and which, he claims, characterises primordial science, is pure reflexivity. Meaning is always related to an I, and rests on no static
ultimate ground. Heidegger argues that we must stick to the formal empty and describe movements and motivations rather than content.

For Heidegger at this time, philosophy must be phenomenological, and phenomenology’s guiding tendency must be toward the understanding of life from out of its origin. But we can only access this realm from within life. Phenomenology must explore the ground of grounds, and it can only do this through a particular way of relating to life (a “how” and not a “what”). Heidegger argues that we need to intensify our questioning relation to life by taking a certain reflexive notice of the structures, movements, tendencies, and motivations of life whilst, all the while, avoiding specific content. The world is fundamentally meaningful and fundamentally indeterminate; our only solidity comes from how we grasp it, how we relate to it. Heidegger stresses the insecurity of this whole enterprise and argues that this very insecurity is the driving motive for philosophy.

After this sequence of courses in 1919-20 that dealt with the nature of philosophy, Heidegger turned to the phenomenology of religion. Yet his religion courses continued to explore the same themes: the ultimate groundlessness, uncertainty, and insecurity of our existence and experience, the need for philosophy to plunge into and heighten this insecurity through a relentless questioning comportment rather than getting caught up in the answers that abound in life, but which are ultimately relative. The structural finding that we can draw from these explorations of Heidegger’s work in this period is that the only escape from the relativism of meanings seems to be in the general formally empty, contentless structural exploration of meaning. All of our certainties in regard to meanings
fall prey to scepticism and relativism without the solidity of an ultimate ground. The individual meanings are fundamentally indeterminate. But, if we analyse the mass of meaning (the phenomenon, \textit{per se}) in structural terms, the contentless, formally empty relational structures begin to become visible.

Heidegger’s thinking in this period makes a massive leap forward after the religion courses, in his engagement with Aristotle. In our exploration of Heidegger’s thought in this period it was necessary to spend a great deal of time on Aristotle’s own thought. This allowed us to see exactly what Heidegger picked up, how he interpreted it, adopted it, or reacted against it, and also what he left behind. Our discussion of Aristotle, and Heidegger’s relation to him, focussed on the question of understanding.

The chief aim of this dissertation is to explore what meaning means. As meaning is that through which our understanding operates, another way of expressing this chief aim is to say that this dissertation aims to explore what it means to understand. For Aristotle, to understand something is to know its ground. Aristotle sees scientific understanding as an aetiological enterprise, a process of grounding. The ground-relation is one of necessity; grounds are solid, fixed, certain, and necessary. And ultimately, Aristotle sees the universe as knowable in these terms. The universe is governed by necessity and its ultimate necessity is guaranteed by a timeless, unchanging ultimate ground that Aristotle sometimes characterises as God. Aristotle’s \textit{Metaphysics} is a science of ultimate ground that attempts to explore that which lies at the very limit of philosophy. As far from our ordinary thinking as it is however, Aristotle is certain that it
is a realm of ultimate necessity. Heidegger, however, has come to reject this kind of
ultimate necessity. This is the fundamental difference that separates him from Aristotle.

Aristotle believed we could only have knowledge of the necessary; the contingent
was, for him, ultimately unknowable. Heidegger, on the contrary, asserts that we can only
have knowledge of the contingent and that knowledge of the necessary timeless absolute
is but a dream. Aristotle argues that there must be a necessary ultimate ground. Heidegger
continues to assert that we can have no such thing, except in a circular self-grounding,
which, as particular and finite, is contingent by nature. He continues to stress the “how”
and in Aristotle’s *Nicomachean Ethics* he finds an account of a particular kind of “how”
that suits his needs. *NE Z* deals with *Phronesis*, the kind of practical know-how that deals
with the contingent. And, in an inversion of Aristotle’s own beliefs, Heidegger privileges
this practical know-how over scientific knowledge (*Episteme*). He argues, as he had in
the earlier courses of 1919-20, that theoretical knowing is derivative from the more basic
experience, which he now equates with Aristotle’s *phronesis*, or practical know-how.

Instead of a theoretical science of grounds and meaning, Heidegger develops an
account of the *kind of being* who experiences meaning and *traces* grounds: “Dasein,”
“being-there,” or, simply, “us,” the human being. Heidegger explores the question of
meaning within the realm it is actually to be found: in our lives as we live them. This
requires analysis of the kind of being that we are. We are not immortal and infinite.
Instead, we are finite; we are born and we die. We live our lives through our concerns.
We are always directed toward this or that, always relating to things in the world, other
humans, ideas, goals, memories, feelings, and, of course, ourselves. Heidegger calls this
relationality at the essence of our being “care.” Care is the basic nature of our existence, and it is something enacted, something we are always doing: caring.

Everything that we experience we experience as meaningful; we experience everything in, as, and through meanings. Meanings are related together in interpretive frameworks or relational nexuses of meaning. And meanings are always meanings in relation to us. Therefore meanings are relative; they are contingent. This proves problematic for any idea of truth as ultimately necessary and unitary. In response to this, and in dialogue with Aristotle, Heidegger develops a new concept of truth as “unconcealment.” Truth is our understanding engagement with entities in terms of their meaning, and is thus, itself, ultimately contingent. All meaning, all grounds, all truth, occur within the temporally particular finite life of Dasein, of the being who is here, in this particular time and place, for a while. We are always relating to the future through our care, always projecting forward. And we are always conditioned by the past because we are born into and grow up within a specific time and place and pick up interpretations and meaning-assignments from the world around us. Meanings and interpretations – meanings are always interpretations and interpretations are always meanings – are ever-shifting within this historical horizon. And they are conditioned not only by our historico-intellectual-cultural heritage through which we find them, but also our own future projections and our own present interpretations.

And yet, as the kind of being that we are, governed by care – about our projects, about things in the world, about others, and about ourselves – we have a tendency to seek security. Care desires security. Our basic way of dealing with the world on Heidegger’s
account – *Phronesis* or practical know-how – seeks to better itself. Heidegger now argues that theoretical thinking arose and arises from this very motivation towards better and better management of life’s experiences and dealings. Thus we develop modes of thinking that tend toward mastery and sets of answers and interpretations of the world that give us a sense of security.

And yet, the fundamental insecurity, finitude, and contingency of our lives always wait for us. The ultimate groundlessness lurks beneath us. Heidegger says that we tend to flee from thinking about our suspension in the void, even as we are always in a constant state of freefall. The desire for ultimate ground and its ultimate impossibility is the insecurity behind philosophy and presents its paradoxical challenge. Life desires to claim itself, our understanding tries to find its own ultimate and necessary ground, but understanding is always *within* temporal, finite, contingent life, which can provide no such ground. This motivated tendency and the impossibility of its fulfilment lie at the core of *Being and Time*’s fundamental ontology. Heidegger’s answer is still a circular self-grounding through a particular self-reflexive “how,” but, as before, it is ultimately contingent. Individual logical relations within the world of our thinking can have their own regional necessities, but all of these live within the ultimate contingency of our lives as we live them. The only necessity is what we could call historically conditioned necessity, or, paradoxically: contingent necessity (regional vs. ultimate necessity, immanent vs. transcendent necessity).
Preliminary Findings

What has Heidegger given us that we can use in our own research into the meaning of meaning, or “the problem of understanding” as we can also put it? We watched his development from an understanding of the universe of meaning as ultimately grounded in God as first principle to a sense of meaning as always enacted within the fundamental contingency of our finite lives. Heidegger’s early account was consonant with that of Aristotle: understanding is a relation between the thinking human being and a rationally ordered universe. Our understanding reflected the universe, governed by a set of necessary, rational, logical relations that were “out there” for us to decipher and absorb. As Heidegger’s thinking evolved he came to focus on the fact that understanding is always something occurring within an understanding being’s life. The entities that make up the universe would still be out there if we were not here, but their meanings, the meaningful relations between them, are purely relational rather than transcendent; they are part of our relation to the world, rather than something out in the world that we can absorb. They are created through the relational interaction, as Neuman would put it, rather than a product of either world or the entity under question.

This fundamental realisation is a logically inescapable finding we can take up from Heidegger. And it serves as a good jumping off point to present our own structural findings produced by analysis of the historical material. Understanding, and the meaning that comprises it, are enacted by an understanding being. Furthermore, this being (us) is finite and contingent. Therefore meaning is contingent. And yet, there are logically necessary connections amongst meanings (the products of our practical know-how and
the theoretical thinking that is a dependent development of this practical know-how).

Regional necessities therefore exist, but they exist within an ultimately contingent horizon. Grounding, as a process – a particular kind of thinking (aetiological thinking) – is, like understanding itself, something that is enacted by a living, thinking, finite being. Grounding therefore, is also ultimately contingent (as then are its products: grounds), and it is through this ultimately contingent process that regional necessities are traced (aetiologically), delimited, and ultimately: formed. Regional grounds exist as the sites of regional necessity and, likewise, exist within an ultimately contingent horizon.

Where have we arrived then? We have traced an historico-philosophical trajectory that led from a necessity-based picture of understanding and meaning defined by a conception of meaning-appropriation as importation from a rationally ordered and necessary universe into the understanding subject, to a contingency based picture of understanding and meaning as an enacted relation within the contingent life of the subject that enacts understanding as a relation to a universe that is indifferently meaningless when this relation is not being enacted. This historico-philosophical trajectory can be understood as a path traced within the physics of understanding itself (albeit contingently enacted here and now within this analysis). This trajectory, as an observed phenomenon, is a key product of the experiment, as are the preceding structural findings. We can lay out our results thus far as follows:

A) The historical trajectory abstracted into its structural form: from a necessity-based importation picture of meaning and understanding to a contingency based picture of meaning and understanding enactment.
This is a major historical turning point in the structural dynamics of understanding. It is, of course, a movement that is not exclusive to Heidegger. It is however, I propose, a movement that is characteristic of this period. And, as a structural picture, it should allow us to better understand other philosophico-phenomenal shifts in this period. Heidegger’s point about the Aristotelian underpinnings of thought in this period is apt. But this is the period of the breakdown of these underpinnings.

There is a large array of crisis literature that explores the late nineteenth and early twentieth century intellectual world and its convulsions: Stromberg points to a general crisis of European thought and its various manifestations in politics, the sciences, the arts, religion, and so forth, between 1880 and 1914. Luft describes a crisis of European culture, liberal values, rationality, and the self in relation to the Generation of 1905. And Burrow draws attention to what he calls a crisis of reason between 1848 and 1914.

Of particular pertinence to this issue however is de Jong and Betti’s discussion of what they call “the classical model of science” and its eventual breakdown in the early twentieth century. They argue that a picture of science, based on Aristotle, but not identical with his conception in the APo, served as “an ideal model of scientific explanation” throughout our period of study, from Kant

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through to the early decades of the twentieth century when it began to be abandoned.\textsuperscript{890} De Jong and Betti’s model focuses on axiomatics, grounding, ideas about independent domains, definitions, and propositions. They call it a “recent reconstruction \textit{a posteriori} of the way in which philosophers have traditionally thought about what a proper science and its methodology should be.”\textsuperscript{891} De Jong and Betti do not argue that this is the way that sciences actually functioned, nor do they argue that the model was held by all, or even explicitly acknowledged in most cases; it is an overall aggregate, a statistical construction of basic underlying assumptions about the ideal of science. And it presents a picture that is consonant


\textsuperscript{891} They break the model down into 7 propositions: 1. “All propositions and all concepts (or terms) of \textit{S} concern a \textit{specific set of objects} or are about a \textit{certain domain of being(s)}” 2a. “There are in \textit{S} a number of so-called \textit{fundamental concepts} (or terms)” 2b. “All other concepts (or terms) occurring in \textit{S} are \textit{composed of} (or are \textit{definable from}) these fundamental concepts (or terms)” 3a. “There are in \textit{S} a number of so called \textit{fundamental propositions}” 3b. All other propositions of \textit{S} follow from or are grounded in (or are \textit{provable} or \textit{demonstrable from}) these fundamental propositions” 4. “All propositions of \textit{S} are \textit{true}” 5. All propositions of \textit{S} are \textit{universal} and \textit{necessary} in some sense or another 6. “All propositions of \textit{S} are \textit{known to be true}. A non-fundamental proposition is known to be true through its \textit{proof} in \textit{S}” 7. All concepts or terms of \textit{S} are \textit{adequately known}. A non-fundamental concept is adequately known through its composition (or definition).” Ibid. p. 186 De Jong and Betti focus on figures such as Kant, Leibniz, and on the logic of Port-Royal, but other examples abound. For instance, Huxley’s 1887 essay “The Progress of Science” expresses the same basic conception: “The object is the discovery of the rational order which pervades the universe… All physical science starts from certain postulates…any of the rules, or so-called ‘laws of nature,’ by which the relation of phenomena is truly defined, is true for all time. The validity of these postulates is a problem of metaphysics; they are neither self-evident nor are they, strictly speaking, demonstrable.” Huxley, T.H. \textit{Selections from the Essays of T.H. Huxley}. New York: Appleton-Century-Crofts, 1948. Pp. 55-6. We will encounter this topic again as we move on to Bohr and quantum physics.
with Heidegger’s assertions about the Aristotelian underpinnings of thought in his period.\textsuperscript{892}

I plan to use this dissertation as a starting point for future research into this crisis situation of the late nineteenth and early twentieth centuries, a crisis I characterise as a foundational crisis of meaning.\textsuperscript{893}

For the moment, in the remaining chapters of this dissertation, I plan to test this finding in a different experimental situation: Niels Bohr’s thought in the 1920’s as part of the development of quantum theory and its culmination in the Bohr’s concept of Complementarity and his attendant philosophical interpretation of quantum mechanics and broader “quantum philosophy”.

\textbf{B) In addition to the observed historical trajectory, several findings about meaning, understanding, ground, and necessity and contingency have also been abstracted (as described above):}

1) Understanding and meaning are always enacted by a being

2) This being is finite and contingent

3) Meaning is ultimately contingent

\textsuperscript{892} To this we may add that the battle between the “realists and idealists” in philosophy in the early decades of the twentieth century, which saw a newly resurrected “neo-Aristotelianism” used as a weapon against the prevalent neo-Kantianism, presupposed a picture of science identical to the model de Jong and Betti described, both on the Aristotelian/realist side, and on the Kantian/idealist side (Kant, of course, even after the critical turn, remained an Aristotelian in terms of logic and his basic understanding of science).

\textsuperscript{893} I hope to develop this work in two different directions: a project that examines the nineteenth century roots of this crisis situation, and a project that provides a more general description of the crisis in its various manifestations in the 1920s.
4) Regional necessities exist within a contingent horizon

5) Grounding is an enacted activity

As with the historical trajectory, these five related findings will also now be tested in the new experimental situation.

C) As we test the two primary divisions of our findings (A and B) in the new experimental situation, we will also be testing their relation to each other. They arose out of the same analysis, but we need to check to see that these structural phenomena hold together in their relations within other philosophico-phenomenal situations as well.

D) As the investigation proceeded the various concepts with which we began this study began to cluster around three primary problem areas, united by a set of structural relations: meaning, ground, and access. These primary problem areas may be expressed in a simple diagram:
Each problem area represents a nexus of problems. Each problem area can be unpacked into more and more detailed and differentiated sets of problems that stand in more or less indeterminate relations to each other. For instance, the problem area of meaning includes relationality, understanding entities within the world, expression, and so forth. Many individual problems will be found in all three problem areas (the problem of truth, for example).

Meaning is related to the problem of access and the question of ground. Ground and access are, likewise, related. And the twin problems of necessity and contingency relate to all three. Thus, we can refine our diagram:
These structural relations also need to be tested in our new experimental situation. In addition to the above findings, our now familiar reference points, particularly in Kant and Aristotle will continue to be important in the new experiment. And it is to this new experiment that we now turn.
Actuality is not served [by placing it within Logic], for contingency, which is an essential part of the actual, cannot be admitted within the realm of logic. Logic is not served thereby, for if logic has thought actuality, it has included something that it cannot assimilate, it has appropriated at the beginning what it should only praedisponere. The penalty is obvious. Every deliberation about the nature of actuality is rendered difficult, and for a long time perhaps made impossible, since the word ‘actuality’ must first have time to collect itself, time to forget the mistake.

...what happens in the greater can repeat itself in the lesser, and the misunderstanding is similar, even if there are less harmful consequences.

Kierkegaard, The Concept of Anxiety

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Part 2

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If you want to penetrate into the heart of physics, then let yourself be initiated into the mysteries of poetry.

Friedrich Schlegel, Ideas

The uncertainty is not coincidental; rather it is necessary.

Heidegger, Introduction to the Phenomenology of Religious Life

Chapter 6 – A New Instance of the Problem Situation:

The Early Development of Quantum Physics

(Or: The Pre-History of Bohr’s Quantum Philosophy)

Our new experimental situation takes us into a new ontological realm: from τα μεταφυσικά πράγματα to τα φυσικά πράγματα, from things metaphysical to things physical. There are a number of reasons that I chose the development of quantum theory and Bohr’s thought in particular. Structural similarities, which will become apparent as these next two chapters progress were a prime reason. So too was the synchronicity between Bohr and Heidegger’s development, including great culminations in 1927. The centrality of language, meaning, and interpretation in both problem situations and both thinkers’ responses is crucial. But I will also admit that there is something deeply satisfying about this pairing of the metaphysical and the physical. I had initially envisioned a larger project that included studies of developments in the arts and theology
in the same period. This, of course, would have made the project impossibly large. And it now seems not only fitting, but preferable to have boiled the project down to its essence by exploring these two primary ontological domains.\textsuperscript{894}

We now move then to the realm of nature, to the realm of physics. We will explore the development of quantum theory in the world of sub-atomic physics from 1900 with Planck’s introduction of quantization into the mathematical expression of blackbody radiation to the so-called Copenhagen Interpretation of quantum mechanics and Bohr’s concept of complementarity in 1927.\textsuperscript{895} As with our study of Heidegger, we will need to range further afield chronologically in order to better understand the thought we encounter within our circumscribed period. As we explore some ideas we will need to follow them outside of Bohr’s own work. We will need to begin by situating ourselves historically. And, first of all, we will need to define some terms. We begin with “physics” itself.

The Greek “physis” means “nature.” The pre-Socratics had already used the term, and it meant not only things that are, but also an account of them. Thus, in Laws X, we hear that “when they use the term ‘nature,’ they mean the process by which the primary substances were created.”\textsuperscript{896} In Aristotle we have a definite description of physics or

\textsuperscript{894} One could envision further iterations of the experiment in synchronous developments in other fields such as the arts or ethics even.

\textsuperscript{895} “The Copenhagen Interpretation” as a term is common, but also slightly problematic. It is true that a basic “Copenhagen” outlook was shared by Bohr, Heisenberg, Pauli, and a number of other physicists associated with Bohr’s institute, but by lumping all of these figures together into a single, monolithic, “interpretation,” we gloss over the differences in their particular views (see below for more).

\textsuperscript{896} Plato, Laws, 892c.
“natural science” as it is also translated, as the study of things that change.\textsuperscript{897} Change, including generation, is movement for Aristotle. Physics, or natural philosophy for Aristotle, was second philosophy, after ontology.\textsuperscript{898} Though he was interested in mathematics, Aristotle’s “physics” was not mathematical. It was descriptive and demonstrative; it was an aetiological science, a science of determining and explaining by causes or grounds. The Aristotelian science of physics described causes of natural phenomena. As he puts it in the first lines of the \textit{Physics}: “when the object of an inquiry… ha[s] principles, causes [grounds], or elements, it is through acquaintance with these that knowledge and understanding is attained.”\textsuperscript{899} Physics, as with all demonstrative sciences in Aristotle is governed by necessity. We only know something if we know its ground, and only if its ground is a necessary ground. For Aristotle there were two or three basic first principles of physics: the subject (that which undergoes the change, whether that be in position, size, shape, or state) and the form of that which it becomes. He says that “everything comes to be from both subject and form.”\textsuperscript{900} On the basis of these three first principles the grand edifice of Aristotelian natural philosophy was built. And the basic stance of physics remained Aristotelian for a long time. It encompassed a vast range of phenomena, from what we would call the physical sciences to the life sciences and even parts of the human sciences like psychology.

\textsuperscript{897} Met 10 1059b16-8, 1061b6-7. 
\textsuperscript{898} Met 5 1025b19-21. 
\textsuperscript{899} Phys 1 184a10-11. 
\textsuperscript{900} Phys 1 190b20. In this sense there are two first principles of physics, but as the subject itself is a combination of its own form and its matter, it can be seen as three as well. Met 190b20-36.
In the seventeenth century and afterward however, natural philosophy began to become increasingly mathematized, becoming more recognisable as approaching the science that we know today. By the twentieth century physics had not only been thoroughly mathematized, it had also divested itself of much of its original subject matter. As von Weizsäcker and Juilfs put it in 1957: “Amongst the natural sciences, physics occupies the central place… Today we consider it as the theory of the general laws of nature, in contradistinction to sciences such as astronomy, geology, meteorology, which deal only with specific phenomena.”

Within our 1900-27 period, Kimball, in his 1911 *College Text-Book of Physics*, published the same year as Bohr’s dissertation, tells us:

Physics deals with the properties and phenomena of inanimate matter [i.e. not biology] as affected by forces, and is especially concerned with the properties common to all kinds of matter and those changes of form and state which matter undergoes without being changed in kind [i.e. not chemistry], as well as such general phenomena as sound, heat, electricity and magnetism.

And yet, as different from Aristotle as this sounds, and as mathematized as Kimball’s physics is, the root has not been entirely extracted from its Aristotelian soil. Kimball tells us that:

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901 For these mid-century authors “physics is rooted in experiment, in active, inquisitive and skilful intercourse with nature… [but] experiments are blind if they are not guided, or at least interpreted subsequently, by theoretical considerations. The tool of conceptual thought in physics is mathematics, for physics treats of relations between measured, that is numerically determined magnitudes.” Von Weizsäcker, C. F. & Juilfs, J. *The Rise of Modern Physics*. New York: George Braziller, Inc. 1957, p. 11.

It is the aim of physical science so to systematize our knowledge of the material world that all its phenomena shall be seen as special instances under a few far-reaching and more inclusive generalizations called laws. And when a given phenomenon is analyzed in this way into separate parts or phases each of which is but a special case under some general law, the phenomenon is said to be explained.\textsuperscript{903}

In true Aristotelian style he asserts that in “seeking an explanation we determine the \textit{causes} of the phenomenon in question…”\textsuperscript{904}

Physics is an enterprise; it is something that human beings do. It is, and has been at its most basic level, an attempt to understand, describe, and explain physical reality at a fundamental level. Einstein described the practice of physics as being akin to a detective story. We try to figure out “what is really going on” from a set of often confusing clues.\textsuperscript{905} Physics tries to understand and explain the behaviour of physical reality. As with Einstein’s detective story the physicist tries to “read” the clues in nature and discover laws that explain why physical phenomena behave as they do. As such, physics is an inherently \textit{hermeneutic} enterprise. Physics is a process of observation (including

\textsuperscript{903} Ibid.
\textsuperscript{904} Ibid. pp. 1-2. Henry Crew in his 1916 \textit{General Physics} has nearly the same account. He notes that “the place of physics in the family of the sciences is then a very modest one, for it deals only with a particular group of phenomena, associated with inanimate matter, and limited essentially to those changes in which the composition of the various substances involved remains unaltered. Within this limited domain the purpose of the physicist is to discover and to describe the universal and constant modes in the behaviour of nature.” Crew, Henry. \textit{General Physics: An Elementary Text-Book for Colleges}. New York: The Macmillan Company, 1916. P. 5.
\textsuperscript{905} He warned though that, unlike a mystery story, we “cannot even be sure that [physics] has a final solution.” Einstein, A. & Infeld, L. \textit{The Evolution of Physics}. New York: Simon & Schuster, 1966. P. 3-5.
measurement and experiment) and *interpretation*. And theoretical physics, which will be our primary focus here is especially so.

The interpretive enterprise that is physics must attempt to deal with two core problems that we have already encountered: those of intuition and expression. Physics is an enterprise that aims at understanding. The problem of just how we are to arrive at this understanding is one that physics has faced from the beginning. But physicists also seek to communicate this understanding and, indeed, they need to do so in order to work collaboratively. The increasing mathematization of physics since the seventeenth century is a response to both problems. Mathematics is both a powerful cognitive tool and a powerful language of expression. The fixing and universalising of the language of physics, from terms to notation, facilitates the communicative process so necessary in such a vast enterprise.

Looked at in this fundamental and basic manner, physics, as an interpretive enterprise that aims to understand and explain the behaviour of physical reality, is rooted in the problem of meaning. Physics is a meaning-determining, creating, and communicating enterprise. The laws that describe the “causes” of physical phenomena are complex semantic entities. Physical description is a meaning constituting act. And, of course, it depends on language. Aristotle already understood this connection between scientific understanding and language and attempted to describe and perfect this relation in the *Analytics*. There is no explanation without predication. But, even before this, there is no understanding without the *matter* of understanding itself: *meaning*. 
As with our first experimental situation however, we are not concerned with a field in general, but with a more limited and manageable domain. We are examining the birth of quantum theory in sub-atomic physics up until 1927. And we are particularly concerned with one figure who played a crucial role in this development: Niels Bohr. Bohr was born in Copenhagen in 1885, just four years before Heidegger. He was also a bright pupil and went on to become world famous even outside of his own field. And yet, it is hard to think of two people whose life-stories and personalities could be more unalike.

Unlike Heidegger’s poor and humble origins Bohr was born in a mansion, not in a small town but in the capital. Heidegger’s father was a sexton, while Bohr’s father was a professor of physiology who was head of the university for a time and was later nominated for a Nobel Prize. Heidegger’s struggle with poverty in his student years had no parallel in Bohr’s life. Heidegger stayed within a very small geographical area not only during his early years but also for most of his life. Bohr travelled extensively, spending crucial years studying abroad in England. While Heidegger’s earliest education came from the Church, Bohr was allowed to sit in and listen while his father held dinner and discussion meetings on Fridays with the some of the greatest minds of Denmark at the time.

Bohr’s upbringing was essentially non-religious. His parents only had he and his brother Harold Christened so that the other children would accept them and they would not feel left out. He therefore had no great “faith of his birth” to break from and react against. And finally, while Heidegger’s work was, for the most part, a solitary pursuit,
Bohr’s work was collaborative, both by necessity (due to the scope and nature of physics) and by inclination. He developed his ideas in dialogue with others, in most cases, quite literally. And therefore in this iteration on the experiment we will encounter the work of others in a way that we did not with Heidegger. Despite all of these differences, however, there are some remarkable structural similarities in the thought-trajectories of these two markedly different men working in these markedly different fields. In order to begin to understand the world of Bohr’s thought however, we must begin by understanding the world of thought into which he stepped as a young physicist in the teens of the twentieth century. We need to understand the world of sub-atomic physics as Bohr found it and, therefore, we begin with its prehistory.

*A Brief Prehistory of the Sub-Atomic Quantum Problem*

“Physics” as Kimball knew it in 1911 and as Bohr would come to know it as he entered Copenhagen University in 1903, had come into existence as a distinctive discipline in the course of the nineteenth century. By 1900 physics had lost some of its earlier subject matter, focusing on the behaviour of non-living matter, and had found its centres of gravity in experiment and mathematical expression. Its major divisions were the studies of mechanics (including both statics and dynamics), electricity and magnetism, the more specialised dynamical studies of hydrodynamics and thermodynamics (formerly considered subjects of applied mathematics), and the study of light. For our purposes, we need to understand developments in mechanics, thermodynamics, and the study of light and electromagnetism leading up to the quantum revolution and its conceptions of the constitution and behaviour of the smallest
components of matter. And the best place to begin our attempt to understand these developments is with the formidable achievements of Newton.

We are primarily interested in three Newtonian themes: mechanics, the calculus, and optics. I say “Newtonian themes” because it is not so much Newton himself that is important in this discussion; rather, what is important are particular constellations of ideas and approaches, centred around these three primary themes, that had their own, post-Newton histories leading up to the quantum revolution. Newtonian themes are a good place to start, particularly because so many of the physicists involved in the changes occurring in the early decades of the twentieth century saw themselves as either confronting the limitations of, or even overturning a “classical physics” that owed much to Newton. This picture was part of a complex history of the self-understanding of physicists that used many different versions of “Newtonianism” to various ends in debates over the proper interpretation of what physics is or should be. Our concerns here are, of course, not over the veracity of any of these historical claims, but with the role that “Newtonian” themes played within the development of what became “classical physics” in the nineteenth century. The simplistic picture of a monolithic classical physics that was overturned as the twentieth century began is prevalent in popular accounts, but it is far from accurate. Rather than defining “classical physics” as a settled

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906 As Koyré put it: “It is utterly impossible to give in a brief space a detailed history of the birth, growth, and decay of the Newtonian world view. [And] It is just as impossible to give a reasonably complete account of the work performed by Newton himself.” Our scope here will be limited to the bare essentials required to understand the world of physical science in 1900 when Planck introduced quantization. Koyré, Alexandre. *Newtonian Studies*. London: Chapman & Hall, 1965, p. 3.

totality by the end of the nineteenth century the end of the nineteenth century we will follow a small number of historico-intellectual trajectories within the world of physical science that came together in the quantum revolution after 1900. Too often the history of this “quantum revolution” takes the form of a story that starts in 1900, with some unresolved problems of a more or less monolithic “classical physics” that barely knew it was about to be overturned by relativity and uncertainty. The changes in modern science which concern us here were not only a revolution in the sense of an abrupt overturning but also in the older sense of a constant process of turn-over and change. And the quantum “revolution” cannot be properly understood without putting it into its longer-scale.

908 Older accounts such as Dampier’s often tend in this direction: “It seemed as though the main framework had been put together once and for all, and that little remained to be done but to measure physical constants to the increased accuracy represented by another decimal place…” Dampier, Sir William C. A History of Science: and Its Relations with Philosophy and Religion. Cambridge: Cambridge University Press, 1944. p. 382. Strangely enough Dampier comes very close to the exact language of Maxwell’s 1871 warning against this very idea. Maxwell, James Clerk. “Introductory Lecture on Experimental Physics.” The Scientific Papers of James Clerk Maxwell. Vol. 2. New York: Dover 2003, p. 244.

909 Crowe has pointed to the need “to call into question the widespread belief that the two great modern revolutions in physics were… Galileo and Newton… and… Planck and Einstein.” Our approach of following a small number of essential trajectories hopes to avoid this oversimplified view. Crowe, Michael. Mechanics: From Aristotle to Einstein. Santa Fe: Green Lion Press, 2007. P. 245.

910 See Staley, Richard. “On the Co-Creation of Classical and Modern Physics.” Isis 96 (2005), pp. 530-58. Boris Kuznetsov points out that “periods of upheaval sometimes coincide with the appearance of new retrospective evaluations connected with radical changes in the content and style of science” and that this is particularly so in the case of relativity and quantum mechanics, but that the modern, non-classical physics, of course, owes its existence, both historically and epistemologically to the classical (which itself owes its existence as “classical” to the new mode). “This is why the modern style and the modern problems of science do not correspond to a ‘clean slate.’” Kuznetsov, Boris. “Quantum-Relativistic Retrospection and the History of Classical Physics: Classical Rationalism and Nonclassical Science.” In Historical Studies in the Physical Sciences 3 (1971), pp. 117-35. Pp. 117, 133.
historical context and seeing it as part of a history of the movement of multiple scientific intellectual trajectories that collided in the world of sub-atomic physics after 1900.

Here we are concerned with locating appropriate starting points that will enable us to develop our own picture of crucial but limited parts of the world of physics before the quantum revolution. This “world of physics” consisted of an interpretation of physical phenomena and the perceived underlying laws that governed their behaviour. Ideally, it represented a world-picture, expressed in mathematical language and verified by experiment and observation.\footnote{McKinsey et al.’s claim that “particle mechanics, like any other science in deductive form, involves an idealization of actual empirical knowledge – and is thus better conceived as a tool for dealing with the world, than as a picture representing it” is based on an imprecise and undefined notion of “picture.” A picture can involve any number of idealizations or derivations from empirical (also ill-defined) experience (representational strategies for instance: think of Duchamp’s \textit{Nude Descending a Staircase} as but one salient example). Their statement also sets up a false dichotomy. “Pictures” can be and often are, tools as well. McKinsey, J., Sugar, A. & Suppes, P. “Axiomatic Foundations of Classical Particle Mechanics.” \textit{Journal of Rational Mechanics and Analysis} Vol. 2, No. 2 (1953) pp. 253-72, p. 254.} In reality it was a complex constellation of observations, interpretations, language rules – both terminological and grammatical – arguments, and consensuses. Here we only have space to deal with a small number of the components of this hermeneutic world, and these are most effectively located and illustrated by beginning with these three crucial achievements of Newton. We begin with Mechanics.

**Mechanics**

In the domain of mechanics we are concerned with the foundation and building blocks supplied by Newton and refined, particularly by Lagrange and Laplace, becoming codified in the system of “classical mechanics,” which was a constellation of consensuses as well as conflicts and contentions, by the close of the nineteenth century. The
“Newtonian” mechanics that Lagrange and Laplace took up and developed, in markedly different directions, in the late eighteenth and early nineteenth century was a process of mathematical description of the movement of point mass bodies and the forces at play therein. Newton’s insistence that he was “considering those forces not Physically but Mathematically” and his hesitation to argue for mechanical descriptions of the causes of these forces played a key role in the mathematization of physics. Newton’s axiomatic system of description and its mathematical language became a template for further work in mechanics in the centuries that followed its publication.

As Cohen sums it up: “Newton’s physics is based on two fundamental concepts: mass and force.” It provides mathematical descriptions of the behaviour of physical bodies, endowed with mass, and affected by forces. A body is a physical thing, a lump of matter of some sort. Mass is the body’s substantiality quantified. Point mass mechanics simplifies the description of bodies, treating them as single points where the gravitational centre of their mass is located. Newton used the term “quantity of matter” to describe mass and defined it as a combination of density and volume. “Movements” refers to the state of a body; a body is either moving or at rest. But Newton’s concept of motion

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915 As he put it: “The quantity of matter is the measure of the same, arising from its density and bulk conjointly.” Newton, *Principia.* P. 1.
involved more than just this simple binary, for bodies could be said to be moving or at rest in two different senses: either relative to other bodies, or absolutely.

Absolute movement or rest were, themselves, relative, not to other bodies but to what Newton referred to as “absolute space,” which he regarded as a physical reality rather than an abstract notion. “Absolute space, in its own nature, without regard to anything external, remains always similar and immovable.” All movement and stasis of bodies occurs within absolute space, the reference frames of relative movement themselves either static or moving within it. Time too had both relative and absolute senses for Newton. The relative time of our experience, which we sense and measure, was contrasted with “absolute, true, and mathematical time, of itself, and from its own nature [which] flows equably without regard to anything external.” Within absolute space and time objects move or remain static because of forces.

Jammer breaks Newton’s concept of force down into inertial and impressed forces. “Inertial force,” Newton’s “vis inertiæ,” is innate; it is inherent in matter. This inertial force is a measure of an object’s resistance to changes in state and thus related directly to mass. Indeed, the modern notion of mass is a body’s resistance to acceleration by a given force \( m = F/a \). Impressed forces impress upon bodies and effect changes of state. There are three basic sorts of impressed force: percussion, pressure

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916 Ibid. p. 6.
917 Ibid.
919 Cohen points to the strangeness of conceiving of inertia as a “force” or vis, and notes that “we have no basis for guessing what was his state of mind.” Cohen, “Newton’s Concepts” p. 62. Jammer explains it as a “concession to pre-Galilean mechanics” and the Aristotelian conception of active and passive dynamis. Jammer. Concepts of Force. P. 120.
(both contact forces), and centripetal force, whereby bodies attract each other toward their centres of mass.\textsuperscript{920}

With these conceptual building-blocks and his three laws of motion\textsuperscript{921} Newton constructed his mechanics. His work was possessed of an “ideal of mathematical realism in which mathematical entities and operations map onto structures and changes in the physical world, thereby promising the mathematization of nature once its laws could be established.”\textsuperscript{922} Laplace, summing up his perception of the history of mechanics since Galileo “laid the first foundations of the science of motion” places supreme confidence in this mathematical ideal. “Geometricians,” he says in 1796, “following up the steps of this great man, have finally reduced the whole science of mechanics to general formula, which leaves nothing to be desired but to bring the analysis to perfection.”\textsuperscript{923} In Laplace’s refined mathematical physics “the determination of the motion of a body, becomes an

\textsuperscript{920} “A centripetal force is that by which bodies are drawn or impelled, or any way tend towards a point as to a centre. Of this sort is gravity, by which bodies tend toward the centre of the earth [and] magnetism, by which iron tends to the loadstone…” Newton, \textit{Principia}. P. 2.

\textsuperscript{921} 1) “Every Body perseveres in its state of rest, or of uniform motion in a right line, unless it is compelled to change that state by forces impressed theron.” 2) “The alteration of motion is ever proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed.” 3) “To every action there is always opposed an equal reaction: or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.” Newton, \textit{Principia} pp. 11-12.

\textsuperscript{922} Gabbey, Alan. “Newton and Natural Philosophy.” In Olby (et al.). \textit{Companion}. p. 250.


Laplace gives his picture of physical science as a whole on the preceding page: “Surrounded as we are by an infinite variety of phenomena, which continually succeed each other in the heavens and on the earth, philosophers have succeeded in recognizing the small number of general laws to which matter is subject in its motions. To them, all nature is obedient; and every thing is as necessarily derived from them, as the return of the seasons; so that the curve which is described by the lightest atom that seems to be driven at random by the winds, is regulated by laws as certain as those which confine the planets to their orbits.” Ibid. p. 221.
investigation of pure analysis, which is reduced to the integration of… differential equations."\textsuperscript{924} Laplace’s own work fell out of favour after the fall of Napoleon and the concomitant shifts in the French scientific establishment.\textsuperscript{925} But he had a profound and lasting influence in mechanics not only through his mathematical refinements but through the overarching goals of his physical theory, which sought a unified system of explanation for all physical phenomena, from celestial and terrestrial mechanics to chemical and biological phenomena.\textsuperscript{926} Laplace and mechanics in general owed a great methodological and mathematical debt to a figure who is too often overlooked in histories of physics: Lagrange. Lagrange played a vital role in the further mathematization of physics and in the development of its conceptual tool-kit. But in order to tell the rest of the story of mechanics properly, we need to pause for a moment and encounter our second “Newtonian” theme, the calculus.

\textit{The Calculus}

“On the non-existent logical foundations of arithmetic and algebra and the somewhat insecure foundation of Euclidean geometry, mathematicians built analysis, whose core is the calculus.”\textsuperscript{927} So wrote Morris Kline in 1980. Analysis works by decomposition. In chemistry, it is the process of breaking chemical compounds down into their components. In philosophy, it is, likewise, the process by which we break compound...

\textsuperscript{924} Ibid. p. 249.
\textsuperscript{926} As Harman points out, the rejection of much of the actual content of his physical theory such as the imponderable fluids did not mitigate his overall impact. Harman, P. M. \textit{Energy, Force, and Matter: The Conceptual Development of Nineteenth-Century Physics}. Cambridge: Cambridge University Press, 1982. Pp. 18-9.
problems, ideas, linguistic statements, and so forth, down into their ultimate constituent parts. In mathematics, analysis is a similar process; it begins with a given phenomenon (a curve, for instance) and breaks it down into its mathematically expressible constituent parts. At its most basic level, mathematical analysis employs algebra, breaking up the phenomenon into its various expressible quantifiable constituents (i.e. constants and variables) and arranging them in an equation, which is an expression of their relations. The calculus, developed simultaneously by Newton and Leibniz, though with earlier precursors, was a method of analysis capable of breaking down complex phenomena hitherto essentially ine xpressible.

Klein calls the calculus “the most subtle subject in all of mathematics.” It has its roots in the earlier analytic geometry of Fermat and Descartes and stretches back further into antiquity. The calculus is a set of mathematical procedures whereby we can describe and analyse change. Before the invention of the calculus in the seventeenth century, analytical geometry had been employed in physics, using equations representing physical trajectories as sets of points located in three dimensions. The calculus allowed natural philosophers to take the next step by rendering mathematically expressible rates of change, and the slopes of curves (differential calculus), and the accumulation of quantities and areas under curves (integral calculus).

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928 Except by such methods as exhaustion, for instance.
929 Klein, Mathematics. P. 127.
931 For a clear and concise explanation of the functions of the calculus see: Klein, Mathematics for the Nonmathematician. New York: Dover, 1967, pp. 365-415. The problem of the logical grounding of the calculus followed long after the development of
Newton had “aimed at injecting certainty into natural philosophy by deploying mathematical reasoning,” and there are tensions and complications within his corpus between his philosophy of mathematics and the employment of analytic methods. But as earlier, we are not so much interested in Newton’s own ideas as we are in their later trajectories through the eighteenth and particularly the nineteenth century, leading up to the subatomic physics of the early twentieth century. Here the further development of the calculus and the uses it was put to in physical problems are the key issues and one of our key players is Joseph-Louis Lagrange (1736-1813).  

Its methods and procedures. For the history of this problem see Klein’s *Mathematics: The Loss of Certainty*, and: Kramer, Edna. *The Nature and Growth of Modern Mathematics*. Princeton: Princeton University Press, 1982. Guicciardini, Nicolò. *Isaac Newton on Mathematical Certainty and Method*. Cambridge: The MIT Press, 2009, P. xiii. Guicciardini traces this tendency and Newton’s attendant philosophy of mathematics, from Newton’s early *Optical Lectures* from 1670 to 72, where he argued for mathematics as a “source of certainty” (p. 21), through to the end of his life. But there exists a tension in Newton’s philosophy of mathematics, particularly in regard to analytic practices, which goes some way towards explaining the primarily geometrical explanations of the *Principia*. As Guicciardini puts it: “Newton’s unsystematic but efficient mathematical practice was at odds with his philosophical agenda. He sought certainty in mathematics, and never ceased to see mathematics as the vehicle for delivering certainty in natural philosophy. He was opposed to the anticlassical stance that he perceived in Descartes… and portrayed himself as indebted to Euclid and Apollonius rather than to the moderns. This notwithstanding, his mathematical methods are a Cartesian heritage. He tried therefore to reformulate his analytical methods of discovery into a synthetic form, a form in which all reference to algebraic analysis is suppressed – the equation is neglected – and the purity, unity, and beauty of geometry recovered. This was largely a failure.” Pp. 385-6. The significance of this tension between analysis and synthesis will become more apparent as we proceed further.  

It is puzzling that Lagrange has not received more attention. Harman is a notable exception, as is Dugas. He features more prominently in histories of mathematics, credited for his mechanics as well as his mathematical innovations. Kramer calls him “possibly the greatest figure in the history of mechanics.” Kramer. *The Nature and Growth of Modern Mathematics*. P. 234. The lack of attention paid to Lagrange by historians of physics is somewhat unusual, considering not only his own innovative work, but the great regard in which it was held by some of the giants of nineteenth century
Lagrange was one of the many great mathematicians who further developed the calculus. Euler (1707-83), who was older than Lagrange and a key promoter of his career, “wrote a prodigious number of books and articles promoting the new analysis, organizing it, and putting it on a formalistic basis.” The tension between a geometrically inclined philosophy of mathematics and the analytic function of the calculus in Newton became more and more decided towards the latter in Euler and Lagrange. While most of Euler’s “predecessors had considered the differential calculus as bound up with geometry… Euler made the subject a formal theory of functions which had no need to revert to diagrams or geometrical conceptions.”

Lagrange, who further developed the methods of analysis, played a similar role in physics in his application of analytic methods to mechanics. He created a purely analytical mechanics, based on the mathematical expression of quantities, which divorced their mathematical expression from physical description itself. Lagrange’s analytical mechanics aimed at a purely mathematical description of physical phenomena. As Maxwell put it in 1873:

The aim of Lagrange was to bring dynamics under the power of the calculus. He began by expressing the elementary dynamical relations in terms of the corresponding relations of pure algebraical quantities, and from the equations thus obtained he deduced his final equations by a purely algebraical process. Certain quantities (expressing the reactions between the parts of the system called into play by its physical connections) appear in the equations of motion of the physics, many of whom used his analytic approach (and his equations of motion) as a basis for their own work (Hamilton, Maxwell, Thomson, Tait, Mach, and Lorenz to name the most prominent).

component parts of the system, and Lagrange’s investigation, as seen from a mathematical point of view, is a method of eliminating these quantities from the final equations.\footnote{Maxwell, James Clerk. \textit{A Treatise on Electricity and Magnetism}. Vol. 2. New York: Dover, 1954, p. 199.}

Lagrange’s equations provided a method of generalised mathematical description that was applicable for both statics and dynamics and that became classical.\footnote{For one of the most cogent accounts of Lagrange’s equations that does not shy away from the mathematics see: Dugas, René. \textit{A History of Mechanics}. New York: Dover, 1988, pp. 342-5, and pp. 332-49 for an account of the \textit{Analytical Mechanics} as a whole. See also, Hamburg, Robin, “The Theory of Equations in the Eighteenth Century: The Work of Joseph Lagrange.” \textit{Archive for History of Exact Science}, Vol. 16, No. 1, pp. 17-36.} These were a related set of equations for describing static systems, dynamic systems, and hydrodynamic systems.

His goal in the \textit{Analytical Mechanics} was to connect all of the branches of mechanics with such a series of descriptive equations. Speculations about the causes of forces were not part of his programme. He analysed forces at play without speculating about the nature of forces beyond his basic description, which is that a force is something that causes motion.\footnote{He defines force simply as “the cause which imparts, or tends to impart, motion to the bodies to which it is supposed to be applied; further, it is by the quantity of motion imparted, or which may be imparted, that the force must be represented.” Lagrange, Joseph. \textit{Analytical Mechanics} (Boston Studies in the Philosophy of Science). Dordrecht: Kluwer, 2010, p. 1.} He summed up his goals as follows:

There already exist several treatises on mechanics, but the purpose of this one is entirely new. I propose to condense the theory of this science and the method of
solving the related problems to general formulas whose simple application produces all the necessary equations for the solution of each problem.

… Those who appreciate mathematical analysis will see with pleasure mechanics becoming a new branch of it and hence, will recognize that I have enlarged its domain.\textsuperscript{938}

Lagrange was intent on producing mathematical description that “feigns no hypothesis.” Though he and Laplace were friends and colleagues, he had no interest in the synthetic descriptive goals of Laplace. His was a strictly mathematical physics, the goal of which was precise mathematical description, rather than explanation.

Though he rarely gets sufficient mention in histories of the subject, Lagrange’s influence on subsequent physics was substantial.\textsuperscript{939} He provided an example of a methodological outlook that would influence Mach.\textsuperscript{940} And his equations of motion would be the basis for much of Maxwell’s work, of Thomson and Tait’s great Treatise, and on the work of Hamilton, who called the Analytical Mechanics “a great poem by the Shakespeare of mathematics”.\textsuperscript{941} Hamilton further developed Lagrange’s approach,

\textsuperscript{938} Ibid. p. 7.
\textsuperscript{939} Dugas, who gives one of the most substantial treatments refers to the Analytical Mechanics as “a piece of work which united and crowned all the efforts which were made in the XVIIth Century to develop a rationally organised mechanics.” Dugas, History of Mechanics. P. 332.
\textsuperscript{941} The quotation is from Kramer, Nature and Growth of Modern Mathematics, p. 219. She does not mention the source, and I am not familiar with the quotation from my own readings of Hamilton, but he does express a similar sentiment in his “On a General Method in Dynamics,” calling Lagrange’s “great work a kind of scientific poem.” Hamilton, William. “On a General Method in Dynamics.” Philosophical Transactions of
developing what were to become “the canonical equations of motion.” Hamilton’s work reduced the number of unknowns to a single “unknown function, namely the principle function $S$, to the search and the study of which he has reduced mathematical dynamics.” As Hamilton himself put it:

This function must not be confounded with that so beautifully conceived by Lagrange for the more simple and elegant expression of the known differential equations. Lagrange’s function states, Mr. Hamilton’s [he is writing in the third person here] function would solve the problem. The one serves to form the differential equations of motion, the other would give their integrals.

With Hamilton’s addition to Lagrange’s work we have a basically complete picture of nineteenth century classical mechanics, which represents a mathematically advanced system of immense power and subtle refinement for describing the movements of and interactions between physical bodies. We have a starting point for understanding the description of the movement of physical objects. The final component we need is a starting point for understanding light.
Newton had made use of a corpuscular model of light in his groundbreaking optical researches. He used this model as a heuristic tool and it seems that he “believed in a corpuscular theory,” but “he never believed that it was a demonstrated scientific truth and considered it to be only a probable hypothesis.”

Regardless of this cautious move on Newton’s part he was later interpreted as endorsing physical corpuscles of light.

The corpuscular model of light had great success in the eighteenth century due, in large part, to Newton’s fame and the success of his theory of universal gravitation. Newton had declared that his design in the *Opticks* had not been “to explain the properties of light by hypotheses, but to propose and prove them by reason and experiments.” He proceeded to lay out a set of “axioms and their explications” upon which he built up a

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*Optics, Light, Heat, Electromagnetism*

Hamilton ploughed was to bear fruit outside the domain of classical mechanics. This power of extension of a formalism which, in the classical field, was equivalent to d’Alembert’s principle deserves emphasis – never have the formal tools of analytical mechanics been more used by physicists than since the time when the classical structure was shaken by the intervention of quanta.” Degas, *History of Mechanics*. P. 401.


Ibid. Also Shapin, “Newtonianism.” “Newtonian” views of various kinds were fashioned out of the raw material of Newton’s own writings and the ideas of those who came after. See also, for instance: Dijksterhuis, Fokko. “Reading up on the *Optiks*. Refashioning Newton’s Theories of Light and Colors in Eighteenth-Century Textbooks.” In *Perspectives on Science* Vol. 16, No. 4 (2008). Pp. 309-27. This simply further stresses our point that what is important are trajectories of ideas rather than fixed notions (trajectories of “Newtonian” ideas, for instance, rather than a monolithic “Newton”).


Ibid. p. 19.
systematic treatment of optical phenomena,\(^{950}\) illustrating his points with descriptions of experiments. To this were added the famous queries, in which Newton laid out hypotheses,\(^{951}\) in question form, about the nature of various phenomena treated in the *Opticks*, *Principia*, and in natural philosophy more broadly. The basic aspects of this particular portion of the “Newtonian” legacy have been summed up succinctly by Toulmin and Goodfield:

Newton’s account of the phenomena of light had had three distinct aspects, all of which had survived in one form or another right down to the year 1800. In the first place he had regarded light as a *substance*, which could enter into chemical combination with other forms of matter; in the second place this substance was composed (like any other) of corpuscles, which were extremely hard and had a very pronounced shape; while finally these ‘rays’ – or atoms – of light were

\(^{950}\) In an unpublished draft for the second edition of the *Principia* Newton defined a phenomenon as “*whatever can be seen and is perceptible* whatever things can be perceived, either things external which become known by the five senses, or things internal which we contemplate in our minds by thinking.” Achinstein, Peter. “Newton’s Corpuscular Query and Experimental Philosophy.” In Bricker, P. & Hughes R. I. G. (Eds.) *Philosophical Perspectives on Newtonian Science*. Cambridge: MIT Press, 1990, p. 137.

\(^{951}\) On the hypothetical nature of the Queries see Shapiro, Alan. “Newton’s Optics and Atomism.” In the *Cambridge Companion*, pp. 227-55 Shapiro quotes Newton’s own commentary on the Queries from 1714-15: “Hypotheses have no place, unless as Conjectures or Questions proposed to be examined by experiments. For this Reason Mr. *Newton* in his Optiques distinguished those things which were made certain by Experiments from those things which remained uncertain, and which he therefore proposed in the End of his Optiques in the Form of Queries.” Ibid. p. 251.
accompanied by waves in the aether, which acted upon the faces of the light-atoms and so directed their paths.\textsuperscript{952}

Newton had rejected\textsuperscript{953} the undulatory theory of light propagated by Huygens, which was to see a triumphal return in the nineteenth century. But he had also pointed to two phenomena in particular that will become important in our discussion later. First, his light corpuscles could interact with matter.\textsuperscript{954} He had argued that the “changing of bodies into light and light into bodies, is very conformable to the course of nature, which seems delighted with transmutations.”\textsuperscript{955} Second, he had pointed to the interrelation between light, matter, and heat.\textsuperscript{956}

At the beginning of the nineteenth century the “Newtonian” theory was dominant and “all the known properties of light could be accounted for on the accepted, corpuscular view – given sufficient mathematical ingenuity.”\textsuperscript{957} Laplace viewed light as one of the “imponderable fluids,” which was particulate and interacted with matter along the lines that Newton’s queries had suggested. By the early nineteenth century, however, opinion was beginning to turn away from the use of hypothetical “imponderable” fluids to explain light, heat, magnetism, and electricity. Sillman points out that, though widespread, and


\textsuperscript{953} In Query 28 in particular, where he rhetorically asked “Are not all hypotheses erroneous, in which light is supposed to consist in pression or motion, propagated through a fluid medium?” Newton. \textit{Opticks}. P. 362.

\textsuperscript{954} Query 30 even explicitly asks “Are not gross bodies and light convertible to one another, and may not bodies receive much of their activity from the particles of light which enter into their composition?” Ibid. p. 374.

\textsuperscript{955} Ibid.

\textsuperscript{956} Ibid. Also Queries 6-11, Ibid. pp. 339-45, and particularly Query 6, which deals specifically with black bodies, Ibid. pp. 339-40.

\textsuperscript{957} Toulmin & Goodfield. \textit{The Architecture of Matter}. P. 251.
though they provided a common blueprint to guide research, “on the whole, the scheme of imponderables testifies to a certain immaturity in physics.” The problem was that the imponderables were “imprecise and largely gratuitous” and “fell short of the scientific standards even of the eighteenth century.” Sillman describes the consolidation of physics as a unified discipline with a single, rigorous methodology using Fresnel’s work on the wave theory of light as an illustrative example. And his concise summary of the framework of the developments that led to physics becoming “a distinct specialty based on common interests, common conceptual commitments, and common procedures” is worth quoting:

At the end of the eighteenth century physics was still an immature, undisciplined pursuit with indefinite limits and little cohesiveness among its various concerns. The main source of disunity was the unequal development of its two chief divisions: general physics, equivalent to mechanics, and particular physics, embracing the study of heat, light, electricity, magnetism, and other special properties of matter. Whereas the former was a coherent, exacting, quantitative science, the latter, otherwise referred to as experimental physics, was essentially a miscellany of empirical findings joined to a loose array of speculative theories. Physics emerged as a discipline when these two components came into closer accord, facilitated by… a gain in the methodological sophistication, entailing improved experimental design, wider, more intensive use of mathematics, and greater philosophical astuteness in matters of theory construction and verification.

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As a result, particular physics was lifted above the level of mere empiricism and was submitted to standards of rigor comparable to those of mechanics. [And] the rise of the ideas of energy and energy conservation, which allowed the theories of particular physics to be related to one another and to the laws of mechanics.\textsuperscript{959}

Taking explicit notice of these developments is, I believe, crucial for understanding the quantum revolution on a fundamental level. Without taking notice of these vitally important nineteenth century developments the quantum revolution can seem “strange” and “magical” as it unfortunately often does.\textsuperscript{960} By breaking down the situation in 1900 by an act of historical analysis rather than beginning \textit{in medias res}, I hope to convey a sounder sense of the actual structure and dynamics of the quantum revolution.

Fresnel’s conception of light as the vibrations of a universal ethereal medium and its successes in describing defraction and interference phenomena, combined with the general trend away from imponderables and spelled the end of schemes like that of Laplace. Young’s work in Britain led in the same direction,\textsuperscript{961} and the work of Rumford and others moved the theory of heat along the same path toward the rejection of imponderables. In the theory of the nature of light the issue was seemingly decided by mid-century. The wave theory was able to explain experimental phenomena that the

\textsuperscript{959} Ibid. p. 138.
\textsuperscript{960} The title of Hofmann’s classic popular history plays with this mystifying tendency, though its account is good as far as popular works go. Hoffmann, Banesh. \textit{The Strange Story of the Quantum: An Account for the General Reader of the Growth of the Ideas Underlying our Present Atomic Knowledge}. New York: Dover, 1959. The less said about the tremendously unfortunate quantum mysticism of the mid to late twentieth century the better.
\textsuperscript{961} Young also argued that light was vibratory, though it seems that neither he nor Fresnel knew of the other’s work at the time of composition.
corpuscular theory simply could not. Meanwhile, further nineteenth century
developments drew the theoretical understanding of the provinces of the other
imponderables together. Ørsted’s 1820 discovery of the connection between electricity
and magnetism provided one starting point for this consolidation,\(^{962}\) as did the long
known observations that heated objects can produce light and that light can produce heat.
Melloni and Ampere’s explorations of the analogous nature of radiant heat and light\(^{963}\)
added to a growing overall belief in the unity and interconvertibility of natural powers
toward 1850.

By mid-century the experimental verification of the interconvertibility of heat and
electricity into work, work into heat and electricity, and so on, had led to the concept of
energy. Energy was a new universal quantity that was defined as the ability to do work.\(^{964}\)
Energy tied the quantification of physical processes to mechanical effect (again, the
ability to do work). Energy was always conserved in physical phenomena, but it could

\(^{962}\) See Maxwell’s chapter on electromagnetism, which begins with Ørsted: James Clerk.

\(^{963}\) See, for instance, Thomson’s note in his 1852, “On The Dynamical Theory of Heat” in
*Mathematical and Physical Papers*. Pp. 174-332. Thomson points to the recent
“discovery of phenomena, especially those of the polarization of radiant heat, which
render it excessively probable that heat propagated through ‘vacant space,’ or through
diathermanic substances, consists of waves of transverse vibrations in an all-pervading
medium.” P. 174.

\(^{964}\) Energy, as it is defined today is the ability to do work, measured in Joules. A Joule is a
measure of work done per unit time, specifically, kg moved per metre squared divided by
seconds squared:

\[
J = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2}
\]

As Maxwell put it: “Now, capacity for performing work is nothing else than energy, in
whatever way it arises, and all energy is the same in kind, however it may differ in form.”
change forms, from potential to actual kinetic energy, from chemical to mechanical
energy, and so on. As Smith puts it:

‘[T]he science of energy’ [became] inclusive of nothing less than the whole of
physical science. Natural philosophy or physics was redefined as the study of
energy and its transformations. As William Garnett… put the issue in the
Encyclopaedia Britannica (9th edition) in 1879: ‘A complete account of our
knowledge of energy and its transformations would require an exhaustive treatise
on every branch of physical science, for natural philosophy is simply the science
of energy.’

The new energy scientists described energy in predominately mechanical terms and this
remained the predominant conception until the development of Energetics in Germany
toward the end of the century.

The predominant mechanical view of the energy concept was based on what
Harman describes as a “mechanistic ontology of matter in motion.” The solid foundation
of energy science in the study of heat and the successful formulation of thermodynamics

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965 Smith, Crosbie. “Force, Energy, and Thermodynamics.” In Nye, Mary Jo. The
Cambridge History of Science: Vol. 5 – The Modern Physical and Mathematical

966 As Thomson and Tait put it in the Treatise: “The whole work done in any time, on any
limited material system, by applied forces, is equal to the whole effect in the forms of
potential and kinetic energy produced in the system together with the work lost in
friction.” This is their expression of “the law of energy in abstract dynamics” and forms
the crucial foundation of their overall project of reformulating all of natural philosophy in
terms of the energy concept (the project, unfortunately, did not progress beyond the first
volume, published in 1867, which deals with mechanics). Thomson, W. & Tait, P.
Treatise on Natural Philosophy. London: Cambridge University Press, 1867, p. 200. The
energeticists divorced the energy concept from mechanical explanation, moving further
and further from the practical, engineering tradition that had provided so much stimulus
to Thomson and his group.
in its two principle laws provided a system of understanding of profound scope, generality, simplicity and power. The massive socio-economic changes wrought by the steam engine seemed to bear witness to the potency of thermodynamics. Earlier beliefs about the convertibility of natural “forces” now had a theoretical framework in the energy concept. As Harman puts it:

The assertion of the equivalence of work and heat brought mechanical processes explicitly into the network of conversion processes discussed by physicists. The law of the conservation of energy provided a conceptualisation of this framework of explanation: a universal principle of the interconversion of natural powers, together with a quantitative measure of conserved physical quantities… [in

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967 The energy of the universe remains constant (energy is conserved in all processes) and the entropy of the universe tends toward a maximum (energy is constantly being dissipated and thus rendered less usable).


969 “By about 1850, rapid consensus meant that the energy principle (that is, energy and its conservation) became the foundation for a new methodology, a new way of approaching physical problems.” Purrington points to the immense importance of Thomson and Tait’s 1867 Treatise on Natural Philosophy for the dissipation of this idea. Purrington, Robert. Physics in the Nineteenth Century. New Brunswick: Rutgers University Press, 1997, p. 112. And Crosbie Smith has pointed to the importance of an unofficial, though closely allied, “North British group” of physicists as well as a small number of Germans who promoted the energy concept and argued for its place at the heart of physics. These mid-century reformers of physical science created a new, energy-based way of viewing science and its quantifiable processes that tied these quantities to mechanical effect. At the same time, they created what was, essentially, a new, universal, ur-quantity that underlay all of the phenomena of the physical world. Smith. The Science of Energy.
which] a mechanistic ontology of matter in motion provided an explanatory foundation.\textsuperscript{970}

By the turn of the twentieth century, the conservation of energy and its dissipation were the two concepts that seemed most secure in all of physics. In 1928 Arthur Eddington wrote that “The law that entropy always increases – the second law of thermodynamics – holds, I think, the supreme position among the laws of Nature.”\textsuperscript{971} And in the mid twentieth century Einstein remarked that “A theory is more impressive the greater the simplicity of its premises is… Therefore the deep impression which classical thermodynamics made upon me. It is the only physical theory of a general nature of which I am convinced that it will never be overthrown.”\textsuperscript{972} The energy concept unified physics, bringing general (mechanics) and particular (or experimental) physics together. It did this in two ways: First, as Sillman noted, particular physics became subject to the same sort of rigorous mathematical treatment that had brought mechanics to such a refined state. The energy concept allowed the application of the methods of mathematical analysis developed by Lagrange and, later, Hamilton, to the former domains of the imponderables. But, second, the measurement of energy in terms of mechanical work re-engaged abstract mechanics with the physical world. As Thomson and Tait put it in their preface to the \textit{Treatise}, they hoped that “the mathematical reader” would benefit greatly from the physical arguments of the treatise:

...as he will be forced to think for himself what he has been too often accustomed
to reach by a mere mechanical application of analysis. Nothing can be more fatal
to progress than a too confident reliance on mathematical symbols; for the student
is only too apt to take the easier course, and consider the formula and not the fact
as the physical reality.973

The significance for the pre-history of quantum mechanics of statements such as these is,
as the acute reader may already gather, great.

The phenomena of light, heat, electricity, and magnetism were united by James
Clerk Maxwell in the 1860s and 70s, first in his 1860-1 “On the Physical Lines of Force,”
and then in his great Treatise on Electricity and Magnetism. Maxwell developed a
mathematical descriptive framework for dealing with electromagnetic phenomena
(including light) that used Lagrangean and Hamiltonian methods inspired both by
Thomson and Tait’s use of this approach in their Treatise974 and by Lagrange’s own
work.975 His resulting “General Equations of the Electromagnetic Field” employed a
Lagrangean system-approach to mathematical description. He utilised Lagrange’s
dynamical equations, using variables such as currents, displacements, and potentials.976

As with Lagrange’s own work on mechanics, Maxwell’s mathematical-descriptive
framework required no speculation about actual physical mechanisms;977 it described the

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973 Thomson & Tait Treatise. P. viii.
976 Ibid, pp. 200-22 For a good, concise description see Smith, “Force, Energy, and
977 “I propose… to examine the consequences of the phenomena on the assumption that
   the phenomena of the electric current are those of a moving system, the motion being
system in a strictly analytical fashion, using the relations between continuously variable quantities to describe the energy of a system. Maxwell noted, “The problem,” of determining the mechanism required to establish a given species of connection between the motions of the parts of a system always admits of an infinite number of solutions.” Hence the need for the mathematical precision of the analytical approach, and, hence Maxwell’s view of his own proposed models as mere working models, which “must be taken for no more than [they] really [are],” demonstrations that “may be imagined capable of producing a connexion mechanically equivalent” to what is actually happening, but should not be taken for an argument that this is actually happening.

Maxwell’s approach pictured an electromagnetic system as fundamentally dynamical, with moving parts rather than action at a distance forces, but it utilised a generalised mathematical formalism to describe the relations between these supposed motions that posited no hypotheses about what the motions actually were.

Nevertheless, despite the power of this method, and even though Maxwell stressed the ‘dynamical truths’ that the formalism concealed and thus avoided the communicated from one part of the system to another by forces, the nature and laws of which we do not yet even attempt to define, because we can eliminate these forces from the equations of motion by the method given by Lagrange for any connected system.”


Thomson and Tait had already used this Lagrangean approach to dynamics in their Treatise, utilising variational methods instead of the point forces of the Laplacian approach, though they drew a distinction between such mathematical description and physical hypotheses, which they still valued. On Maxwell’s own ideas about “physical analogy” and “mathematical resemblance” see Harman, Energy, Force, and Matter. Pp. 89-94. In a letter to Tait, Maxwell once referred to his own earlier “idle-wheel” description of a vortex-particle based conception of the ether as “to the true mechanism what an orrery is to the Solar System.” Ibid. p. 92.


Ibid.
aridity of an entirely algebraic formalism, he remained dissatisfied with this mode of mechanical explanation. He pointed out that, according to the theory of the Treatise, electrical action was ‘a phenomenon due to an unknown cause, subject only to the general laws of dynamics,’ but that a ‘complete dynamical theory’ of the electromagnetic field would represent the hidden structure of the material system constituting the field, so that ‘the whole intermediate mechanism and details of the motion, are taken as the objects of study.’ Although he realised that an infinite number of mechanical ether models could be constructed so as to represent the field, his desire to achieve a ‘complete’ theory of the field led him to envisage the possibility of a mechanical model fully consistent with physical reality.981

And herein lies a crucial problem. In our attempts to describe phenomena we have developed powerful mathematical methods of describing relations. Yet to employ these methods, to use this language, without imbuing its terms with more substantial meaning, proves to be profoundly unsatisfying to many – in some cases, to great mathematical communicators themselves. This tension between relational mathematical description and what we might call scientific-mathematical semantics will remain a crucial issue throughout our discussion of the quantum revolution and Bohr’s thought.

Though they employed Lagrangian and Hamiltonian methods, Thomson and Tait also hesitated to endorse Lagrange’s full banishment of models. Again, as they put it in the Treatise: “Nothing can be more fatal to progress than a too confident reliance on

mathematical symbols; for the student is only too apt to take the easier course and consider the formula and not the fact as the physical reality.”\textsuperscript{982} When we arrive at the “crisis” point of the development of the quantum theory in the mid 1920’s this point will become acute. Thomson and Tait’s observation gives us some indication that the difference of outlook between Bohr and his school, who saw their physics as being in a state of crisis, and Sommerfeld and his more mathematically oriented school, who seem to have had no such beliefs.\textsuperscript{983}

The project of physics, as we have described it thus far, is a phenomenological enterprise. It attempts to develop the logos of a specific range of phenomena from the broader phenomenal manifold. Physics, as we have delimited it thus far, takes the realm of physical phenomena as its material for interpretation and attempts to provide communicable understanding about this realm of phenomena. This is a meaning-generating and a meaning-conveying activity. Physics employs the language of mathematics in order to communicate information about meaningful relationships amongst and between physical phenomena. But the axiomatic logical structure of mathematics allows us to expand and deepen these relational networks of phenomenal understanding.

Mathematical relations have their own intricate relationships, governed by the logical rules of their axiomatic foundations. Where mathematics touches the physical

\textsuperscript{982} Thomson & Tait. \textit{Treatise}. P. viii (emphasis in the original).

\textsuperscript{983} Suman Seth argues that the difference lies in overall outlook; Bohr and his school were engaged in a physics of “principles,” while Sommerfeld and his school were engaged in a physics of “problems.” I could not agree more, as the reader shall see. Seth, Suman. “Crisis and the Construction of Modern Theoretical Physics.” \textit{British Journal for the History of Science}. 40 (2007), pp. 25-51.
world, at a point where mathematical description accurately portrays relations between phenomena, we have an entry point into the non-physical world of further mathematical relations, which can lead physicists to further speculation about other, perhaps yet unobserved points of contact between the mathematical and physical. That mathematical exploration, leading theory in this way, has often led to predictions that have eventually been confirmed by experience instils confidence in this method. But the relation between the mathematical and physical worlds is by no means simple, or settled, as the above words of these great mathematical physicists reminds us.

Mathematics is a language for describing relations. It seems obvious to say that it is a language of quantity, but this is an important point. Our experience of phenomena is both qualitative and quantitative, and mathematics is particularly a tool of quantitative description of relations. When we observe different phenomena that can each be accurately described by the same mathematical formulae we reasonably infer from this

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984 As Russell put it: “Pure mathematics consists entirely of assertions to the effect that, if such and such a proposition is true of anything, then such and such another proposition is true of that thing. It is essential not to discuss whether the first proposition is really true, and not to mention what the anything is, of which it is supposed to be true.” Russell, Bertrand. “Mathematics and the Metaphysicians.” In Russell, Bertrand. Mysticism and Logic and Other Essays. London: George Allen & Unwin, 1917, p. 37. In The Principles of Mathematics, Russell goes so far as to argue that “mathematics and logic are identical” and that this “fundamental thesis” of the work “is one that I have never since seen any reason to modify,” even though this “thesis was, at first, unpopular, because logic is traditionally associated with philosophy and Aristotle, so that mathematicians felt it to be none of their business, and those who considered themselves logicians resented being asked to master a new and rather difficult mathematical technique.” Russell, Bertrand. The Principles of Mathematics. New York: W. W. Norton & Co. 1996, P. v.

quantitative relational identity that there is a real similarity between the phenomena in some way. This identification of mathematical similarity was what allowed Maxwell to propose the unity of electromagnetism (including light). It is, in a sense, a grammatical identity that is discovered in this manner; the quantified relations are found to be identical. This is one method of arriving at a (relational) understanding that is beyond (transcends) actual physical experience of phenomena. If we take Maxwell’s work as an example we may arrive at a better understanding of what this means.

By what right may we say “electromagnetism” and mean, in one breath: electricity, magnetism, light, and radiant heat? Our experience of each of these phenomena is markedly different. In the course of the nineteenth century it was determined that these phenomena behave in similar ways. But what does this mean? In experimental circumstances they display periodicity, interference, defraction, and so on. But again, what does that mean? What Maxwell hoped (and Thomson and Tait shared this hope) was that it meant that there was some, as of yet unobservable, physical process that was a common cause, of which each of these phenomena was an effect. This, some twenty two centuries later, was an Aristotelian hope. Modern, more mechanistic notions of cause and effect had entered the science in the intervening years, as had mathematization, but the dream is still aetiological; the dream is still to find the grounds of phenomena. Maxwell developed the mathematics to describe the quantifyable relations, what was still lacking was a mechanism to explain them, or, to put it another way: what the relations meant (in the broader sense, rather than their regional mathematico-semantic position).
The aim of science is understanding. And understanding always involves the twin problems of access, or intuition, and expression. Access to the physical phenomena that physics seeks to understand begins with perception (though it does not end there, as we shall see). We observe and describe phenomena, assigning meanings to them. In order to describe something (mathematically or otherwise), one needs to experience it as a phenomenon. Physical objects are phenomena, so are ideas, so are relations, and so are feelings. Even phantasms of the imagination are phenomena. Anything we have experience of is a phenomenon. To speak of non-phenomenal entities is to speak of something to which we, by definition, cannot ever have any relation. And even the positing of such an entity is the consideration of an idea, which is a phenomenon. All entities then are phenomena; they are (at least possible) objects of our experience. But we do not experience all phenomena in the same way.

Our experience of physical items is different from our experience of ideas, and different from our experience of feelings. We can categorically divide phenomena into large groupings such as these and create a phenomenal topology. We may fruitfully vastly over-simplify the picture by saying that physics deals with two primary phenomenal categories: physical objects (bodies) and relations (masses, forces, distances, speeds, rates

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These, of course, will not be the only meanings of these phenomena, but rather a particular class of meanings, or to put it another way, meanings within the particular semantic world of physics.

And, of course, our experience does not strictly delimit phenomena into such classes and then experience them one at a time; rather, we are constantly experiencing a melange of phenomenal classes at any given moment.
of change, intensities, and so on).\textsuperscript{988} Physical objects and relations are experienced through various forms of observation. And observed phenomena are the basis and \textit{sine qua non} of physics. But, by the use of our reason and the additional powerful tools of mathematics we may speculate beyond observation.\textsuperscript{989} We are still dealing with phenomena, for the ideas in our mind are phenomena, but we are leaving the world of experienced physical observation behind.

When we move beyond the realm of experienced physical observation we enter the realm of imagination. And I do \textit{not} use this term disparagingly.\textsuperscript{990} I do not mean unwarranted fancy, but rather, in this case, the creative application of the reason to speculation based on phenomena that we \textit{have} observed, rules that we have learned, and tools such as logic and mathematics. Polanyi and Prosch have described the role of imagination in scientific discovery in their book on \textit{Meaning}. As they put it: “Works of

\begin{itemize}
\item This description would include all of the imponderables, which are only made manifest to us through relations between physical bodies. That is, light, electricity, and magnetism are phenomena that are abstracted from our experience of physical objects and their relations. For instance, in Thomson’s work: “The existence of magnetism is recognized by certain phenomena of force which are attributed to it as their cause.” I.e. we observe certain phenomena, posit a cause for them, and call that cause “magnetism.”
\item They are “imponderable” in the original and literal sense of being non-weighty, we cannot touch them, and not in the colloquial sense of being something that we cannot “ponder” or think about. In fact, as abstractions, they are ideas.
\item That is, beyond our experience of observation of physical phenomena (objects and their relations).
\item Indeed, I take the term from Thomson who, as countless other physicists also do, often asks us to “imagine” certain illustrative situations, some possible, some hypothetical, and some clearly impossible. Indeed, in an 1849 paper outlining “A Mathematical Theory of Magnetism” Thomson introduces “the imaginary magnetic matter by means of which the polarity of a magnetized body may be represented.”
\end{itemize}

science, engineering, and the arts are all achieved by the imagination.” As we apply our imagination in this manner we create new phenomena in the form of ideas. In some cases we can then test the accuracy of these ideas against physical phenomena. In other cases the limits of our perceptual ability prevent us from doing so. In theory if not in practice, all such ideas should be testable by physical observation (within the limits of our abilities), as they are ideas about physical phenomena.

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991 Polanyi, M. & Prosch, H. *Meaning*. Chicago: University of Chicago press, 1975, p. 85. See also pp. 95-7, where they discuss the role of “imaginative perception of things hitherto unknown” in scientific discovery.

992 For instance, our visual apparatus detects motion, but only that which falls above certain thresholds of distance. “Measurements with a single moving object show that an object must traverse at least 1 minarc [1/60 or 1 degree] for a sensation of motion to be experienced… This value varies, however, with the object’s duration, velocity, and luminance, as well as with the region of the retina stimulated.” And there are more variables at play: “We are vastly better at detecting relative motion than we are at detecting absolute motion.” Pashler, H. & Yantis, S. (Eds.) *Stevens’ Handbook of Experimental Psychology. Volume 1: Sensation and Perception*. New York: John Wiley & Sons, 2002. P. 126. There are also limits to our ability to determine trajectories, direction, speed, and coherence. Pp. 129-34. And, of course, the perception of time itself is not a straightforward and uncomplicated issue. See for example Boring, Edwin. *Sensation and Perception in the History of Experimental Psychology*. New York: Appleton-Century-Crofts, 1942, pp. 574-88. Mach “discussed both space and time as if they were sensations.” Ibid. p. 576. Mach argued that “the foundations of science as a whole, and of physics in particular, await their next greatest elucidations from the side of biology, and especially from the analysis of the sensations.” Mach, Ernst. *The Analysis of Sensations, and the Relation of the Physical to the Psychical*. Chicago: Open Court, 1914. Pp. vii-viii. Mach calls for a general questioning of the conceptions of effective causality in physics and the teleological causality seen in the biological sciences; he argues that the two fields and forms of causation are not as unrelated as they may appear and that a broader and function-based conception of “dependence of the characteristics of phenomena on one another.” Ibid. p. 89. See also Mach. *The Science of Mechanics*. Pp. 504-7.

993 I am not making a Vienna Circle sort of claim, that there is no meaning in the non-verifiable, but that statements of physics must all be (in theory, if not in practice) physically verifiable.
Here the question arises of the status of ideas arrived at through the application of imagination without the confirmation of physical observation. If these ideas are, for all intents and purposes, unconfirmable (that is, confirmable in theory, but not in practice), how are we to take them? Indeed, what would even count as confirmation? This would depend on the nature of the idea. We could say that the idea that the moon is an oblate spheroid and not a flat disk, has been confirmed by people who went there. But it is a different story when we are talking about that which Aristotle and Maxwell sought: causes.

For Aristotle we know causes though our reason; and the idea that the world is rationally ordered and therefore actually knowable by the application of our reason is unquestioned. Hume, however, attacked this very idea, and this troubled Kant deeply. Lagrange did not even feel it was worth his trouble to speculate about causes. Maxwell, who employed Lagrangian methods, nonetheless believed that the ultimate goal of

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994 According to Hume “we never can, by our utmost scrutiny, discover any thing but one event following another, without being able to comprehend any force or power by which the cause operates, or any connexion between it and its supposed effect.” Hume argues that, when we see one thing follow another often enough we assume a causal relation that we do not actually observe, in a sense, the mind invents it. “We then call the one object Cause; the other, Effect.” Indeed, for Hume, “There are no ideas, which occur in metaphysics, more obscure and uncertain, than those of power, force, energy, or necessary connection [i.e. cause and effect]…” Hume, David. An Enquiry Concerning Human Understanding. New York: Dover, 2004, pp. 47 & 37. For Kant, however, “connection is not the work of mere sense and intuition, but is here rather the product of a synthetic faculty of the imagination, which determines inner sense with regard to temporal relations.” And “it is only because we subject the sequence of the appearances and thus all alteration to the law of causality that experience itself, i.e., empirical cognition of them, is possible; consequently they themselves, as objects of experience, are possible only in accordance with this law.” Kant. CPR, B233-5.
physics was to find the causes,\textsuperscript{995} the actual mechanisms at play, the grounds for the phenomena that we experience. And Thomson and Tait agreed. But Maxwell was cautious, as were Thomson and Tait.

We may describe three main sorts of position in regard to the status of these ideas arrived at through scientific imagination but not (or not yet) directly confirmable by physical observation.\textsuperscript{996} The first is a realist response that believes that the ideas accurately describe “the way things really are.” The realist position, of course, admits of a wide spectrum of degrees, from a rigorous (we might say naïve) realism (Boltzman’s firm belief in the existence of physical atoms for instance) to a more tempered belief that the idea is highly likely (as with Thomson’s position on vortex atoms for a time).\textsuperscript{997} The second is a pragmatic, use-based response that conceives of the ideas as useful models or

\textsuperscript{995} Maxwell’s views on the topic were complicated and evolved throughout his career. He questioned how much of nature was actually knowable, strict determinism, and, in particular, our ability to accurately explain that which we cannot observe. But the basic outlook of his physics still “aimed, in traditional style, to lay the foundations of a scientific worldview.” “Maxwell certainly believed in scientific progress, the ‘approach… to the truth’ as he described it…” He adhered to the traditional aspirations of the natural philosopher, apparent in his concern with the philosophical foundations of physics… In expounding the rationale of his physical theories he regularly and deliberately raised questions of analogy and intelligibility, discussed the meaning of the concepts of matter and force, and examined the conceptual status of the laws of mechanics and thermodynamics.” Harman, P. M. \textit{The Natural Philosophy of James Clerk Maxwell}. Cambridge: Cambridge University Press, 1998. Pp. 10-11. As Maxwell himself put it: Every science must have its fundamental ideas – modes of thought by which the process of our minds is brought into the most complete harmony with the process of nature – and these ideas have not attained their most perfect form as long as they are clothed with the imagery, not of the phenomena of the science itself, but of the machinery with which mathematicians have been accustomed to work problems about pure quantities.” Maxwell, James Clerk, “Elements of Natural Philosophy. By Professors Sir W. Thomson and P. G. Tait.” (Review). \textit{The Scientific Papers} Vol. 2, p. 325.

\textsuperscript{996} The problem of just what we mean by confirming a cause by observation brings us directly back to Hume’s objections.

\textsuperscript{997} The early Bohr falls somewhere on the realist side of the spectrum.
ways of approaching a problem without passing judgement on whether they may accurately portray the actual, unobservable state of affairs. The pragmatic approach likewise admits of a range of leanings on the question of the likelihood or unlikelihood of ideas accurately representing actual states of affairs. Those who take a pragmatic view (Maxwell is a good example, as is J.J. Thomson) have the advantage of flexibility; because they are not fundamentally committed to any one model, they may use a variety of different models as tools in their research (true of Maxwell and Thomson) depending on what is most useful in any particular situation. The third position is phenomenal. It stresses the need to describe the phenomena we actually observe and not to speculate beyond that. As with the first two positions the phenomenal approach also permits of a spectrum, the extremity of which we may call phenomenalism, which is essentially pessimistic about knowledge beyond sensation and is liable to such assertions as the denial of cause and effect, the veracity of permanence claims, and so on. The phenomenalist position is ultimately difficult to reconcile with the pursuit of physics and in its most extreme cases represents a cul-de-sac. But the spectrum between the realist and phenomenal approaches, encompassing the pragmatic, is sufficient on its own to introduce a great deal of uncertainty as to the fundamental nature of this enterprise. The imagination then is one way in which we can extend the episteme of physics beyond what is available to direct observation of the senses, albeit one that introduces a great deal of philosophical uncertainty. Another way is to extend the reaches of perception itself. The telescope and microscope are, of course, paradigmatic examples of this.998

998 For explorations of the questions surrounding these particular sensory extensions see:
We have now laid out some of the basic *theoretical* equipment of physics that enabled the quantum revolution to occur. But the realm of subatomic physics could not have developed without physical equipment as well. This physical equipment allowed the extension of our perceptual range beyond the limits imposed by our unaided sense organs. The nineteenth century saw amazing developments in technology used for physical research. From increasingly efficient vacuum apparatuses to increasingly capable batteries, to increasingly precise optical devices, experimenters and technicians produced innovations that granted them an ever increasing range of experimental ability and precision measurement. These developments opened up new realms of physical phenomena for exploration and provided the contact-point between thought and actual physical phenomena.

For our story four classes of devices are important: 1) Electrical instruments, 2) Optical instruments, 3) Thermal instruments, and 4) Pressure-Related instruments (i.e. Gas or Vacuum instruments).

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Zik, Yaakov. “Science and Instruments: The Telescope as a Scientific Instrument at the Beginning of the Seventeenth Century.” *Perspectives on Science*, Vol. 9, No. 3 (2001), pp. 259-84. And Berge, Ann. “Debate as Scientific Practice in Nineteenth-Century Paris: The Controversy over the Microscope.” *Perspectives on Science*. Vol. 12, No. 4 (2004), pp. 424-53. As Zik puts it: “Scientific observation is determined by the human sensory system, which generally relies on instruments that serve as mediators between the world and the senses …to exploit the telescope as a device for astronomical observations Galileo had to: 1. Establish that the telescopic images are not optical defects, imperfections in the eye of the observer, or illusions caused by lenses; 2. Develop procedures for systematically handling errors that may occur during observation and measurement and methods of processing data.” “Galileo was the first scientist who established the linkage among theory, method, and instrument – the telescope. The laws of optics enabled Galileo to employ a theory-laden instrument to bridge the gulf between picture and scientific language, between drawing and reporting physical facts, and between merely sketching the world and actually describing it.” Zik. “Science and Instruments.” Pp. 259 & 281.
Electrical Instruments: batteries (Bunsen cells, etc.), induction coils (Rühmkorff coils), discharge devices (in evacuated tubes, Crookes tube, Geisler tube), electromagnets, electrolysis

Optical Instruments: improved lenses, prisms, gratings, spectroscopes and spectrographs, photography

Thermal Instruments: Bunsen burner, thermo-electric devices, particularly detectors, (thermopile, bolometer, spectro-bolometer), electrical heating elements, the blackbody cavity

Pressure-Related Instruments: vacuum pumps (mercury pump), evacuated tubes (Crookes tube, Geisler tube), cloud chamber

These devices opened up new phenomena for study (x-rays, radioactivity, cathode rays, etc.), allowed old phenomena to be studied in new ways (the spectral analysis of light for instance), and led to a host of new discoveries that needed to be interpreted. In the experimental results produced with these new technologies, physicists were presented with a range of new phenomena in another way as well; that is, they were presented with new phenomena in the form of the experimental findings themselves. They then needed to determine what these findings meant.

Max Planck, Blackbody Radiation and the Quantum

In the third volume of his 1974 textbook of classical and modern physics, Kenneth Ford presents a thumbnail sketch of the period that will occupy our analytic attention for the remainder of this project. As he put it:

In December, 1900, Max Planck introduced an idea that was to shake the foundations of physics: the idea that material energy can be transformed into radiant energy only in units of a certain size, or ‘quantum units.’ A dozen years later, Niels Bohr generalized Planck’s idea into a quantum principle of nature and used the principle with astonishing success to account for the structure of the hydrogen atom. Bohr’s principle is this: Some of nature’s variables can take on only discrete values and can, accordingly, change only in finite jumps. Building on this principle of discreteness or quantization in nature, in the years 1925-1928 European theoretical physicists created the edifice that we now call the theory of quantum mechanics. The giant stride of physics in those few years has not been equalled since.1000

In a sense, this is our story. The account shows how, fifty odd years later, the quantum revolution had been incorporated into the standard narrative of basic physics education. In this necessarily over-simplified account we see how the quantum revolution, this “giant stride,” was incorporated into a physics as a component in a new theoretical norm, and, at the same time, its achievement of a sort of canonical status. Planck, Bohr, and their quantum world now ranked among those worthy of such thumbnail sketches as

Galileo and Newton; the quantum had now “made it.” But the simplicity of the account belies the complicated history and its deep and profound philosophical implications, to which we now turn.\textsuperscript{1001}

In the years immediately preceding the turn of the century, in addition to those of radioactivity and the various “rays,” one of the problems that occupied the time and energy of experimental and theoretical physicists alike was the blackbody problem.\textsuperscript{1002} The blackbody problem lay at the intersection between the physical and the electromagnetic. Researchers were looking for a universal function that described the relation between frequency of radiation and temperature. Blackbodies are often inadequately explained in accounts of the birth of the quantum, which is unfortunate given their importance. We can begin to get a feel for the idea of a blackbody if we think about how we feel out in the sun on a hot day if we are wearing black instead of white.\textsuperscript{1003} Black objects tend to absorb heat, while white objects tend to reflect it. This turns out to be true of radiation more generally.\textsuperscript{1004} But we should not take the perceptual idea of darkness too far, because the sun is also a blackbody (though not a perfect blackbody).

\textsuperscript{1001} This should in no way be interpreted as a criticism of Ford’s text, which is excellent.
\textsuperscript{1002} The distinction between experimental and theoretical physicists was a recent one at the time. For a good overview see Jungnickel, C. & McCormmach, R. \textit{Intellectual Mastery of Nature – Theoretical Physics from Ohm to Einstein, Vol. 2: The Now Mighty Theoretical Physics, 1870-1925}. Chicago: University of Chicago Press, 1986, pp. 33-58.
\textsuperscript{1003} I distinctly remember a demonstration from my primary school science class where two goose-neck lamps were shone on two pieces of paper, one black, the other white, for a considerable amount of time and we were then instructed to feel the papers and note the difference.
\textsuperscript{1004} Colours, of course, are the product of reflectivity, and if visible light and thermal radiation formed a spectrum, then there had to be a relation between that spectrum of radiation and temperature.
A blackbody is a hypothetical physical body that completely absorbs all radiation that comes into contact with it; it is a perfect absorber, which means that it is, conversely, a non-reflector.\textsuperscript{1005} This theoretical perfect absorber and non-reflector was determined to be a perfect emitter of radiation as well (hence the sun approximating a blackbody). The relation between absorption and emission of a blackbody therefore is $1$.\textsuperscript{1006} The fact that a blackbody’s relation between temperature and radiation frequency would not be dependent on its material meant that, from the study of blackbodies, one could learn general and universal things about the relation between radiation and temperature, and thus findings in this field would have far-reaching applications across physics as well as practical applications in areas such as lighting.

As the nineteenth century drew to a close physicists were hard at work attempting to discover the laws governing radiation. They had in their hands the tools of Maxellian electrodynamics, Thomson, Clausius, and Helomoltz’ thermodynamics, “classical” mechanics, and the calculus, as well as the latest experimental devices and methods. Max Planck entered the fray as a young professor of theoretical physics at the University of Berlin; he could not have been better situated. Planck’s background and first love in physics was thermodynamics. What attracted him to the discipline was the seemingly

\textsuperscript{1005} The hypothetical nature of the perfect blackbody is often not clearly emphasised. The blackbody is a theoretical construct that allowed physicists an approach to the problem of the relation between radiation frequency and temperature. Imperfect blackbodies like the sun, or the filament of a tungsten light bulb, or the approximation of a blackbody represented by the physical apparatus described below, are the closest physical representations of a blackbody, but no perfect absorber actually exists. I owe the reference to the tungsten filament to a classic mid-century college textbook: Ford, \textit{Classical and Modern Physics}, Pp. 869-70.

\textsuperscript{1006} I.e. $\frac{\infty}{\infty} = 1$
absolute nature of its laws. In his scientific autobiography he describes his scientific outlook and motivations in particularly telling terms and it is worth quoting him at length:

My original decision to devote myself to science was a direct result of the discovery which has never ceased to fill me with enthusiasm since my early youth – the comprehension of the far from obvious fact that the laws of human reasoning coincide with the laws governing the sequences of the impressions we receive from the world about us; that, therefore, pure reasoning can enable man to gain an insight into the mechanism of the latter. In this connection, it is of paramount importance that the outside world is something independent from man, something absolute, and the quest for the laws which apply to this absolute appeared to me as the most sublime scientific pursuit in life.\textsuperscript{1007}

In thermodynamics Planck found just the sort of laws of great generality and fundamental power that he sought. He described learning the law of the conservation of energy as “like a revelation”; it was “the first law I knew to possess absolute, universal validity, independently from all human agency.”\textsuperscript{1008}

In Berlin he came into contact with Lummer, Pringsheim, Karlbaum, and Rubens at the Imperial Institute of Physics and Technology (Physikalisch-Technische Reichsanstalt PTR) where research into the entire spectrum of radiation was going on, and particularly, research into the blackbody problem, based on experimental apparatuses

\textsuperscript{1008} Ibid. p. 14.
of increasing subtlety and sophistication. Planck was attracted to the problem of describing the blackbody spectrum because it promised to have the sort of generality and fundamental nature that so gripped him. In his own words the “so-called Normal Spectral Energy Distribution represents something absolute, and since I had always regarded the search for the absolute as the loftiest goal of all scientific activity, I eagerly set to work.” The universal function, “which depended only on temperature and wavelength, and was in no way related to the properties peculiar to any substance” that lay at the core of the blackbody problem, was just the sort of problem Planck wanted. It “gave promise of a deeper understanding of the relationship of energy to temperature, which forms the chief problem of thermo-dynamics and, therefore, also of all molecular physics.”

In Berlin Planck began theoretical work on “the problem of the distribution of energy in the normal spectrum of radiant heat” in 1897, while back at the PTR lab they were working on the problem experimentally. Planck’s proximity to and contact with these brilliant experimenters was an ideal situation. Several different equations had been proposed as radiation “laws;” most important for Planck’s development was Wien’s Law (the later Raleigh-Jeans law of 1900 and 1905 seems not to have played a part in

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1009 For a detailed discussion of the instruments and experiments involved see: Hoffman, Dieter. “On the Experimental Context of Planck’s Foundation of Quantum Theory.” *Centaurus*, Vol. 43 (2001), pp. 240-59. Key instruments were the cavity blackbody radiators themselves, particularly Lumner and Kurlbaum’s Electrical Glowing Blackbody of 1898, and measurement instruments such as the Bolometer, which was far more accurate than the thermopile.


1012 Ibid. p. 102.
Planck’s work at all, coming far too late and perhaps not coming to Planck’s attention at all until after 1900, though it is sometimes incorrectly presented as playing a key role). These equations, however, were found to fail at certain frequencies so, as it turned out, none of them could actually lay claim to being a law that described the situation adequately.

Planck, in an attempt to simplify the problem, used his imagination. He imagined the walls of the blackbody cavity to be Hertzian oscillators. Planck conceived of the blackbody as a resonating system, where the walls of the cavity were composed of “resonators,” and though resonance is a different phenomenon than simple oscillation, Planck assumed his “resonators” were simple oscillators.\(^{1013}\) In fact, in his papers he tended to use the terms synonymously.\(^{1014}\) Hertz had described the propagation of electromagnetic waves in terms of harmonic oscillation. In Hertz’ situation, one primary system emitted the waves, while a secondary system absorbed them. In Planck’s system the oscillators that made up the walls of the cavity emitted and absorbed the radiation,

\(^{1013}\) On the issue of resonators see Kuhn, Thomas. *Black-Body Theory and the Quantum Discontinuity, 1894-1912*. Chicago: University of Chicago Press, 1978, pp. 28-37 (esp. 33). Planck speaks about his use of “Hertz’s oscillator, the laws of emission of which, for a given frequency, have recently been fully developed by Hertz” as “especially suited for [his] purpose” in “The Origin and Development of the Quantum Theory,” In Planck, Max. *A Survey of Physical Theory*. New York: Dover, 1993, pp. 103-4. As Segrè puts it: “Planck… thought to analyze a blackbody with walls made of hertzian oscillators whose behaviour could be calculated. He thus avoided dealing with the detailed constitution of real molecules, which was unknown at that time.” Segrè, Emilio. *From X-Rays to Quarks: Modern Physicists and Their Discoveries*. New York: Dover, 1980, p. 71.

which was propagated in continuous waves.\(^{1015}\) He used this approach to derive Wien’s law, and the same approach persisted in his later theory.

The use of simple theoretical constructions that could be described with known mathematics, like these Plank oscillators, as imaginary models to solve complicated problems was not new. Huygens, Newton, and Hooke had used pendulums (which are simple oscillators) in a structurally similar way.\(^{1016}\) Thinking of the walls as being composed of simple oscillators instead of real atoms greatly simplified the issue. Oscillators were good tools of simplification because they could be described with available mathematics. The nature of the blackbody problem gave Planck a particular degree of latitude for simplification, which he used to his advantage:

The harmonic oscillators were chosen not because they were thought to be a realistic model for matter, but rather because Kirchoff’s theorem asserted that the equilibrium radiation distribution was independent of the system with which the radiation interacted, and oscillators were the simplest to treat.\(^{1017}\)

The distance between theory and physical objects was great here. In the lab, real physical heated containers interacted with electric measuring devices (Bolometers) and produced sets of data. But in the mind of the theoretician, the imagination and mathematics held sway. When the two realms came together in Planck’s radiation law, implications from

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\(^{1015}\) Planck had initially hoped that the transition between emission and absorption could account for strict entropic determinism; this hope was, however, not to be fulfilled.

\(^{1016}\) For Newton see the General Scholium to the Axioms or Laws of Motion in the *Principia*. For Hooke, see Koyrê’s *Newtonian Studies*, pp. 180-4. And for Huygens, see his *Horologium Oscillatorium* of 1673. URL: http://www.17centurymaths.com/contents/huygenscontents.html

the theoretical development would have to be given a physical interpretation, which was no small task.

To return to the situation before Planck discovered his law, he had, by 1899, worked out a theory from which he could derive Wien’s “law.” Things were not, however, going swimmingly for Wien’s law. As better and better experimental data came out of the PTR lab it was becoming apparent that it failed at low frequencies (while the Raleigh-Jeans law was found to fail at high frequencies). The “disagreement was greater than possible experimental errors” but “it appeared to be correct.” Planck then worked out a new formula based on the latest data and was able not only to describe the data, but to derive Wein’s law for the frequency range at which it was accurate. Planck’s new law was a great mathematical achievement but it was, for the moment, merely that. One of the key problems was that it introduced what appeared to be a new constant (technically two, but only one is of crucial importance for our story), later known as Planck’s constant, which served to quantize (i.e. render discontinuous) the transfer of energy from the radiation to the oscillators and back. Planck had to explain this.

In the end, Planck was forced into what he called “an act of desperation.” He appealed to statistical mechanics, and particularly to the kinetic theory of gasses of Boltzmann, to which he had previously been opposed. Segré’s description of what Planck did is one of the most clear and concise I have read:

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1018 Segré. From X-Rays to Quarks. P. 72.
1020 “If... the radiation formula should be shown to be absolutely exact, it would possess only a limited value, in the sense that it is a fortunate guess at an interpolation formula.
The hertzian oscillators of the wall of the blackbody have a certain energy distribution and an entropy distribution. At equilibrium the entropy has to be maximum, and it can be statistically calculated using the fundamental Boltzmann equation \[ S = k \log W \]. To calculate the probability by methods of combinatorial analysis, Planck found it convenient to divide the energy of an oscillator into small but finite quantities, so that the energy of the oscillators could be written as \( E = P\varepsilon \) where \( P \) is an integral number. With this hypothesis Planck could calculate the average energy of an oscillator and thus find the blackbody formula. Planck expected that \( \varepsilon \) could become arbitrarily small and that the decomposition of \( E \) in finite amounts would only be a calculational device. However, for the results to agree with Wien’s thermodynamic law, \( \varepsilon \) had to be finite and proportional to the frequency of the oscillator \( \varepsilon = h\nu \) where \( h \) is a new universal constant, appropriately called Planck’s Constant [or, the elementary quantum of action as Planck himself often called it].

The energy density in the blackbody thus becomes

\[
u(\nu, T) = \frac{8\pi \nu^3}{c^3} \frac{h}{e^{h\nu/kT} - 1}
\]

Therefore, since it was first enunciated, I have been trying to give it a real physical meaning, and this problem led me to consider the relation between entropy and probability, along the lines of Boltzmann’s ideas. After a few weeks of the most strenuous work of my life, the darkness lifted and an unexpected vista began to appear.” Planck. “Origin and Development” p. 106. For a detailed discussion of the period between October and December 1900 see Kuhn, Black-Body Theory, pp. 102-13.
Where $hv$ is a finite amount, a quantum of energy. The harmonic oscillator could not have any energy as classical mechanics and electricity taught, but only discrete values integral multiples of $hv$.\textsuperscript{1021}

Planck had combined statistical kinetic theory with electrodynamics and presented a radiation formula that fit the data. But even in his new version of December 1900, which included Boltzmann’s ideas, real problems remained by way of a deeper, fundamental understanding.\textsuperscript{1022}

He had discovered the formula, but now the hermeneutic task lay before him. As Planck put it:

But even if the absolutely precise validity of the radiation formula is taken for granted, so long as it had merely the standing of a law disclosed by a lucky intuition, it could not be expected to possess more than a formal significance. For this reason, on the very day when I formulated this law, I began to devote myself to the task of investing it with a true physical meaning.\textsuperscript{1023}

He developed the theory with the help of statistical mechanics, but found it impossible to reconcile with the “classical theory.”\textsuperscript{1024}

By his own account, Planck did not realise the full scope of what he had discovered and tried, for many years, to reconcile his discovery with “classical theory.”

\textsuperscript{1021} Segrè. \textit{From X-Rays to Quarks}. P 73.
\textsuperscript{1022} In particular, a more fundamental understanding of “the fact which Planck had considered to be the ‘most essential part’ of his derivation of the blackbody radiation law: namely, the assumption that the energy is distributed among the cavity resonators only in integral multiples of finite energy elements.” Mehra & Rosenberg, \textit{Historical Development}, p. 51.
\textsuperscript{1023} Planck. \textit{Scientific Autobiography}. P. 41.
\textsuperscript{1024} Ibid. p. 44.
As he saw it, “the significance of the quantum of action for the interrelation between entropy and probability was thus conclusively established,” however:

[T]he part played by this new constant in the uniformly regular occurrence of physical processes still remained an open question. I therefore, tried immediately to weld the elementary quantum of action \( h \) somehow into the framework of the classical theory. But in the face of all such attempts, this constant showed itself to be obdurate. So long as it could be regarded as infinitesimally small, i.e. when dealing with higher energies and longer periods of time, everything was in perfect order. But in the general case difficulties would arise at one point or another, difficulties which became more noticeable as higher frequencies were taken into consideration. The failure of every attempt to bridge this obstacle soon made it evident that the elementary quantum of action plays a fundamental role in atomic physics, and that its introduction opened up a new era in natural science. For it heralded the advent of something entirely unprecedented, and was destined to remodel basically the physical outlook and thinking of man which, ever since Leibniz and Newton laid the groundwork for infinitesimal calculus, were founded on the assumption that all causal interactions are continuous.\(^{1025}\)

Planck’s work provided the advent of these great changes, but he was not the one to carry them through, and, for many years, he failed to see the profound significance of what he had discovered. Indeed, it was Einstein, in his *annus mirabilis*, who first drew proper attention to the implications of Planck’s elementary quantum of action.

\(^{1025}\) Ibid. pp. 43-4.
When people think of Einstein’s 1905 paper, most, if they do not incorrectly name it his “photoelectric effect” paper and think it was only about that important topic, refer to it as his “paper on light quanta.” The early significance of this paper, however, was not in regard to the hypothesis of light quanta, which was doubted even into the 1920’s. The real early significance of Einstein’s paper “On a Heuristic Point of View Concerning the Production and Transformation of Light” was for its more general, theoretical work, and in particular, for the way it, along with Einstein’s 1906 paper on specific heats, cast new light on the fundamental import of Planck’s quantum work. Einstein realised that Planck’s description was incompatible with Maxwellian ideas.

The problem lay precisely in Planck’s “act of desperation” where he turned to Boltzmann’s kinetic theory. As Einstein put it: “A profound formal difference exists between the theoretical concepts that physicists have formed about gases and other ponderable bodies, and Maxwell’s theory of electromagnetic processes in so-called empty space.”\(^{1026}\) The problem lay in the very individuality, or discreteness, of physical bodies:

While we consider the state of a body to be completely determined by the positions and velocities of an indeed very large yet finite number of atoms and electrons, we make use of continuous spatial functions to determine the electromagnetic state of a volume of space, so that a finite number of quantities

cannot be considered as sufficient for the complete determination of the electromagnetic state of space.\textsuperscript{1027}

The problem lay between the continuous and the discontinuous:

According to Maxwell’s theory, energy is considered to be a continuous spatial function for all purely electromagnetic phenomena, hence also for light, whereas according to the present view of physicists, the energy of a ponderable body should be represented as a sum over the atoms and electrons.\textsuperscript{1028}

The difficulty of reconciling continuous and discontinuous conceptions is reflected in the difficulty of even adequately describing the problem.

We could think of physical pieces vs. unified wholes, comparing a pile of individual marble spheres with a single large marble sphere of the same mass. It is difficult not to see the two as easily reconcilable and basically equivalent. We can imagine carving the many small spheres out of the larger single mass. We can picture them all in there. Can we imagine it the other way though? Can we make the single mass out of the discrete individuals? And, indeed, if we carve the individuals out of the single mass do we not actually side-step the problem?\textsuperscript{1029} That is, when we carve the individual pieces out, the single mass ceases to be. When we introduce discontinuity continuity ends. We can have the one or the other, but never both. Indeed, if our single marble spheres were made of metal rather than stone and we melted them all into a single ball by introducing great heat as an outside agency, we still would not avoid the fact that now

\textsuperscript{1027} Ibid.
\textsuperscript{1028} Ibid.
\textsuperscript{1029} We would lose mass in the carving process, and could not make the equivalent number of single spheres to equal the mass of the original whole, or monad, if you will.
that we have continuity, discontinuity has, in fact, vanished. This is, of course, a vastly oversimplified example, but it is in simplicity itself that we find the problem. Continuity and discontinuity are basic concepts, and basic concepts are deceptively simple; they are, in fact, extremely difficult because of this.

Another, and perhaps more prescient way to think of the problems of continuity and discontinuity is to imagine being in a dark room lit by a strobe light. As one moves one’s arm one sees, in a series of individual flashes of light, a series of discrete still images of the arm at different places in space. When the room is lit by a continuously operational light-source and we repeat the same arm movement we see our arm in continuous movement. We cannot build the continuous movement out of the individual still images seen in the light of the strobe, nor can we create the still states whilst in the continuous light. But “ah,” the reader will say, “the discontinuity of the still images was merely perceived in the discontinuous light of the strobe.” Indeed, this is true, but now we begin to get close to the issue.1030 For continuity and discontinuity are, in fact, ideas about the world based on our perceptions of it. I do not mean to invoke an idealist conception here, nor a phenomenalist, nor a relativist conception. I am not saying that things are merely as we perceive them. The distinction I am drawing requires none of that.

Physical things in the physical world are there regardless of what we think about them, and they do what they do regardless of what we think about that. But continuity and discontinuity are ideas. They are precisely the result of what we think about the

world and what goes on in it, rather than actual things going on. This is not to reduce these ideas to mere phantasms, or to deny a sort of “real” existence to them. Ideas really exist: as relations of meaning in our mind, as communicable complexes of information, as motivating, as conditioning, as discoverable, and, of course, as tools. Ideas may accurately describe physical phenomena; but they are still ideas. Modern physics developed complex apparatuses for describing phenomena based on discontinuous and continuous ideas, wedded to a sophisticated complex of mathematics. What came to be called “classical physics” employed both continuous and discontinuous notions when dealing with different phenomena. One way to understand the quantum problem is to think of the intersection between the continuous and discontinuous; just what exactly may occur at this intersection when the continuous and discontinuous collide is part of the problem.

Yet another way to look at the problem is to locate the space of the continuous and discontinuous; that is, these are ideas that occur precisely at the point of contact between the mind and the physical world. This too is a difficult region because the “boundary” (if one may legitimately describe it as such) is both fuzzy and permeable. As mind relates to the physical things of the natural world we easily see that they, as phenomenal stimuli, affect the mind, but it may be equally easy to overlook the fact that we delineate and descry natural things themselves, picking them out and determining them. A natural thing, as this or that entity is only so as perceived, but even then it is not merely thus or just so. For all such encounters take place within knowledge complexes and a social world with others, to say nothing of a larger physical world. The
subject/object binary collapses upon further inspection into an ever-changing and amorphous grand complexity of implication and interconnection.

Ideas such as continuity and discontinuity are fundamentally implicated in wider networks and complexes that are, themselves, amorphous, polyvalent, and ever-shifting, to say nothing of the more determined, trusted, and value-added complexes within the specificity of physical science. As we “zoom in and out” to different levels of understanding and look across, within, or between interrelated systems of understanding the complexity of the simple and the simplicity of the complex change places like wave and particle in different experimental circumstances. The difference, complexity, and mutability of the phenomena with which we are dealing must never be lost sight of.

Einstein, possessed of a powerful mind, a broad vision, and a desire to see the fundamental, caught sight of the more basic and far-reaching implications of Planck’s discovery. And in his 1905 paper he pointed to just these phenomenal issues, or issues of perception, description, and understanding that we have encountered in this brief digression.\textsuperscript{1031}

\textsuperscript{1031} As Einstein put it in his Autobiographical notes in 1949, “I shall not hesitate to state here in a few sentences my epistemological credo. [Although] This credo actually evolved only much later and very slowly... I see on the one side the totality of sense-experiences, and, on the other, the totality of the concepts and propositions which are laid down in books. The relations between the concepts and propositions among themselves and each other are of a logical nature, and the business of logical thinking is strictly limited to the achievement of the connection between concepts and propositions among each other according to firmly laid down rules, which are the concern of logic. The concepts and propositions get ‘meaning,’ viz., ‘content,’ only through their connection with sense-experiences. The connection of the latter with the former is purely intuitive, not itself of a logical nature. The degree of certainty with which this relation, viz., intuitive connection can be undertaken, and nothing else, differentiates empty phantasy from scientific ‘truth.’ The system of concepts is a creation of man together with the rules
Einstein pointed to the incompatibility of the two approaches Planck had combined, that is, to the continuous and discontinuous ideas at work beneath the ideas of Maxwellian electrodynamics and Boltzmann’s kinetic theory of gasses. And he focused his own discussion on the problem of light, which was illustrative of these fundamental problems. Pointing to the issues of perception and theoretical understanding, Einstein began by acknowledging the great success of the (continuous) wave theory of light:\footnote{1032}

One should keep in mind, however, that optical observations refer to time averages rather than instantaneous values; and it is quite conceivable, despite the complete confirmation of the theory of diffraction, reflection, refraction, dispersion, etc., by experiment, that the theory of light, operating with continuous spatial functions, leads to contradictions when applied to the phenomena of emission and transformation of light. [I.e. where radiation meets matter.]\footnote{1033}

The theory developed in response to particular observed phenomena. It may be that it is not adequate for describing other phenomena such as the interaction between light and matter (especially as these phenomena are, in fact, unobservable, or, not directly observable).

\footnote{1032}{A wave is continuous by definition.}
\footnote{1033}{Einstein, “On a Heuristic” p. 178.}
“Indeed,” Einstein remarks, a whole range of phenomena, “'blackbody radiation,’ photoluminescence, production of cathode rays [streams of electrons] by ultraviolet light, and other phenomena associated with the emission or transformation of light appear more readily understood if one assumes that the energy of light is discontinuously distributed in space.” And here Einstein introduces the notion of light quanta (latter dubbed “photons”):

According to the assumption considered here, in the propagation of a light ray emitted from a point source, the energy is not distributed continuously over ever-increasing volumes of space, but consists of a finite number of energy quanta localized at points of space that move without dividing, and can be absorbed or generated only as complete units. In this paper Einstein develops this concept and then employs it against a range of problems: blackbody radiation, the entropy of monochromatic radiation at low radiation density, the generation of cathode rays by illumination of solid bodies, and the ionization of gases by ultraviolet light.

Though the photon was not universally accepted on the paper’s publication, its general theoretical work contributed enormously to the evolution of quantum theory. As Segrè puts it:

The progress beyond Planck’s ideas is enormous. Planck had only quantized material oscillators forming the walls of the blackbody, perhaps without even believing in the reality of energy levels. The whole tone of Planck’s first, and

1034 Ibid.
1035 Ibid.
even later, work gives the impression that quantization was little more to him than a calculational device. For Einstein, on the other hand, it was a fundamental phenomenon; in particular, light, that is, the electromagnetic field itself, is quantized. 1036

The next great step in the development of the quantum theory would be made by Bohr who, somewhat ironically, was sceptical of Einstein’s light quanta for some time.

In his “Autobiographical Notes,” written in 1949, Einstein describes the situation. He notes that Planck had “got his radiation formula if he chose his e-elements ε of the magnitude ε = \( h\nu \)”: 1037

The decisive element in doing this lies in the fact that the result depends on taking for ε a definite finite value, i.e., that one does not go to the limit ε = 0. This form of reasoning does not make obvious the fact that it contradicts the mechanical and electrodynamic basis, upon which the derivation otherwise depends. Actually, however, the derivation presupposes implicitly that energy can be absorbed and emitted by the individual resonator only in ‘quanta’ of magnitude \( h\nu \), i.e., that the energy of a mechanical structure capable of oscillations as well as the energy of radiation can be transferred only in such quanta – in contradiction of the laws of mechanics and electrodynamics. 1037

Planck’s derivation was a building erected on unsound foundations; it rested on two incompatible ideas.

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1037 Einstein. “Autobiographical Notes” p. 45.
Einstein’s realisation of the incompatibility at the heart of Planck’s discovery was a vision of the profound difficulties in store. For Einstein this represented the need for a new formulation. He saw the implications for the photoelectric effect, the ionization of gases, and the specific heat of solids. And he tried to sort out the foundational issues. Though he met with great successes solving individual problems, re-configuring and re-conceiving the foundations proved more elusive. As he put it:

All my attempts… to adapt the theoretical foundation of physics to this [new type of] knowledge failed completely. It was as if the ground had been pulled out from under one, with no firm foundation to be seen anywhere, upon which one could have built. That this insecure and contradictory foundation was sufficient to enable a man of Bohr’s unique instinct and tact to discover the major laws of the spectral lines and of the electron-shells of the atoms together with their significance for chemistry appeared to me like a miracle – and appears to me as a miracle even today. This is the highest musicality in the sphere of thought. \(^{1038}\)

Bohr’s contribution was indeed profound, and we shall be concerned with it for the remainder of this chapter.

**Enter Bohr**

In 1911, after his students had observed some large angle deflections of heavy α particles by thin gold foils in 1908-9, Ernest Rutherford produced a basic picture of the atom that included a very small but massive positively charged core within the atom, the rest of which was largely empty space. Rutherford’s reasoning was that something

massive and positively charged must have been in the way of the stream of alpha particles in order to cause the large-angle deflections that were observed. Based on the scattering data he estimated the radius of the nucleus to be “about a hundred thousand times smaller than that of an atom.”

In 1897 J. J. Thomson had already “discovered” the electron; that is, Thomson had established its $e/m$ value and proposed that it was a fundamental constituent of matter. And from this basic discovery arose a series of atomic models made out of electrons. Because of the electron’s small mass compared to that of atoms, these early models often used enormous numbers of electrons. Rutherford’s discovery of the massive nucleus at the heart of the atom allowed these numbers to be greatly reduced. It also created its own particular problems, as we shall shortly see. Less than a year after its discovery Niels Bohr would be in Manchester working with Rutherford, and two years later his atomic model would set the new standard.

Bohr’s 1911 dissertation, *Studies on the electron Theory of Metals*, had “traced conductivity and other metallic properties to ‘free’ electrons, i.e. to charged particles unattached to the molecules making up the metals.” Already this early work “expresses its author’s conviction of the ultimate incompetence of ‘the ordinary

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1039 Pais. *Niels Bohr’s Times in Physics, Philosophy, and Polity*. Oxford: Oxford University Press, 1991, p. 124. Rutherford’s account of his response, that it was as though one had fired a cannon at tissue paper and the shot had bounced back, has been recorded in various different forms and attributed to various different moments, but it seems to have been a much later more historical reflection on his part.


Bohr’s aims in his dissertation set the tone for all of his later work; he aimed to solve *fundamental* difficulties rather than more narrowly focused specific problems by attacking a cluster of seemingly related fundamental problems. “He expected thereby to achieve a coherent new position which, expressed in consistent models, would yield results in exact quantitative agreement with experiment.” Two things are worth noting about Bohr’s outlook here: First, he took models seriously in terms of their representational scope and power; he expected them to agree with experimental results exactly. J.J. Thomson, whom Heilbron and Kuhn compare to Bohr, took models simply as tools to point thought in the right direction and did not expect or require such close quantitative agreement. The difference lies in the perceived role of the model. For J.J. Thomson they were mere tools, means to an end, and thus “if Thomson’s imprecise, often conflicting models helped him and suggested further experiments, they fully served their purpose.” For Bohr, however, the models were the goal; the aim was to come up with a basic and fundamental picture, and therefore models had to be compatible, both with each other and with experimental results. The second thing to note is closely related to this point: Bohr was attracted to problems of principle. Seth has outlined two approaches within physics in this period: one of problems and one of principles; Bohr certainly falls into the latter category.  

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1042 Ibid. p. 215.  
1043 Ibid. p. 226.  
1044 J.J. was the originator of the famous “plum pudding” model of the atom and determiner of the $e/m$ value for the electron.  
1045 Ibid.  
1046 Seth. “Crisis.”
After completing his dissertation Bohr travelled to Cambridge to work under J.J. Thomson but, due to a number of reasons (linguistic and temperamental reasons as well as differences in fundamental approach such as those outlined by Heilbron and Kuhn) the situation did not work out. Bohr however soon came into contact with Rutherford and arranged to move from Cambridge to Manchester to work with him. In Rutherford Bohr was to find a mentor who became a sort of scientific second father to him and provided the exemplar for his own collaborative and collegial method of running a physics institute. Bohr went to Manchester to learn more about radioactivity from Rutherford. While there he continued to work on his electron theory, even as he delved into experimental work on radioactivity under Rutherford’s direction. But “by mid-summer of 1912,” Bohr had turned away from experiment and directed his theoretical energies to the key concerns of Rutherford’s lab, “the problems of radioactivity and the nuclear atom.”

In mid June of 1912 Bohr wrote to his brother Harold that he had “worked out a little theory… which even if it is not much in itself, can perhaps shed a little light on some things concerning the structure of atoms.” The fruit of this idea that Bohr called “perhaps a little piece of reality” was a paper on α particle scattering and eventually the Bohr atom, communicated to the world in his great 1913 trilogy of papers “On the Constitution of Atoms and Molecules.” In 1912 Bohr, back in Copenhagen, wrote up an outline of his work that was to follow and sent it to Rutherford. In what has come to be known as “the Rutherford Memorandum” we see the beginnings of the work in the

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1048 Quoted in Ibid. p. 237, 238.
trilogy.\textsuperscript{1049} Bohr focuses on the instability of the Rutherford atom that classical theories predict. According to the classical theory a Rutherford nuclear atom with a positive nucleus and negative electrons assumed to be orbiting it should not exist, and yet the picture he had produced had to be close to the truth in order to account for scattering. Thus Bohr devoted himself above all to the problem of the stability of what he referred to as the “Rutherford” atom (though Rutherford had been careful not to propose a definite model that he thought could not be proved\textsuperscript{1050}); the result was to be a new model of the atom, the Bohr atom, which incorporated Rutherford’s tiny but massive central nucleus and added a theory of electronic distribution that focussed on addressing instability problems.

There were two reasons why the “Rutherford” atom should be unstable. It should be radiatively unstable; that is, an orbiting negatively charged electron should, according to Maxwellian electrodynamics, constantly radiate energy. This radiation would cause the electron’s orbits to rapidly decrease in size until it plummeted into the nucleus in a tiny fraction of time, diminishing the atom’s size to that of the nucleus itself amongst other problems. This obviously did not occur, otherwise all atoms would only be of nuclear size and they would emit radiation frantically before they shrank, so the problem had to be addressed.\textsuperscript{1051}

\textsuperscript{1049} Kragh notes that the Memorandum was “full of ideas, which were, however, sketches and proposals rather than explicitly worked out.” Kragh, Helge. \textit{Niels Bohr and the Quantum Atom: The Bohr Model of Atomic Structure, 1913-1925}. Oxford: Oxford University Press, 2012, p. 54.
\textsuperscript{1050} See Ibid. pp. 30-1.
\textsuperscript{1051} See Ibid. p. 59 for a good discussion of radiative instability.
In many accounts of the formation of the Bohr atom, radiative instability is taken to be the key problem (it certainly was one key problem) and therefore to have been Bohr’s prime concern (which, at least at first, it does not seem to have been). Heilbron and Kuhn have convincingly argued, based on the available historical sources, that it was, in fact, the mechanical instability (where oscillation would eventually tear the atom apart) of the “Rutherford” atom that was Bohr’s chief early concern. Bohr would eventually solve these problems by “extra mechanical fiat” by incorporating Planck’s elementary quantum of action.

The key piece of the puzzle that allowed the transformation of the ideas present in the Rutherford Memorandum to the Bohr atom of the trilogy was Bohr’s incorporation of the problem of atomic spectra. We have encountered spectra already. It was already known in the late nineteenth century that each element, when heated, displayed a distinct and individual set of lines within the spectrum of radiation it produces. Physicists quickly realised that individual spectra could be used as a sort of fingerprint to identify elements. But the reasons for, and, in many cases, the mathematical expression of these spectral lines eluded them. Certain spectral series of the hydrogen atom had been mathematically described by the time Bohr turned to the problem, and one such description, the Balmer series, was to play a crucial role. Bohr had initially not taken much of an interest in

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1053 Ibid. p. 243.
spectra; their interpretation seemed to him to be a bit of a morass that did not, at present, promise to lead to great advances.\footnote{As Bohr later put it: “The spectra was a very difficult problem... one thought that this is marvellous but it is not possible to make progress there. Just as if you have the wing of a butterfly then certainly it is very regular with the colours and so on, but nobody thought that one could get the basis of biology from the colouring of the wings of a butterfly.” Interview of Niels Bohr by Thomas Kuhn & Leon Rosenfeld on October 31, 1962, Niels Bohr Library & Archives, American Institute of Physics, College Park, MD USA, http://www.aip.org/history/ohilist/4517_1.html} There is no mention of spectra in the Rutherford Memorandum, but some time after it was penned, Bohr had latched onto them.\footnote{Bohr recalled that he had discussed his ideas with Hans Hansen, who asked him: “But how does it do with the spectral formulae?” And Bohr “said I (would look it up,) and so on.” Bohr continues: “This is probably the way it went. I didn’t know anything of the spectral formulae. Then I looked it up in this book of Stark. And then I just saw at once that this is the way the spectrum comes.” Interview of Niels Bohr by Thomas Kuhn & Leon Rosenfeld on November 7, 1962, Niels Bohr Library & Archives, AIP, http://www.aip.org/history/ohilist/4517_3.html}

Figure 7, The Balmer Series of Hydrogen (White):
In 1912 the pieces were there, but it took a great creative achievement on Bohr’s part to bring them together. Atomic spectra were known to be useful as fingerprints for elements. Planck had introduced his elementary quantum of action into the description of radiation and temperature, and Einstein had significantly expanded its generality and scope. To this we can add Pais’ list of “what was known about atomic structure at the time Bohr wrote” the Rutherford Memorandum:

First, electrons had been discovered and it had been realised that these are universal constituents of matter. Secondly, it was known that the atom’s mass is concentrated in a tiny central body, the nucleus… in his work on α particle scattering Rutherford had justifiably ignored the role of electrons in this scattering process. Darwin had equally justifiably ignored the influence of the nucleus in his treatment of α particle absorption, thus up to that time, June 1912, the nucleus and the atomic electrons had been considered separately. The central question of what the structure of an atom was like, given that it contains a nucleus surrounded by electrons, had not yet been systematically addressed.\textsuperscript{1058}

Bohr was to do so and he was to address the instability problems and incorporate Planck’s quantum of action and the problem of spectra at the same time.

The pieces all apparently fell together for Bohr when he learned about one of the great mathematical successes in describing spectra: the 1885 Balmer formula for the spectrum of Hydrogen. Balmer “showed that, within the limits of experimental error,

\textsuperscript{1057} White, \textit{Introduction to Atomic Spectra}. P. 5.
\textsuperscript{1058} Pais, \textit{Niels Bohr’s Times}, p. 136.
each line of the series is given by [a] simple relation.” Bohr had not paid much attention to spectra and was put onto the problem only after drafting the Rutherford Memorandum. As Bohr was later to put it, “as soon as I saw Balmer’s formula, the whole thing was immediately clear to me.” Though he owned and had read books that contained Balmer’s formula, Bohr seems not to have taken any explicit notice of it until this time. When he did notice it in this context, things fell into place quickly. One key piece to the puzzle was that in Balmer’s formula “the frequency appears as the difference of two quantities.”

After being put on to the question of spectra and “discovering” the Balmer formula, Bohr produced an atomic model that incorporated Rutherford’s positive nucleus with a system of orbiting electrons. As to the question of stability, Bohr posited stationary states of the atom (that is, certain electron orbits), stable, as Heilbron and Kuhn note, “by extra-mechanical fiat,” transitions between which produced the distinctive spectral series. “What Bohr had seen… was a relationship between his one electron Hydrogen model and the Balmer formula.” Pais has characterised Bohr’s picture of the Hydrogen atom as a “triumph over logic.” This is perhaps taking things a bit too far. Its creation was certainly, as Heilbron and Kuhn point out, “altogether ad hoc with respect to the

\[ \lambda = h \frac{n_2^2}{n_2^2 - n_1^2} \]  
“where \( h = 3645.6 \) Å and \( n_1 \) and \( n_2 \) are small integers.” White.


Kragh, Niels Bohr, p. 56


Heilbron & Kuhn, “Genesis,” p. 266.

Pais, Niels Bohr’s Times, p. 146.
determination both of energy levels and of radiated frequency.\textsuperscript{1064} The adapted mathematical description had to be incorporated into an understanding-providing explanation that imbued the description with a more fundamental meaning.

Bohr’s picture of the atom, which, with due deference, he attributed to Rutherford, was as follows:

[T]he atoms consist of a positively charged nucleus surrounded by a system of electrons kept together by attractive forces from the nucleus; the total negative charge of the electrons is equal to the positive charge of the nucleus. Further, the nucleus is assumed to be the seat of the essential part of the mass of the atom, and to have linear dimensions exceedingly small compared with the linear dimensions of the whole atom. The number of electrons in an atom is deduced to be approximately equal to half the atomic weight.\textsuperscript{1065}

This picture should be familiar from basic secondary school physics.

\textsuperscript{1064} Heilbron & Kuhn, “Genesis,” p. 266.

By this model the Hydrogen atom would look like this:

**Figure 8, The Hydrogen Atom (1913):**

According to the classical theory the size of the electron’s orbit should be arbitrary; there is no more reason for it to be one size rather than another. But this would mean that the size of any atom would be arbitrary (as the orbit of the outermost electrons would define the ultimate limit of the atom’s extension) and atoms seem to tend to have a basic definite size.

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1066 There were rough estimates of the size of atoms at the time based primarily on the behaviour of molecules (in Brownian motion or according to the kinetic theory of gases), which suggested that atoms had a definite rather than arbitrary and infinitely variable size.
Bohr addressed this problem, along with the problem of radiative instability, and the production of spectra with a series of assumptions that were designed to allow his model to fit the experimental facts as known and interpreted thus far.

There is a noticeable development of Bohr’s ideas between the three instalments of his paper, but for our purposes it makes sense to “skip to the end,” if you will, and treat Bohr’s model in the more fully developed form presented in his closing comments.

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See Heilbron & Kuhn, Kragh, and Ulrich Hoyer’s introduction to the facsimilie reproduction of the essays and the Rutherford Memorandum in Collected Works (Vol. 2), pp. 103-34.
in Part 3. In Parts 1 and 2 he had already asserted that classical ideas had to be abandoned\(^{1068}\) and that a new way forward was to be found in Planck’s quantum.\(^{1069}\) By the end of the third paper he was clear about some of the details of the new picture, which he presented as a list of “assumptions used in the present paper”:\(^{1070}\)

1. That energy radiation is not emitted (or absorbed) in the continuous way assumed in the ordinary electrodynamics, but only during the passing of the systems between different ‘stationary’ states.

2. That the dynamical equilibrium of the systems in the stationary states is governed by the ordinary laws of mechanics, while these laws do not hold for the passing of the systems between the different stationary states.

3. That the radiation emitted during the transition of a system between two stationary states is homogeneous, and that the relation between the frequency \(v\)

\(^{1068}\) “The result of the discussion of these questions [of instability] seems to be a general acknowledgement of the inadequacy of the classical electrodynamics in describing the behaviour of systems of atomic size.” Bohr, “On the Constitution of Atoms and Molecules,” Part 1. P. 162.

\(^{1069}\) “Whatever the alteration in the laws of motion of the electrons may be, it seems necessary to introduce in the laws in question a quantity foreign to the classical electrodynamics, i.e. Planck’s constant, or as it is often called the elementary quantum of action. By the introduction of this quantity the question of the stable configuration of the electrons in the atoms is essentially changed, as this constant is of such dimensions and magnitude that it, together with the mass and charge of the particles, can determine a length of the order of magnitude required.” Ibid.

\(^{1070}\) He sums up his work in the following manner: “In the present paper an attempt has been made to develop a theory of the constitution of atoms and molecules on the basis of the ideas introduced by Planck in order to account for the radiation from a black body, and the theory of the structure of atoms proposed by Rutherford in order to explain the scattering of \(\alpha\)-particles by matter.” Bohr “On the Constitution” (Part 3), in *Collected Works* (Vol. 2), p. 232.
and the total amount of energy emitted $E$ is given by $E = hv$, where $h$ is Planck’s constant.

4. That the different stationary states of a simple system consisting of an electron rotating round a positive nucleus are determined by the condition that the ratio between the total energy, emitted during the formation of the configuration, and the frequency of revolution of the electron is an entire multiple of $h/2$. Assuming that the orbit of the electron is circular, this assumption is equivalent with the assumption that the angular momentum of the electron round the nucleus is equal to an entire multiple of $h/2\pi$.

5. That the ‘permanent’ state of any atomic system – i.e. the state in which the energy emitted is maximum – is determined by the condition that the angular momentum of every electron round the centre of its orbit is equal to $h/2\pi$.\textsuperscript{1071}

The sum of these “assumptions” produces an atomic model in which electrons are “allowed” to orbit at certain, set distances from the nucleus (integral multiples of $n$). In these states the atom is stable and emits no radiation. Here we can then describe the electron’s orbit in classical terms. When an atom is disturbed or excited (by collisions, by radiation), however, the electron may be “knocked down” to a lower state, in which case it emits a quantum of energy of frequency proportional to the “jump.”

\textsuperscript{1071} Ibid. pp. 232-3.
Each stationary state or orbit, has a degree of stability, the “ground” or “permanent” state being the most stable because no more energy may be emitted. Atomic size, therefore, is restricted by quantization; the atom cannot be any size but only certain, discrete sizes. And the seemingly identical size of atoms is, in fact, statistical, owing to the greater and lesser degrees of stability of the various quantum states.

Spectra are produced when electrons “jump” between orbits; thus, the different possible jumps between orbits relate to the different spectral lines.
With the relatively simple case of the hydrogen atom Bohr was able to demonstrate the effectiveness of his model by deriving the Balmer series and Rydberg’s constant, and to propose a method for approaching the far more complicated cases of more complex atoms. On the basis of his atomic model he also offered a theory of periodicity, and of molecular combination.
Before considering spectra and “discovering” the Balmer formula, Bohr already believed that the classical concepts must fail at the atomic level and that Planck’s elementary quantum of action was likely to be involved in a new formulation. His atomic model involved quantization, and thus discontinuity, in its picture of the basic building blocks of matter. It received a great deal of experimental confirmation and support, but there were some who saw it as mere mathematical juggling with numbers and denied that it could possibly provide an accurate picture of “what was really going on” inside the atom. Bohr himself knew and admitted that the model merely described what happened and not precisely how it happened or for what reason. Rutherford was impressed with Bohr’s work, but asked, rather presciently, how the electron knew which state it would jump to before it did:

There appears to me one grave difficulty in your hypothesis which I have no doubt you fully realize, namely, how does an electron decide with what frequency it is going to vibrate and when it passes from one stationary state to another? It would seem to me that you would have to assume that the electron knows beforehand where it is going to stop.\(^{1072}\)

This was a question that would take some time to answer.

\(^{1072}\) Rutherford to Bohr March 20 1913. In Pais, *Inward Bound*. P. 212 Regardless of this perplexing issue Rutherford supported Bohr and his ideas. As he put it in February 1914: “The theories of Bohr are of great interest and importance to all physicists as the first definite attempt to construct simple atoms and molecules and explain their spectra.” And in August of the same year: “Bohr has faced the difficulties [of atomic structure] by bringing in the idea of the quantum. At all events there is something going on which is inexplicable by the older mechanics.” Ibid. pp. 209-10.
Bohr’s model lacked a full philosophical interpretation, but it provided a workable way forward and, in a sense, its successes shifted attention from its grounding to its further implications and the working out of its details. What is now referred to as “the old quantum theory” had many successes in the decade after the publication of Bohr’s trilogy, but as it was pursued further and further, expanded and refined, and applied to more and more phenomena, its limitations began to seem overwhelming to some physicists by the mid twenties. Our next chapter begins with the quantum theory in crisis as Bohr’s model reached the end of its theoretical usefulness.
Chapter 7 – Grounding Meaning in Bohr’s Philosophical Interpretation of Quantum Mechanics

In the decade that followed the publication of the trilogy Bohr’s atomic theory was massively successful. Initial reactions ranged from the enthusiastic to the despondent. But after a series of successes and confirmations, the general opinion of physicists was that Bohr’s theory was a great advance. By 1920 it had been expanded and generalised by Sommerfeld and had proved widely successful. Five years later it was at the end of its useful life, soon to be replaced. There were criticisms of Bohr’s ideas, particularly of their lack of a solid foundation in physical theory – there was, after all, no

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1073 “Beautiful are those things that we can see, More beautiful are those things that we understand, By far the most beautiful are those things about which we are ignorant.” (Translation mine) Pais, Niels Bohr’s Times, p. 94.
1074 Otto Stern and Max von Laue “who later were to do so much for the advancement of Bohr’s ideas, studied the paper and said that if by chance it should prove correct, they would quit physics.” And Lord Rayleigh commented, ‘I have looked at it, but I saw it was no use to me. I do not say that discoveries may not be made in that sort of way. I think very likely they may be. But it does not suit me.’” Segrè, From X-Rays to Quarks, pp, 128-9.
explanation of how and why the electrons made their “jumps,” why they jumped to a particular level, why only certain orbits were allowed, and so on – and many therefore saw the theory as mere mathematical “juggling.” Sommerfeld, who was reported to have reacted favourably to Bohr’s papers was in fact initially hesitant, but by 1916 was remarking that “one can no longer doubt the absolute correctness of this theory.” And it was Sommerfeld who was to dramatically extend, refine, and generalise Bohr’s theory, particularly in his *Atomic Structure and Spectral Lines*, which was first published in 1919 and was followed by many further editions, which updated the book according to recent developments. Sommerfeld’s book became *the* textbook of atomic theory for an entire generation of physicists.

By 1920 those who dismissed Bohr’s theory were in the minority. There were problems, of course, pertaining to the theory’s foundations, and there were still phenomena it was unable to explain, but it had generally been accepted as the framework and basis that, with further refinements and developments, would be the way forward. As Kragh sums it up, “During the early years of the 1920s, Bohr’s atomic model and its extension by Sommerfeld and others enjoyed a nearly paradigmatic status within atomic

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1076 Ibid. p. 123.
and molecular physics.” But as the twenties progressed the Bohr-Sommerfeld model faced a growing list of problems. By 1923,

At the time when Bohr’s atomic model would have been celebrating its tenth anniversary, problems began to accumulate. Some of these were experimental anomalies, while others were of a logical and conceptual nature; some of them were old, others new. To the list of old problems belonged the anomalous Zeeman effect, which turned out to be intimately connected to the complex spectra and the assignment of quantum numbers to many-electron atoms. The physicists could account for the spectroscopic details of the Zeeman effect, but only by proceeding phenomenologically and abandoning any explanation of the effect based on established atomic theory.\(^{1079}\)

The anomalous Zeeman effect (where spectral lines split into a complicated series of closely spaced finer lines in a magnetic field) was particularly problematic because there was no way to explain it in terms of Bohr’s theory. To this particularly troublesome problem\(^{1080}\) were added a number of others, chief of which were the theory’s inability to explain the more complex spectra of atoms with more than a single electron; in fact, the Bohr-Sommerfeld theory failed even to explain neutral Helium.\(^{1081}\) Molecules and the

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\(^{1078}\) Ibid. p. 226.

\(^{1079}\) Ibid. p. 313.

\(^{1080}\) Pauli was famously reported to have been found sitting on a park bench in Copenhagen “looking dejected and [was] asked what was making him so unhappy. Pauli answered, ‘How can one avoid despondency if one thinks of the anomalous Zeeman effect?’” Segrè, *From X-Rays to Quarks*, p. 140.

\(^{1081}\) For instance, “in early 1923, Born and Heisenberg completed a systematic treatment of the helium spectrum on the basis of perturbation theory, a treatment that revealed basic contradictions with experimental data, and with predictions made on the basis of Bohr’s
covalent bond were further problems, and various other experimental failures were added to the list by 1925.\(^\text{1082}\)

Basically successful as Bohr’s theory was, its empirical success was limited and countered by a growing number of anomalies… Anomalies are of course bad news for a theory, but they come in different kinds and are often evaluated in widely different ways by the scientific community. Some are regarded as crucially important – the kind of stuff that may cause a wholesale refutation of a theory – while others are hardly noticed and have almost no effect at all on how a theory is judged. In the case of the Bohr atom, physicists paid great attention to the anomalies related to the helium atom and the Zeeman effect, which, as we have seen, were characterized as nothing less than catastrophes.\(^\text{1083}\)

In light of these problems there was a growing sense on the part of many physicists that the quantum theory was in a state of crisis.\(^\text{1084}\) Many different attempts were made to try correspondence principle. Born called the result a ‘catastrophe,’ while Bohr claimed it as ‘evidence of the inadequacy of the present basis of the quantum theory.’” By 1923 Bohr already felt that the foundations of the theory itself would need to be revised, rather than mere additional adaptations to account for these new problems. Seth, Suman. *Crafting the Quantum: Arnold Sommerfeld and the Practice of Theory, 1890-1926*. Cambridge: MIT Press, 2010, p. 265.

\(^\text{1082}\) For a good “tallying up” of experimental successes and failures see Kragh’s list in his chapter on the end of the Bohr model. Kragh, *Niels Bohr and the Quantum Atom*, p. 347.

\(^\text{1083}\) Ibid. p. 349.

\(^\text{1084}\) Suman Seth draws attention to the fact that this sense of crisis was by no means shared by the entire community of physicists who worked on quantum problems. Seth draws a distinction between physicists who were interested in principles such as Bohr, who did feel that the theory was in crisis and required a new re-thinking of its foundations and those such as Sommerfeld, who focused on problems to be solved and saw no such crisis situation. Indeed, when the new quantum mechanics arrived, Sommerfeld saw it not as a revolution, but merely as a further working out of the tools for sub-atomic problem solving. See Seth. *Crafting the Quantum*. It is, of course, Bohr
to solve the theory’s problems, even to the extent that Bohr and some others questioned even such fundamental tenants as the conservation of energy. The way forward was unclear and many tentative starts were made before the next major step in the history of quantum theory occurred: the development of quantum mechanics.

*A Brief Note on “Correspondence”*

As the problems of what is now called the “old quantum theory” began to mount, Sommerfeld and others questioned the analogous relationship between the quantum theory and the old, now “classical,” mechanical ideas. In 1923 Bohr had attempted to account for the anomalous Zeeman effect in terms of a “Zwang” [a compulsion or obligation], “which forces the atomic core to assume two different positions in the atom…” When Bohr presented a version of these ideas in English in *Nature* in 1925 he translated Zwang as “strain.” In 1923 Bohr simply stated that this Zwang “cannot be described by our mechanical concepts…” The “hypothesis was qualitative and quite speculative” and had the problem of being essentially *ad hoc*. A real solution to the laundry list of problems for the quantum theory would need to be more fundamental.

Many of the great successes of Bohr’s theory had been due to what Sommerfeld called Bohr’s principle of analogy, which Bohr himself dubbed the “Correspondence Principle” in 1920. The correspondence principle is deceptively simple to describe in basic terms and notoriously difficult to actually pin down. The most basic way one could frame it would be to say that concepts in the quantum world “correspond” in a certain

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and the physicists of principles with whom we are interested here, but it is important not to take the Bohr story as standing for physicists as a whole in the period.

sense and to a certain degree to concepts in the “classical” world. Pais sums it up by saying that “classical physics, though limited in scope, is indispensable for the understanding of quantum physics.” Or, in Bohr’s words: “Every description of natural processes must be based on ideas which have been introduced and defined by the classical theory.”

The roots of the correspondence principle are sometimes described as lying in the fact that new scientific theories must be able to incorporate the successes of previous theories, but this description misses the mark by a wide angle. Instead, the correspondence principle was, as Kragh describes it, a way of bridging the gap between the classical and quantum physical worlds. Kragh points out that Bohr saw his principle as being “primarily of heuristic value.” It was a tool that allowed Bohr and others at Copenhagen (particularly his assistant Kramers) to approach quantum problems using classical concepts as a sort of rough guide. The exact nature of this tool and the exact way in which it operated was not clear to others outside of the Copenhagen world. As Kramers put it in 1935, “In the beginning the correspondence principle appeared to the world of physicists as a rather mystic wand that did not work outside Copenhagen.”

In the hands of Bohr and Kramers though, this magic wand achieved great results. Sommerfeld, who was critical of the method, was also forced to admit its successes. In 1923 Kramers said of the correspondence principle: “It is difficult to explain in what [it] consists, because it cannot be expressed in exact quantitative laws, and it is, on this

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1087 See Kragh, *Niels Bohr and the Quantum Atom*, pp. 196-203.
1089 Pais, *Niels Bohr’s Times*. P. 193 Sommerfeld critically referred to it as a “magic wand” early on. See Seth, *Crafting the Quantum.*
account, also difficult to apply. [However,] in Bohr’s hands it has been extraordinarily fruitful in the most varied fields.”

There is some debate over how early Bohr had something like the correspondence principle in mind. He first coined the term in 1920, but he did use correspondence, or analogous methods as early as 1913. Radder discerns “three successive phases, in which the principle was used in different ways.” The first, from 1913-15 was a period focusing on “numerical correspondence, which concerned “numerical agreement of the values of some physical quantities in classical mechanics and electrodynamics and in Bohr’s atomic theory.”

The basic argument was that “for large values of the principle quantum number \( n \) the hydrogen levels lie so close together that they form ‘almost a continuum’; and that therefore the classical continuum description of the emission of radiation should be very nearly valid for transitions between two very close-lying states both with very large \( n \).” Yet, in this period Bohr was “well aware of, and also explicitly pointed out, the fact that despite this numerical agreement at a theoretical level a large conceptual gap existed between his atomic theory and classical mechanics and electrodynamics.” In Radder’s second period, from 1916 to 1922, the idea was extended to a concept of “correspondence and conceptual continuity” where “it was assumed that in due course this conceptual gap could be

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bridged also.\textsuperscript{1095} In Radder’s third phase of “numerical and formal correspondence” from 1923 to 1925, “the optimism of the second phase turned out to be unjustified [as] Bohr’s theory encountered increasingly more empirical and conceptual problems.”\textsuperscript{1096} This is, of course, our period of crisis and breakdown of the old quantum theory. In this period “correspondence arguments played again a crucial, albeit an unmistakably altered, role.” In this period the idea of conceptual correspondence was gradually abandoned in favour of a fundamental conceptual discontinuity, but one whereby “formal (not conceptual) correspondences, expressing the existence of certain relations of mathematical identity or substitution” such as those introduced by Born in 1924 became the important analogous thrust.\textsuperscript{1097}

For our purposes it is important to see the correspondence principle as a meaning-assigning procedure, or, rather, as a sort of meta-directional tool that provided an indefinite but still directional road-marker or map by which meaning-assignment could be made – a sort of semantic map whereby data from a world that did not yet have its own language (the sub-atomic realm where quantum conditions apply) could be translated into the language of another world (that of classical physics where quantum conditions do not apply). The correspondence principle was not a definite algorithm, and as such it was something one had to “have a feel for,” but as such an heuristic tool, it provided a way of groping forward while the theoretical foundations of the new quantum world were as of yet unformulated.

\textsuperscript{1095} Ibid.
\textsuperscript{1096} Ibid. p. 206.
\textsuperscript{1097} Ibid. pp. 206-7.
The quantum world of sub-atomic phenomena was something unseen. As theory developed in the decade following Bohr’s trilogy speculative pictures of what might be occurring within the atom were proposed that were meant to relate to empirical results arrived at through experiments (spectral lines, cloud-chamber trails, x-ray diffraction, and so on). This was a procedure whereby data from experiments were *assigned meanings* based on models or pictures of what might be going on inside the atom to cause these experimentally observed phenomena, pictures which, in turn, depended on complexes of understanding (the existing theories of mechanics and electromagnetism) and the language of mathematics. The correspondence principle served as a rough guideline for how to approach these meaning assignments. As Komar puts it:

> Every physical theory must of necessity have two distinct aspects. On the one hand it must be a consistent mathematical theory capable of rigorous formulation, whereas on the other hand there must be some procedure for relating at least some of the mathematical symbols which occur in the formalism to quantities which one can measure in the laboratory. The later procedure must necessarily be informal for it is in this way that the symbols of the mathematical formalism are removed from the realm of syntactical manipulations and are given semantic content.\(^\text{1098}\)

Komar describes the transition process between the meaning of terms in the mathematical expression of “classical” physical phenomena based on classical coordinate systems and the meaning of terms in the mathematical expression of quantum phenomena, with their

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own attendant coordinate systems. These terms have their relational meanings within their respective mathematical formalisms; that is, they have their meanings based on relations to other terms within a set of mathematical relations. But the \textit{conceptual expression} of such terms as position and momentum (as phenomenal descriptors), only have meaning as related to \textit{measurements} performed by physical measuring devices. Or, to use Komar’s own terms: “we assert that the very concepts such as ‘position’, ‘momentum’, ‘energy’ attain meaning only to the extent that the corresponding measuring devices can in principle be constructed and operated.”\textsuperscript{1099}

The question of measuring devices is of tantamount importance to this part of our story and will become a central focal point of Bohr’s later concerns. For the moment we may put the correspondence principle to rest by taking Komar’s concluding remarks to heart:

Whenever we take vague intuitive concepts, such as position and momentum, and attempt to make them more quantitative in order to employ them in a precise, categoric physical theory, we find that this process, which inevitably involves relating these concepts to the output of laboratory devices, can invariably lead to exposing new and unexpected properties for these concepts.\textsuperscript{1100}

This is precisely what happened with the “classical” concepts that were employed to try to paint a picture of the interior of the atom that would describe behaviour, which would

\textsuperscript{1099} Ibid. p. 85. Komar notes that “the issue of attaining semantic content for our symbol requires more than the analysis of what a particular theory of nature permits. The fundamental limitation is ultimately placed by nature itself, and there is a good deal more subtlety to nature than can occur in any physical theory.” Ibid.

\textsuperscript{1100} Ibid. p. 91.
causally account for observed phenomena. The correspondence principle provided a way to employ familiar concepts in this manner, but it reached its limits as, in the early 1920s, those who used it, including its originator, became increasingly convinced that such pictures could not accurately be describing what was going on inside the atom. Bohr and others increasingly began to lose faith in the applicability of classical concepts as the failures of the theory began to look like they outweighed the successes.

**Pauli & Heisenberg**

In 1921 Bohr’s own institute for theoretical physics at the University of Copenhagen was officially inaugurated. Bohr’s institute was a collaborative environment, which attracted and put up young scholars from all over Europe and further afield. The two most important of these young scholars for our story are Wolfgang Pauli and Werner Heisenberg. Pauli, “son of a medical doctor [and] godson of Ernst Mach” had studied under Sommerfeld at Munich, and in 1920 he published a review article on relativity that caught Einstein’s eye as well as others. In 1991 Pais said that it was “still one of the best presentations of the subject.” Pauli had a sharp critical mind and an often caustic wit. In 1922 he attended a series of lectures that Bohr gave at Göttingen (referred to by the students at the time and afterward as the “Bohr Festival”). As Pauli put it “a new phase of my scientific life began when I met Niels Bohr personally for the first time.” Bohr invited him to Copenhagen where Pauli studied from 1922 to 23. In the

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1101 Pais provides a good account of the founding and operations of the institute, but other accounts abound, particularly amongst the younger generation who studied at the institute as graduate students. See Pais, *Niels Bohr’s Times*.

1102 Ibid. p 200.

1103 Ibid. p. 201.
problematic later years of the old quantum theory Pauli was to contribute several key ideas. In 1924, in an attempt to account for the anomalous Zeeman effect he introduced “a peculiar non-classically describably two-valuedness” [Zweideutigkeit or “double-meaningness”].\textsuperscript{1104} Pauli’s greatest contribution in this period though was his exclusion principle, which asserted that no two electrons within an atom could have the same combination of quantum numbers.\textsuperscript{1105}

Heisenberg, the second and, for our story, most important of Bohr’s young students/collaborators, had also been a student of Sommerfeld in Munich where he befriended Pauli. He was also at the 1922 “Bohr-Festival” in Göttingen and, likewise, was invited to Bohr’s institute in Copenhagen. In Göttingen Heisenberg had gone for a long walk with Bohr where the two discussed the world of quantum physics. As Heisenberg put it:

I was at once impressed by the difference in his way of seeing quantum theory from Sommerfeld’s way. For the first time I saw that one of the founders of quantum theory was deeply worried by its difficulties… He never looked at problems from the mathematical point of view, but from the physics point of view. I should say that I have learned more from Bohr than from anybody else about that new type of theoretical physics which was… more experimental than

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\textsuperscript{1104} Ibid. The details are less important for our story here, which focuses primarily on Bohr, than the fact that this Zweideutigkeit was completely non-describable classically. Pauli would go on to assign a Zweideutig quantum number to all electrons as part of his article where he presented his “exclusion principle” (the term was coined by Dirac).

\textsuperscript{1105} Quantum numbers were variables in the mathematical description of subatomic phenomena that could take only discrete integral values. As quantum theory developed it accumulated an increasing number of the puzzling quantum numbers.
mathematical... Later on, for course, I have tried to learn that way of thinking from him, so that was a very exciting experience.\textsuperscript{1106}

Heisenberg and Bohr became close and, after his initial visit in 1924-5, Heisenberg was selected to replace Krammers as Bohr’s assistant when the latter left Copenhagen to take up his own professorship in Utrecht in 1926. Heisenberg was thus in Copenhagen, working closely with Bohr from 1926 to 27, a crucial period for our study. By that time, of course, Heisenberg had already come into his own as a major contributor to the quantum theory.

\textit{Light Quanta, Crisis, & The BKS Proposition}

One of the odd facts about Bohr’s thought in the early 1920s was his steadfast refusal to accept the idea of light quanta. He was not alone in this reluctance to believe in particles of light, but on first glance it does seem out of character for someone so willing to give up the universal scope of classical mechanics as early as 1912. Stranger still, in the early 1920s Bohr even seriously considered the idea of non-conservation of energy and momentum in the subatomic realm, in part at least, in order to avoid light quanta. We will recall that Einstein’s first great contribution to the quantum theory, “On a Heuristic Point of View Concerning the Production and Transformation of Light,” exploited a particulate picture of light where individual quanta of light energy (latter dubbed photons) were employed. In his 1913 trilogy, Bohr had not speculated about the nature of the radiation produced by the atom or its propagation though space once it was

\textsuperscript{1106} Ibid. pp. 262-3.
emitted.\textsuperscript{1107} Of course, it is not emission that is particularly problematic, but absorption, as in the case of the photoelectric effect. As Wheaton puts it,

To be sure, the quantum regulation of the emission of radiant energy has no classical explanation; yet there is no electromechanical inconsistency implied in the creation of a spherical wave containing a definite amount of energy. It is the inverse case that causes real difficulty. How can that quantum of spherically radiating energy concentrate its full power on a single electron?\textsuperscript{1108}

This question would require some time to arrive at an answer.

Through the difficult crisis years of the old quantum theory he avoided incorporating light quanta into his ideas; he simply did not believe in them. The idea of particulate light contradicted the experimentally verified wave theory of light; particles of light were an old idea that, to Bohr’s mind, had been discredited and disproved by crucial experiments in the nineteenth century. He tended, as did many others, to see the emission of energy within an atom in terms of quanta and the propagation of energy through the void or ether in terms of waves. The crux of the problem, Bohr and others (such as Planck) believed, lay at the interactive boundary between energy and matter; there was some sort of transition involved that led physicists to mistakenly consider the old particulate view of light; if this transition were better understood (that is, the interaction between waves and matter) then the problem would go away.

\textsuperscript{1107} Bohr’s theory is sometimes presented as describing the emission of a “photon” as the electron jumps to a lower orbit, which is grossly historically inaccurate.\textsuperscript{1108} Wheaton, Bruce. \textit{The Tiger and the Shark: Empirical Roots of Wave-Particle Dualism}. Cambridge: Cambridge University Press, 1983, p. 233.
Bohr was willing to give up a great deal of what seemed most certain in the physical picture of the cosmos in order to avoid light quanta. “In a 1921 manuscript Bohr laid out the problem and the direction in which he believed the solution lay:

Einstein’s light-quantum seems to offer the only simple possibility of accounting for… photoelectric action, if we adhere to an unrestricted application of the notions of conservation of energy and momentum… [however] the interesting arguments… by Einstein… rather than supporting the theory of light-quanta will seem to bring the legitimacy of conservation of energy and momentum to the radiation processes into doubt.”\(^{1109}\)

In 1923 Compton observed the scattering of light by electrons, which he explained in terms of light quanta. His results seemed to confirm not only that light behaved as if it was made up of particles, but also that “energy and momentum are conserved in light-quantum-electron scattering.”\(^{1110}\) Bohr was, however, still not ready to give in.

In 1924 Bohr published a joint paper with Krammers and a young American student at Copenhagen, John Slater. The Bohr-Krammers-Slater paper (BKS), took up an idea that Slater had before he arrived at Copenhagen, but was substantially altered by Bohr, to Slater’s later chagrin. The BKS proposal was imaginative but strange; it did not receive wide acceptance and was quickly refuted. Slater, in a theoretical picture that originally included light quanta, proposed that atoms constantly emit virtual waves

\(^{1109}\) Pais, *Niels Bohr’s Times*, pp. 232-3. “In 1923 he was more explicit: ‘A general description of phenomena, in which the laws of the conservation of energy and momentum retain in detail their validity in their classical formulation, cannot be carried through… the conservation of energy, as defined by means of classical conceptions, seems at once to be excluded.’” Ibid. p. 233.

\(^{1110}\) Ibid. p 234.
through which they communicate with other atoms, this communication included the possible transition frequencies to lower states. The communication occurred through a “virtual radiation field… distinct from the conventional, real radiation field.”\footnote{This virtual field, carried by the atom in a given stationary state, was supposed to know and carry all the possible transition frequencies to lower states, waiting, one might say, to release one of those frequencies. Emission of light in an atomic transition is, BKS posited, not spontaneous but rather induced by the virtual fields ‘by probability laws analogous to those which in Einstein’s theory hold for induced transitions.’ Accordingly, ‘the atom is under no necessity of knowing what transitions it is going to make ahead of time.’” Ibid. p. 236.} The paper was seen by many as bizarre and unnecessary. Einstein remarked that “Abandonment of causality as a matter of principle should be permitted only in the most extreme emergency.”\footnote{Ibid. p. 237.} And when in 1925 further experiments on the Compton effect showed that energy was indeed conserved and that causality was in fact maintained, Einstein expressed relief that the BKS theory had been disproved so quickly. Bohr quickly admitted defeat and moved on.

Though the BKS theory had little overall impact due to its obscurity, lack of mathematics, and its short life, it is important to our story to show what Bohr was willing to abandon in his search for an understanding of what occurred in the subatomic realm. Heisenberg referred to the BKS theory as “the culmination in the crisis in the [old] quantum theory.”\footnote{Ibid. p. 236.} And it was Heisenberg who was to create the next great step forward. Bohr’s own reaction to the death of the BKS theory was sanguine. “It seems… that there is nothing else to do than to give our revolutionary efforts as honourable a funeral as possible” he remarked. At the same time though, the death of the BKS theory

\footnote{Ibid. p. 236.}
gave a bit of hope in that it provided confirmation that the conservation of energy was at least something solid one could hold onto. As Bohr put it in 1926:

The recent years have been very confusing, and we have at times been close to despair, especially when the hope of describing the radiation phenomena with simple pictures had to be given up after Compton’s and Geiger’s [experiments]. However it was at the same time very comforting that there is now no longer any reason to doubt the energy principle.\textsuperscript{1114}

Of course, many physicists had not believed there had been any reason to doubt the energy principle in the first place.

\textbf{Heisenberg and Quantum Mechanics}

Heisenberg’s great contribution of 1925 arose out of a nexus of concerns and influences. He had imbibed much of Sommerfeld’s “problem based” approach in Munich, had studied with Max Born in Göttingen, and had been greatly influenced by Bohr and the colleague of his Munich student days, Wolfgang Pauli. Heisenberg developed a professional style of physics that was a melange of these influences, his own audacity, and a lack of care for the sort of foundational thinking that has played such a large role in our discussions this far. As Cassidy put it:

In its most creative form Heisenberg’s style of physics was characterized by paradox, inconsistency, and pragmatism. In his search for solutions to seemingly insoluble problems, he developed old theories as far as they would go and then added new, if necessarily problematic, hypotheses to force the theoretical

\textsuperscript{1114} Ibid. p. 238.
structure to produce empirical data. In this way he thought he could provide clues for a definitive future theory free from all inconsistencies. His style was summed up in his early motto: *der Erfolg heiligt die Mittel* – success justifies the means. His was an “unphilosophical” mode of reasoning, or so Pauli complained to Bohr in 1924, and it was clearly evident in his “second core model” published a year later.¹¹¹⁵

This approach, as antithetical as it may seem to a “physics of principles” delivered results that could not be denied.

The relationship between Heisenberg’s thought and Bohr’s was, therefore, complex. From Bohr Heisenberg learned to look to principles and, as Pauli hoped, he learned to be more “philosophical” about his physics while at Copenhagen. As Mehra and Rechenberg put it: “The Copenhagen attitude, at least in 1922 and 1923, was to set up the principles of atomic theory and to discuss the physical phenomena… according to these principles; if this treatment led to a disagreement with the empirical data, it had to be stated openly.”¹¹¹⁶ Heisenberg’s approach in his early work (particularly his core model of the atom) was very much at odds with that of Bohr:

Heisenberg… had deviated from this procedure. First, he had employed new assumptions – without worrying whether they agreed with the accepted principles of atomic theory – just to arrive at a successful description of the data. Second, he

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had applied certain mathematical methods without a proper understanding of their physical meaning, a procedure which contradicted the attitude of Niels Bohr. Third, Heisenberg had mixed together assumptions and hypotheses, whose consistency was not proven at all... Hence, Pauli felt that Heisenberg had either forgotten about the real difficulties of atomic theory or had buried them in a formal approach.\textsuperscript{1117}

And yet, Heisenberg had showed creativity and promise. In a letter to Bohr in advance of Heisenberg’s first visit to Copenhagen Pauli sounded both themes: Heisenberg had potential, but he also needed to learn to be more philosophical. “Niels Bohr was thus prepared to receive Heisenberg; he knew that the most important point on which he could influence Heisenberg was to acquaint him with a more philosophical attitude toward atomic physics.”\textsuperscript{1118} From Bohr Heisenberg learned a new way of looking at the problems of atomic physics, which he would eventually couple with the mathematical approach of Born (who was sympathetic to Bohr’s approach and the correspondence principle, but was himself far more focused on mathematics). Heisenberg’s 1925 paper was, therefore, a paper that came out of the traditions of Copenhagen and Göttingen, with deeper roots lying in Munich with Sommerfeld.

From Bohr Heisenberg learned a concern over principles, which led him away from a physics of problems and resulted in his concern, along with Bohr, Pauli, and others, over the quantum theory as a whole; it led him to believe that the theory was in

\textsuperscript{1117} Ibid. p. 135.
\textsuperscript{1118} Ibid.
crisis. And key to this re-orientation of his thinking, was Bohr’s concern over consistency. As Heisenberg later described it:

Bohr was more worried than anybody else about the inconsistencies of quantum theory. Neither Sommerfeld nor Born had been so much worried about these things. Sommerfeld was quite happy when he could apply nice complex integrals [to solve problems], and he did not worry to much whether [his] approach was consistent or not. And Born, in a different way, was also interested mostly in mathematical problems. Inconsistencies were realized, but, after all, neither Born nor Sommerfeld really suffered [because of them], while Bohr couldn’t talk anything else.  

From Bohr Heisenberg also learned the concern for consistency, though, as Cassidy notes, his own concern over consistency was still tied to his goal-oriented overall approach; that is, he discovered that consistency led to results. And, with “success arising from consistency, consistency suddenly became a virtue.”

Heisenberg’s great breakthrough was born out of restriction and limitation. By the time of the BKS paper it was already clear to Bohr and others that the “old” quantum theory was in crisis; it was no longer seen as up to the task of describing the necessary experimental phenomena. It had become a set of tools, procedures, pictures, and ad hoc...
adjustments that seemed to be in great want of its own logic. Quanta had replaced the classical mechanical picture within the atom; what was needed was a new system of understanding that could account for the quantum’s successes, solve its problems, and unify subatomic physics. By 1924 Max Born had already been calling for a new “quantum mechanics” that would be the equivalent of the classical mechanics (which still worked on the macro-scale) within the atom, and Heisenberg, by 1924, was “receptive to Bohr’s insistence upon facing the fundamental problems of quantum theory all at once.”

Heisenberg’s 1925 paper took up this challenge and provided a first, strange glimpse into what this new mechanics would look like.

The limitation that Heisenberg employed to such effect was to focus on observables. Bohr’s 1913 quantum theory, the reader will recall, had presented a picture of the atom akin to a tiny solar system, with a massive but small positively charged nucleus, around which orbited tiny negatively charged electrons. Only certain orbits were allowed, the so-called “stationary states,” the angular momentum of each of which is equal to integral multiples of \( \frac{\hbar}{2\pi} \). Energy was emitted when electrons transitioned from higher to lower energy levels (or from larger to smaller orbits, if you will), the total energy emitted in such transitions being equal to \( \hbar v \). Building on the successes of Bohr’s work, Sommerfeld expanded and generalised the theory, eventually birthing complex and beautiful pictures of orbital situations within the atom.

What Heisenberg did was to retain the basic structural form of the Bohr-Sommerfeld theory, without the picture of the tiny solar system. Pauli, who, in his letters, had begun to criticise pictorial models while Heisenberg was still attached to them was undoubtedly an influence. But Heisenberg’s lack of loyalty to any one method or set of principles and his “ends justify the means” approach gave him a certain intellectual freedom which led to great results. As Cassidy puts it, “Heisenberg – unphilosophical, pragmatic, and formalistic – could advance on two fronts at the same time and respond quickly on each.” In his letters to Pauli at the time, Heisenberg would switch between arguments based on orbital models and arguments based on observables. Heisenberg kept the stationary states (when the atom does not emit radiation) and the transitions (where it does) but gave up attempting to describe them in terms of orbits. The Bohr-Sommerfeld theory had accounted for spectroscopic data (line spacing, intensity, magnetic effects, and so on) by a mathematical description of a picture of what was going

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on inside the atom. Heisenberg began with the mathematical relations and their connection to spectroscopic data, but dropped the picture. This of course sounds simple, but it was not merely a matter of getting rid of imagined orbits, there was also the task of working out a logically consistent set of relations that, again, would incorporate the successes and address the problems of the “old” quantum theory. In order to do this, Heisenberg employed Bohr’s correspondence principle, and what he achieved was an act of translation.

Heisenberg’s 1925 article was the turning point and first major step in the translation of classical to quantum-mechanical relations and the formation of a unified quantum mechanics for the subatomic realm. The advance made by this paper was soon developed by Born, Jordan, and Heisenberg into the form of quantum mechanics known as matrix mechanics. Heisenberg’s paper, “Über quantentheoretische Umdeutung kinematischer und mechanischer Beziehungen” of July 1925 sought “to lay the ground for a quantum-theoretical mechanics based exclusively upon relationships between magnitudes which in principle are observable.” What Heisenberg offered was certainly an Umdeutung, a re-interpretation or re-casting of relations; as such, it was a re-assigning of meanings, but it was by no means yet a meaning-fixing establishment of the entirety of the new quantum mechanics; that would come with Born’s contributions.

Heisenberg’s paper was a “quantum theoretical re-interpretation of kinematic and mechanical relations” [quantentheoretische Umdeutung kinematischer und mechanischer Beziehungen].

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Beziehungen]. And the difference between kinematics and the broader mechanics was an important aspect. Kinematics is simpler than dynamics, which is more general. “Kinematics, it may be said, is the geometry of motion.”\textsuperscript{1125} It deals with change in position over time, but not with mass and force, the addition of which brings us into the realm of mechanics. By 1925 physicists had, in their attempts to describe the mechanics of the subatomic realm, largely abandoned strictly kinematic descriptions. In fact, the idea that one could accurately describe the motions of entities within the atom seemed to directly conflict the trend toward abandoning models and certainly Heisenberg’s focus on observables; that is, one could not observe electrons orbiting around inside atoms and therefore to attempt kinematic description of these motions seems to be a futile idea. And yet, there had to exist some analogous relationship because, as Heisenberg put it: “All effects in quantum theory must, of course, have an analogy in classical theory, since the classical theory is almost correct…”\textsuperscript{1126} Hence the need for translation. As Heisenberg had already put it in 1924: “hence [physical] effects always have two names, a classical and a quantum-theoretical one…”\textsuperscript{1127} Heisenberg therefore turned to the equations of motion (the basic form of which is: $\ddot{q} + f(q) = 0$ where $\ddot{q}$ is the acceleration and $f(q)$ is potential, the values can then be determined by an integral Fourier series) and attempted to translate them into quantum mechanical terms. His new “kinematics” replaced the


\textsuperscript{1126} Mehra & Rechenberg. \textit{The Historical Development of Quantum Theory}. P. 154. Emphasis in original.

\textsuperscript{1127} Ibid.
motions of bodies with “atomic frequencies and the transition amplitudes, which, taken
together, represented the ‘motion’ of the ‘new kinematics.’”

To describe the motion of a body you need to know some things. Motion is a
change of position that occurs through time, so you need time values and you need
position values. Position may be described by a set of coordinates. A simple system for
doing this is that of Cartesian Coordinates \((x,y,z)\). In the simplest form described
kinematically, motion occurs where two sets of values of coordinates differ through of
period of time, where change in these coordinates, \(\Delta(x,y,z)\), happens in a stretch of time
(from \(t\) to \(t_2\)). If the motion occurs at a uniform rate, then the change in Cartesian values,
\(\Delta(x,y,z)\), per unit time is a simple, direct relation. If the rate of change of \(\Delta(x,y,z)\) varies
through \(\Delta t\) the situation becomes more complicated. If we take energy values for the
moving body into account (both kinetic and potential) then the situation becomes more
complicated still. And we can further complicate the issue by taking various forces acting
within a mechanical system into account besides a single moving body in free space
(other bodies, magnetic effects, and so on). Classical physics had worked out the
mathematical tools for describing complex motions based on the observation of macro
bodies and had constructed a sophisticated, deterministic mechanics.

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1128 Darrigol, Olivier. From c-Numbers to q-Numbers: The Classical Analogy in the
“Heisenberg takes the square table of characteristic amplitudes to represent quantum-
theoretical motion, that is, the object of a ‘new kinematics.’” Ibid. P. 272. Darrigol’s
chapter on matrix mechanics offers a good overview of Heisenberg’s “translation” of
classical kinematics. See Ibid. pp. 260-84. Hendry points out that Pauli had been
recommending a new re-interpretation of kinematics to Bohr and Heisenberg before the
latter began his project, but it was Heisenberg who successfully carried the project out.
In the description of atomic phenomena, physics had, up to this point, been able to get results by using classical mechanics that was modified by quantum conditions. Heisenberg took the partial success of this situation as a clue and attempted to find a quantum-theoretical analogue of the classical equations of motion instead of using classical equations to describe presumed motions, and then imposing quantum conditions. The classical equations of motion describe the motion of bodies in a physical system using position and momentum values as their data. But Physicists did not actually have access to this data in the subatomic realm; they could not actually observe electrons orbiting the nucleus and record their position and momentum through direct observation. They speculated that certain motions were the cause of certain macro-phenomena that they did observe (spectra, magnetic effects, cloud-chamber tracks, and so on). Heisenberg re-interpreted the equations of motion in terms of these actual observables, rather than speculated but unobserved motions. Again, it was the fact that, with quantum-modifications, the classical equations had given workable and promising results that gave him confidence.

Figures 12 and 13 describe the crucial relations involved in Heisenberg’s re-interpretations:
Heisenberg had to determine the aspects of the macro-phenomena that could be “plugged into” the equations so that these equations described the observable phenomena rather than the types of motion for which they had been designed to account. One would then have the beginnings of a new quantum mechanics, which would include the quantum conditions from the beginning and would have greater hope of internal consistency.
Heisenberg was attempting to find a ground upon which the new quantum mechanics could be built. The “old” quantum theory lacked such a solid foundation. As he put it:

It is well known that the formal rules that in quantum theory are generally used for calculation of observable quantities (e.g. the energy of the hydrogen atom) can be seriously objected to on the grounds that they contain, as a basic element, relationships between quantities that are apparently unobservable in principle (such as, for example, position and period of revolution of the electron), thus these rules seem to lack a clear physical foundation, unless one still wants to retain the hope that the hitherto unobservable quantities might later become experimentally accessible. This hope could be regarded as justified if the above rules were consistent and applicable to a clearly defined area bounded by quantum-theoretical problems in itself.¹¹²⁹

Experiments had, of course, shown that this was not the case. The rules were neither consistent, nor were they applicable to the whole range of atomic phenomena (even the helium atom resisted their effects).

Heisenberg explains and justifies his approach to re-interpretation as a way to provide a new, solid foundation thus:

It has become common, to characterise this failure of the quantum-theoretical rules, as a deviation [or “turning away from” *Anwendung*] from classical mechanics [the translation in *Sources* adds: “since the rules themselves were

essentially derived from classical mechanics”). This description can, however, scarcely be seen as approaching the essential meaning [of the situation], if one considers that even the Einstein-Bohr frequency condition already represents such a complete rejection of classical mechanics, or, better, from the standpoint of the wave theory, of the kinematics on which this mechanics is based, that even in the simplest quantum-theoretical problems the validity of classical mechanics absolutely cannot be imagined [or “thought to apply”]. In these circumstances, it seems more advisable to give up all hope of observing hitherto unobservable quantities (such as the position and period of the electron) and to admit that the partial agreement of the said quantum rules agrees with experience more or less accidentally, and to try to form an analogue between classical mechanics and quantum-theoretical mechanics, in which only relations between observable quantities occur.\textsuperscript{1130}

Heisenberg attempted to construct a theoretical quantum mechanics analogously to classical mechanics, starting with its ground in kinematics. As Van der Waerden puts it, “In Heisenberg’s paper, every formula of quantum mechanics is motivated by a corresponding classical formula.”\textsuperscript{1131} This is an act of translation down on a fundamental level.

This problem was one of translation, but how to go about this translation? One had to proceed analogously, and one had to start with basic elements. Heisenberg looked

\textsuperscript{1130} Ibid. pp. 382-3, emphasis mine.
\textsuperscript{1131} Van der Waerden. \textit{Sources}, p. 28.
at the way variables may be arranged in series\textsuperscript{1132} related to time in the classical equation of motion and asked, how might quantum variables be thus arranged? As he put it:

We can put the question in its simplest forum thusly: If, instead of the classical variable $x(t)$, we have a quantum-theoretical variable, which quantum-theoretical variable then takes the place of $x(t)^2$? [i.e. the next term in the Fourier series]\textsuperscript{1133}

We cannot place the electron (for instance) in space, but we can ascribe to it the emission of radiation. Heisenberg then looked to basic structural movements and looked at the emission of radiation as differences in the series of variables, again, analogously to differences in the series of variables for position (for instance) in the classical equation of motion.

The crucial moment was Heisenberg finding his translation key, and this came from focusing on the simple structural relations in a power series. Again, as he puts it:

Similarly, all variables in the form $x(t)^n$ can be represented in quantum theory, and when any function $f[x(t)]$ is given, so whenever this is developable as a power series of $x$, we can find the corresponding quantum-theoretical analogue.\textsuperscript{1134}

We can represent a classical variable as a function of time and develop its subsequent values for further times in a power series. The translation key was discovering the multiplication rules for the new quantum mechanics.\textsuperscript{1135}

\textsuperscript{1132} A Fourier series is a particularly flexible mathematical series that can be used to represent different functions together as a sum of sine waves. It breaks down complex situations into sums of simple oscillators (these sums can be infinite). A power series is a “series whose terms contain ascending positive integral values of a variable.” James & James. \textit{Mathematics Dictionary: Multilingual Edition}. Princeton: D. Van Norstrand Co. Inc. 1968, p. 328.

\textsuperscript{1133} Heisenberg, “\textit{Über quantentheoretische Umdeutung}” p. 384.

\textsuperscript{1134} Ibid. p. 386, emphasis mine.
With this multiplication rule, one could work out the rest. Heisenberg explains the crux of the matter thus:

If one resolves to establish a quantum-theoretical mechanics, which is as similar to classical mechanics as possible, so one must incorporate the classical equation of motion (11) directly into quantum theory, and it is only necessary – in order not to depart from the firm foundation of quantities that are in principle observable – in place of the variable \( \dot{x} \) and \( f(x) \) to put their quantum-theoretical representatives as given in [section] 1 [i.e. where the multiplication rule is introduced].

These are the basic movements of Heisenberg’s development of quantum mechanics in 1925.

If we take the values for a state of a physical system for a given point in time, plugging the values into the classical equation of motion for state \( x \), the next sets of values, following the pattern of a classical Fourier series, are determinable; we can then find the state-values for other values in the series (\( x, x^2, x^3, x^4 \), and so on). What

\[ B(n,n-\beta)e^{i\omega (n,n-\beta)t} = \sum_{-\infty}^{+\infty} \alpha A(n,n-\alpha)A(n-\alpha,n-\beta)e^{i\omega (n,n-\beta)t} \]

Or

\[ \text{Or} = \int_{-\infty}^{+\infty} d\alpha A(n,n-\alpha)A(n-\alpha,n-\beta)e^{i\omega (n,n-\beta)t} \]

Heisenberg described the multiplication rule as coming to him in a feverish flash late at night on the rocky northern island of Helgoland where he had retreated to recuperate from a severe case of hay fever. See Cassidy, *Uncertainty*, pp. 181-203, for a good description. The rule itself is complex and odd, but it was related, as we shall see below, to existing mathematical structures, though this was not at first apparent. Various attempts have been made to reconstruct the reasoning that led Heisenberg to this rule. See Mehra & Rechenberg, *Historical Development*, Vol. 2, Aitchison, MacManus, & Snyder. “Understanding Heisenberg’s ‘magical’ paper of July 1925: a new look at the calculational details.” *American Journal of Physics* 72 (2004), pp. 1370-9.

\[ \text{Ibid. p. 387-8.} \]
Heisenberg discovered was a multiplication rule to get from quantum state $x$, in a Fourier series, to $x^2$, and so on. The multiplication rule was, in effect, a translation key. The mathematical translation key opened up new possibilities, but as a multiplication rule it was a strange bird indeed. It was non-commuting, and this was odd.

Darrigol argues that Heisenberg’s insistence on observable quantities in his paper was at least part rhetoric and that, methodologically, he was still much more influenced by Bohr’s correspondence principle and, indeed, Bohr’s own quantum conditions, which allowed one to only to speak concretely about observables, while unobservables, like orbits, were actually only to be taken as indicative. He argues that “the correspondence principle appears to have played a more crucial role than the principle of observability” in the creation of quantum mechanics. As he puts it:

To summarize in a few words, Heisenberg’s breakthrough resulted from an attempt to symbolically translate classical mechanics into a form expressed in terms of genuine quantum-theoretical concepts that were identified in accordance with the two following criteria: to have a direct relation to Bohr’s quantum postulates, and to lead to a coherent symbolic scheme. The role of the observability principle appears to have been limited to the elimination of alternative strategies… that would have retained more of the visual apparatus of the classical theory. If one still wishes to isolate a single element that contributed more than any other to Heisenberg’s quantum mechanics, the only reasonable candidate is the correspondence principle. The idea of a symbolic translation of classical mechanics finds its roots in the general context of this principle, namely,
the idea that a formal analogy exists between the laws of quantum theory and those of classical theory.\textsuperscript{1137}

Darrigol admits that “Bohr would have preferred a realization of this formal analogy leading to a higher descriptive content, instead of Heisenberg’s and Born’s utterly symbolic procedures.”\textsuperscript{1138} But Bohr was won over by the coherence of the new mechanics and had was prepared to give up much after the failure of the BKS proposal. As Bohr himself put it in a December 1925 note in Nature: “the whole apparatus of the quantum mechanics can be regarded as a precise formulation of the tendencies embodied in the correspondence principle.”\textsuperscript{1139} Heisenberg’s work had opened a door and things now moved rapidly.

The next breakthrough came from Born. Heisenberg had given Born his “crazy paper” and asked that Born read it and, in Born’s words “if I liked it, send it to the Zeitschrift für Physik.” Born approved, sent the paper on for publication, but continued to puzzle over it.

He ‘began to think about it day and night… this multiplication law must have a meaning [he recalled thinking]. Then ‘one morning about 10 July 1925 I suddenly saw light: Heisenberg’s symbolic multiplication was nothing but the matrix calculus, well known to me from my student days.’ Whereupon Born started a

\begin{footnotes}
\item[1137] Darrigol. \textit{From e-Numbers to q-Numbers}. Pp. 275-6. \\
\item[1138] Ibid. p. 276. \\
\item[1139] Heisenberg, Born, and Jordan confirmed this in the so-called “three-man paper,” noting that “the new theory can be regarded as an exact formulation of Bohr’s correspondence considerations…” Ibid. 
\end{footnotes}
collaboration with his student Pascual Jordan in which they transcribed and extended Heisenberg’s result in systematic matrix language.\(^{1140}\)

Born and Jordan’s “On Quantum Mechanics” was published in the next volume of *Zeitschrift für Physik*. As they describe it in their abstract:

The recently published theoretical approach of Heisenberg is here developed into a systematic theory of quantum mechanics… with the aid of mathematical matrix methods. After a brief survey of the latter, the mechanical equations of motion are derived from a variational principle and it is shown that using Heisenberg’s quantum condition, the principle of energy conservation and Bohr’s frequency condition follow from the mechanical equations.\(^{1141}\)

The equations of motion, ultimately derived from Lagrangian variational calculus in its Hamiltonian form, are now combined with matrix calculus to “build up a closed mathematical theory of quantum mechanics which displays strikingly close analogies with classical mechanics, but at the same time preserves the characteristic features of quantum phenomena.”\(^{1142}\) The matrix elements represent “physical quantit[ies] which [are] given in classical theory as a function of time. The mathematical method of treatment inherent in the new quantum mechanics is thereby characterized through the employment of matrix analysis in place of the usual number analysis.”\(^{1143}\) That is, a

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\(^{1140}\) Pais, *Niels Bohr’s Times*, p. 278.


\(^{1142}\) Ibid. p. 278.

\(^{1143}\) Ibid.
matrix represents each time dependent function that forms a component of the canonical Hamiltonian equations.\textsuperscript{1144}

Heisenberg’s paper was a first step, but it was an uncertain one. Even after Born and Jordan’s contributions, opinions were divided. Einstein was not convinced, but Bohr was more optimistic. As Pais puts it:

If the early readers of Heisenberg’s first paper on quantum mechanics had one thing in common with its author it was an inadequate grasp of what was happening. The mathematics was unfamiliar, the physics opaque… Bohr considered the work of Heisenberg to be ‘a step probably of fundamental importance’ but noted that ‘it has not yet been possible to apply [the] theory to questions of atomic structure. [However,] whatever reservations Bohr initially may have had were dispelled by early November when word reached him that Pauli had done for matrix mechanics what he himself had done for the old quantum theory: derive the Balmer formula for the discrete spectrum of hydrogen.\textsuperscript{1145}


\textsuperscript{1145} Pais, Inward Bound, p. 255.
With the Balmer formula derived and with the further elaboration of quantum mechanics in the so-called “three-man paper” of Heisenberg, Born, and Jordan\textsuperscript{1146} subatomic physics finally had its own mechanics.

Bohr was enthusiastic; writing to Rutherford in late January of 1926 he called Heisenberg “a young German of gifts and achievement.” He saw the new developments out of Göttingen as the beginning of a new post-crisis era. As he put it, because of Heisenberg’s “last work prospects have at one stroke been realized which, although only vaguely grasped, have for a long time been the centre of our wishes. We now see the possibility of developing a quantitative theory of atomic structure.”\textsuperscript{1147} In May Heisenberg came to Copenhagen to replace Kramers as Bohr’s assistant.

The new quantum mechanics was vigorously discussed in Copenhagen. One key focus of the debate was on Heisenberg’s observability criterion. Focusing strictly on observables had led to great success, and so he continued to insist that one should not speak of things like electron orbits within the atom. There were however, reasons for thinking of things like moving particles within the atom. What, for instance, if one could not speak of a moving electron, made tracks in a cloud chamber? Pauli, ever critical regardless of which side he was on at any given time, now argued (contrary to his earlier insistence that one should not talk about orbits), sarcastically: “The moon, like the electron, occupies a stationary state. We can all see it following its orbit. So orbits must

\textsuperscript{1146} Born, M, Heisenberg, W, & Jordan, P. “On Quantum Mechanics II.” In Van der Waerden, Sources of Quantum Mechanics. Pp. 321-85. The authors note the equivalence of Dirac’s results as well as further conclusions he provides.

exist under some circumstances. There must be a place for them.” He also backed up his pointed arguments with mathematics. Bohr was apparently delighted with the situation. “How wonderful that we have met with a paradox.” He was said to remark. “Now we have some hope of making progress.”

**Wave Mechanics**

The situation grew increasingly paradoxical as Erwin Schrödinger published his first paper on wave mechanics, an alternative quantum mechanics to Heisenberg, Born, and Jordan’s matrix version, but an alternative that did not require the sophisticated matrix calculus that was unfamiliar to many physicists. Schrödinger’s wave mechanics used familiar mathematics and was, on the surface, more easily understandable than the confusing relations of the matrix formalism. In his first paper on wave mechanics Schrödinger outlined the ideas underlying his approach:

[I wish] to show that the customary quantum conditions can be replaced by another postulate, in which the notion of ‘whole numbers’, merely as such [i.e. quantization of classical equations through the quantum rules], is not introduced. Rather when integralness does appear, it arises in the same natural way as it does in the case of the node numbers of a vibrating string. The new conception is capable of generalisation, and strikes, I believe, very deeply at the true nature of the quantum rules.  

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1148 Ibid. p. 140.

Schrödinger’s approach utilised a version of the standard equation for describing wave motion in order, like Heisenberg’s reinterpretation, to replace the old process of taking classical equations and then applying quantum conditions; like Heisenberg, Born, and Jordan’s version, in Schrödinger’s new quantum mechanics the quantisation occurred naturally, as part of the formalism rather than as an imposition from outside. As Schrödinger put it: “The essential thing seems to me to be, that the postulation of ‘whole numbers’”, that is, quantization in terms of integral units of $\hbar$, “no longer enters into the quantum rules mysteriously, but that we have traced the matter a step further back, and found the ‘integralness’ to have its origin in the finiteness and single-valuedness of a certain space function.”\footnote{Ibid. p. 9.}

Schrödinger’s approach involved a central wave function $\Psi$, the interpretation of which was not immediately certain. However, he “strongly suggested that we should try to connect the function $\Psi$ with some vibration process in the atom, which would more nearly approach reality than the electronic orbits, the real existence of which is being very much questioned today.”\footnote{Ibid.} He had been inspired\footnote{See, for instance, “Quantisation and Proper Values II,” Collected Papers, pp. 13-40, p. 20-1.} by the work of Louis de Broglie, who had, on the basis of the idea that light sometimes seemed to display wave-like and sometimes particle-like characteristics, proposed the idea of matter waves that would be to the particles of subatomic matter what light waves were to photons, or energy quanta. Schrödinger came to the conclusion that, just as the ray-theory of light worked to describe many optical phenomena, but when it came to issues such as diffraction, the wave-theory
was necessary, so too the particle as opposed to the wave-theory of matter was accurate, within a certain range, but beyond that range, the wave theory was necessary. For Schrödinger, classical mechanics was merely approximate, as was, analogously, ray-based optics. As he put it:

The true mechanical process is realised or represented in a fitting way by the wave process in $q$-space, and not by the motion of image points in this space. The study of motion of image points, which is the object of classical mechanics, is only an approximate treatment, and has, as such, just as much justification as geometrical or ‘ray’ optics has, compared with the true optical process… We have seen that the same laws of motion hold exactly for such a signal or group of waves as are advanced by classical mechanics for the motion of the image point. This manner of treatment, however, loses all meaning where the structure of the path is no longer very large compared with the wave length or indeed is comparable with it. Then we must treat the matter strictly on the wave theory, i.e. we must proceed from the wave equation and not from the fundamental equations of mechanics, in order to form a picture of the manifold of the possible processes. These latter equations are just as useless for the elucidation of the micro-structure of mechanical processes as geometrical optics is for explaining the phenomena of diffraction.\footnote{Ibid. p. 25, For Schrödinger, having meaning here, equates with applicability to phenomena. That is, a theory is a system of descriptive signifiers that, when they fit together in the right way, accurately give a “picture” of the phenomena; if the descriptive system achieves this it is meaningful; if not, it is meaningless.}
Though the majority of physicists adopted Schrödinger’s more manageable mathematics as opposed to those of Heisenberg-Born-Jordan and Dirac, his particular physical interpretations (particularly of the meaning of the wave function $\Psi$) were less widely accepted.\textsuperscript{1154} The situation became more complicated still, when Schrödinger and others discovered that wave mechanics and matrix mechanics were, in fact, mathematically equivalent and reducible to each other.\textsuperscript{1155} Bohr was very interested, and in 1926 he invited Schrödinger to Copenhagen to lecture to the Danish Physical Society and to converse with Bohr and the students at his institute.

The tale of Schrödinger’s visit has become legendary and is reproduced in nearly every account of the history of quantum mechanics. The legend is that Bohr so pestered and perturbed Schrödinger with his unrelenting debates over the interpretation of the new quantum mechanics (which could now be taken to include both matrix and wave mechanics as mathematically identical theories) that Schrödinger fell ill and became bedridden, while Bohr continued his interrogations from the bedside.\textsuperscript{1156} It has become an emblematic story about the unrelenting nature of Bohr’s critical mind as well as the force

\textsuperscript{1154} Heisenberg, as may be expected, was not impressed. As he put it in a letter to Pauli: “The more I ponder about the physical part of Schrödinger’s theory, the more horrible I find it… What Schrödinger writes on the visualizability of his theory… I find rubbish.” In Mehra & Rechenberg. \textit{Historical Development of Quantum Theory}. Vol. 5, Part 2, p. 821.


\textsuperscript{1156} For a good summary of the discussions based on several accounts (all of which are, themselves, based on later recollections, as no contemporary accounts or even notes are known to exist) see Mehra & Rechenberg \textit{Historical Development} Vol. 5, Part 2, pp. 822-5.
of his personality. In this first visit between the two men Bohr left a deep impression on Schrödinger. As the latter remarked in a letter to Wilhelm Wein shortly after his visit:

There will hardly come in the near future another man who scores such immense external and inner successes, to whom one pays homage, in his sphere of activity, nearly as to a demigod in the entire world, and who remains at the same time – I don’t say modest and free from presumption – really bashful and shy like a candidate of theology.¹¹⁵⁷

In the same letter Schrödinger also briefly outlined the prevailing view in Copenhagen of the current state of atomic theory. While Schrödinger, de Broglie, and others now believed that a wave-picture should replace the old particle-picture of the interior of the atom, Bohr, Heisenberg, and the other Copenhagen-aligned physicists had come to believe that neither the particle, nor the wave picture would do. In fact, they had come to the conclusion that one had to abandon the hope of visualisable pictures of the interior of the atom at all. In his letter Schrödinger stated his opposition to Bohr’s certainty that “the visualizable wave pictures work as little as the visualizable point[-particle] models, there being something in the results of observation which cannot be grasped by our erstwhile way of thinking…”¹¹⁵⁸ Indeed, in various of the latter accounts of the Copenhagen debates between Bohr and Schrödinger the former often pointed to the results of experiments (“sudden flashes of light on a scintillation screen or the sudden rush of an

¹¹⁵⁷ Ibid. p. 825.
¹¹⁵⁸ Ibid.
electron through a cloud chamber” for instance\textsuperscript{1159}. Schrödinger’s response was that the sort of issues that Bohr brought up were ones that he would “prefer to leave to the philosophers.”\textsuperscript{1160} As the mathematics were further and further refined the question of interpretation became the next great hurdle and increasingly contentious.

In June of 1926 Born published his probability interpretation. Born had been crucial in the development of matrix mechanics and was deeply impressed with the greater mathematical simplicity of wave mechanics and the fundamental identity of the two versions of the quantum mechanics. His presentation focused on collision events \textsuperscript{(Stoßvorgänge)}, and he interpreted Schrödinger’s wave function (\(\Psi\)) as a probability function. The wave equation, he argued, gave probabilities for the electron’s location, rather than density of electrical charge, or a certain “weight function” as Schrödinger proposed at one point.\textsuperscript{1161} Born proposed giving up the notion of strict causality in favour of a statistical probabilistic picture of micro processes. In collision processes:

Schrödinger’s quantum mechanics thus gives a complete answer to the question as to the effect of a collision, but there is no question of a causal relationship. One cannot answer the question ‘what is the state after the collision’ but only the question ‘what is the probability of a given effect of the collision”… Here the whole problem of determinism presents itself. From the standpoint of our quantum mechanics there is no quantity that remains causal in the case of an

\textsuperscript{1159} Ibid. p. 824. The quote is from a statement attributed to Bohr retrospectively by Heisenberg in 1971.

\textsuperscript{1160} Ibid. P. 823, from the same recollected conversation.

\textsuperscript{1161} Schrödinger, “Quantisation and Proper Values IV.” \textit{Collected Papers}, pp. 102-123. p. 120.
individual collision effect… My… inclination is that determinism is abandoned in
the atomic world. But that is a philosophical question, for the physical arguments
are not conclusive.¹¹⁶²

On Born’s view one could, if one wished, take a different philosophical position and
argue that determinism perhaps did obtain and that it would be found by some further
developments, but he did not think this outcome was likely. Hendry argues that Born was
largely won over by the completeness of the mathematics and that, though the situation
could not be physically pictured, nevertheless as Born put it: “the theory is complete,”
due to “the completeness of the logical foundations of quantum mechanics.”¹¹⁶³

The probability interpretation, not universally accepted, but popular, particularly
in Copenhagen, still left many questions unanswered. It offered no explanation as to why
subatomic phenomena seemed to require a probabilistic description, nor did it give any
answers as to the more basic question of the universal applicability of determinism. In a
probabilistic approach the “meanings” of data values became contingent and uncertain.
Continuity and discontinuity still seemed to play roles, with no firm decision toward one
or the other. Were the meanings of the values within matrix and wave mechanics
ultimately purely relational and ungrounded? Was physics becoming untethered as
Schrödinger, Einstein, and others feared? Further developments would answer these
questions for some, though for others, Einstein in particular, the answers arrived at

¹¹⁶² Hendry. The Creation of Quantum Mechanics. P. 89.
¹¹⁶³ As Hendry puts it: “Born’s insistence upon acausality, resting as it did on the non-
existence and non-observability of further microscopic coordinates, was equivalent to his
insistence that his theory was final, and the above remarks tie in this insistence with that
of the superiority of a mathematical to a physical approach…” Ibid. p. 92.
remained ultimately unacceptable. But here we are getting ahead of ourselves. So let us return to Copenhagen in 1926 and the search for a full interpretation that would provide meaning and answer these and other fundamental questions.

Uncertainty

With Heisenberg at Copenhagen working as Bohr’s assistant and closest collaborator the two set out to find the much needed (and contested) interpretation. But Heisenberg and Bohr set out towards this common goal on different tracks. Heisenberg, the creator of the matrix version of quantum mechanics, was defensive when it came to the wave theory; he used it as a convenient mathematical tool, but argued for the priority of the matrix formulation, which, he argued, more accurately captured the physical situation. Heisenberg therefore focused his efforts on the matrix version, utilising the wave version only as a convenient tool for calculation. He “began to search specifically for a physical interpretation of” what he saw as a “mathematically completed theory.”

1164 Heisenberg and others argued that the shortcomings of Schrödinger’s theory (that is, particularly his interpretation of what his wave equation meant) were primarily that it failed to adequately explain experimental phenomena (from cloud chamber tracks to the photoelectric effect, and even blackbody radiation, as Heisenberg did not fail to point out). Heisenberg was particularly offended by Schrödinger’s rather aggressive comments about the matrix formulation in print where he dismissively referred to matrix mechanics as “transcendental algebra” and spoke about how he had been “repelled” by it. Schrödinger, “Matrix Mechanics and Wave Mechanics.” Collected Papers, p. 46. Heisenberg even went so far as to avoid using the wave method in situations where it would seem to be more appropriate. As Mehra and Rechenberg put it: he “took a very strong stand, for he felt that the very foundation of his work was at stake.” His “message in the second half of 1926 was clear: wave mechanics may serve as a powerful slave, as a practical instrument for calculating the details of atomic problems, but for the discussion of physical principles it had to be excluded.” Mehra and Rechenberg. Historical Development of Quantum Theory. Vol. 6, Part 1, p. 129.

1165 Ibid. p. 94.
Bohr’s approach was different. Mehra and Rechenberg characterise it as a “systematically odd pattern, for he took during the period under consideration what appeared – to both outsiders and insiders – to be a zigzag course between the principle mathematical schemes and their physical interpretation.”¹¹⁶⁶ Heisenberg tells the story as follows:

During the next few months [November 1926 to February 1927] the physical interpretation of quantum mechanics was the central theme of all conversations between Bohr and myself… Bohr would often come into my attic [room at the institute] late at night, and we constructed all sorts of imaginary experiments to see whether we had really grasped the theory. In so doing, we discovered that the two of us were trying to resolve the difficulties in rather different ways. Bohr was trying to allow for the simultaneous existence of both particle and wave concepts, holding that, though the two were mutually exclusive, both together were needed for a complete picture of atomic processes. I disliked this approach. I wanted to start from the fact that quantum mechanics [and here he means specifically matrix mechanics] as we then knew it already imposed a unique physical interpretation of some magnitudes occurring in it – for instance, the time averages of energy, momentum, fluctuations, etc. – so that it looked very much as if we no longer had any freedom with respect to that interpretation. Instead, we would have to try to

¹¹⁶⁶ Ibid. p. 91.
derive the correct general interpretation by strict logic from the ready-to-hand, more special interpretation.\footnote{Heisenberg, Werner. \textit{Physics and Beyond: Encounters and Conversations}. New York: Harper Torchbooks, 1971, p. 76. We can see Heisenberg’s impulse here as basically Aristotelian; that is, he believed that the matrix formalism had established most of the basic principles of the science (discrete energy states, “jumps” between these states, discontinuity, probability, and the focus on observables) and he believed that the rest of the principles (whatever remained to allow for a complete and coherent interpretation, the unknown $X$) could be logically inferred from these principles and their fundamental relations. As he put it in another retrospective account, he “had been so far educated by the Göttingen mathematical school as to assume that, through logical application of the quantum mechanical formalism, conclusions must also be inferable as to the remainder of the old concepts that would survive in the new language.” That is, the intelligible world of the mathematics was complete and coherent, and therefore, on the basis of this and the known relations to known existing physical premises, the rest of the premises could be worked out. Heisenberg, Werner. “The Beginnings of Quantum Mechanics in Göttingen.” \textit{Encounters with Einstein: And Other Essays on People, Places, and Particles}. New Jersey: Princeton University Press, 1983. P. 53.}

It seems from Heisenberg’s account, and from those of others at the institute at the time, that there was a great deal of serious debate between the two, but also a good deal of talking past one another. Their “talks often continued till long after midnight, and did not produce a satisfactory conclusion despite protracted efforts over several months…” In the end both of them “became utterly exhausted and rather tense. Hence Bohr decided in February 1927 to go skiing in Norway,” and Heisenberg “was quite glad to be left behind” where he “could think about these hopelessly complicated problems undisturbed.”\footnote{Heisenberg, Physics and Beyond. p. 77.}

It was during this period of solitude after an intense and protracted period of strenuous debate that both Heisenberg and Bohr came up with their respective interpretations. When Bohr arrived back from his long (about a month) skiing holiday in Norway with his interpretation Heisenberg had his own waiting for him.
Heisenberg later recalled that, after Bohr left, he “concentrated all [his] efforts on the electron path in the cloud chamber” following up on suggestions by Pauli, with whom he corresponded throughout this period. Pauli acted as the great critic of the Copenhagen physicists at this time; he was a sounding board and he relentlessly exposed flaws in theories. The Heisenberg-Pauli correspondence in this period is invaluable for understanding the genesis of Heisenberg’s ideas, but in this discussion of Bohr we will have to pass over it. What is important for our story is the turn that Heisenberg’s thinking took after Bohr left. Again, in his own words: “I began to wonder whether we might not have been asking the wrong sort of question all along.” But exactly where they had “gone wrong” was still a puzzle to him. The track left by the electron in the cloud chamber “obviously existed: one could easily observe it.” And the “mathematical framework of [matrix] quantum mechanics existed as well, and was much too convincing to allow for any changes. Hence it ought to be possible to establish a connection between the two, hard though it appeared to be.”

In his various retrospective accounts Heisenberg points to a moment where he remembered a conversation with Einstein as the turning point. According to Heisenberg this conversion was about his then new matrix mechanics. Einstein had asked him whether he really believed that one could construct a theory based solely on observables and Heisenberg responded that this was, he believed, what Einstein himself had done with special relativity. In some versions of the recollection Einstein replies that he did

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believe that once, but now has changed his mind, in others he pithily replies that “a good trick should not be tried twice.”\footnote{Cassidy. \textit{Uncertainty}. P. 239.} In any case, the key remark came when Heisenberg tried to argue that the observables should determine the theory, and Einstein replied that, on the contrary: “It is the theory which decides what we can observe.” Heisenberg claims that, on recalling this argument of Einstein’s, he “was immediately convinced that the key to the gate that had been closed for so long must be sought right here.”\footnote{Heisenberg. \textit{Physics and Beyond}. P. 77.} Heisenberg and his fellow physicists “had always said so glibly that the path of the electron in the cloud chamber could be observed. But perhaps what [they] really observed was something much less.”\footnote{Ibid. p. 78.}

In a cloud chamber, a sealed vessel of super-saturated air, an electron produces condensation by ionisation. A precisely triggered camera photographs the tracks left by electrons as they pass through the chamber, leaving ephemeral trails of condensation that dissipate. The chamber thus makes visible the trajectory of individual electrons. Or does it? This was the question Heisenberg pondered. In actual fact, the answer is: no. The visible tracks in the cloud chamber photograph are in fact composed of a series of tiny (though much larger than the electron itself) water droplets; that is, what appears to be a continuous track, is in actual fact, \textit{discontinuous}. As Heisenberg put it: “In fact, all we do see in the cloud chamber are individual water droplets which must be much larger than the electron.” Here we are confronted again with Einstein’s antinomy of continuity and discontinuity; we are confronted with the room and the strobe light again. In simple

\footnote{1171} \footnote{1172} \footnote{1173}
terms, what the cloud chamber showed was the result of a series of individual moments where one could say that the electron was *approximately* at $\Delta X,Y,Z$ locations. Heisenberg then asked himself if one could quantify this approximation; this is the source of his uncertainty relations: “the product of the uncertainties in the measured values of the position and momentum… cannot be smaller than Planck’s constant.”

Heisenberg’s uncertainty paper, which was completed and waiting for Bohr on his return in mid March (it had already been looked over by Pauli and sent to the *Zeitschrift für Physik*) made philosophical and epistemological claims, established the quantitative uncertainty relations, and provided concrete examples where they were shown to obtain in actual physical situations. But the key structural feature of the paper is an examination of definition, that is, of *meaning determination*.

The title of Heisenberg’s paper is *Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik*, (On the Visualisable Content of Quantum-theoretical Kinematics and Mechanics) [or, On the Visualisable *Meaning of*]

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1174 Ibid.
1175 Heisenberg’s abstract lays out the basic features of this groundbreaking interpretation thus: “In the following work first, exact definitions are given for the words: position, velocity, energy, etc. (e.g. of the electron), so that they are also valid [or “so that they also hold”] in quantum mechanics, and then we show that canonically conjugate variables can be simultaneously determined only with a characteristic inaccuracy [often translated as “uncertainty”, but it also means “vagueness” or “haziness” *Ungenauigkeit*]. 1. This inaccuracy is the real ground for the appearance of statistical relations in quantum mechanics. Their mathematical formulation is made possible by the Dirac-Jordan theory. 2. Beginning from the basic principles [*Grundsätzen*] thus won, we shall show how the macroscopic processes can be understood from the standpoint of quantum mechanics. 3. Then, for the further clarification of the theory, several imaginary experiments are discussed. ” Heisenberg, Werner. “Über den anschaulichen Inhalt der quantentheoretischen Kinematik und Mechanik.” Gesammelte Werke Series A1, pp. 478-504. I will use the pagination from the original article in *Zeitschrift für Physik* 43 (pp. 172-98), as it appears in the Gesammelte Werke and elsewhere. P. 172 Translations mine.
Quantum-theoretical Kinematics and Mechanics]). The title has been translated in a number of ways. The key word in the title is “anschaulichen,” which is perhaps best translated as “visualisable.” But we must be careful here, because anschaulich also means “descriptive, graphic, expressive, plastic,” and even “vivid.” And an anschauung, in addition to being a “view” can also mean an idea, or a notion, a concept or conception, or, particularly in philosophical and religious senses, an intuition. Thus, one way to translate the title would be to say that the paper is “On the Intuitive Meaning of Quantum-theoretical Kinematics and Mechanics.” I spend so much time on this point because it is precisely the concept of anschaulichkeit that Heisenberg re-defines for his own purposes. Schrödinger had previously criticised the Heisenberg-Born-Jordan version of quantum mechanics for being unanschaulich, for being unvisualisable, and hence, “essentially irrational.” Heisenberg’s title should be seen as a direct response to this criticism.

Cassidy captures the essence of the paper perfectly in his account. He points out that Heisenberg responds to Schrödinger’s criticism by redefining the word anschaulich “to refer to the physical or experimentally meaningful, rather than Schrödinger’s supposed preference for the merely visualizable or pictorial.” He gives Heisenberg’s new definition of anschaulich as “perceptual,” which is a good rendition. “Intuitive” however makes sense in some of the cases where Heisenberg is speaking epistemologically; in these cases “perceptual” draws attention toward ideas about sensory perception away from the way in which we grasp a theory when we understand it, which

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1176 A translation done by NASA in the early 1980s renders the title as: “The Actual Content of Quantum Theoretical Kinematics and Mechanics,” which is a poor translation that gives precisely the wrong idea about Heisenberg’s argument (see below).

is what Heisenberg means in these cases. The German word is able to convey both meanings, depending on the context, in a way that, unfortunately, a single English term cannot.  

Heisenberg presents what he calls an “intuitive understanding” of quantum theory. He says that “We believe we understand a physical theory intuitively, if in all simple cases we can imagine the experimental consequences of the theory, and if we simultaneously realise that the utilisation of the theory never leads to inner contradictions.” He uses the theory of Relativity as an example of a successful theory in this sense. Quantum mechanics, as it stands, he argues, is still riddled with internal contradictions, particularly “made evident in the battle of opinions on discontinuous and continuous theories, corpuscles and waves.” These contradictions suggest that an interpretation in terms of classical kinematic and mechanical concepts will not be possible (recall that with matrix mechanics Heisenberg had proposed a reinterpretation of such classical concepts and that Schrödinger had, in direct contrast, proposed a return to classical concepts in terms of a continuous wave interpretation). Heisenberg takes his act of translation as a certain starting point and ground. His matrix mechanics “directly derives from the attempt to break from certain known kinematic concepts and in their

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1178 Mehra and Rechenberg use “intuitive” so we are not alone in our choice. See Mehra and Rechenberg. Historical Development Vol. 6, Part 1, p. 157. Our suggested use of “meaning” for *Inhalt* has less precedence, but it is one of the meanings of the word, and, in this case, the “content” that Heisenberg points to is precisely the semantic content of the terms involved, hence “meaning.”


1180 Ibid.
place to set a relation with concrete *experimentally* derived values.”¹¹⁸¹ He argues that this was a success and that the theory is mathematically complete and that the mathematical schema “will not require revision.”¹¹⁸²

Matrix mechanics had worked out new relations between the terms, but the vital question that remained was: What did these terms mean? What did they signify? To which physical phenomena did they point? The abstractions upon which their mathematical expression was based were once derived from physical phenomena or relational aspects thereof. But, in the case of quantum mechanics, these abstractions had been applied *analogously* to a new domain of phenomena. They displayed a remarkable degree of relational coherence, but it seemed unlikely, based on the developments we have followed here, that they could be assigned to the same kinds of phenomena (not observable) within the atom. The same basic question applied to Schrödinger’s wave function \( \Psi \): What did it mean?

In his uncertainty paper, Heisenberg defines terms. And the central issue is whether and when terms *have meaning* or *are meaningless*, and to what degree. In classical physics, “When a mass, \( m \), is given, it has, in our usual view [“picture,” “sense” *Anschauung*], a simply understandable meaning; with the position and velocity of the centre of gravity of that mass we can speak [meaningfully] about this mass.”¹¹⁸³ I.e., these terms *have meaning*. However, in quantum mechanics, a different relation obtains: \( pq - qp = \frac{\hbar}{2\pi i} \). Because of this relation, in very small spaces and times

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¹¹⁸¹ Ibid. Emphasis mine.
¹¹⁸² Ibid.
¹¹⁸³ Ibid. p. 173.
“discontinuities are somehow typical, therefore the failure of just these concepts of ‘position’ and ‘velocity’ becomes immediately plausible…”\textsuperscript{1184} We should note that Heisenberg specifically points to the \textit{words}, which he puts between quotation marks. He is pointing to the semantic content of terms, rather than their (established, in the case of both classical, and now in its matrix formation, quantum physics) mathematical relations. He uses a graphic example to illustrate his point about the discontinuities that we merely assume to be components of an unobserved, but obtaining continuity. He then moves on to definitions of terms.

It is in his definitions that Heisenberg’s Einsteinian reflection takes centre stage, for it is the experiments that, in fact, determine meaning. In Heideggerian terms we might say that Heisenberg is calling attention to the \textit{situation}, to what we might call, in our own terms, \textit{the phenomenal context of meaning differentiation}. As Heisenberg puts it:

\begin{quote}
When one wants to understand clearly what is meant by the term ‘position of the object,’ e.g., an electron, (relative to a given reference system), then one must think of the definite experiments by aid of which one intends to determine the ‘position of the electron’; otherwise the word has no meaning. Of such experiments, which, in principle, determine the ‘position of the electron’ to any desired accuracy, there is no lack.\textsuperscript{1185}
\end{quote}

However, these very experiments, by which we may determine values for our various terms seem to have a peculiar feature: “In the moment in which the position of the electron is known, precisely then the impulse can not be known with any great

\textsuperscript{1184} Ibid.
\textsuperscript{1185} Ibid. p. 174.
The more precisely we know the one the less precisely can we know the other. The degree of indeterminacy Heisenberg discovers to be $p_1q_1 \sim h$ (Heisenberg’s equation (1)).

Heisenberg insists that this uncertainty exists in principle, and this is perfectly true based on his conception of quantum mechanics as matrix mechanics, based on observable quantities; the uncertainty is resultant upon the observation principle, which is fundamental in the conception of matrix mechanics. He sums up and generalises his findings thus:

All concepts, which we use in the classical theory to describe a mechanical system can also be employed for atomic processes in analogy with the classical concepts. But the experiments, which serve for such definitions carry an empirical uncertainty if we demand the simultaneous determination of two canonically conjugated variables from them. The degree of uncertainty is given by equation (1), widened to include any canonically conjugate variables.

He again compares this conception with relativity and its concomitant reinterpretation of the notion of simultaneity.

Heisenberg concludes by arguing – as Born had earlier – that the findings of quantum mechanics force us to abandon the strict formulation of the law of causality. As

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1186 Ibid. p. 175. Heisenberg’s example uses a thought experiment whereby a Γ-ray microscope is used to “illuminate” an electron, but when the Γ-ray strikes the electron revealing its position, because of the interaction, we may no longer be precisely sure of its momentum.

1187 See pp. p175 & 179-80. Or, in the modern form for position and velocity: $\Delta p \Delta q \geq h/2\pi$ (and for energy and time: $\Delta E \Delta t \geq h/2\pi$). That is, the product of the uncertainties in the measurements of each variable must be equal to or greater than $h/2\pi$.

1188 Ibid. p. 179. Bold in original.
Heisenberg pithily characterises it: “If we know the present precisely, we can calculate the future.”\textsuperscript{1189} In relation to this strict conception of causality he argues:

It is not the conclusion, but the premise that is false. In principle, we cannot know the present in all of its parameters. Therefore, all perception is a selection out of a totality of possibilities and a limitation of what is possible in the future. Since the statistical character of quantum theory is tied so closely to the uncertainty in all perceptions, one could be tempted to conclude that behind the observed, statistical world some sort of ‘real’ world is hidden, in which causality obtains. But such speculation, we want to stress, we see as being both fruitless and meaningless. The sole task of physics is to formally describe the relations between observations. Much more, one can characterise the true situation better thus:

Because all experiments are subject to the laws of quantum mechanics and hence to equation (1), so it must be that, through quantum mechanics, the invalidity of causality is definitely established.\textsuperscript{1190}

Heisenberg’s formation, groundbreaking as it was, did not satisfy Bohr on his return from Norway, and a fresh round of strenuous debates began. Bohr wanted Heisenberg to withdraw his paper from publication and make fundamental changes; Heisenberg, obviously, did not want to do so. In the end Bohr convinced Heisenberg that his own ideas, formulated during his month long solo ski trip in Norway, were more fundamental and lay beneath and encompassed Heisenberg’s views. And the two compromised on the article: it would go to press, but it would contain an addendum referencing Bohr’s new

\textsuperscript{1189} Ibid. p. 197.
\textsuperscript{1190} Ibid.
ideas and indicating real flaws in some of Heisenberg’s arguments that Bohr had pointed out. It is to these ideas of Bohr’s that we now turn.

**Bohr’s Concept of Complementarity**

In the months that followed his return from Norway and his subsequent discussions with Heisenberg, Bohr worked on drafts of a planned article for *Nature* and a paper that he was to present at a centenary celebration of Alessandro Volta at Lake Como in September of 1927. We have several draft versions of what was to be Bohr’s first statement of his new interpretation, but I will focus here on the *Nature* article as it finally appeared in April of 1928, as it essentially contains the 1927 lecture at Lake Como but also expands upon it and refines the account. Contrary to those who assert that Bohr’s writing was unclear and hard to follow (which it often was), I would stress the precision and conciseness of this presentation, distilled as it was from a year of discussions, intense thought, and previous attempts. The article is incredibly tight, but it is also comprehensive. I am going to discuss this distillation of Bohr’s first year of attempts to express his interpretation in some depth before moving on to some of his later elaborations, which grant us a deeper understanding of his thoughts on the issue.

Bohr opens the *Nature* article, “The Quantum Postulate and the Recent Development of Atomic Theory” (also the title of the Como lecture),1191 in his characteristically low-key manner:

> In connection with the discussion of the physical methods developed during recent years, I should like to make the following general remarks regarding the

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1191 Titles of draft versions were: “Philosophical Foundations of the Quantum Theory,” and “Fundamental Problems of the Quantum Theory.”
principles underlying the description of atomic phenomena, which I hope may help to harmonise the different views, apparently so divergent, concerning this subject.\textsuperscript{1192}

He then delves into the heart of the matter in his first section on the “Quantum Postulate and Causality.” I quote this at length because it shows us how Bohr saw the situation in quantum physics at that moment and, crucially, where he saw the fundamental problem as lying:

> The quantum theory is characterised by the acknowledgement of a fundamental limitation in the classical physical ideas when applied to atomic phenomena. The situation thus created is of a peculiar nature, since our interpretation of the experimental material rests essentially upon the classical concepts. Notwithstanding the difficulties which hence are involved in the formulation of the quantum theory, it seems, as we shall see, that its essence may be expressed in the so-called quantum postulate, which attributes to any atomic process an essential discontinuity, or rather individuality, completely foreign to the classical theories and symbolised by Planck’s quantum of action. This postulate implies a renunciation as regards the causal space-time coordination of atomic processes. Indeed, our usual description of physical phenomena is based entirely on the idea that the phenomena concerned may be observed without disturbing them appreciably. This appears, for example, clearly in the theory of relativity… Now the quantum postulate implies that any

observation of atomic phenomena will involve an interaction with the agency of observation not to be neglected. Accordingly, an independent reality in the ordinary physical sense can neither be ascribed to the phenomena nor to the agencies of observation. After all, the concept of observation is in so far arbitrary as it depends upon which objects are included in the system to be observed.

Ultimately every observation can of course be reduced to our sense perceptions. The circumstance, however, that in interpreting observations use has always to be made of theoretical notions, entails that for every particular case it is a question of convenience at what point the concept of observation involving the quantum postulate with its inherent ‘irrationality’ is brought in.¹¹⁹³

The “Irrationality” that Bohr speaks of here (in scare-quotes) may cause the reader to see a connection with Heidegger and the world of “irrational” philosophy associated with Germany at this time, but it is a red herring in this case. What Bohr means here is that we have no rational explanation for the discontinuities we find in the subatomic realm. In Aristotelian terms, the quantum postulate (that subatomic phenomena are essentially discontinuous and come in multiples of Planck’s constant \( h \)) is not a fact of the science to be explained by demonstration. Rather, it is a principle; it is a non-explainable first principle of quantum physics. The measurement problem is closely related to this.

We cannot observe an atomic system without disturbing that system to such an extent that the uncertainties that Heisenberg quantified obtain. Mathematical physics is based on measurement. And classical physics could presuppose that this measurement

¹¹⁹³ Ibid.
was unproblematic. In quantum physics, however, the entities that are to be measured are so small that the effects of our measurement render measurement itself complicated and introduce uncertainties. To these two first principles we can add the wave/particle duality expressed (or indicated) by the success of the wave and matrix versions of quantum theory (which Bohr mentions later in the paper).

Though he incorporates a vast range of ideas and experimental and theoretical phenomena, Bohr’s interpretation can be derived from these first principles. “This situation” as Bohr notes “has far-reaching consequences.” If the principles of quantum mechanics differ from those of classical mechanics then it must be a different sort of science, regardless of similarities and correspondences (which we could see as the result of shared axiomata). In the Como address and in this article Bohr gives an outline of this science in its basic structural form. The key notion of this new interpretation is “Complementarity,” which, in Bohr’s view, describes sets of relationships within the science where two mutually exclusive notions are both necessary for a full description of phenomena. The twinned pairs of mutually exclusive concepts do not meet in a middle ground. As mutually exclusive, they may only be applied one at a time (either/or), but in each case, only certain aspects of the phenomena to be described are explained, while others remain unexplainable (with this notion). In order to explain these phenomena (unexplainable by the first notion) we must employ the second, but then, just those phenomena that we were able to explain with the first notion become unexplainable now. Thus both concepts are needed for a complete explanation of the phenomena, but both are still mutually exclusive and cannot be employed at the same time. Quantum physics is
inherently paradoxical because of this. But in paradox lay the deeper understanding that Bohr sought.

On Bohr’s interpretation the wave and particle pictures of light were complementary. One needed the wave picture to explain diffraction but one needed the particle (light quanta) picture to explain the photoelectric effect. Likewise the particle and wave theories of matter were complementary. So too were more basic theoretical notions or components of quantum physics such as continuity and discontinuity, and observation and definition (space-time co-ordination and causality).

After outlining the situation in quantum theory in its basic terms Bohr noted that “this has far-reaching consequences.” What were they? Bohr continued:

On one hand, the definition of the state of a physical system, as ordinarily understood, claims the elimination of all external disturbances. But in that case, according to the quantum postulate, any observation will be impossible, and, above all, the concepts of space and time lose their immediate sense. On the other hand, if in order to make observation possible we permit certain interactions with suitable agencies of measurement, not belonging to the system, an unambiguous definition of the state of the system is naturally no longer possible, and there can be no question of causality in the ordinary sense of the word. The very nature of the quantum theory thus forces us to regard the space-time co-ordination and the claim of causality, the union of which characterises classical theories, as complementary but exclusive features of the description, symbolising the idealisation of observation and definition respectively. Just as the relativity theory
has taught us that the convenience of distinguishing sharply between space and
time rests solely on the smallness of the velocities ordinarily met with compared
to the velocity of light, we learn from the quantum theory that the appropriateness
of our usual causal space-time description depends entirely upon the small value
of the quantum of action as compared to the actions involved in ordinary sense
perceptions. Indeed, in the description of atomic phenomena, the quantum
postulate presents us with the task of developing a ‘complementary’ theory the
consistency of which can be judged only by weighing the possibilities of
definition and observation.\footnote{1194}

Bohr is, in a certain sense re-humanising science here. There is a great deal of
consonance with some of Mach’s ideas, but it is not as deep as one might expect, and
Mach seems not to have been too great an influence on Bohr even here. Mach, in
particular, had stressed the relationship between physics and physiology, pointing out that
our physical notions ultimately depend on sense impressions. This was an idea that would
have been known to and not seemed strange to Bohr, whose father, of course, had been a
physiologist; and, indeed, Bohr’s father is a much more likely source for such notions.\footnote{1195}

Bohr stresses the physicist’s ultimate reliance upon sense impressions, but he is not
particularly interested in sense perceptions \textit{as such}, and certainly not as problematic. He

\footnote{1194} Ibid.
\footnote{1195} Bohr seems to have taken great pride in the fact that, with his ideas, expressed here
and later, he was able to, in some way, carry on the legacy of his father. See Jørgen
Kalckar’s excellent introduction to Volume 6 of Bohr’s \textit{Collected Works}, pp. xvii-xxvi
does not particularly stress the importance of physiology, but the *boundary relation* between subject and object.

Like the early Heidegger’s description of philosophy, Bohr’s interpretation focuses on science as something that people *do*. And he draws attention toward the activities that constitute his science, rather than just the “objective” content. For Bohr, science is *examination* (a human activity) and *attempt at explanation* (a human activity) of physical phenomena. Again, physics is something that we *do*. Bohr draws attention to this; that is, he draws attention to the how of this particular kind of dealing-with a what.

Bohr goes through various parts of quantum physics, highlighting this relation, the principles noted above, and their consequences. He begins with concepts of the nature of light, then matter. He discusses the “Quantum of Action and Kinematics” (his Section 2), Heisenberg’s Uncertainty relations, then moves on to Section 3: “Measurements in the Quantum Theory.” Here the “essence of this consideration is the inevitability of the quantum postulate in the estimation of the possibilities of measurement.” He explains the uncertainty relations in a more fundamental manner than had Heisenberg, by looking beneath the matrix version to more basic problems. As Heisenberg noted, Bohr had initially “probably” seen his uncertainty relations as “too special a case of the general rule of complementarity.” After their discussions the two both saw the merits of the other’s point of view, Bohr realised the value of Heisenberg’s contribution and its compatibility

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with his own view, and Heisenberg became convinced of Bohr’s more fundamental and far-reaching interpretation.\footnote{Heisenberg, \textit{Physics and Beyond}, p. 79.}

In his examination of the relations involved in quantum physics, Bohr came to the problem of the ungrounded ground. In particular, the relation between our sensations and observations led to the problem of the \textit{regressus ad infinitum} that had been such a problem for Heidegger. For Bohr the problem was to be found in measurement. In quantum physics one deals with subatomic micro phenomena, but these are not perceptible by our senses. Instead what we observe are radiation effects, spectra, cloud chamber tracks, and so on. But in the interactions that make up our very measurements themselves, we introduce a relation between a macro object (the measuring apparatus) and micro phenomena.\footnote{“…we see that the uncertainty in question equally affects the description of the agency of measurement and of the object. In fact, this uncertainty cannot be avoided in a description of the behaviour of individuals [that is, individual particles] with respect to a co-ordinate system fixed in the ordinary way by means of solid bodies and unperturbable clocks. The experimental devices – opening and closing of apertures, etc. – are seen to permit only conclusions regarding the space-time extension of the associated wave-fields.” Again, the particle and wave theories are complementary, and the macro devices by which we arrive at information about micro-states are bound by the same restrictions. Bohr, “The Quantum Postulate” pp. 583-4.}

This leads to uncertainties. Bohr notes that we could conceive of the measuring apparatus as part of the system and to try to take its own tiny changes into account, \textit{but what would we use to measure the measuring apparatus}? Indeed we could only measure it with another measuring apparatus, where we would encounter the same problem, and so on. As Bohr put it:

\begin{quote}
In tracing observations back to our sensations, once more regard has to be taken to the quantum postulate in connection with the perception of the agency of
\end{quote}
observation, be it through its direct action upon the eye or by means of suitable auxiliaries such as photographic plates, Wilson clouds, etc… It might even be conjectured that the arbitrariness in what is regarded as object and what as agency of observation would open a possibility of avoiding this uncertainty altogether. In connexion with the measurement of the position of a particle, one might, for example, ask whether the momentum transmitted by the scattering [caused by the measurement] could not be determined by means of the conservation theorem from a measurement of the change of momentum of the microscope – including light source and photographic plate – during the process of observation. A closer investigation shows, however, that such a measurement is impossible, if at the same time one wants to know the position of the microscope with sufficient accuracy.\textsuperscript{1199}

That is, the same uncertainty would apply to any measurement of the measuring apparatus and so on, \textit{ad infinitum}.

Bohr follows this discussion of the problem of measurement with sections dealing with matrix mechanics (Section 4), wave mechanics (Section 5), the “Reality of the Stationary States” (Section 6), finally concluding with a discussion of “The Problem of Elementary Particles” (Section 7). Bohr’s conclusion draws an analogy with the required reassessments that came in the wake of relativity. He notes that when the principle of relativity itself is incorporated into quantum mechanics (which was still non-relativistic),

\textsuperscript{1199} Ibid. p. 584.
physicists must be prepared for still more reassessments; but that, he hopes his interpretation at the level of principle might help:

Already the formulation of the relativity argument implies essentially the union of the space-time co-ordination and the demand of causality characterising the classical theories. In the adaptation of the relativity requirement to the quantum postulate we must therefore be prepared to meet with a renunciation as to visualisation in the ordinary sense going still further than in the formulation of the quantum laws considered here. Indeed, we find ourselves here on the very path taken by Einstein of adapting our modes of perception borrowed from the sensations to the gradually deepening knowledge of the laws of Nature. The hindrances met with on this path originate above all in the fact that, so to say, every word in the language refers to our ordinary perception. In the quantum theory we meet this difficulty at once in the question of the inevitability of the feature of irrationality characterising the quantum postulate. I hope, however, that the idea of complementarity is suited to characterise the situation, which bears a deep-going analogy to the general difficulty in the formation of human ideas, inherent in the distinction between subject and object.\footnote{Ibid. p. 590.}

Bohr’s closing comments on the insufficiency of language remind us of Heidegger’s similar concerns. Essentially, Bohr is confronting our old friends the twin problems of intuition and expression. These two problems lie at the core of his concept of complementarity and provide its real ground. As Bohr’s own sense of his new
interpretation became more and more refined these problems would come to the fore. And we should note that, while in the *Nature* paper they come at the very end, they had been present in his mind for a long time. As Heisenberg later pointed out, even in their early discussions in 1926, “Bohr had repeatedly pointed out, indeed, that the ordinary language of the physicist was plainly unequal to describing events within the atom.”

And, as both Pais and Kalckar note, Bohr had been preoccupied with such problems since his student days. As a young undergraduate, Bohr had wanted to write a book on epistemology, but had abandoned the project as his work in physics took up increasingly large amounts of his time and energy. However, “shortly before his death Bohr spoke of his youthful philosophical work” and he was asked “what place this work then had in his existence, he replied, ‘It was, in a way, my life!’” It is not possible to completely reconstruct Bohr’s planned book, but its main focus was an attempt to overcome the ambiguities of communication and understanding. That is, Bohr was concerned about the fact that,

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1203 Ibid.
1204 Bohr seems to have thought he could use the mathematical treatment of multivalued functions, applied to language, in order to fix meanings. As Petersen succinctly puts it: “He became convinced that the ingenious geometrical device for eliminating the ambiguity of such functions, mapping the various functional values on different sheets of
though using the same words, people cannot communicate unambiguously because the same words do not always mean the same thing (different people may take them in different ways) as well as the problem of the subject/object relationship, which, as the subject can also be made an object (*ad infinitum*), is seemingly impossible to fix in place. Petersen argues that in the world of quantum physics Bohr found a new place to pursue his earlier philosophical interests, and a new mechanism through which to attack the problem of ambiguity. Bohr’s philosophy, first presented to the scientific world at Como and later developed in a series of articles and lectures, published in various places, continuing right up to the time of his death, centred on the concept of complementarity, and was, at heart, concerned with the problem of ambiguity.

Before we delve any deeper into Bohr’s philosophical concept of complementarity, it will be useful to pause for a moment to take note of what it is not. Bohr’s philosophy is *not* a form of idealism. Bohr did not believe that the world was an illusion, nor that the true reality was to be found in ideas in the mind, nor that the mind formed reality in some sort of way. He also did not hold a kind of Kantian view that the *a priori* categories shaped reality and that the thing in itself was beyond our reach. Bohr was definitely a realist, though he was a realist of a certain kind. Folse calls him a “critical realist” rather than a “classical realist” and this characterisation is entirely apt. Bohr was also not a subjectivist. His philosophy was *not* a relativistic view where each person’s subjective view was its own truth. Nor was he any sort of mystic. Bohr was also not a logical positivist, or a phenomenalist, or an instrumentalist. These various...

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*a* so-called Riemannian surface, could be exploited for clarifying paradoxes connected with the subject-object partition.” Ibid.
inaccurate views have all, at one time or another, been ascribed to Bohr, but they are all incorrect.\textsuperscript{1205}

Bohr believed that the things of the world that physics described were real and that they really were the source of our perceptions. Like Heidegger, Bohr never considered questioning the independent reality of the world as a serious question and those who attribute this sort of solipsistic view to either man grossly misunderstand them. One can see where the misunderstanding arises, if we take the wave-view and introduce wave-based experimental arrangements and discover wave-like phenomena, or, conversely, take a particle-view, introduce particle-based experimental arrangements and discover particle-like phenomena, it can seem like our views have created the phenomena that we experience. But this view is not Bohr’s. There can be no doubt that he believed in the reality of atomic phenomena. As he put it in 1929, “the wonderful development of the art of experimentation has enabled us to study the effects of individual atoms.”\textsuperscript{1206} Bohr’s scientific and philosophical writings all take the reality of atoms and of “physical objects” as an unquestioned given. And he specifically argued against our actions creating the phenomena we experience in any sort of way. When one “speaks of ‘disturbance of

\begin{itemize}
\item Folse has tirelessly and effectively argued against these misunderstandings. For an outline of the various incorrect views and careful refutations see Folse, Henry. \textit{The Philosophy of Niels Bohr: The Framework of Complementarity}. Amsterdam: North Holland, 1985, as well as Folse, Henry. “Kantian Aspects of Complementarity.” \textit{Kant Studien} 69 (1978), pp. 58-66. And his essay review, “Niels Bohr and the Construction of a New Philosophy” \textit{Studies in the History and Philosophy of Modern Physics}. Vol. 26, No. 1, pp. 107-16. For the most part we will take these inaccurate readings as sufficiently refuted (as have most recent works in the field) and focus on Bohr’s own writings and what they actually do say.
\end{itemize}
phenomena by observation’ or ‘creation of physical attributions to atomic objects by measurements’” one goes astray. “Such phrases… are apt to cause confusion, since words like phenomena and observation, just as attributes and measurements, are here used in a way incompatible with common language and practical definition.” Bohr’s proposed re-conception of the notion of the phenomenon to include both the physical object and the experimental apparatus was an attempt to avoid this problem. As he put it: “On the lines of objective description, it is indeed more appropriate to use the word ‘phenomenon’ to refer only to observations obtained under circumstances whose description includes an account of the whole experimental arrangement.”

The phenomenon, as an indivisible unity that includes micro-physical objects and macro-physical objects presupposes that both of these kinds of objects are real. Atoms, electrons, and protons were real things for Bohr, but our experience of them was not direct. How then could we understand that experience, and, even more importantly for Bohr, how could we talk about it?

In the two years following his Como address, Bohr further clarified his position and refined his presentation in a series of essays that were collected and published in Danish, German, and English as *Atomic Theory and the Description of Nature*. Bohr opened the collection with an “Introductory Survey,” written in 1929, where he put the

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1207 Bohr, Niels. “Unity of Knowledge (1954).” *Philosophical Writings: Vol. II.* p. 73. “In such terminology, the observational problem in quantum physics is deprived of any special intricacy and we are, moreover, directly reminded that every atomic phenomenon is closed in the sense that its observation is based on registrations obtained by means of suitable amplification devices with an irreversible functioning such as, for example, permanent marks on a photographic plate caused by the penetration of electrons into the emulsion. In this connection, it is important to realise that the quantum-mechanical formalism permits well-defined applications referring only to such closed phenomena. Also in this respect it represents a rational generalization of classical physics in which every stage of the course of events is described by measurable quantities.” Ibid.
developments of quantum theory into broader context. “The task of science,” as he sees it, “is both to extend the range of our experience and to reduce it to order, and this task presents various aspects, inseparably connected with each other.” The twin problems of intuition and expression loom large in Bohr’s account. He speaks of “experience” and its primary role in the development of scientific knowledge. And he argues that we must always be prepared to jettison old ideas as we enter into new realms of experience, where we may discover that they turn out not to hold:

Only by experience itself do we come to recognize those laws which grant us a comprehensive view of the diversity of phenomena. As our knowledge becomes wider, we must always be prepared, therefore, to expect alterations in the points of view best suited for the ordering of our experience. In this connection we must remember, above all, that, as a matter of course, all new experience makes its appearance within the frame of our customary points of view and forms of perception.¹²⁰⁸

Bohr’s point is that, in addition to needing to be prepared to jettison concepts that do not work in new phenomenal realms, we must also bear in mind that, as we enter into these new realms, it is only by these very concepts that we are able to orient ourselves. The

¹²⁰⁸ Bohr, Niels, “Introductory Survey (1929).” Atomic Theory and the Description of Nature. Cambridge: Cambridge University Press, 1961, p. 1. The English version of the collection was first printed in 1934; the Danish original was 1929 (the first two essays were originally written in English, the third was originally written in German, and the fourth in Danish). As Bohr put it in his preface to the 1961 reissue: “The articles were written at a time when the programme of developing a comprehensive treatment of atomic problems, on the basis of Planck’s original discovery of the universal quantum of action, had obtained a solid foundation by the establishment of a proper mathematical formalism.” Ibid. (Front Matter.) By this time, contrary to the view of Einstein, Bohr believed that he had found the proper grounding for the science of quantum mechanics.
“frame of our customary points of view and forms of perception” are our guides in the new realm.\textsuperscript{1209}

\textbf{Quantum Philosophy}

Bohr saw the developments in quantum physics as providing a new impetus to philosophical reassessments. In 1929 and throughout the rest of his life Bohr would point out that, historically, physical investigations had prompted people to reassess broader philosophical ideas. He saw the developments of quantum theory as not just another case of such an occurrence, but as a particularly profound instance. Bohr believed that the philosophical, and, particularly, the epistemological lessons that the discoveries of quantum physics taught were \textit{foundational}; they pertained to grounds. Again, as he put it in the Introductory Survey:

The great extension of our experience in recent years has brought to light the insufficiency of our simple mechanical conceptions and, as a consequence, has shaken the foundation on which the customary interpretation of observations was based, thus throwing new light on old philosophical problems. This is true not only of the revision of the foundations of the space-time mode of description brought about by the theory of relativity, but also of the renewed discussion of the principle of causality which has emerged from the quantum theory.\textsuperscript{1210}

\textsuperscript{1209} As the young Heidegger was to do several years before, Bohr points to the fact that we approach all situations with \textit{presuppositions}. The new situations may necessitate the re-thinking of our presuppositions, even their replacement with new ideas that, in turn, become new presuppositions, but we never approach a situation without them.\textsuperscript{1210} Ibid. p. 2.
Bohr’s comparison of the revelations provoked by quantum theory and relativity was already present at Como and would recur again and again in his subsequent writings. Heisenberg would also use the same analogy again and again as well. Einstein saw the situation differently and continued, until his death, to see quantum theory as fundamentally incomplete.

The survey, and the essays that follow it in the volume (including the article from *Nature*), follow a pattern already present in the Como lecture that would, likewise, repeat itself over and over again in Bohr’s writings in the decades to follow. Bohr begins with an historical account of varying length and key points, but one that establishes the basic structure of a “classical physics” that is comprised of “Newtonian” mechanics and Maxwellian electrodynamics. This “classical” framework informed and lay beneath our view of what it means to observe and to explain phenomena. That is, our ideas about causality took on a more modern form after the Newtonian revolution. The reader will recall the difference between an Aristotelian *cause or ground* and the modern notion of *cause-and-effect*, with its mechanical conception of the relation. The point that Bohr makes is that this new notion of what causality means, was the result of Newtonian physics. It was a *mechanical notion of causality*. And, particularly through the example of Newton’s great success in describing universal gravitation and the motions of the planets, it became the paradigm for the way in which we understand causality itself.\(^{1211}\)

\(^{1211}\) I am compiling my account of Bohr’s historical presentation from the vast bulk of his writings from 1927 until his death. Of particular importance, in addition to the *Nature* article and the essays in *Atomic Theory and the Description of Nature*, are Bohr’s various papers on complementarity, the questions of causality, the unity of knowledge, and so on, which are collected in the four volumes of his *Philosophical Writings (Atomic Theory*
This new, mechanical notion of causality had a companion that it carried along with it, which was, itself, a principle of mechanics: that of observation. Newtonian mechanics was based on quantifiable observations of physical phenomena. It used mathematics to describe the relations between these quantified observations, which included measurements of position within a co-ordinate system, of time, and of forces.

Bohr’s key point about observation was that, before the new revolutions in early twentieth century physics, observation had been an unquestioned principle. Relativity had showed that description of position in space and time was affected by the position and velocity of the observer and that the ideas of absolute space and time, therefore, needed to be reconsidered. Quantum mechanics pointed to another aspect of observation. In “classical” mechanics it could be assumed (and it was implicitly assumed) that the act of observation had no effect on the phenomena observed. In quantum mechanics this was patently not the case. Thus observation needed to be re-thought. In light of this discovery Bohr argued that we needed to view observation as an implicated process where, to use a phrase he was fond of using again and again, “we ourselves are both actors and spectators in the drama of existence.”

Heisenberg had spoken of the measuring process disturbing the subatomic situation, but Bohr rejected this view. To speak of disturbing the subatomic phenomena was to still see things in the classical frame; that is, to speak of disturbing the phenomena is to see the subatomic phenomena and the measurement process as two separate systems that interact in the process of observation, where the one disturbs the other. Bohr’s point was that such a description had already gone wrong, because the subatomic system and the measurement system needed to be taken together, as an individual phenomenon, for the very reason that we never have any view of a subatomic system without a measurement interaction. \textsuperscript{1213} Bohr argued that we needed to re-think the concept of phenomenon itself to think of it as an interaction, or, to use Heideggerian terms, an event. Bohr argued that we can never meaningfully talk about a “subatomic phenomenon” without including the observational interaction in our description. The “subatomic phenomenon” and the observational parameters together form an indivisible individuality, a basic unit for quantum description.

For Bohr, this “individuality,” or unity of phenomenon (in Bohr’s new sense, which includes the physical objects and the observation interaction together as a single phenomenon), was a newly discovered philosophical and epistemological fact that

\textsuperscript{1213} “As already mentioned, the finite magnitude [i.e. individuality] of the quantum of action prevents altogether a sharp distinction being made between a phenomenon and the agency by which it is observed, a distinction which underlies the customary concept of observation and, therefore, forms the basis of the classical ideas of motion.” Bohr’s notion of the individuality of the micro-macro-observation-interaction phenomenon and the individuality/indivisibility of the quantum of action are therefore intimately related. “With this in view, it is not surprising that the physical content of the quantum-mechanical methods is restricted to a formulation of statistical regularities in the relationships between those results of measurement which characterise the various possible courses of the phenomena.” Bohr. “Introductory Survey” p. 11-2.
physics had discovered. Again and again after Como he spoke of the “epistemological lesson” that quantum theory taught. The classical notion of observation, as independent of the “phenomena” (in the old sense) observed (or as non-disruptive in Heisenberg’s view), had arisen because the phenomena observed had been on too large a scale compared to the quantum of action for the effects to be noticed. The analogy that Bohr drew with relativity was that classical observations had been based on velocities sufficiently slower than the speed of light for relativistic effects to have been noticed. As Bohr put it in 1929:

In both cases we are concerned with the recognition of physical laws which lie outside the domain of our ordinary experience and which present difficulties to our accustomed forms of perception. We learn that these forms of perception are idealizations, the suitability of which for reducing our ordinary sense impressions to order depends upon the practically infinite velocity of light and upon the smallness of the quantum of action.\textsuperscript{1214}

The difficulty though, was that, as Bohr had already pointed out earlier, our common frame of reference and modes of understanding and explanation are the only ones we have for description; that is, these ordinary modes are the only ways that we have of sensibly conveying information. “In appraising this situation,” Bohr notes, “we must not forget that, in spite of their limitation, we can by no means dispense with those forms of perception which colour our whole language and in terms of which all experience must

\textsuperscript{1214} Ibid. p. 5.
ultimately be expressed.” And it is the problem of language, that is, the problem of expression, that makes the discovery of the limitations of intuition in quantum mechanics both so complicated and profound. “It is just this state of affairs which primarily gives to the problems in question their general philosophical interest.”

In 1929 Bohr also published an article to celebrate the fiftieth anniversary of Max Planck’s doctorate. In this article, also published in *Atomic Theory and the Description of Nature*, Bohr “discussed in more detail the general philosophical aspects of the quantum theory.” As he describes it in the “Introductory Survey,” in the Planck article Bohr, attempts to show that the difficulties concerning our forms of perception, which arise in the atomic theory because of the indivisibility of the quantum of action, may be considered as an instructive reminder of the general conditions underlying the creation of man’s concepts. The impossibility of distinguishing in our customary way between physical phenomena and their observation places us, indeed, in a position quite similar to that which is so familiar in psychology where we are continually reminded of the difficulty of distinguishing between subject and object.

This comparison of the observer/observed relation in quantum physics and the subject/object relation in psychology is, as with the previously mentioned formulations, one that Bohr will use again and again. And in this context it becomes easier to see how

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1215 Ibid.
1216 Ibid.
1217 Ibid. p. 15.
the friends of his youth saw the connection between Bohr’s quantum-inspired philosophy and the epistemological musings of his youth.¹²¹⁸

For Bohr, the epistemological lesson of quantum mechanics brings us face to face with the problem of the relativity of meaning. Thus, though, in this part of our examination we began in a very different domain from that of our initial investigation of the early Heidegger, we are still in familiar territory, and our overall concern with the problem of the meaning of meaning is still very much in view. In his Planck article of 1929 (“The Quantum of Action and the Description of Nature”), Bohr again makes the connection between the observer/observed relation in quantum physics and the subject/object relation more broadly, again arguing that the former teaches us a lesson about the latter. As he puts it:

The epistemological problem under discussion may be characterized briefly as follows: For describing our mental activity, we require, on the one hand, an objectively given content to be placed in opposition to a perceiving subject, while, on the other hand, as is already implied in such an assertion, no sharp separation between object and subject can be maintained, since the perceiving subject also belongs to our mental content. From these circumstances follows not only the relative meaning of every concept, or rather of every word, the meaning depending upon our arbitrary choice of viewpoint, but also that we must, in general, be prepared to accept the fact that a complete elucidation of one and the same object may require diverse points of view which defy a unique description.

¹²¹⁸ It also is the basis for which so many commentators have seen Kierkegaardian themes in Bohr’s thought.
Indeed, strictly speaking, the conscious analysis of any concept stands in a relation of exclusion to its immediate application.\textsuperscript{1219} Meanings are the result of an interaction between the subject and object and thus form an individuality that includes both. However, just this realisation points to the ultimate relativity of meanings. That is, as the result of interactions, which by nature involve contingency – or, better, are contingent – meanings are relative (relative to the interaction in all its contingency). Meanings then, including those involved in scientific explanation, lack the kind of ultimate ground in necessity that the Aristotelian view of science presupposes, as does the “classical” mechanics of Newton and electrodynamics of Maxwell. Does this mean then that Bohr is not a realist? The answer is a conditional, but nonetheless definite: no.

Bohr has been characterised as an anti-realist,\textsuperscript{1220} but as we have seen, this is not accurate. Bohr was certainly not what Folse describes as a “classical realist,” but he was still a realist of sorts. He was, I would argue, first and foremost, an empiricist, and his realism existed within the overall constraints of empiricism. Thus when empirical findings forced a limitation on our conceptions of the real, Bohr took these restraints as unavoidable, while still believing in the reality of things. Indeed, there is no Kantian distinction between the Kantian things in themselves and our perceptions in Bohr’s thought. Our perceptions and the things in themselves form the indivisible individuality of

phenomena. In Kant’s view, the “Newtonian” concepts of space and time are a priori features of our reason that exist irrespective of experience and form and order it as its necessary conditions. Bohr’s conception is the polar opposite: our concepts are the result of our interaction with things in experience. For this reason, attempts to describe Bohr as a kind of Kantian are fundamentally misguided.

Bohr’s “critical” or empirical realism (as I would term it) has parallels in the early Heidegger’s thought. In both views meanings are the result of an event, of a happening of experience where the thinking human interacts with phenomena in a meaning-constituting act. Both views have their own form of realism that falls within the particular constraints necessitated by the contingency of our existence. In both views meanings have no ultimate ground in necessity, but instead are dependent upon the contingencies of human experience. How then does Bohr deal with the problem of the lack of ultimate ground? Heidegger pointed to a particular form of the how of experience. But Bohr’s background and concerns were different. How then did he address this issue?

In his Planck essay Bohr speaks of “how profoundly the new knowledge has shaken the foundations underlying the building up of concepts, on which not only the classical description of physics rests but also all our ordinary mode of thinking.”1221 The relativity of meaning undercuts the concepts by which we base our understanding of the world around us as well as the ways in which we communicate this understanding (again, the problems of intuition and expression). How then do we deal with this problem? The classical, Aristotelian model of science was rooted in ultimate necessity, and this did not

1221 Ibid. p. 101.
change with the advent of Newton. Indeed, one of Bohr’s central points is that Newtonian physics cemented certain conceptions of space, time, and causality as themselves necessary for scientific description of any kind, and that, as a result of the great successes of Newtonian mechanics, these conceptions became normative for rational explanation outside of the sciences as well.

De Jong and Betti describe a “classical model of science” as an ideal set of standards of scientific rationality going back ultimately to Aristotle… These standards got progressively shaped by and adapted to new scientific needs and tendencies. Nevertheless, a core of conditions capturing the fundamentals of what a proper science should look like remained remarkably constant all along.” De Jong, W. & Betti, A. “The Classical Model of Science: A Millennia-Old Model of Scientific Rationality.” *Synthese* 174 (2010), pp. 185-203, p. 185. They define the classical model of science “as a system $S$ of propositions and concepts (or terms) which satisfies the following conditions: (1) All propositions and all concepts (or terms) of $S$ concern a specific set of objects or are about a certain domain of being(s). (2a) There are in $S$ a number of so-called fundamental concepts (or terms). (2b) All other concepts (or terms) occurring in $S$ are composed of (or are definable from) these fundamental concepts (or terms). (3a) There are in $S$ a number of so-called fundamental propositions. (3b) All other propositions of $S$ follow from or are grounded in (or are provable or demonstrable from) these fundamental propositions. (4) All propositions of $S$ are true. (5) All propositions of $S$ are universal and necessary in some sense or another. (6) All propositions of $S$ are known to be true. A non-fundamental proposition is known to be true through its proof in $S$. (7) All concepts or terms of $S$ are adequately known. A non-fundamental concept is adequately known through its composition (or definition).” Ibid. p. 186 The authors refer to conditions 6 and 7 as “the Knowledge Postulate” and note that the justification for the “fundamental items” in their list was often achieved by “invoking what [they] call the Evidence Postulate, i.e. the fundamental propositions and fundamental concepts of $S$ are known immediately or by themselves.” It is just this self-evidence of “fundamental items” that Bohr believed the quantum revolution called into question. As de Jong and Betti put it: “With the rise of modern physics not only the Evidence Postulate but also the Knowledge postulate became more and more problematic, at least in application to the empirical sciences.” Ibid. p. 193.

“The principles of mechanics enunciated by Newton, by which he created a model for any causal description of natural phenomena, served indeed as a basis for the subsequent development of physical science and have even, as is well known, afforded a main source of inspiration for philosophers attempting to set up ultimate categories of human thinking.” [i.e. Kant] Bohr, Niels, “Newton’s Principles and Modern Atomic Mechanics (1946).” *Philosophical Writings: Vol. IV*, p. 126.
Bohr’s reassessment of the ideas of observation and description entailed a re-definition of the aim of science. Instead of the “objective” description of nature with its strict notions of a subject/object or observer/observed division (no longer tenable in the post-quantum-of-action world) and the renunciation of strict determinism that went along with it, Bohr now insisted that the goal of science must be “unambiguous” description.\textsuperscript{1224} Indeed, as we will see below, he would re-define objectivity itself, based on the issue of expression. But how, given the relativity of meanings, may we achieve unambiguous description? In physics the very process of observation and means of description are the very classical ideas that have now been undercut. As Bohr put it: “As mentioned above, only with the help of classical ideas is it possible to ascribe an unambiguous meaning to the results of observation.”\textsuperscript{1225}

In 1938 Bohr argued that science’s aim was that of “enlarging human understanding.”\textsuperscript{1226} To achieve this aim science must overcome the problem of access, or intuition (that is, how can scientists \textit{arrive at} understanding?) and the problem of expression (that is, how can scientists \textit{communicate} such understanding?). By 1954 Bohr had re-formulated what it meant to be objective in science to the reduction of ambiguity. The ideal of objectivity was replaced by the ideal of unambiguous communication. And this is fitting if the goal of science is “enlarging human understanding,” for it is not our own, personal, solipsistic understanding that is the goal, it is a \textit{shared} understanding, and because of this, communication is key. “Every scientist,” Bohr argued, “is constantly

\begin{footnotesize}
\begin{enumerate}
\item[\textsuperscript{1224}] Bohr. “Introductory Survey” p. 16.
\item[\textsuperscript{1225}] Ibid. p. 17.
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\end{footnotesize}
confronted with the problem of objective description of experience, by which we mean unambiguous communication.”

Bohr’s solution to the ground problem is found in communication. “Our basic tool,” he says, “is, of course, plain language which serves the needs of practical life and social intercourse.”

Ideas about basic concepts like space and time had, post-Newton, developed in two directions: they were taken as real phenomena of a sort that were present in nature to be discovered, or they were seen, in Kantian fashion, as *a priori* categories of the human understanding that order experience. As Bohr was to put it in 1960:

The extension of physical experience in our days has, however, necessitated a radical revision of the foundation for the unambiguous use of our most elementary concepts, and has changed our attitude to the aim of physical science. Indeed, from our present standpoint, physics is to be regarded not so much as the study of something *a priori* given, but rather as the development of methods for ordering and surveying human experience. In this respect our task must be to account for such experience in a manner independent of individual subjective judgement and

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1228 Ibid.
1229 “Above all, the explanation of the orbital motion of the planets in our solar system, based on simple mechanical principles and the law of universal gravitation, deeply influenced the general philosophical attitude in the following centuries and strengthened the view that space and time as well as cause and effect had to be taken as *a priori* categories for the comprehension of all knowledge.” Bohr, Niels. “The Unity of Human Knowledge (1960).” *Philosophical Writings: Vol. III, Essays 1958-1962 on Atomic Physics and Human Knowledge*. P. 9.
1230 Ground of meaning.
therefore objective in the sense that it can be unambiguously communicated in the
common human language.\textsuperscript{1231}

For Bohr, the new developments in physical science did not represent the triumph of any
sort of subjectivity, but rather, a redefinition and refining of what objectivity meant. And
this meant an account that included not only a description of the physical phenomena (in
the old sense), but a description that included the experimental arrangement (the complete
\textit{phenomenon} in Bohr’s new sense). In Heideggerian terms we might say that this was a
realisation that the \textit{situation} must be included in any description.

The reason that we need to include a description of the experimental arrangement
as part of the phenomenon, is that, as Bohr put it at Como and in his \textit{Nature} article in
1928, “the quantum postulate implies that any observation of atomic phenomena will
involve an interaction with the agency of observation not to be neglected.”\textsuperscript{1232} The
situation is not one where we can assume a particular state of affairs in the sub-atomic
realm, which we merely “peer into” without consequences. Nor, however, is it the
situation such that there is a particular state that our observation “disturbs.” Nor again is
it the situation that our observation somehow “creates” the state within the subatomic
realm. Instead, on Bohr’s view, there is a subatomic realm, and this is a realm of real
entities. But we can only view these real entities in such a way that we \textit{know} that our
observation has an effect. Observation and observed form an “individuality” and
therefore must be described together. We are forced to say: “when we observe this system
in this manner, this is the result” (X system + Y observational apparatus = Z data). The

\textsuperscript{1231} Ibid, pp. 9-10.
\textsuperscript{1232} Bohr, “The Quantum Postulate” p. 148.
wave/particle duality is a result of the individuality (X + Y = 1 phenomenon) of quantum phenomenal interaction: when we observe systems with certain types of experimental arrangements (those that presuppose the wave view) we achieve wave-like data, and when we observe systems with other types of experimental arrangements (those that presuppose the particle view) we achieve particle-like data.\textsuperscript{1233}

In quantum mechanics we are, as Bohr put it in 1937, forced to recognise “that in this region it is no longer possible sharply to distinguish between the autonomous behaviour of a physical object and its inevitable interaction with other bodies serving as measuring instruments.”\textsuperscript{1234} And herein lies the root of Bohr’s concept of complementarity. As he puts it:

Indeed this circumstance presents us with a situation concerning the analysis and synthesis of experience which is entirely new in physics and forces us to replace the ideal of causality by a more general viewpoint usually termed ‘complementarity.’ The apparently incompatible sorts of information about the

\textsuperscript{1233} “The apparent contrast between different types of quantum phenomena, the description of which involves different classical ideas, like space-time coordination or momentum and energy conservation, finds in fact its straightforward explanation in the mutually exclusive character of the different experimental arrangements demanded for the appearance of such phenomena.” Bohr, Niels “The Causality Problem in Atomic Physics (1938). Philosophical Writings: Vol. IV P. 102.

\textsuperscript{1234} Bohr, Niels. “Causality and Complementarity (1937).” Philosophical Writings: Vol. IV, p. 84. Complementarity is a generalisation of the notion of causality because it represents a new, inclusive view of what is necessary for description of phenomena; that is, both causal and space-time views are necessary. As Bohr put it: “Although the phenomena in quantum physics can no longer be combined in the customary manner, they can be said to be complementary in that sense that only together do they exhaust the evidence regarding the objects, which is unambiguously definable. Truly, the view-point of complementarity may be said to present a rational generalization of the very ideal of causality.” Bohr, Niels. “Newton’s Principles and Modern Atomic Mechanics (1946).” Philosophical Writings: Vol. IV. P. 130.
behaviour of the object under examination which we get by different experimental arrangements can clearly not be brought into connection with each other in the usual way, but may, as equally essential for an exhaustive account of all experience, be regarded as ‘complementary’ to each other. In particular, the frustration of every attempt to analyse more closely the ‘individuality’ of single atomic processes, symbolised by the quantum of action, by a subdivision of their course, is explained by the fact that each section in this course definable by a direct observation would demand a measuring arrangement which would be incompatible with the appearance of the uniformities considered.  

If we, for instance, attempt to track “the space-time course of some physical event” in the quantum realm, then we need measurements. As Bohr puts it, this means that “the account consists in the last analysis in the establishment of a series of unambiguous connections between the behaviour of the object and the measuring rods and clocks which define the system of reference involved in the space-time description.” But we may only do this “as long as we may completely ignore, in the description of all the important circumstances of the event, all interaction between the object and these measuring instruments, which unavoidably accompanies the establishment of any such connection.” In the quantum realm, however, we cannot do this:

For the use of rods and clocks to fix the system of reference makes it by definition impossible to take into account the energy of momentum which might be transferred to them in the course of the phenomenon. Conversely, those quantum

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1235 Ibid. pp. 84-5.
laws whose formulation rests essentially on the application of the concept of energy or momentum can appear only under circumstances of investigation from which a detailed account of the space-time behaviour of the object is excluded.\textsuperscript{1236} The result of this is that “the whole situation in atomic physics \textit{deprives of all meaning} such inherent attributes as the idealisations of classical physics would ascribe to the object.”\textsuperscript{1237} The classical ideas of continuity and strict causality are therefore idealisations that are based on our generalisations from experience of phenomena of the macro-scale, where quantum effects are not noticeable. And yet, these conceptions are essential parts of our descriptive apparatus.

The goal of Bohr’s reassessment of some of the fundamental concepts of scientific description was to avoid the slippery slope into subjectivity and to regain an (albeit modified) objectivity that one might see as lost in the new quantum world. Bohr believed that the idea of complementarity widened the conceptual frame of scientific description enough to encompass the new situation. Phenomena were no longer the physical object and its behaviour alone, but the physical object’s behaviour as displayed in the observational interaction. And this is where Bohr’s insistence on ordinary language comes into play. In Bohr’s view, science’s goal is communal understanding, and thus its findings must be expressible in unambiguous terms; therefore, it is necessary to include the experimental arrangement in one’s description. But experimental apparatuses are macro-objects. As Bohr puts it:

\textsuperscript{1236} Ibid. p. 85.
\textsuperscript{1237} Ibid. p. 86, emphasis mine.
The requirement of communicability of the circumstances and results of experiments implies that we can speak of well defined experiences only within the framework of ordinary concepts. In particular it should not be forgotten that the concept of causality [not strictly applicable in the quantum realm] underlies the very interpretation of each result of experiment, and that even in the coordination of experience one can never, in the nature of things, have to do with well-defined breaks in the causal chain. The renunciation of the ideal of causality in atomic physics which has been forced on us is founded logically only on our not being any longer in a position to speak of the autonomous behaviour of a physical object, due to the unavoidable interaction between the object and the measuring instruments which in principle cannot be taken into account, if these instruments according to the purpose shall allow the unambiguous use of the concepts necessary for the description of experience. In the last resort an artificial word like ‘complementarity’ which does not belong to our daily concepts serves only briefly to remind us of the epistemological situation here encountered, which at least in physics is of an entirely novel character.1238

Bohr saw the elements of description – classical concepts as idealisations, new conceptions of phenomena necessitated by the quantum postulate, the ideal of unambiguous communication, and the need to rely on ordinary language – as the logically connected core of a new generalisation, a widening of the epistemological frame to encompass the new discoveries.

1238 Ibid. p. 87.
In one of his most straightforward accounts of the epistemological problems, written as his contribution to Schlipp’s volume on Einstein for the Living Philosophers series Bohr notes:

...it is decisive to recognize that, however far the phenomena transcend the scope of classical physical explanation, the account of all evidence must be expressed in classical terms. The argument is simply that by the word ‘experiment’ we refer to a situation where we can tell others what we have done and what we have learned and that, therefore, the account of the experimental arrangement and of the results of the observations must be expressed in unambiguous language with suitable application of the terminology of classical physics. \(^{1239}\)

And as simple as this sounds, this is the nub of the issue. Bohr expanded our notion of explanation, to include the event of interaction. At the macro-level this was not necessary because of the vast difference in scale compared to the size of the quantum of action. On the micro-level it was absolutely necessary for unambiguous description.

In his post-Como papers Bohr speaks often of the epistemological lesson that quantum theory has taught. He explains that it necessitated the broadening of the classical frame that had seemed so necessary. As he put it in 1954:

The main point to realise is that all knowledge presents itself within a conceptual framework adapted to account for previous experience and that any such frame may prove too narrow to comprehend new experiences. Scientific research in

many domains of knowledge has indeed time and again proved the necessity of abandoning or remoulding points of view which, because of their fruitfulness and apparently unrestricted applicability, were regarded as indispensable for rational explanation.\textsuperscript{1240}

For Bohr, a conceptual framework meant “the unambiguous logical representation of relations between experiences.”\textsuperscript{1241} When we widen the frame, old presuppositions about it must be jettisoned in order to achieve a new logical representation of relations between experiences in a new realm. Bohr saw the historico-philosophical import of the quantum postulate as the prompt that necessitated such a widening reassessment of fundamental conceptions. But how, to return to an earlier question, does this address the ground problem?

**Once More: Ground**

If we abstract from Bohr’s complicated and often repetitive formulations of his view, we can see some structural similarities to the young Heidegger’s idea of a circular ground. That is, in Bohr’s view we always approach the world with a set of presuppositions and concepts (meanings of varying degrees of complexity, weight, etc.). Though he often asserts that he wishes to make no speculations about the origin of our concepts it is obvious that, in Bohr’s conception, concepts (meanings) arise from past experience; we learn them. To put it another way, on Bohr’s view, meanings arise from experience but are necessary to understand and describe experience. And presuppositions are a kind of always-already that can be replaced if new experience shows us that they are

\textsuperscript{1241} Ibid. p. 68.
Bohr’s answer, like that of the young Heidegger, is to focus on the \textit{how}. Heidegger’s circular grounding was achieved through a sort of rigour, a particular comportment that approached the difficulties head on. Bohr’s approach is similar. His focus on unambiguous description and an empirical realism is his own way of promoting rigour. And, like Heidegger, Bohr stresses practical activity. In 1960 he explained the situation by recounting an episode from Paul Møller’s \textit{The Adventures of a Danish Student}, a book that he gave as a gift to students at his institute once they achieved a certain degree of proficiency in Danish. In particular he focuses on a discussion between what was “then, and even now… known among students as a philistine” and his cousin, a “licentiate” who was “addicted to remote philosophical meditations detrimental to his social activities.” The philistine suggested that the licentiate employ himself, but the licentiate replied that this was impossible:

‘My endless enquiries make it impossible for me to achieve anything.

Furthermore, I get to think about my own thoughts of the situation in which I find myself. I even think that I think of it, and divide myself into an infinite retrogressive sequence of “I”s who consider each other. I do not know at which “I” to stop as the actual, and in the moment I stop at one, there is indeed again an
“I” who stops at it. I become confused and feel a dizziness as if I were looking into a bottomless abyss, and my ponderings result finally in a terrible headache.’

In his reply the cousin says:

‘I cannot in any way help you sorting your many “I”s. It is quite outside my sphere of action, and I should either be or become as mad as you if I let myself in for your superhuman reveries. My line is to stick to palpable things and walk along the broad highway of common sense; therefore my “I”s never get tangled up.’

The trick here is to realise that Bohr himself is neither the licentiate nor the philistine. Instead we might say that the two viewpoints are complementary; they are mutually exclusive but both are necessary for a complete view. “Fortunately,” he remarks, “the risk of falling into the deplorable situation of the licentiate is small in normal life, where we become gradually accustomed to coping with practical necessities and learn to communicate in common language what we need and what is on our mind.” But at the same time he notes “the complementary way in which words like contemplation and volition are used” and the “richness of experience” to which “the flexibility of the subject-object separation in the account of conscious life corresponds.”

Bohr’s picture of grounding is fundamentally empirical; it is of a constant interaction between experience and the experiencing human being who rationally orders and communicates her experience. As such his concerns are fundamentally narrower than

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Heidegger’s (although it should be noted that Bohr also stressed the complementary nature of such phenomena as artistic communication). Bohr was, after all, first and foremost a scientist, and his philosophical concerns were largely limited to what he believed were the epistemological lessons that physical science could teach. Though his thought came near such questions as what substance means, or what it means for things to exist, his work never really strays into the domain of ontology.

For Aristotle, *aitia*, or “causes,” were grounds. According to Bohr in the post-Newtonian age the notion of cause took on a mechanical sense that was disseminated into the broader culture, establishing the modern notion of cause-and-effect as we commonly conceive it. Bohr’s concept of complementarity broadened and generalised the concept of cause by seeing it as a logical relation within a frame that always rests on presuppositions. As Folse puts it, complementarity is not a philosophical *principle*, but is, in fact, “a ‘conceptual framework’ from which to view physical principles or theories.”1245 It represented a broadening of the notion of causality because it acknowledged the necessity of including the complementary space-time description in order to arrive at a full account of subatomic behaviour, but also because it acknowledged the necessity of including the interactive component (the observational interaction as a vital component of the phenomenon); it brought experience into causality.1246

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1246 “Recapitulating, the impossibility of subdividing the individual quantum effects and of separating a behaviour of the objects from their interaction with the measuring instruments serving to define the conditions under which the phenomena appear implies an ambiguity in assigning conventional attributes to atomic objects which calls for a reconsideration of our attitude towards the problem of physical explanation. In this novel
The implications of the quantum postulate, the indivisibility of the quantum of action and the individuality of phenomena necessitated such re-thinking. As Bohr would put it in 1954:

Such considerations point to the epistemological implications of the lesson regarding our observational position, which the development of physical science has impressed upon us. In return for the renunciation of accustomed demands on explanation, it offers a logical means of comprehending wider fields of experience, necessitating proper attention to the placing of the object-subject separation. Since, in philosophical literature, reference is sometimes made to different levels of objectivity or subjectivity or even of reality, it may be stressed that the notion of an ultimate subject as well as conceptions like realism and idealism find no place in objective description as we have defined it; but this circumstance of course does not imply any limitation of the scope of the enquiry with which we are concerned.¹²⁴⁷

Heidegger made similar arguments about the inappropriate use of such terms as “realism” and “idealism,” but he also made the same arguments about such terms as “subject” and “object” themselves. The closest that Bohr comes is noting that “the impossibility of distinguishing in or customary way between physical phenomena and their observation places us, indeed, in a position quite similar to that which is so familiar in psychology situation, even the old question of an ultimate determinacy of natural phenomena has lost its conceptual basis, and it is against this background that the viewpoint of complementarity presents itself as a rational generalisation of the very ideal of causality.”


where we are continually reminded of the difficulty of distinguishing between subject and object." And we must note that Bohr clings to an ideal of objectivity, even though he has been accused of abandoning it. In fact, however, Bohr’s entire philosophical project can be seen as an attempt to maintain objectivity, albeit within a new framework:

I have tried, however, to indicate a general attitude suggested by the serious lesson we have in our day received in this field and which to me appears of importance for the problem of unity of knowledge. This attitude may be summarised by the endeavour to achieve a harmonious comprehension of ever wider aspects of our situation, recognising that no experience is definable without a logical frame and that any apparent disharmony can be removed only by an appropriate widening of the conceptual framework.

Ground, for Bohr, is found in the empirical, in the event, and meanings are both the empirically created products of the event and the inherited means by which we orient ourselves in the event itself. Objectivity is defined in empirical terms and comes to encompass contingency and the situation.

A Concluding Analysis

I would like to close our discussion of Bohr with a brief final speculation on the structural features of his philosophical outlook based in part on our previous studies here and partly on his own historical account, abstracted into its main structural features and articulations in regard to the concept of meaning. This will not only situate Bohr within our broader discussion, but will also further elucidate the place of the meaning problem

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within the structure of his thought and allow for some further insight into this thought itself.

In the Aristotelian view, phenomena are endowed with epistemic meaning through demonstration (that is, through grounding). Relational meanings are grounded, ultimately, in first principles and axioms (both grounds). First principles and axioms are, themselves, ungrounded in the above sense. Instead, they derive their ultimate meaning *theologically* by the divine guarantor of a rationally ordered cosmos that is discoverable by man. Meanings are, in this view, grounded in necessity.

In the world of “classical” mechanics (by Bohr’s account), strict causality ensures determinism. If we know, for instance, all of the position and momentum values for all objects within a closed physical system at one point in time, we can calculate what they will be at any subsequent point in time or what they were at any previous point. Phenomena are endowed with epistemic meaning through description, which presupposes precise determination of values. Like the Aristotelian view, the “classical” view presupposes a rationally ordered cosmos that is discoverable by man. Relative meanings are grounded in the fundamental laws of nature that are discoverable. Meanings then, in this view, are ultimately discoverable in the world.

For Newton, the ultimate ground for meaning was to be found in God. In the “classical” view more broadly, this became de-sacralised (though, of course, adherents to a natural-theological view like Thomson and Maxwell persisted). We might say that in this “classical” view relative meanings were ultimately grounded in a sort of quasi-Newtonian *absolute meaning* (or body of basic meanings), in its own nature, without
regard to anything external, which remains always similar and immovable (and which is, again, discoverable by man amidst the multitude of relative meanings with which we deal in our daily lives). As in the Aristotelian view, then, meaning is grounded in necessity.

In Bohr’s view, phenomena are endowed with epistemic meaning by description. But the notion of description has been expanded, of necessity, to include the observational interaction. But this inclusion of the observational action renders description ultimately situational; it introduces contingency. Precise determination of values is still presupposed, and now, with the inclusion of the observational interaction the uncertainty relations themselves become another precise value within the systematic individuality of description. Bohr’s view does not presuppose a rationally ordered cosmos along the lines of “classical” notions of continuity, strict causality, and determinism, but neither is it irrational and subjective; instead, Bohr’s view presupposes an interaction between a rational human subject and an empirical world to be ordered and understood, which may thwart and baffle her aims and presuppositions, necessitating their revision or even abandonment.

This is, of course, a form of the very procedure of scientific exploration itself, but it is coupled, in Bohr’s outlook, with a profound sense of limitation. This limitation is imposed upon us by nature and has been revealed through the discovery of the quantum postulate. In Bohr’s view, as in the classical view, relative meanings are grounded in fundamental laws of nature, but these laws are the result of discovery, rather than merely out there to be discovered. One of the epistemological lessons of quantum theory is that even what we think of as the most basic, fundamental laws and concepts are the result of
interactions in the past between human beings and nature and that they are, therefore, all ultimately contingent.

In Bohr’s view there is no ultimate, absolute meaning (or set of basic meanings), in its own nature, without regard to anything external, and remaining always similar and immovable. Instead, all meanings are the result of experience, which is the final, ultimate, but fundamentally contingent arbiter. As rational, thinking beings, we endow phenomena with meaning through the application of our reason, striving for logical consistency and unambiguous expression, but all of our endeavours are grounded in experience, which is contingent. Meaning is then, in Bohr’s view, ultimately grounded in contingency or relativity.

In the young Heidegger’s view, meanings can be grounded in a particularly heightened how, in a grounding act. But although Bohr stresses a heightening and a grounding act of its own sort, his view is, in the final analysis, profoundly different from Heidegger’s. Heidegger’s view focuses on the individual as the site of grounding of meaning in understanding. For Bohr understanding is a communal activity. And here those who argue for a strong Kierkegaardian influence on Bohr should take extreme caution. For, in his communal notion of understanding, of the establishment and grounding of meaning, where unambiguous communication is the heart and soul of the endeavour, Bohr is as far away from the Kierkegaardian “single individual” and “indirect communication” as can be imagined. In Bohr’s view there is a grounding act, like there is in Heidegger’s view, but it is not an act on the part of the individual in a single moment.
On the contrary, it is a communal act, or, better, an ongoing history of acts. Bohr’s conception of ultimate grounding is evolutionary.

Bohr’s evolutionary view was of an ever-shifting re-grounding of even the most basic epistemic meaning assignments and even the most basic categories in experience. This was a communal endeavour and, for Bohr, the very notion of objectivity itself came to mean logically consistent and unambiguously communicable information about the relational structures of reality. As such, he saw the old ideas about objective and subjective knowledge as being fundamentally mistaken in their orientation. He believed that science aimed “at the development of general methods for ordering common human experience,” while, religion, for instance, originated “in endeavours to further harmony of outlook and behaviour within communities.” With “the development of the mechanical conception of nature at the time of the European Renaissance” a “veritable schism between science and religion” developed. Science undercut and co-opted parts of the former domain of religious explanation and therefore, “many phenomena, hitherto regarded as manifestations of divine providence, appeared as consequences of general immutable laws of nature.” But “on the other hand, the physical methods and view-points were far remote from the emphasis on human values and ideals essential to religion.” This schism, in Bohr’s view, led to the confusion and disorientation in regard to ideas about objective and subjective knowledge. As he put it in 1929: “Common to the schools of so-called empirical and critical philosophy, there prevailed therefore an attitude of more or less vague distinction between objective knowledge and subjective belief.”\[1250\]

Bohr believed that the discovery of the quantum postulate and the attendant rethinking of foundational ideas in the broadening and generalisation of the conceptual frame that was Bohr’s view of complementarity, changed this situation by providing us with a profound epistemological lesson. And just as the idea of biological evolution supplanted older ideas about divine creation, so too the new notion of causality replaced, in Bohr’s view, the old notion of the grounding of meanings in an ultimate ungrounded ground. Instead, the grounding of meaning in Bohr’s view was an ongoing historical process of interaction between humanity and the cosmos, enacted in the process of experience, in the event. Or, to use Bohr’s own words:

In emphasising the necessity in unambiguous communication of paying proper attention to the placing of the object-subject separation, modern development of science has, however, created a new basis for the use of such words as knowledge and belief. Above all, the recognition of inherent limitations in the notion of causality has offered a frame in which the idea of universal predestination is replaced by the concept of natural evolution.\textsuperscript{1251}

\textsuperscript{1251} Ibid. pp. 80-1.
History and Poetry differ in this,
that one speaks of things which have happened,
and the other speaks of such as might have happened.

Aristotle, Poetics

Conclusion: Straining at the Limits of Human Understanding

(OR: The Structural Dynamics of Human Understanding)

This project began with a puzzle and it ends with a puzzle. The puzzle can be best expressed in the form of a question: How do we understand things? We are able to understand because of meaning. Phenomena in the world are intelligible because they have meanings. Phenomena are intelligible because they mean something to us. We understand them through meaning. The puzzle of understanding is a puzzle of meaning. Meanings are more than just name-labels for things, but then, there is a lot more to name-labels than we might usually think. “What’s in a name?” is a question both difficult and important. Reference is all about the conveying and classifying of meaning, which is the very stuff and matter of understanding, which is a relational activity – the basic activity of human beings qua human beings.

The animale rationale is the relating, thinking, communicating, understanding animal. The animale rationale is an animal of meaning. This is both why I find the puzzle
of meaning and understanding so fascinating and why it is so difficult and likely unsolvable: we are within it – or, perhaps more accurately: *we are it*. This, in turn, is why I see historico-philosophical exploration of the problem to be such a fruitful approach. How do we discover the movements of the heavens when we are a part of the system, standing, as we are, on this moving ball? We begin with observables. And through examination of these observables, we begin to build our hypotheses. We look for the joints and articulations within meaning, the parts and their rules, but always with reference back to observables. The best way to explore meaning and understanding, I believe, is to examine it in action. And this is what I have tried to do here. I measure the success or failure of this experiment by two metrics: The degree to which I have been able to deepen my own understanding of the problem. And whether, by conveying the process-oriented results, I have been able to do the same for a reader. On the first count the experiment has been a success. I hope that it has been on the second as well.

This account has largely taken the form of a structural analysis of historical phenomena; we have constantly been encountering the phenomena of the history of thought and taking them apart to see how they work. We take things apart to see how they are made, to come to know them in their parts and articulations. This is structurally akin to what physics does; it takes observed physical phenomena apart and comes to know them as complexes of components (matter, forces, motions, etc.). Analysis in chemistry is another fruitful metaphor. But we can also caution ourselves by peering through the lens of a biological metaphor. Have we been dissecting dead ideas? Have we been vivisecting living ones; torturing their vitality away even as we gain knowledge of
them? Bohr’s cautionary remark that the living *use* of a term and its *definition* are complementary may be apt.

Certainly, I believe that the vital and important part of this dissertation is to be found in the historical examinations/explorations themselves rather than in a conclusion (in the *experiment* itself, rather than its findings). In the *Optics* Newton argued that analysis must always precede synthesis. And in the science of history, where so much of what we do is tell stories, I think we can also say that analysis should be first in importance as well. To say that the journey is more important than the destination is a cliché. But, if we speak about historiography, such a statement has its own logic. It is in the story telling itself that the vitality of historiography lies, not in the ending.

Historical thinking is a particularly powerful mode of thinking. We are historical beings from the ground up. Our lives are determined by history. We are born into a spatio-temporal particularity, into a particular time and place. The sheer and fundamental contingency of our being born into a particular time and place becomes, in relation to our own particular life, the sheer particular necessity beyond which we cannot go. The spatio-temporal particularity into which we are born and which we inhabit through the course of our lives, is determinative of a great number of things, from the sort of ideas and outlooks we imbibe, to the philosophical toolkits we pick up, and even to the stark realities of whether we die from a childhood illness or are hit by a bus at ninety-seven. The historical contingency of our lives is, in this way, also the great gripping necessity of our lives. This is, of course, one of Heidegger’s chief notions: that it is in the iron necessity of contingent factual life that all of our actions, great and small, philosophical and
mundane, our great loves and our petty cruelties, play out. We are creatures of action; we
do things; we have wills; we are forces unto ourselves. And yet, we pace a stage set not
of our choosing, and not of our creation. And we do so for a short while, in a time that is
finite, and manifestly our own.

We are also, as I noted a moment ago, relating, thinking, communicating,
understanding animals. We are animals of meaning. And again, we are historical animals.
But the scope of our historicality does not end at the particularity of our birth. We live out
our lives as histories. The living of a human life is the enactment of a history. But we are
also historical at every moment within that life, as Heidegger points out, particularly in
Being and Time. We constantly project forward into the future in projects, from our grand
schemes and designs to the simple act of reaching for our coffee cups. Human life is
always temporal, we swim in time like sharks, and when we stop, we are dead. Time, and
thus temporality, is the great constant. And as we project into the future, making
decisions in the present, we are always, at the same time, drawing on the past. It is the
past – history – that provides the horizon of possibilities for the present, where we make
our projections into the future. The past conditions the present, providing its possibilities.
We live within an historical horizon of possibility, and each moment of human life, and
human thought, likewise, exists within its own particular historical horizon of possibility.
This is, I believe, one of the prime reasons why historiology and historiography are so
important for philosophy (or, better: philosophising).

In our introduction we rehearsed some of the more common reasons for
employing historiology in the pursuit of philosophy: We can avoid repeating past
mistakes. We can avoid time-consuming re-treading of old ground (even when we are not making mistakes). And we have a place to start; we can begin with observations; we have data we can examine. To this list we may add the benefit to be derived from tracing the roots of historically conditioned ideas that we have imbibed from within our own particular historical horizon of possibility. But the benefit of historiography for philosophical endeavour is great as well, and perhaps even more important. Our thinking is structurally historical, and the examination of ideas, through historiography – through the writing of history and the reading that follows – “taps into” (for lack of a better term) our fundamental historicality. Learning through the reading and writing of histories, through the hearing and telling of stories, is basic; it gets at the ground of our being as historical creatures. When the muse sang through Homer she taught him to lay bare the essential movements of life and philosophy and to communicate them into the profound depths of his audience’s souls.

History is, the reader may gather by now, my own particular answer to the twin problems of intuition and expression. That historiography should be posited as an answer to the problem of expression should not, I hope, come as a surprise. Expressing ideas – even the most complicated and difficult – through stories, is as old as language. And this practice is employed even in the sciences, where accounts of experiments are a fundamental mode of communication.\textsuperscript{1252} The reader has now heard my argument for the particular worth of this mode of communication. But historiology, and, indeed, historiography, is my answer to the question of access or intuition as well. Historical

\textsuperscript{1252} Bohr stresses exactly this point.
thinking is fundamental thinking. Whenever we are thinking in any mode (whether explicitly historical or not) we are drawing on the range of interpretive possibilities, outlooks, ideas, algorithms, attitudes, etc., provided by our historical horizon. Thus, even when we are not thinking historiologically (i.e. not specifically focusing on examining relations of events in time), we are still and always being historical. Historiological thinking reflects our fundamental historicality. As such, I argue, it provides a particularly vital and fruitful mode of access to the world of philosophical problems. Historiography, as – likewise – a mode of access, is related to this; as we write we read; as we tell the story we hear it, and, indeed, live it in a way.

**Meaning**

So what of meaning then? Meanings are the relata of relationality. We are relational beings who, in our acts of relating, which are the fundamental stuff of our lives themselves, traffic in meanings. All relation occurs through meaning. We are creatures of meaning. Even when we think or speak about “mere things,” we speak in and through meanings. The physical things of the world would all be there without us, but they would not be what they are in our conceptions, in our philosophies, or our sciences, if they did not have meaning (i.e. they would be there, but they would not be what we say or think that they are). A rock would not be “a rock” without, not only the signifier “rock,” but the whole structural manifold of meaning itself. To paraphrase Novalis: *What seem to confront us are phenomena, but what we encounter are meanings.*

Meaning itself is a reflexive category. We do not catch sight of it unless we examine our relations reflexively. In the directness of our normal relating we do not see
meaning; rather, we see the meanings; that is, we see “rocks,” “trees,” “ideas,” “feelings,” etc. We only catch sight of meaning itself when we turn our reflection upon ourselves and examine what we are doing. This is, on a small scale, an historiological act; in reflexivity we observe a micro-historical act. But the issue of reflexion also brings us face to face with Bohr’s problem of fixing the subject/object division, and, indeed, with the problem of the regressus ad infinitum (recall the Licentiate’s endless series of “I”s). Aristotle said that man, by nature, desires to know, and this appears to be fundamental truth (at least, as far as it is empirically attested to by the history of human thought and by self-observation). We are relating, thinking, communicating, and understanding creatures. We are creatures of meaning.

Aristotle was also right when he said that we have different kinds of knowledge. Certainly we know how to produce things (an historical activity that involves projecting an end goal – based on knowledge of possibilities from the past – and working to achieve this goal in the present by using knowledge of methods, likewise, gained in the past). We also have a practical know-how whereby, through experience, we become more adept at getting about in life. And we also have scientific knowledge (taken broadly as well as narrowly). Scientific knowledge for Aristotle is necessary knowledge. Indeed, Aristotle believed we could have no Episteme of things that are not necessary.

What both Heidegger and Bohr discovered though (discovered for themselves and attempted to “dis-cover” for others) was the ultimate contingency of our lives. If we exist within a contingent historical horizon then there exists a fundamental contingency beneath all seeming necessities in our lives. If one argued that the seeming necessity of
certain ideas in one’s mind were, in fact, not so, because these ideas would perish with
one’s death, one could easily reply (as Aristotle would) that the ideas themselves remain
and remain necessary. Following Husserl, the young Heidegger had made such an
argument.

But history presents a problem for us here. Bohr realised this problem and pointed
out that even those ideas that humans have believed were most absolute, necessary, and
ture, have, time and time again, been proved false as history has progressed. Benjamin’s
Angel of History, gazing back upon the infinitely accumulating wreckage of history, even
as the angel is propelled forward by a wind from paradise, witnesses the death of all such
ideas, carried out by the unending massacre of progress. Heidegger put it simply in the
1920s when he said that history has shown time and again that what seemed like the most
secure philosophical ideas could be toppled. And indeed, we should add: created. One of
the features of the nineteenth century Higher Criticism that had the most profound impact
was the notion of the Bible as a created, historical document.

Time erodes even the mountains to dust. “Stars too,” Swinburne reminds us, “but
abide for a span.”1253 And we humans live within the profound insecurity of our own
finitude. We are fragile creatures who will only ever be here for a short while. Yet, and,
most likely, precisely because of this, we seek security and permanence. Heidegger
attributes this to the fundamental nature of our existence as care. We are beings that care
about our being. Our lives are important to us; we care about them. But all of our daily
dealings are also manifestations of care. There are no dealings without care. Even

1253 Swinburne, Algernon C. “A Nympholept.” The Poems of Algernon Charles
indifference is merely a privative form of care. Relating is a manifestation of care and we are relating beings at our very core. All we do, as long as we live, is relate – whether that be in human relationships, in deep philosophical examination of ideas, in exacting scientific exploration of physical phenomena, or even just opening our eyes and seeing – we constantly relate until we relate no more. But all of our relations occur through meaning. And if relating is a manifestation of care, then the stuff of care too is meaning. Hence, the use of the word “meaning” to denote worth and value is entirely appropriate.

And if, as beings whose very mode of existence is care, and beings who care about our existence itself, then meaning is tied up in this care over our existence. It is not merely the words that we use to describe phenomena that have meaning. Our own lives have meaning for us as well. Hence: “the meaning of life.” And this perhaps explains our desire to find certainty, security, and permanence in our ideas as well. Aristotle says that we desire to know, and we think we know a thing when we know its ground. We can compress this statement and say: We desire grounds. It is the desire for grounds that prompts us to seek necessity. And this search leads us to the question of ultimate ground. We seek an ultimate ground that will guarantee the security of our world of meanings (in which we live, through which we understand, and without which we could not exist as the kind of beings that we are). Yet, empirical observation of history shows us that this search is unlikely to succeed. And, logically, if this search occurs within the contingent horizon of our historical particularity, it is, likewise, doomed to failure. We disprove ultimate necessity by examining the theatre of our existence: we exist within ultimate
contingency (the finite particularity of our lives) therefore we cannot find ultimate necessity. _QED_.

Meanings are the blood within the veins of relationality/care, which is the fundamental essence of our existence. Yet meanings, like human beings, are created things. The only necessity in the worlds of meaning that we inhabit is to be found within this overall fundamental contingency. This is not to say that there are not _regional_ necessities within the worlds of meaning that we inhabit. Logical relations provide regional necessities within the more general, fundamental contingency. Relations with the actual physical objects of the world and their dis-covered laws also provide regional necessities. But if we push our search further, to the question of the ultimate ground for meaning, we find no such necessity. Even the regional necessities, _necessitated_ by the physical world cannot escape this. That there is gravity, for instance, is a _brutum factum_. But that there should be gravity, is a question that pushes us beyond necessity. We can explain the ground for a brute fact with another fact, and then provide a ground for this ground, and so on. Bohr pointed to this fundamental feature of the process of explanation when he addressed the measurement problem: We can measure the measuring device, but then we will need another measuring device, and the problem repeats itself. Aristotle pointed to the same problem and, rejecting the proposition of an infinite number of grounds, posited a theological ultimate ground. This became a traditional solution, but, particularly after the nineteenth century crisis of historicism, it became increasingly problematic for many thinkers, even in a de-sacralised form.
Heidegger’s solution, of a particularly passionate how of relating has a deeply problematic dark side. If the how is all that is important, does the what make no difference? By the time of Being and Time, Heidegger’s answer had developed a distinctly decisionist aspect. The how of questionability gave way to Dasein’s “choosing its own hero”\textsuperscript{1254} in an “authentic” decision about the meaning of one’s life. This decisionism that could justify any what with a how is, as the reader will already see, dangerous. It provides a sort of normative justification for anything. Heidegger’s own reprehensible decision of 1933 only confirms this.

Bohr’s optimistic, communal, evolutionary solution is, in some ways, more in harmony with some aspects of Heidegger’s earlier thought than this dangerous decisionism. Bohr also posits the relativity of our existence and our ideas, but, to use Heidegger’s terms, Bohr seems to take our “being-with-others” much more to heart than Heidegger himself. Bohr tends to think of us as a species, or even as a world community, more than as individuals (at least in the Heideggerian sense of individuals). Bohr seems to want the Angel of History to turn around and face the future. History certainly represents the unending slaughter of old ideas, but it also represents the unending birth of the new. History is a story of the march of infinite death, but it is also a story of the progress of infinite birth.\textsuperscript{1255} The great ambiguity of this is the ambiguity of humanity, of philosophy, of science, and of our individual lives. Each idea, like each human being, has

\textsuperscript{1254} Heidegger, Being and Time, p. 385.
\textsuperscript{1255} Hesiod proclaimed that the twin motive forces in the universe were love and strife.
its time. The ultimate ground of meaning is an historical ground. As such it is ultimately contingent, unless we note the necessity in that very contingency itself. Being and existence are fundamentally indeterminate, as is meaning. Grounds are, indeed, infinite. The only permanence is change. “Changing, it rests” as Heraclitus said. Grounding is the key to Episteme, not ground. We desire to know and hence we try to do so. Yet, as Swinburne says of man:

He hath given himself to time, whose fold
   Shuts in the mortal flock that lives
On its plain pasture’s heat and cold
   And the equal year’s alternatives.
Earth, heaven, and time, death, life, and he,
Endure while they shall be to be.

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1256 As Luther put it in his commentary on the letter of St. Paul to the Romans: “Every doctrine has its measure, its time, and its age.”


This selected bibliography contains the works that I made use of in the writing of this study. It is broken up thematically for ease of use. I have divided the bibliography into “Part 1” and “Part 2,” covering the two primary divisions of the dissertation. I have then arranged the entries into various thematic sections, presented in roughly chronological order (Aristotle, Medieval, Kant, etc.). I have put works that fit into multiple thematic categories (books on Heidegger and Aristotle, for instance) in the spot that seemed to make most sense on a case-by-case basis. For some major topics I have broken the thematic sections up into primary and secondary sources. Again, the idea has been to aim for ease of use in a bibliography this large. All works actually cited in the text are given full bibliographic references in footnotes, rather than referring back to the bibliography, which is always tiresome for the reader.

Part 1

Introduction: Meaning, Semantics, Language, Logic, & Epistemology


**Dictionaries, Lexica, and Other References**


*Oxford English Dictionary*. Oxford: Oxford University Press,


**Greeks**


**Aristotle – Primary**


**Aristotle – Secondary**


**Medieval**


**Kant – Primary**


**Kant & Neo-Kantianism - Secondary**


Romanticism


Secondary:


Husserl – Primary


**Husserl - Secondary**


**Phenomenology (General, Collections, Etc.)**


**Heidegger – Primary**


**Heidegger – Secondary**


**Modern Philosophy – General**


**General Intellectual Histories**


**Part 2**

**Mathematics**


**Physics – Texts**


**Physics 1500-1900**


**Bohr – Primary**


Interview of Niels Bohr by Thomas Kuhn & Leon Rosenfeld on October 31, 1962, Niels Bohr Library & Archives, American Institute of Physics, College Park, MD USA, [http://www.aip.org/history/ohilist/4517_1.html](http://www.aip.org/history/ohilist/4517_1.html)


**Bohr – Secondary**


*The Quantum Revolution – Primary*


**The Quantum Revolution – Secondary**


**General History and Philosophy of Science**


**Psychology**


APPENDICIES
Appendix 1 – Heidegger’s Early Lecture Courses: 1919-26

The prime sources for understanding the development of Heidegger’s thought between the 1916 publication of his Habilitationsschrift and the 1926 publication of Being and Time are his lecture courses. For the period 1916-19, unfortunately, we have little to work with. But from the Kriegsnotsemester (KNS hereafter) of February to April 1919 through to the 1926-7 printing of Being and Time and beyond, we have the wealth of materials from the world of Heidegger’s teaching. The published lecture courses, compiled from Heidegger’s own manuscripts, student notes, and student transcripts (some taken down in shorthand), are the historical traces of the world in which he worked out the ideas for what eventually became Being and Time, but they are also the traces of a historic philosophical interaction between Heidegger the lecturer and his students. These early lecture courses, from whence Heidegger’s fame spread, even before the publication of his magnum opus, were more than just a dry recitation of sets of ideas; they were challenging confrontations, between teacher and students, but also, more importantly, between thinkers and the matter of philosophy. For the historian of thought, they represent the evidence of philosophy very much in progress, and thus for the story told here, concerned as it is with the development of ideas, they provide the motive material
(particularly for Chapter 2) that both deepens our understanding of the destination that is

*Being and Time* and complicates it at the same time.

**Organisational Schemes**

In order to trace the stages of Heidegger’s development in the period from 1919 to 1927 it is useful to divide the long list of courses into periods. Theodore Kisiel’s rough divisions provide a good starting point. He breaks up the period into:

1) The Breakthrough to the Topic (beginning with the student years in 1915 but centring on the crucial KNS semester in 1919, and moving on through Heidegger’s early religion courses in 1921-2)
2) Confronting the Ontological Tradition (beginning with Heidegger’s explorations of Aristotle in 1921 and ending with his 1924-5 interpretations of Plato)
3) Three Drafts of Being and Time (The Dilthey Draft of 1924-5, The Ontoeroteric Draft of 1925-6, and The Final Draft: Toward a Kairology of Being in 1926)

Each of Kisiel’s large categories is itself divided into smaller sections corresponding to individual courses and/or themes that Heidegger explored. John Van Buren’s more thematic approach divides the period after “The Student Years” into several topical discussions of the issues Heidegger was dealing with at the time:

1) The Student Years
2) The End of Philosophy
3) New Beginnings
Both approaches help us to better grapple with the large amount of material that the lecture courses represent. Scott Campbell’s scheme, which combines aspects of the two, is also useful for us to consider here:

1) Philosophical Vitality, 1919-21 (here “vitality” refers not so much to Heidegger’s own energy (though this connotation is not unintended), which would imply that the later periods lacked such “vitality” but rather Heidegger’s focus on the idea of vitality itself and a philosophy that lives in life)

2) Factical Life, 1921-2

3) The Hermeneutics of Facticity, 1922-23

4) The Language of Life, 1923-25

For our purposes, where both thematic and chronological issues are important, a scheme that makes use of features from all three will be the most effective in organizing the information that follows. Hence, I will break up the courses into the following divisions:

1) The “Breakthrough” Period of KNS 1919 and the following courses that focus on the meaning of philosophy, the theoretical and pre-theoretical, and phenomenology as a stance. This period covers 1919 to 1920.

2) Explorations of the Phenomenology of Religion. In this period Heidegger feels the influence of Luther most heavily and we see a complex situation involving these new thoughts about primitive Christianity as well as ideas from his Catholic past. During this period Heidegger is working on a phenomenological interpretation of religious life. This period covers the 1920-1 religion courses.
3) The Confrontation with Aristotle. Here Heidegger moves from a phenomenological interpretation of religious life to a phenomenological interpretation of Aristotle. During this period Heidegger was attempting to write a book on Aristotle that he never finished (though portions of this work made their way into Being and Time). This period covers the courses on Aristotle, beginning in 1921, and the 1924-25 courses on Plato, which herald the period of Kisiel’s three drafts of Being and Time.

4) The writing of Being and Time. This is the period of Kisiel’s three drafts, running from 1924 to 1926-7. This periodisation helps to highlight the different trajectories and paths that Heidegger was pursuing during these years without publication. Though, in some ways, these sharp divisions belie various and sundry continuities that run throughout longer stretches of time (and some that run throughout the whole period), they help to draw attention to the fact that there was no linear development between the Heidegger of the Habilitationsschrift and the Heidegger of Being and Time. In fact, there are more Heideggers in this period than there are individual lecture courses for us to explore.

1919-20 – The “Breakthrough” Period

KNS 1919

The Idea of Philosophy and the Problem of Worldviews

KNS 1919 is our first real clue to the directional changes that Heidegger’s thought had taken since 1916. This course has become famous in the scholarship as a moment of
radical breakthrough into a new way of doing philosophy, markedly different from the scholastic explorations of the *Habilitationsschrift*. The course takes on the questions of primordial philosophy and worldview (which is to be rejected). Heidegger proposes the idea of philosophy as primordial science in the light of Husserl’s *Logos* essay of 1911 calling for philosophy to become a strict science; what would such a primordial science look like? It would be a primordial philosophy. Heidegger goes over the various forms of dominant neo-Kantianism then current, describing each form and then showing its unsuitability for the task of developing a philosophy as primordial science. He then proposes phenomenology as primal philosophy/primordial science (but this is a new sense of phenomenology that Heidegger has developed out of Husserl’s work, rather than Husserl’s vision itself). Heidegger describes phenomenology as a specific rigorous stance toward living life – there are echoes of the *Habilitationsschrift* conclusion here – and it is this stance toward living life that is a primal philosophy as a basic “how” of approaching phenomena, rather than a specific body of doctrines. Philosophy, as phenomenology, was, in Heidegger’s view, a *pre*theoretical science that looked at the origins of phenomena (always already meaningful) with a necessary degree of immediacy in order not to lose their living nature with dead theoretical abstraction. Though we find a radically changed Heidegger already in this first course after the war, the topics that we are following in this dissertation (meaning, ground, and necessity and contingency) are all still at play, albeit in new and exciting constellations.
Summer Semester 1919

Phenomenology and Transcendental Philosophy of Value

In this course Heidegger loses some of the great momentum that he built up by the end of KNS 1919. The idea behind the course was to take the methodological conclusions of the previous semester and apply them, exploring a specific problem-constellation in terms of its tendency and motivation. Heidegger intended this course to be a radical historical critique of transcendental philosophy of value, and the critique is certainly present, but it falls short of the extreme radicality that it promises. As Kisiel puts it:

In this first of many courses which we have from Heidegger on the history of philosophy, he outlines a new and powerful method of ‘critique’ which promises to go more deeply into intellectual history than the old-fashioned factual history of surface ‘influences’, and then by and large gives us precisely that!\textsuperscript{1259}

Despite this failure to live up to its own promise, and its rather turgid description of Rickert and Windelband’s work, the course does bring some new methodological equipment into play such as the historico-philosophical method that Heidegger will later term “destruction;” and it does continue to explore the problems of meaning and ground. Indeed, transcendental value philosophy’s inability to adequately ground its conceptual apparatus is one of the core faults that Heidegger exposes in the course.

On the Essence of the University and Academic Studies

\textsuperscript{1259} Kisiel, Genesis. p. 60.
Heidegger offered a second course during SS 1919 On the Essence of the University and Academic Studies. In published form we possess only a partial student transcript of this course in the form of excerpts and then, apparently, only of portions of the course, but Kisiel has expanded our knowledge of the course by supplementing his account with another, unpublished transcript.\textsuperscript{1260} Heidegger’s earlier comments on university reform (KNS 1919) may give us a slightly fuller picture of the ideas he expressed (that university reform must begin with a reform of philosophy and the cultivation of a new attitude of rigorous research). Heidegger describes university life as a particular “situation” in which students and instructors live out a particular relation to “science,” conceived in the more expansive sense of \textit{Wissenschaft}. Heidegger distinguishes between different theoretical comportments (those of the natural and humanistic sciences) and stresses the need for a vital primordial phenomenology that intensifies life and leads towards true and fundamental, rather than “false problems”.\textsuperscript{1261}

\textbf{Winter Semester 1919-20}

\textit{Basic Problems of Phenomenology}

This course is a further and deeper systematic exploration of phenomenology as the primordial science of life in and for itself that Heidegger first described in KNS1919. Heidegger further clarifies the nature of understanding and its access to the primordial within life that is already and primarily meaningful. The situation, formal indication, and other basic concepts are further explored and refined. Tendency and motive are further

\textsuperscript{1260} Ibid. p. 64.
\textsuperscript{1261} Ibid. p. 67
revealed as prime components of our modes of access to understanding. And worlds are given further systematic elaboration. *History* is here highlighted as a term that indicates our understanding-access to life in our familiarity with it in the experience of experience (the “certain familiarity that life already has with itself”1262).

Again, meaning lies at the heart of the course, as it lies at the heart of the phenomenological (and any philosophical enterprise). As the primordial science of origins, phenomenology must direct its gaze at its *own* origins, the origins of meaning itself. As Scott Campbell puts it in his introduction to the English edition of the course:

…we see here a systematic and concerted attempt to describe the intensity and immediacy of life as a way of then uncovering the hidden depth of meaning that underlies the immediacy of life-experience. This is the main task of the primordial science of phenomenology. In this course, Heidegger is trying to uncover the original region that is the domain of meaningfulness.1263

The origin of meaning, the ground from whence it springs, lies at the heart of phenomenological questioning. Heidegger’s examinations of the ground of meaning in this course represent the culmination of developments that arose out of KNS1919 and point the way to further modifications both of his methodology and ideas in the next steps of his development in the courses on religion that follow.

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1262 Ibid. p. 122
**Summer Semester 1920**

*Phenomenology of Intuition and Expression: Theory of Philosophical Concept Formation*

In this course Heidegger explores the idea of philosophical concepts, particularly in relation to the twin problems of intuition and expression, which have been important themes since KNS 1919, drawing particular attention to the difference between philosophical and natural scientific concepts. This course draws heavily on Heidegger’s method of phenomenological destruction that takes concepts and traces them back to their original problem situations. The result of this process destabilises the concepts and allows us to examine them critically, rather than taking them as basically settled and useful tools for rational endeavour, a practice that leaves much covered over. (Orwell’s discussion of clichés that have lost their original meaning, or “dying metaphors” as he calls them, in his “Politics and the English Language” comes to mind here.\(^{1264}\)) Phenomenological destruction is meant to tear down concepts that have lost their vital power and become unquestioned (and thus, not properly understood) commonplaces: “It comes into play with the experience of life which has become diluted, and seeks to place meanings back into their proper contexts.”\(^ {1265}\)

Heidegger performs two destructions in this course, one, of the concept of the *a priori*, and the other, of the concept of history. At the root of these two concepts he finds the original uncertainty and distress of philosophy, of the individual human being standing before the phenomenal manifold. As Kisiel sums it up:

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\(^{1264}\) Orwell, George. “Politics and the English Language.” URL: http://gutenberg.net.au/ebooks03/0300011h.html#part42

\(^{1265}\) Kisiel, *Genesis*. p. 129.
The questions of intuition and expression are to be understood in this original context of insecurity. Intuition queries the how of philosophical experience, and expression in the manner of explicating whatever is given in the how. The problem of philosophical concept formation is thus not a secondary supplementary problem. It is the problem of arriving at the philosophical experience. It is the task of the ways and means of approaching the origin, of securing it so as to bring the motive and tendency of the philosophical experience to expression in genuine philosophical concepts.\textsuperscript{1266}

Contrary to the needs of natural scientific exploration, philosophy needs to stay within the original distress and uncertainty of our concerned relating to life.

\textit{1920-21 – Explorations of the Phenomenology of Religion}

\textbf{Winter Semester 1920-1}

\textit{Introduction to the Phenomenology of Religion}

This course is broken into two halves. The first, is a lengthy and involved methodological introduction, where Heidegger, picking up exactly where he left off in his previous courses, focuses on the nature of philosophical questioning itself. He argues for the difference (not just in methodology and subject matter, but in principle) between philosophy and the sciences. He stresses the need to begin and end with factual life. And he points to the centrality of the historical. Towards the end of the first half, however, in the midst of his most sustained explanation of the formal indication, Heidegger’s course

\textsuperscript{1266} Ibid. p. 136.
was interrupted by complaints to the dean that he was not dealing with any actual religious material. Heidegger then broke off his methodological introduction (abruptly!) and moved on to the examination of Paul’s letters.

In Paul’s letters Heidegger found a particular kind of religious experience (the religiosity of primal Christianity) that, like his picture of philosophy, dwelt within the historical and had its basic focus in insecurity and distress. This primal Christian outlook expressed a particular kind of temporality, a particular way of dwelling within the historical that looked forward in expectant distress but also looked backward to a historical having-become.

**Summer Semester 1921**

*Augustine and Neoplatonism*

“Augustine and Neoplatonism” once again focuses on the question of Access. Heidegger begins the course by reviewing three recent interpretations of Augustine (by Troeltsch, von Harnack, and Dilthey). He then goes on to analyse each of these interpretations according to their mode of access and their motivational basis. He then again differentiates between the object-historical modes of access of the science of historiology and the enactment sense that phenomenology is after. Heidegger argues that each approach merely treats Augustine as an historical object. He goes on to argue that what is needed is to move beyond this object-historical approach to the enactmental phenomenological approach that takes the phenomenon as it presents itself. Once he has thus prepared his students for his own methodological approach, he plunges into a
phenomenological interpretation of Book X of the *Confessions*, where Augustine meditates on memory and the value of confession itself.

Heidegger’s own interpretation moves along with Augustine from *confiteri*, through *memoria*, *curare*, *tentatio* (*concupiscentia carnis et concupiscentia oculorum, et ambitio saeculi*), self importance, and finally to *molestia* which he associates with the facticity of life and “the Endangerment of Having-of-Oneself.” Heidegger provides his own, phenomenological explication of each of the phenomena that Augustine describes. Augustine himself is already at an historical remove from the kind of primal Christianity that Heidegger described in the previous course, thus Augustine cannot be effectively disentangled from neoplatonism to arrive at a picture of a more basic experience. What one can hope to do is to locate basic problems for research in Augustine’s thought and pursue them phenomenologically; this is what Heidegger attempts to do.

1921-24/5 – *The Confrontation with Aristotle*

**Summer Semester 1921**

*Phenomenological Practicum “Relating to” Aristotle’s De Anima*

We do not have a published version of this course (either from Heidegger’s own hand or cobbled together from student transcripts), but Kisiel provides a summary based on unpublished transcripts and accounts:

These exercises (*Übungen*) constitute a kind of zero-point for the period, an hors d’oeuvre before the main meal. …they yield a somewhat plodding exegesis with only a few suggestive moments to be gleaned for what is yet to unfold over the
problem of οὐσία, a halting start toward the climax that we have been led to expect. But the genesis of great ideas have their routine moments which might well mask a mighty struggle. Shortly before the beginning of this semester, Heidegger (on April 2, 1921) reports to Löwith that he is now under way in a ‘self-destruction’ toward a ‘new explication of life.’ From this seminar context, we can surmise that the phenomenological account of factic life begun in 1919 is now to be taken in an overtly ontological direction, utilizing Aristotle as a kind of norm and sounding board, and so as a source of new insights.¹²⁶⁷

It will not be until the following lecture courses on Aristotle that Heidegger’s encounter with the ancient author will really begin to bear fruit.

**Winter Semester 1921-2**

*Phenomenological Interpretations to Aristotle: Introduction to Phenomenological Research, Einleitung*

Here Heidegger’s engagement with Aristotle begins in earnest. This course is, as the title indicates, largely an introduction, but an introduction to phenomenological research into Aristotle. The course is famous for being a course on Aristotle that never actually gets around to talking about Aristotle, but as I argue in Chapter 3, this is largely a mischaracterisation; even in the large Introductory portion of the course, where Aristotle is rarely mentioned, his thought is, in fact, constantly at issue.

The course begins with a brief reflection on the nature of historical study in philosophy, followed by an equally brief history of the reception of Aristotle’s philosophy. Then Heidegger turns to the now familiar question: “What is philosophy?” His exploration of this question centres on the problem of definition. What is definition? What does/must it do? And what, in particular, is philosophical definition? He unpacks the common cliché that “philosophy is philosophizing,” approves of this characterisation, as long as it is understood correctly: philosophy is a cognitive comportment, on the level of principle, to beings in their being. This is followed by an exploration of factical life, as the proper subject ground of philosophy, a discussion of the ways in which factical life loses its grasp of itself by getting lost in itself, and a characterisation of this situation as “ruinance.” He then describes a philosophically counter-ruinant mode of relating to factical life as an alternative.

The published version of the course includes an appendix marked “Presupposition” that Heidegger inserted into the lectures at two points during the course. The “Presupposition” is a methodological reflection on philosophy, phenomenology as interpretation and philosophizing, and the question of scepticism and relativism. The published version poses some problems for the historian in that it contains “addenda and changes, of which the reader is not forewarned, which date to at least as late as 1924.” This is not as much of a problem for us here as our analysis does not need to be as fine grained as that of Kisiel and others, who are focussed on Heidegger’s development itself rather than the problem of meaning. Kisiel’s warnings (such as pointing out that “terms like ‘existenziell’ and ‘existenzial’… which proliferate in excess in the published
version… are not to be found at all in student notes”) should be enough to keep us at a sufficient level of distance and avoid the temptation to read forward (particularly to Being and Time).  

This course sees Heidegger moving further and further from his theologically grounded roots. Here we find the ‘new explication of life’ ensuing from the ‘self-destruction,’ which Heidegger is carrying out at this time. But this ontological revision of the categories of life… is preceded by an extensive re-view of the question “What is Philosophy?”… recalling the course title of early 1919 and the contents of subsequent courses. The upshot of this particular review is a change in Heidegger’s ‘fundamental definition of philosophy’ in the direction of a phenomenological ontology.’ It accordingly manifests an increasing concern for life’s ‘sense of being,’ in its way also a return to Aristotle’s most basic sense of ὄνσια.

Heidegger is charting new phenomenological ground here, and is already well on his way to the characterisation of phenomenology as primarily interpretive that he will present in his groundbreaking course “Ontology: The Hermeneutics of Facticity” in SS 1923. Here

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1268 Kisiel, Genesis. P. 232. In the context of his study, Kisiel notes: “In view of the chronologically compromised character of the published edition, much of the analysis of this verbose, baroque, and turgid course can, for our purposes, be put off until we come to the later, somewhat clearer draft of the Einleitung of October 1922.” Ibid. p. 235. For our purposes we can deal with Heidegger’s engagement with Aristotle as an extended episode, the fine grained details of which (whether a particular development is from 1922 or 3, for instance) does not affect our broader discussion, which is not focused on Heidegger’s development per se, but on the problem of meaning in Heidegger’s work.

already the importance of history and the historiological conditioning of our thought is a paramount concern. “Ultimately,” Kisiel notes, “there is no difference between the ontological and the historical – this is clearly not Aristotle or Husserl – and philosophy must bring its methods in accord with this deeper movement of factic life itself.”

**Summer Semester 1922**

*Phenomenological Interpretations to Aristotle: Ontology and Logic*

Kisiel argues that while the previous course was very much an interpretation that was to lead “to” Aristotle, this course was the first proper presentation of a phenomenological interpretation “of” Aristotle:

This was a four-hour lecture course, the longest of the early Freiburg period, providing ample time for the extensive and innovative translation paraphrases of texts, selected largely from the *Metaphysics* and *Physics*, which Heidegger developed line by line in class. Heidegger opts for the freer form of translation, backed by meticulous and exhaustive expository statements, in order to loosen the sedimented expressions of the tradition and draw out the context of meaning out of which the texts speak. This style of exegesis will in later courses become Heidegger’s hallmark… After the turmoil of the previous semester, Heidegger now asserts himself as master of the Aristotelian opus, pressing new and unsuspected dimensions out of its well-worked but rich hold.

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1270 Ibid. p. 233.
1271 Ibid. p. 238.
This is an exploration of Aristotle’s ontology that is strikingly different from the scholastic view of Heidegger’s early training. This Aristotle looks decidedly “Heideggerian” in contrast to the Aristotle of Aquinas. Here Heidegger finds Aristotelian grounds from his own developing methodological approach and conception of philosophy as a counter-ruinant cognitive comportment to beings in terms of their being.

The themes of movement, developed in previous courses, are now more and more expressed in terms of modes of temporality and tied to the fundamental human mode of being that is care. Thus Heidegger not only discusses the opening chapters of the *Metaphysics*, where Aristotle introduces “the science under question,” but the opening chapters of the *Physics* as well. Movement, grounded in temporality becomes a central phenomenon, wherein “all the phenomena of life are modes of movement. Hence beings, the topic of ontology, ‘temporalize themselves’ in our experience as the ‘with which’ of our getting around.”\(^{1272}\) The roots of ontology lie in our basic experience of getting about the world, the historical conditionality of which precludes a set, static mass of information accruing as the content of philosophy. Rather, philosophy (as in the previous course) is a “how” or a *way* of comporting oneself toward the phenomena of existence.

**Winter Semester 1922-3**

Heidegger only held seminars this semester and thus we do not have a lecture course to work from. Kisiel describes the WS 1922-3 seminar on “Phenomenological Interpretations to Aristotle (Nichomachean Ethics VI; Metaphysics VII; De Anima)”

\(^{1272}\) Ibid. p. 243.
based on transcripts. He notes Heidegger’s “new focal interest” in book 6 of the *NE* and the “crucial role” it will play “in the composition of BT.” He also points to further development of the ontological question in relation to facticity, in terms of: “Something happens with me.” Kisiel says, “This is the real problematic of facticity, a primal phenomenon of ontology which defines the human Being, how it is there, in the world, as well as how the world is there. Facticity actually concerns neither life nor the world, but rather the relation between them.”

**Summer Semester 1923**

*Ontology: Hermeneutics of Facticity*

In this course Heidegger continues to develop the themes that had been forming and evolving in the previous Aristotle courses, but here he takes them out of the specifically Aristotelian framework. This is also the point where Heidegger first begins to use the term “Dasein” (which literally means: “being-there”) as a term for the human subject and as an alternative to “facticity.” This is an attempt to describe the human subject in ontological rather than personal, or subject/object, or even taxonomical terms. He is attempting to describe what we are (in what is an Aristotelian move) in terms of our ontological essence – that is, what we are in terms of our being itself. We are, literally “being there.” It is an active description (*being* [verb]-there, not merely *there* like a

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1273 Ibid. P. 271.
1274 Ibid. p. 272.
1275 “‘Facticity’ is the designation we will use for the character of the being of ‘our’ ‘own’ *Dasein*. More precisely, this expression means: *in each case* ‘his’ Dasein in its being-there for a while at the particular time.” Martin. *Ontology: The Hermeneutics of Facticity*. Bloomington: Indiana University Press, 1999. P. 5.
thing); it describes what we do on the most basic level. We exist, in this particular here and now, in this particular world, etc.

The course further develops the concept of world from previous courses, now in terms of Dasein’s being-in-the-world in its particular “mine-ness.” As Kisiel puts it, “out of the characterisation of world as meaningful context comes its own characterisation as disclosedness.” This world is disclosed to us, but there are the potential problems of getting caught up in explanations and interpretations from our dealings within the world which can conceal the nature of the world as mine (as my particular world, the particular there of Dasein), thus concealing “the ownness and potential authenticity of Dasein.” Heidegger proposes a hermeneutics of facticity, that is a rigorous interpretive engagement with factical life as my particular horizon of disclosure and a mode of access for genuine ontological philosophizing. Heidegger closes by stressing that “the phenomenon of care must be seen as a fundamental phenomenon of the being-there of Dasein.”

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1277 Kisiel, Genesis. p. 275.
1278 Ibid.
1279 Or a “Hermeneutics as the self-interpretation of facticity.” Heidegger, Ontology. P. 11.
1280 Ibid. p. 80.
Winter Semester 1923-4

*Introduction to Phenomenological Research*

This course is the first in Heidegger’s new teaching position in Marburg. It marks both a return to Aristotle and a fresh focus on the nature of phenomenology. Heidegger opens by stressing the “passion for questioning genuinely and rightly.” He stresses in particular that “no foundation, no program or system, is given here” and that “not even philosophy should be expected.” He insists that “it is my conviction that philosophy is at an end” and that “we stand before completely new tasks that have nothing to do with traditional philosophy.” He tells his students that this is only a clue and that “only facts of the matter are of significance” echoing the phenomenological rallying cry: “to the matters themselves.” But the introduction to phenomenology that Heidegger presents in the course is already straying far from a traditional Husserlean stance and methodology. Instead, Heidegger will present his own developing version of a hermeneutic phenomenology that focuses on factical existence.

He begins by unpacking the term “phenomenology” and exposing what he sees as its philosophical roots in Φαινομενον and λογος in Aristotle. He follows this with a description and critique of Husserl’s self-interpretation of phenomenology and the ways in which, by focusing on certain knowledge and an insistence on becoming a “rigorous science,” it misses the more important questions regarding Dasein, facticity, and ontology. Heidegger then initiates one of his famous “historical destructions.”

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1282 Ibid.
1283 Heidegger draws our attention to literally: speaking about phenomena.
the powerful concern for certain knowledge in Husserl and modern philosophy in general back to the Descartes’ scholastically oriented ontology and his (and subsequent modern philosophy’s) neglect of the question of being arriving again at Husserl by the end.

**Summer Semester 1924**

*Basic Concepts of Aristotelian Philosophy*

This introduction to some of the “ground-concepts” of Aristotelian philosophy begins with a discussion of definition and its ground. Unsurprisingly, Heidegger argues that ὦσια is the basic concept of Aristotelian philosophy. He discusses the concept in terms of its traditional meaning (household goods), as beings, and as Being (or the being of beings), and then specifically argues for “莠σια as being-there” He then moves into a discussion of being-there in Aristotle, particularly in the *Nicomachean Ethics* and the *Rhetoric* (with reference also to the *Physics*, *Metaphysics* and *De Anima*). Of particular interest is his discussion of “The Interpretation of the Being-There of Human Beings with regard to the Basic Possibility of Speaking-with-One-Another Guided by Rhetoric.”

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1284 The German term is “Grundbegriffe.” Kisiel sums up Heidegger’s methodological intentions thus: “We must get at the ground (Boden) out of which these ground concepts (Grundbegriffe) grew and see how they grew. In short, the very conceptuality of these concepts must be considered: How the matters they intend are seen, to what end they are addressed, in what way they are determined. Considering concepts in this way in fact gives us insight into the basic requirements for any kind of scientific research.” Kisiel, *Genesis*. Pp. 286-7.


1286 Ibid. pp. 71.
Winter Semester 1924-5

Interpretation of Platonic Dialogues (Sophist, Philebus)

Heidegger’s lecture course on Plato’s Sophist operates under the premise that in order to better understand Plato we should begin with someone who understood the issues in his thought better than he did himself; that is, we need to enter into the world of Plato’s thought through his student who took things further and understood them better: Aristotle. In this course on Plato then, there is a great deal of Aristotle, and, as with Aristotle in previous courses, there ends up being less Plato than planned. He begins this Aristotelian entry into Plato’s thought by way of yet another analysis of Nicomachean Ethics 6. Heidegger focuses on the practical know-how of getting about in the world, which, along with the concept of truth as “un-concealment” becomes his key points of interest in Aristotle (to the detriment of Aristotle’s own praise of and focus on σοφία as the highest form of knowledge in Met). His discussion of truth picks up on the negative literal meaning of the Greek word for truth, αληθεία (α-ληθεία, literally “un-hiddenness” or “un-concealment”). Heidegger develops an account of truth out of this that posits the entities we encounter in the world as in constant need of wresting from concealment and constantly slipping back into the hiddenness from whence they came. This is an account of the difficulty of truth, of truth as an achievement that we must continually enact, of truth, particularly, as a relation between the human being and the world that she encounters. He argues against the idea that truth is a correspondence between thought and

As Kisiel puts it, Heidegger “presumes that a philosopher of the stature of Aristotle understood his teacher better than Plato understood himself, that therefore what Aristotle said is but the more radical and scientific development of what Plato meant.” Kisiel, The Genesis of Heidegger’s Being and Time. P. 301
actuality and, instead, argues that truth is a process of coming to know phenomena that are always slipping back out of our knowledge. The problems of philosophy, are then, the problems of access that Heidegger was already discussing in his earliest courses, but now re-framed in terms of the question of truth as un-concealment.

1924-26/7 – The Writing of Being and Time

Kisiel characterises the following courses as drafts of Being and Time. They are attempts, on Heidegger’s part, to address the question of being; in these “drafts” he attempts to enter into the problem from many different angles. The structural similarities of these various attempts at ingress to this difficult problem domain to the collection of texts that we know as the Metaphysics are palpable here (see Chapter 3) and in Chapter 4 I treat them largely as a collection of attempts at entry into a problem domain, rather than drafts of a single work.

Summer Semester 1925

History of the Concept of Time: Prolegomena toward the Phenomenology of History and Nature

This course opens with another of Heidegger’s introductions to phenomenology (both an historical introduction and a thematic and methodological introduction to his own conception of phenomenology and the ways in which it differs from that of Husserl). Following this lengthy introduction is what was to be the main focus of the course, an analysis of the phenomenon of time. Heidegger begins this “main part” with a description
of the being, the analysis of which will give us access to an understanding of time: Dasein. Through the self-interpretation of the being that we ourselves are, Dasein, we gain access to the phenomenon of temporality, which is the primordial experience of time, that can then give birth to the “derivative” phenomenon of clock-time, the fourth dimension of mechanics. His “exposition of time itself” is cut short and the course lacks a satisfying conclusion.\textsuperscript{1288}

Heidegger stresses that the question of time is in fact intimately connected to the all important ontological question, the question of the meaning of being. In regard to meaning itself, it is a matte of our relation to the phenomena of the world, which we encounter within our caring temporality. Language and its relation to meaning in terms of our dealings is explored here in a more substantial way than in the earlier courses. As Kisiel puts it:

\begin{quote}
…the prepositional nexus of praxis (with, for, in order to, for the sake of) preceding the predications of perception, which environmentally give meaning to those things normally called tools… Beings thus receive their meaning and so their being from the operative structuration of contextualization, from the ‘world.’ They are thereby articulated or ‘expressed.’ The active locus of such contexturing ‘expression’ – and this is why ontology is hermeneutic phenomenology – is already in life itself, its comportmant, its experiences…\textsuperscript{1289}
\end{quote}

\textsuperscript{1288} Kisiel notes that “On its face, this is a course of misnomers, false starts, and false promises, beginning with the irrelevance of its announced title and followed by an inertially faulty introduction, which concludes with a course outline far beyond the scope of a single semester.” Kisiel, \textit{Genesis}. p. 363.

\textsuperscript{1289} Ibid. p. 371.
Meaning comes from the primacy of praxis and *phronesis* rather than theoretical seeing/knowledge. And meaning is that through which we encounter the world, “the ‘primary presence’ is meaning and not object.”\(^{1290}\) And meaning is rooted in care. “Not the surface presence of the world of perception, but the deeper presence of the world of concern *comes* first.”\(^{1291}\)

**Winter Semester 1925-6**

*Logic*

It is this course that Kisiel characterises as the “Kantian” draft of *Being and Time*. Heidegger is already hard at work on his opus when he delivers this course on Logic. The course itself explores the connections between being, truth, and language, in historical and systematic manners. His historical exploration touches on psychologism and Husserlian phenomenology, Aristotle and the question of truth as unconcealment vs. correspondence, and the connections between truth and being, care, and language (the questions of access and expression, present in Heidegger’s work from the beginning remain prominent here) are explored through this engagement with the history of “logic.” Heidegger’s analysis of the *Critique of Pure Reason*, and the Transcendental Analytic in particular reinforce his previous assertions about the primacy of doing over knowing (the primacy of the what for over even Husserlian intuition). He concludes with an analysis of Kant’s interpretation of time and its limitations, finally arguing for a conception of time

\(^{1290}\) Ibid. p. 375.

\(^{1291}\) Ibid.
as an “existential,” an ontological feature of “human existence” i.e. of Dasein. Dasein is as care, and “care is determined ‘by’ time in such a way that care itself is time. Care is the very facticity of time.” Time, as the root of care, becomes the ground of facticity, which, as Dasein, is the contingent ultimate ground of possibility: it is the condition of possibility of the fact that there is being (not entities [or mere things]).

**Summer Semester 1926**

*Basic Concepts of Ancient Philosophy*

This was an introductory survey course (Heidegger was required to teach such courses at the time) that Heidegger gave while he was completing the last portions of *Being and Time*, the first sections of which were already being published in Husserl’s *Jahrbuch* before the publication of the whole as a separate book. All we have of the course are Heidegger’s rough notes (which he did not polish off into sentence form as with previous and subsequent courses, due to time constraints) and some student transcripts. The course touches on the ancient roots of some of the main concerns of *Being and Time* and gives us a glimpse into what portions of the projected “destruction of the history of ontology” from the never completed second part of Heidegger’s incomplete magnum opus.

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1293 Ibid. p. 338.
1294 Ibid.
Being and Time

With the publication of Being and Time in 1926-7 we reach the end of our study of the young Heidegger. In Being and Time (see Chapter 4) many of the concepts and ideas from Heidegger’s early lecture courses are expressed in their most polished and systematic form, but there are already signs that they have lost some of their vitality and are on the path to becoming ossified. Partly, I believe, because he sensed this, Heidegger never completed Being and Time as projected. Instead, he eventually moved on, by 1933 to a disastrous political involvement with the Nazi party that, I believe, should make us deeply distrustful of the decisionist aspects of Being and Time and Heidegger’s particular response to relativism that centres on the notion of “Authenticity”, a notion that, I believe, offers both a false solution and a dangerous abdication of the sort of questionability that the younger Heidegger of the early 1920’s had stressed.

During the time of publication of Being and Time and in the last years of the decade Heidegger gave courses on the following topics:

History of Philosophy from Thomas Aquinas to Kant (WS 1926-7)
The Basic Problems of Phenomenology (SS 1927)
Phenomenological Interpretation of Kant’s Critique of Pure Reason (WS 1927-8)
Logic (SS 1928)
Introduction to Philosophy (WS 1928-9)

The most interesting of these is his course on Kant’s Critique of Pure Reason, where Heidegger declares his new goal to be laying the ground for metaphysics. In many ways this is the culmination of Heidegger’s interest in metaphysics and the ground problem in
this period, and it goes part of the way toward completing the project of *Being and Time*.

But this takes us beyond the range of our study here.
Appendix 2 – Lexical Glossary

The purpose of this glossary is to provide a quick reference point whilst navigating the semantic thicket of terms in the first three chapters. This is far from an exhaustive list; rather, it focuses on some of the key terms, attempting to point to their key significations, relations, equivalents, etc. The entries here provide only a rough outline of the terms, as a point of reference, the details of which emerge in the chapters themselves. I have broken the list down into four sections: the primary terms for this project, some additional terms that are particularly important for understanding Heidegger, some more technical, attributive or predicative terms, and finally some key Greek terms. The order of presentation is indicative of a certain structural and didactic relatedness, but only loosely. The idea is to provide an aid that can be referred back or forward to in the course of reading the chapters that will, hopefully, provide a different perspective on some of the concepts, to put them in a different light that may be helpful.

The definitions attempt to provide an outline for understanding each term. They focus primarily on the specific ways in which I use each term, but they also attempt to convey the standard meanings as well as illuminating alternate meanings. My sources for these definitions are varied. They range from texts by Heidegger, Kant, Aristotle, and so on, to etymological dictionaries, philosophical lexica, and monographs and journals arguing for alternate translations. These sources are all listed in the bibliography.
Primary Terms

Meaning

**German: Sinn, Bedeutung**

The extent to which it makes sense to include meaning here is not entirely clear to me. Understanding meaning is, of course, one of the goals of this project. Nevertheless, a rough, schematic definition of the general shape of the concept seems in order. A good portion of the introduction is dedicated to achieving a schematic definition of this term so I will try not to repeat too much here.

Meaning is the stuff by and through which we understand; it is semantic content, the very relata of relationality. It is the signifying content of every what. There are two different but intertwined German terms that equate to “meaning:” *Sinn* and *Bedeutung*.

*Sinn* commonly means “sense” or “meaning,” but also “sense” as in “the five senses,” and “sense” as in “she showed good sense,” or “he was a sensible man.” It can also mean “opinion,” and “mind” or even “consciousness” and “desires” as well as “feeling” or even “taste.” And it can mean the basics of an idea, as in “I think I’ve got the sense of it.” It originally meant “journey,” a historical connection that interested Heidegger.

*Bedeutung* means “meaning,” “denotation,” and “signification,” but also “sense.” It also means “importance,” “significance,” and “consequence.” *Bedeutsamkeit* means “importance.” And the verb *bedeuten* means “to signify” or “to mean” and to designate or name, which comes from “*deuten (auf),*” which means “to indicate” or “to point to.”
These two terms played an important role in the development of modern logic when Frege used them to indicate the terminological distinction between what we call reference (*Bedeutung*) and sense (*Sinn*)\textsuperscript{1295} – that is, what a word means (*Bedeutung*) and the sense that a word conveys within a thought expressed in a sentence (*Sinn*). The distinction is between strict denotation and a more complex, relational, and situational intending – that is, the distinction between what a word denotes and the role that the use of that word plays and the mode in which it does so in expression.

Heidegger, who, as a young logician, was very familiar with Frege, uses both terms, though not in the strictly Fregean sense, even though, he would have been well aware of his audience’s familiarity with this more strict terminology. Indeed, as with many terms, Heidegger’s use of *Sinn* and *Bedeutung* is both specific and idiosyncratic. Husserl had taken issue with Frege’s terminology rather than the distinction itself, criticizing the use of two words that he thought were “synonymous, a circumstance which makes it seem rather a dubious step if their meanings are differentiated.”\textsuperscript{1296} But Heidegger had charted his own course. Dilthey had used “*Sinn* for the meaning of the whole – a life, a sentence – and *Bedeutung* or *Bedeutsamkeit* for the meaning of its parts – events, words.”\textsuperscript{1297} The young Heidegger had followed him in this, but as he progressed toward *Being and Time* he developed his own uses for these words.


Bedeutsamkeit became the relational whole of meanings in which we dwell and which we employ and inhabit. We signify by pointing to (be-deuten) meanings within the whole of meaningfulness (Bedeutsamkeit). He uses Sinn as “sense,” in terms of our understanding; things are sensible when we understand them – what they are, but particularly what they are for.\textsuperscript{1298}

We can run into problems with these precise differentiations, however, because Heidegger is not always consistent in his use of these terms, and his usages shift and evolve throughout the period we cover. Added to this, the differences in the closest English equivalents and the fact that the English word “meaning” in fact covers all of these German differentiations and we have a murky and potentially muddled semantic situation. Here we must take recourse to the concept or idea, or, better, facet or feature of experience to which the signifier “meaning” points. Both Sinn and Bedeutung play their more or less differentiated roles within the structural whole of Bedeutsamkeit. Or, to put it another way, both of these German terms point to dynamic and relational facets of the structural whole of meaning (or “meaningfulness” if you will [older translations of Heidegger use “significance” but this is not quite adequate] that we are trying to understand. I therefore, for the most part, employ the English term “meaning” for both Sinn and Bedeutung and differentiate only when the discussion focuses on the structural role of a facet (Sinn, Bedeutung) rather than the nature and dynamics of the structure as a whole. This avoids awkward and unfamiliar English terminological usage and keeps the

\textsuperscript{1298} Inwood has an excellent concise account of Heidegger’s use of these terms. Ibid. p. 123-6.
philosophical focus on the issue at hand: not a study of Heidegger for the sake of Heidegger, but an philosophico-historical exploration of the problem of meaning.

**Ground**

<table>
<thead>
<tr>
<th>German: Grund</th>
<th>Latin: Principium</th>
<th>Greek: Aitia</th>
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As with “meaning” the nature of ground is discussed in the introduction. Ground is the foundation, the base upon which… The ground is that out of which things grow and upon which things stand. A ground of something is a reason for something. Grounds are causes, reasons, or even principles. The German word *Grund* is the only cognate to the English word ground, and it has the same denotations and connotations. Amongst the German mystics who Heidegger studied and about whom he once planned to write, *Grund* was used to refer to the divine essence within the soul. Grounds are fundamental principles and they are causes. This was how Kant and other German philosophers used the term, and it is only through inappropriate latinisations in translating things like “the four-fold root of the ground of sufficient reason” that renders them as “the four-fold root of the *principle* of sufficient reason.” Kant defined a ground as “that which determines a subject in respect of any of its predicates” and differentiated between grounds for knowing that something is and grounds for knowing why something is.\(^{1299}\)

Heidegger’s use of “ground” varies throughout the period under study. The self-grounding ground and the groundless ground become important concepts in the period

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from KNS 1919 onward. And one of the tasks of Chapter 3 in particular is to come to
terms with the nature of Ground in Heidegger’s thought in this period in regard to
meaning and understanding. In *Being and Time* Dasein (Heidegger’s term for human
existence) represents the ground of possibility of encountering entities as entities at all.

**Necessity and Contingency**

*German: Notwendig & Kontingent (adj)  Greek: Ananke & Symbebekos*

Necessity and contingency, that which must be as it is and that which can be otherwise
are crucial terms for Heidegger, and his engagement with them becomes wrapped up in
his engagement with Aristotle in the period under study. For Aristotle, science only seeks
to explain that which is necessary and it does this through demonstrations of necessity
that lead back to first principles. Heidegger’s relationship with necessity and contingency
is more complicated. In his earliest years he seems to struggle to keep ahold of necessity,
only to delve into the contingent and relative. But this is only a surface impression.
Heidegger’s work in the 1920’s displays a constant striving for necessity of one kind or
another, but the necessity to be found in *Being and Time*’s account is nearly
unrecognisable from the point of view of his *Habilitationsschrift*.

Necessity of facts means that they could not be otherwise. Contingency in regard
to facts means that they can. In logic, necessity in a proposition means that it is not
possible for it to be false; whereas contingency in a proposition means that it could be
true or not. The contingent is possible in a way that the necessary is not; the contingent
can be, or be as it is, but it need not. The two terms are not exact contradictories
(necessary vs. non-necessary, rather than necessary vs. contingent and vice versa), though they are mutually exclusive. They are a related pair of terms that express different properties or modes of being and because of this (the fact that each defines a different mode rather than the absence of the other’s mode) they cannot be seen as a pair of opposites; the relationship is more difficult than that.

Some Secondary Terms

Being

German: Sein  Latin: Ens  Greek: Ousia/On

Being is, of course, Heidegger’s key term: according to his own accounts, he spent his entire career in search of its meaning. The question of what it means for things to be is the most fundamental question in philosophy. Ontology, or the science of being *per se*, is one of the topics of Aristotle’s *Metaphysics*; and, according to readings that see the *Metaphysics* as a unified work, ontology is closely related, if not equivalent, to the other topics of the *Metaphysics*: first philosophy and theology. In the Western tradition after Aristotle these three pursuits have long been studied as either closely related or identical. After Heidegger’s break with Catholicism and, then, with any religiously grounded philosophy at all, the equation and even the link with theology became impossible for the philosopher. And the idea of first philosophy had to be rethought.
Existence

*German: Dasein*  *Latin: Ens/Sum/Existio*  *Greek: Ousia/On*

“Existence” is a key term for Heidegger, but he introduces a literalness into its usage – eventually hyphenating the German compound noun – that is intended to make us take phenomenological notice. From some philosophical standpoints there is little difference between what it means for something to be and for something to exist. In Heidegger’s thought and particularly in the existential analytic of *Being and Time*, however, while all entities are, only Dasein (the human being) exists. Existence in this sense is not just being, but a particular *way* of being; we are not just here in the world as objects are, but we relate to the world in a particular way. Heidegger explores this particular way of being and uses the term Dasein, or “existence” to denote it.

**Dasein (Da-sein)**

Litterally “being-there,” Dasein is Heidegger’s term for the human being. In common parlance the term means “existence;” and this was the common philosophical use for the term before Heidegger as well. Heidegger wants to specifically invoke the literal meaning of the word to point to the fact that we are as being-there, that is, our mode of being, as the kind of beings that we are, is to exist in a world. At the same time however, as with many of his other terms, he also wants to leave the common usages of the terms ringing in our ears.
Understanding

German: Verstehen [verb]/Verstand/Verständnis       Greek: Dianoia

The understanding is the faculty of comprehension. Understanding is tied to judgement and interpretation, and takes place through meanings. When we understand something we know what it means, and vice versa. When we understand something we “stand under” an interpretation, understanding means locating a phenomenon within the world of meaning.

Dilthey proposed that understanding was the goal of the human sciences. He thought that the human sciences should aim to uncover and trace the meaning-structures of human lived experience. Rather than explaining phenomena through examining causal relationships (i.e. as in Aristotle’s conception of science), the human sciences were to attempt to understand the internal meanings of phenomena for living human beings. The human sciences were to be hermeneutic, or, “interpretive,” rather than demonstrative or analytical.

Heidegger differentiates between the different German terms for understanding. He focuses on the verb verstehen, which has the same sense of “standing” as the English term. Understanding for Heidegger is taking a stand on the meaning of something, or standing under an interpretation of a given phenomenon’s meaning. “Unlike verstehen, [verbal] Verstand, [noun] ‘(the faculty of) understanding, intellect, common sense’, is for Heidegger, a term of disapproval.” \(^{1300}\) Heidegger uses this term to refer to common, unquestioned or ‘vulgar understanding’ (as he often puts it). “By contrast, Verständnis,

Heidegger stresses the active, verb-sense of the word as the positive, and the more static noun as the ossified and degraded sense of understanding. This comes from his general focus on activity over passivity, of active impulses or modes rather than passive faculties. He wants to stress that understanding, when it is at its most vital, is something we do, rather than something we have.

**Comportment**

*German: Verhalten*

*Verhalten* is literally the state of being held. But it is generally used to mean: “behaviour,” “attitude,” “conduct,” “demeanour,” or “comportment.” The verb, *Verhalten* means “to hold,” or “check one’s step,” whereas *Verhalten sich*, the reflexive personal form means “to behave” (particularly in the sense of behaving correctly or incorrectly) and “to behave-towards,” to assume an attitude towards (to be to X). Heidegger intends this directionality, which is why translators have chosen the somewhat cumbersome term “comportment” as “behaviour,” “conduct,” “carriage,” “bearing,” or “course of action” with its sense of direction and “dealing with X.” Inwood points out that this reflexivity is involved in the way that Heidegger stresses the difference between humans and animals. As he puts it, according to Heidegger: “Humans, animals and substances are so different in kind that they cannot be said to ‘behave’ in the same sense. To clarify matters then, we should find a different word for each case, and say that while humans *sich verhalten,*

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1301 Ibid.
animals *sich benehmen* (cf. MOVEMENT).” We behave in a way that we are held by the projections that we make, held by the meanings that we point towards, and so on.

“Comportment” is perhaps not an ideal term, but at least, with its very cumbersomeness it conveys somewhat of a sense of particularity as it expresses the notion of “directed-behaviour-that-holds-us” (which might be the best way to express Heidegger’s notion here).

**Interpretation**

*German: Deuten/Deutung/Auslegen/Auslegung/Interpretieren/Interpretation*

*Latin: Interpretation-em/Interpretari*

To interpret is to discover and expound the meaning of a phenomenon, word, text, etc.

When we interpret we bring the meaning of something to light. The German verb “*deuten,*” (to interpret) is related to *Bedeutung* (meaning) and has the sense of “pointing” or “indicating” (i.e. expounding the meaning). German also uses *auslegen,* which means “to lay out,” and the Latin-derived *interpretieren.*

Hermeneutics is the science of interpretation. And for Heidegger, picking up from Dilthey, philosophy itself must be hermeneutic rather than analytic, demonstrative, or deductive. Heidegger uses all three terms: *auslegen* rather loosely for interpretation in general, *interpretieren* for systematic interpretation, and *deuten* more casually, and at times he characterises his own work as hermeneutic phenomenology.

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1302 Ibid. p. 3.
1303 See Inwood, pp. 105-7 for a good concise account.
Positional/Attributive (as in they assign position. cause of x, etc.)

/Predicative Terms

Cause

*German:* Ursache/Grund  *Latin:* Causa  *Greek:* Aitia

A cause is something that produces an effect. A cause produces a phenomenon. A cause is a reason for something. A cause is a ground of an action or phenomenon. Causation is a relation; indeed, it is perhaps the prime relation involved in human understanding.

Modern science is as rooted in causal analysis as Aristotelian science was. The causal relation is inescapable as the basic building block of the way we interpret our experience of the world. "Hume called it ‘the cement of the universe.’"\textsuperscript{1304} As such a basic part of our understanding, however, it is very difficult to understand. If we say that a cause is that which produces an effect we run into the problem of determining just what production means. Are all modes of production or causing the same? Aristotle, of course, distinguished between different sorts of Causes. He distinguishes among what we have come to call the material, efficient, formal, and final causes of a phenomenon. But a more general and inclusive way of understanding causes would be to think of them broadly as explanations. A cause is an explanation (in whichever mode [for “the modes of causation are many”\textsuperscript{1305}]) for why a given phenomenon, broadly construed, is as it is, or, indeed, is at all. Causes are the grounds of phenomena, and both German and English use Grund or ground for cause.

\textsuperscript{1304} Aldi, Robert, *The Cambridge Dictionary of Philosophy.* P. 125.

\textsuperscript{1305} *Physics* 2. 3. 195a 28.


Principle

*German: Prinzip*  
*Latin: Principium*  
*Greek: Arche*

Principle is related to ground. A principle is that from whence something arises, its root, or origin. A principle, in a “generalized sense, [is] a fundamental source from which something proceeds; a primary element, force, or law which produces or determines particular results; the ultimate basis upon which the existence of something depends; cause (in the widest sense).”\(^{1306}\) The word comes from the Latin *principium*, which means beginning, foundation and even the headquarters of a military camp. Thus principle also has connotations of rule, hence its relation to “prince” and the sense of principle as governing law.

“Principle” is the word most commonly used to translate the Greek word *Arche* in Aristotle’s corpus. *Achai* are, of course, also beginnings. They are the first building blocks of demonstrative sciences as in *APo*, for instance, and their distinguishing feature in this regard is the fact that they are indemonstrable. Principles are the indemonstrable basis upon which one builds a demonstrative science, and the material comes from the features of the world that fall within its object domain. This of course begs the question of whether there is a sort of first principle – a principle that does not derive from a principle as the scholastics would put it – that sits beneath the many principles of the sciences. Aristotle rejects both a *regressus ad infinitum* and a groundless universe devoid of certainty (which would, at its most fundamental level, be impenetrable to reason and

\(^{1306}\) *Oxford English Dictionary*
therefore not understandable). Exactly how and to what extent he answers this question depends heavily on how one reads the *Metaphysics*.

**Greek Terms**

*Aition/Aitiai*

“Cause” is the word often used to translate the Greek *Aition* (the scholastics used *Causa*), which, as I will argue below, should, in philosophical terms at least, be translated as “ground.” Causes are, of course, grounds, but the connections of the word with modern conceptions, and particularly the cause/effect relation, impoverish the term by making it too narrow and thus, ironically, less accurate. Indeed, *Aition* suffers from the same sort of fate in translation as the German *Grund*. The latinisation of philosophical terms in the Western intellectual tradition has led to certain mischaracterisations of terms that become impediments to clear understanding (for Greek as much as German).

*Aitiai* are causes, explanations, grounds. And in Aristotle (and thus for Heidegger dealing with Aristotle), they play the central role in demonstrative science, which proceeds by making propositional statements that tie phenomena back to grounds. I follow McKirahan in translating *Aitiai* as grounds, rather than “as ‘cause’ (Mure, Ross) or ‘explanation’ (Barnes).”\(^{1307}\) McKirahan argues that neither of these English terms “captures the sense of *aitia* required by the theory of demonstration.”\(^{1308}\) He goes on:

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\(^{1308}\) Ibid. p. 209.
I have preferred to translate *aitia* and *aition* as “grounds” or “explanatory grounds,” partly to avoid the inappropriate translation “cause,” and partly to avoid the word “explanation,” since even though demonstrations are explanations, they are explanations of a special kind, and it seemed a good idea to find a somewhat different term. Moreover, “explanation” is more squarely in the realm of language than is desirable. An explanation is a series of propositions whose truth accounts for a fact. But Aristotle’s premises and conclusions are simultaneously or indifferently facts and propositions. He moves back and forth between the two ways of looking at them, sometimes saying that the principles and conclusions must be true (so that they are propositions) and sometimes treating them materially (e.g., “the conclusion belongs per se to a genus,” I.7 75a40-41).

“Grounds” and “explanatory grounds” can be used on both levels, since we may say that the premises (propositions) are the grounds of a conclusion (another proposition) and that certain facts are grounds of others. “Explanatory grounds” is clumsier, but conveys the idea that premises are grounds of conclusions by being the grounds (both as facts and as propositions) on which demonstrations are based, since demonstrations provide a certain sort of explanation of their conclusions and show that one proposition follows from others and also that one fact is necessitated by others.  

My own reading of the *Posterior Analytics* is as a text that explains the grounds of necessary knowledge, which is why I see it as a crucial text in Heidegger’s engagement

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with Aristotle and why I find his lack of explicit discussion of this text to be so telling (see my Chapter 3).

**Arche/Archai**

Archai are beginnings; they are principles. Principles are unproven and unprovable. As the first components of a demonstrative science, upon which all demonstration is based and from which all demonstration proceeds, the principles themselves cannot be demonstrable without a *regressus ad infinitum*, which Aristotle dismisses as an impossible irrationality.\(^{1310}\)

In APo I.2 71b20-22 Aristotle argues that “demonstrative scientific knowledge must depend on things that are true, primary, immediate, better known than, prior to, and grounds of the conclusion.”\(^{1311}\) Key for our discussion is Aristotle’s claim that principles must be grounds.\(^{1312}\) Demonstrative science begins with indemonstrable principles that are the grounds of the knowledge that follows.

There are different sorts of archai, or principles. Some principles are existence postulates: that there are such things as physical bodies is a principle of physics. Other principles are qualitative pronouncements, or laws about the nature and behaviour of phenomena: that physical objects can move, for instance, is likewise a principle of physics. But both of these kinds of principles are grounds for further knowledge.

\(^{1310}\) See *APo* I 1-3 for instance.


\(^{1312}\) Ibid., pp. 19, 105.
Scientific knowledge begins with these “first grounds” (if you will) and proceeds to make propositional statements that tie phenomena back to these grounds.

**Axiom/Axiomata**

Axioms, are common principles. They underlie and are a functional component of all sciences rather than just one. Aristotle points to the law of the excluded middle as an example of an axiom. We could look at them in a quasi-Kantian fashion as the *archai* of thinking itself rather than the *archai* of thinking within a given positive science. They pertain within *episteme* in general.

**Ousia**

*Ousia* is often translated as substance, being, or existence. Originally it meant one’s household goods, one’s property (this origin is important for Heidegger). Hanley chooses to leave the term un-translated, arguing that “the term is complex, and the possible translations so misleading, that to translate *OUSIA* is only to distort its meaning seriously.”\(^{1313}\) The common translation “substance” suffers from this problem; deriving from *substantia* it is a result of the latinisation of western philosophy and while, as a Latin term, it is not a bad fit, the English word “substance” has too much of the connotations of physical materiality to be useful.

“Being” is an obvious contender as a translation. Individual beings are sometimes described as *ousia*, while at other times the term is used in a more general sense as that which has qualities. Hanley presents an excellent account of *ousia* and argues that it primarily means form.\(^{1314}\)

“Existence” or even “that which is there” (*τα όντα*) are other possibilities, but each has its own problems as well.

**Logos**

*Logos* is speech, language, account, dialogue, speaking, reason, rational faculty, definition, proportion, order (McKirahan focuses on “account”). *Logos* is often translated as definition. Lear notes that “*Logos* is a protean word: it can also mean proportion, ratio, order.” In the *Physics* Aristotle defines form as “the *logos* of the essence” and Lear notes that in this case “the *logos* of the essence need not be a linguistic item; it can be the order, arrangement, proportion instatiated by the essence itself.”\(^{1315}\) This drives home the difference between the Greek sense of *logos* and our modern, language-focussed sense.

**Episteme**

*Episteme* is science, scientific knowledge, true knowledge, an organised body of knowledge. Aristotle’s theory of scientific knowledge, outlined in the *Posterior Analytics* in particular, describes an understanding of scientific knowledge as demonstrative, necessary, and certain knowledge. Scientific knowledge in the Aristotelian sense is, at its

\(^{1314}\) Ibid. pp. 57-67.

base, knowledge of grounds, or in its details, knowledge that points back to grounds. In APo I.2 71b9-12 Aristotle says “We think we have scientific knowledge [epistasthai] without qualification of each thing… when we think we know [ginoskein] the grounds [aitia] of the thing [pragma] as being its grounds, and that this cannot be otherwise.”

As McKirahan puts it: “Two requirements of having scientific knowledge of something are that (1) we know its aitia and (2) we know that its aitia is its aitia.”

Nous

Nous is the way of being that leads to knowing the principles. (McKirahan 257) It has been seen as a faculty of intelligence, intellect, mind (Lear’s preferred use), but this way of looking at nous is too passive. I see Aristotle’s arguments here in more active terms (along the lines of Kosman’s account of Aristotle’s ontology). Mckirahan points out that “Nous is a state,” but “way of being” is a more active characterisation, albeit one with Heideggerian overtones. As indemonstrable, the archai cannot be known like other things, which are known by demonstration, that leads back to the grounding archai. As McKirahan puts it: “If episteme is demonstrative knowledge of conclusions of

\[\text{\textsuperscript{1316} Ibid. p. 22.}\]
\[\text{\textsuperscript{1317} Ibid. p. 209.}\]
\[\text{\textsuperscript{1319} McKirahan, Principles and Proofs p. 257.}\]
\[\text{\textsuperscript{1320} Nous is a hexis (as is episteme), and, as Hanley argues, “Hexis cannot be translated as ?state? (as it so often is): it is a form of potentiality [dunamis].” I prefer to follow Kosman and translate dunamis as “capacity” (a capacity for an activity [his translation of energeia]), which captures the “activity of being” in Aristotle, and sees hexen in terms of ways of being rather than static “states”. Hanley, Being and God in Aristotle and Heidegger. p. 26. See also Kosman, The Activity of Being, introduction, for a quick account of his argument.}\]
scientific proofs, undemonstrated knowledge of principles must be something else.

Aristotle gives reasons (the unjustified premises) to identify this knowledge as *nous*.”

We do not know principles through demonstration; we must simply grasp them.

**Noesis**

*Noesis* is the operation of nous, thinking, intuition, or in my terms, it is the enactment of the way of being that is *nous*. *Noesis* is the process of grasping.

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1321 Ibid.
Appendix 3 – Timeline of the Development of Quantum Mechanics

This brief appendix is meant to serve as a quick reference guide to the basic chronology of the events described in my two chapters on the history of quantum physics. The analytical process that these chapters enact requires some chronological “bouncing around” in the presentation. Thus this short list is provided to help to keep the reader on track.

The Pre-History of the Quantum Problem

1687  Publication of Newton’s *Principia*

1704  Publication of Newton’s *Optics*

1788  Lagrange develops his equations of motion and presents a mechanics devoid of models and explanations in his *Analytical Mechanics*

1818  Fresnel publishes his paper on diffraction based on a wave theory of light

1833  Hamilton’s equations of motion

1860  Kirchhoff proposes the idea of a blackbody and describes the function between wavelength and temperature

1867  Thomson and Tait’s *Treatise on Natural Philosophy* published

1873  Maxwell’s *Treatise on Electricity and Magnetism* published
**1890s** Study of blackbody radiation at the PTR in Berlin

**1897** J.J. Thomson determines the charge to mass ratio of the electron “discovering” it

**1900-1925 The Old Quantum Theory**

**1900** Planck introduces quantization in order to solve the problem of blackbody radiation

**1905** Einstein introduces the quantization of light (the light quantum will later be dubbed the photon); Einstein produces his special theory of relativity

**1911** Rutherford discovers the nucleus, Bohr’s dissertation

**1913** Bohr introduces his quantized theory of atomic structure in a trilogy of papers

**1916** Einstein introduces probabilities into quantum theory

**1919** First edition of Sommerfeld’s *Atombau und Spektrallinien*

**1920** Bohr introduces a theoretical foundation for the periodic table in what is sometimes called his “second atomic theory”

**1923-5** Period of the “crisis” of the so-called “old quantum theory”

**1924** BKS paper (Bohr, Kramers, Slater) proposes that the conservation of energy applies only statistically in the sub-atomic realm (quickly refuted by experiment the next year); papers by Einstein and Bose on quantum statistics; Prince Louis de Broglie proposes the idea of matter waves
1925 Quantum Mechanics

1925 Pauli’s exclusion principle; Heisenberg, along with Born and Jordan develop Matrix Mechanics; the new era of Quantum Mechanics has begun

1926 Schrödinger develops Wave Mechanics; Born produces his probability interpretation of quantum mechanics; Dirac produces his papers on the mathematical foundations of quantum mechanics; Schrödinger visits Copenhagen and debates with Bohr; Bohr and Heisenberg attempt to arrive at an interpretation of quantum mechanics, strenuous debates ensue

1927 The “Copenhagen Interpretation,” Bohr’s Concept of Complementarity, and Bohr’s Quantum-Philosophy

1927 Heisenberg introduces the Uncertainty Relations; Bohr announces his concept of Complementarity at Lake Como; Bohr’s interpretation, along with Heisenberg’s work represents what comes to be called the “Copenhagen Interpretation,” centring on complementarity and wave/particle duality


1929 Bohr presents “The Quantum of Action and the Description of Nature” and writes his “Introductory Survey” to *Atomic Theory and the Description of Nature*.

After 1929

Bohr continues to refine his interpretation, centred on the concept of complementarity; he continues to expand upon the “epistemological lesson” that
he believes recent developments in quantum physics can teach to other sciences, but also to the arts, human sciences, and philosophy in general