EVALUATION OF THE PHYSIQUE, DEVELOPMENTAL
LEVEL, AND BASAL METABOLISM OF TWO
HUNDRED SELECTED INDIVIDUALS BY THE
APPLICATION OF THE WETZEL GRID
TECHNIQUE

by

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Typed by Barbara J. White

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CHAPTER I

INTRODUCTION

The school-age period is one in which the health status of
the pupil must constantly be observed and appraised if optimum growth
and development are to be realized. The aim of this study is to
apply the Grid technique to the appraisal of the physical growth
and development of children. Of special interest is how the
physique, developmental level, and basal metabolism of students in
Klamath Falls, Oregon compare with the Wetzel Grid norms and with
children studied in other American and Canadian cities.

Statement of the Problem. This study is a factual pre-
sentation and analysis of how two hundred selected individuals in
the Klamath Falls high school compare with the Wetzel Grid norms.
The problem divides itself into several parts. In evaluating the
physique the investigator was interested in obtaining an accurate
picture of how these selected individuals compare with Wetzel's
"chart child". In evaluating the developmental level, the investi-
gator was interested in finding out whether these individuals in
question are developing according to the Wetzel norms obtained on a

nationwide basis. If they are not developing in a pattern similar to that of the national norms, the question then is raised as to what the cause might be.

Value of the Study. This study is designed to obtain an accurate record of how the two hundred selected individuals compare in their physical make-up as assessed by the Wetzel Grid. In the later part of the study the results will show whether there is growth failure in these children, whether they are developing according to a normal growth pattern, or whether their growth is accelerated.

Purpose of the Study. This study deals with the various factors inherent in the Wetzel Grid. Healthy progress is reflected in development along a channel of given body type on an age schedule pertaining to the subject. The year to year preservation of that subject's basic natural physique also is essential. On the year to year progress in development each child should be considered his own standard for comparison. The grid is so constructed that it is possible to determine quantitative ratings on such factors as physique, developmental level, basal metabolism and caloric needs from height, weight, sex and age data. The quality of a child's growth is related to the direction and speed of development of the child. Conclusions must be made on the basis of a series of observations, because growth is fundamentally a dynamic matter and not one of fixed status. In attempting to evaluate growth quality, attention must be turned to what has been happening to a child from one year to the next over a period of years.

Procedures Used in Making the Study. The data used in this study were obtained from the health records of those children entering Klamath Union High School as freshmen in the school year of 1956-1957. Complete records were available for the eight years of their school life. Two hundred complete health records were chosen at random, one hundred of which were boys and the other hundred girls. The height, weight, and age were recorded on the data chart of the Wetzel Grids and these in turn were plotted on the graphs. Other health data were recorded on the reverse side of the Grid in the general information chart. From this information the study was pursued.

CHAPTER II

BACKGROUND STUDIES

Too often taken for granted is the highly complex phenomena of growth and development of children. Many obstacles arise even when effort is exerted to assure proper growth and development. Lack of time, lack of funds, personnel, reliable or practical methods, and the infinite variety of differences between children all add greatly to the difficulties of analyzing and judging physical growth and development in the individual child. Because of its relative simplicity and effectiveness, the Wetzel Grid for evaluating physical status was employed in this study.

Basis of the Wetzel Grid. The Grid consists of definite standards. Each of its items may be separately measured and distinguished from data on weight, height, and age. The following characteristics are found on the Grid: growth, development, physique (which is body build), nutritional grade, physical status, age advancement, maturation, basal metabolism, caloric needs and net progress. The definitions of these characteristics are contained in the following sentences.

DEFINITIONS: Growth. -- For Grid purposes there are two forms: (a) growth in weight and (b) growth in height. The former is measured along the vertical weight scale, the latter along the horizontal height scale.

<u>Development</u>. -- The resultant of growth in weight and growth in height, measured in "levels" read off from the diagonal scale of the channel system. The physical development is measured on the grid by means of the iso-developmental level lines.

<u>Physique</u>. -- Body type. Nine principal varieties of physique are classified by channels extending from A_4 through M to B_4. All subjects in a given channel have substantially the same body type irrespective of developmental level. Obese subjects have points outside and to the left of channel A_3; the stocky in A_3 and A_2, those of medium build in A_1, M, B_1, the slender in B_2 and B_3 and extremely linear types plot in B_4 and below.

<u>Nutritional Grade</u>. -- Measured by the slope or steepness of a child's curve with respect to the pitch of the channel system. The normal or optimal nutritional gradient is along any given channel, provided also that development proceeds at a rate not much more or less than 1 level line per month and hence keeps to a self-specific schedule paralleling the standard auxodromes of the Grid chart. "Over-nutrition" is indicated by a slope greater than that of the channel system; "undernutrition" by slopes less than the channel inclination.

<u>Physical Status</u>. -- The combined result of the interplay between the four preceding items. Six grades of physical status are classified in the Key Table to the left of the Grid: Obese (A_4 or greater), Stocky (A_3, A_2), Good (A_1, M, B_1), Fair (B_2), Borderline (B_3) and Poor (B_4).

<u>Age Schedule</u> (<u>Auxodrome</u>). -- A curve representing the age at which a

child arrives at any developmental level in the channel. Five such time tables of developmental advancement are included in the panel to the right of the grid and have been standardized to give the percentage of children on or ahead of these respective schedules. They are to be read and understood as follows, from the top down:

-- 2 per cent of children will have reached the 68th level in the channel as early as 6 years, the 83rd level by the seventh year and 100th level by 8.3 years, etc.;

-- 15 per cent of children are scheduled to reach the 47th level by the age of 6, the 61st level by the age of 7 and the 100th level on or before 10.3 years, etc.;

-- Again, two out of three healthy children reach the 32nd level on or before their sixth year, the 75th level on or before 9.2 years, etc.;

-- Finally, 98 per cent of all children will have reached level 40 at least by the eighth year, level 70 by the eleventh year, etc.

The 67 per cent auxodrome is taken as the standard of reference for determining whether a child is advanced, normal, or retarded in development. A child's own auxodrome may thus be compared directly with these standardized schedules of development and a decision be reached as to whether the subject in question is keeping to his schedule.

Maturation. -- Advent of puberty. This may be expected in the neighborhood of the greatest upper curvature of an individual auxodrome.

Basal Metabolism. -- Standard values for either sex with which to compare actual tests or from which to estimate expected basal heat production are erected on the scale at the extreme right and are aligned directly to the grid and auxodromes by means of the horizontal isodevelopmental level lines. No corrections for "off size," age or body build are required. Simply read the value of heat output for developmental level in question. Percentage deviation of actual test from this value may be computed as usual. The sensitivity of the method is high, i.e., deviations from the Grid standards tend to be greater than by other methods both in hyper- as well as in hypometabolism. Reliability is also high, the coefficient of variation in control series being only 4.6%.

Caloric Needs. -- For maximum daily caloric intake multiply the foregoing basal heat estimate by two. For average values use 1.9 for boys and 1.8 for girls.

Net Progress. -- Evaluated by character of channel course and corresponding auxodrome taken as a whole. Generally unsatisfactory progress is easily distinguished from satisfactory types by failure to parallel the channels and auxodromes. Progress thus measured enables one to avoid fallacies connected with the estimates of "height-age", "weight-age" and other similar indices which are based on the untenable assumption that all children should be referred to some center such as that of the M channel. This, of course, is precisely what should not be done; a child, whose natural channel is A_3, has no business in M; similarly, a natural B_3 should not be

forcibly driven into B_1, still less into M, even if 95% of B_3's are known to be there as a result of unfavorable circumstances. A natural B_3, as also a natural B_1, M or A_2, etc., will be found to keep to his channel on a schedule paralleling the standard auxo-dromes. Departures from this rule call for investigation.

For some of these ten characteristics the Grid is the only existing method of measurement; for all of them it is the simplest.

Dr. Wetzel's Study of 2,093 school children in Cleveland, Ohio presents the following results. He used only one developmental level to arrive at his percentage findings listed in the Table VI. This developmental level was number 100. The percentages give the grid ratings of physical status corresponding to the location of points in various channels. The greatest percentage of students (61.6) were charted in the A_1, M, and B_1 channels. In the auxodrome development section, the greatest percentage of students (67) were ch-arted on or above the 67% auxodrome, this being the normal develop-ment. The other percentages were 2, 15, 82, and 98 which became the auxodrome channels of the Wetzel Grid.

Other Studies Using the Wetzel Grid. There are three other surveys which will be compared with the study of Klamath Union High School freshmen. The first is E.N. Scramlin's survey taken in Muncie, Indiana in 1946. This study deals only with the physical status of the subjects. The results compare satisfactorily with those of Dr. Wetzel's study listed in Table V. The greatest percentage of students (59.5) were charted in the A_1, M, and B_1 channels.

The second survey was carried out in eight schools of the University Health District of Toronto, Ontario, Canada. It was made over a period of three years. The survey began in October, 1948 when grids were started for all the 568 first grade children in the eight schools. The following year, the children entering the first grade were added to the group making a total of something over 1100. Then a large group of the children moved away leaving a total of 808 for the completion of the survey. This survey deals with both the physical status and the auxodrome development of the subjects. The results compare satisfactorily with those of Dr. Wetzel's study listed in Table V. The greatest percentage of students (65.8) were charted in the A_1, M, and B_1 channels in the physical status section. In the auxodrome development section, the greatest percentage of students (71.9) were charted on or above the 67% auxodrome, this being the normal development. This result was computed on a cumulative percentage basis.

The third survey was initiated in September, 1947 in British Columbia, Canada. The Provincial Department of Health recommended the Central Vancouver Island Health Unit as the area of study. This survey is based on a two-year study. Some 5,565 elementary school children were screened by the use of the Wetzel Grid during the first year. The children were divided into two groups: grid satisfactory, which shows those children whose growth and development is normal, and grid unsatisfactory which shows those children whose growth and development is beyond the limits of

tolerance. After the results were charted on the Wetzel Grids, only those charted in the unsatisfactory grid were examined by the medical staff. Time limit did not allow for medical examination of the grid satisfactory group. The second year of the study, 1948-1949, was devoted to the grid records of all children in grades one to eight. A clinical appraisal of the grid records was made of all the students from the first year. In addition, a study was made of those who had moved into the study area since the survey began. This entire survey deals with both the physical status and the auxodrome development of the subjects. The results compare satisfactorily with those of Dr. Wetzel's study listed in Table V. The greatest percentage of students (69.3) were charted in the A_1, M, and B_1 channels in the physical status section. In the auxodrome development section, the greatest percentage of students (82.3) were charted on or above the 67% auxodrome, this being the normal development. This result was computed on a cumulative percentage basis.

CHAPTER III

THE STUDY

The study was made of a random group of two hundred incoming freshmen to Klamath Union High School in the school year 1956-1957. The individuals came from various elementary schools throughout the Klamath Falls district. This study began in June, 1956 with the random selection of 200 health record cards, 100 of which were boys and 100 girls. Information obtained from these health cards begins with these students entering elementary school as first graders and leaving to become ninth graders. The height, weight, and age of these individuals was taken from their health record cards and recorded on the Wetzel Grids. Other health information was recorded on the back of the Grids in the general information chart. This information was used later in the analysis of the change in growth development of the individuals according to channels and auxodromes. When the height and weight measurements were taken the children wore indoor clothing, however their shoes were removed. These measurements were taken only once a year as close to September as possible.

Evaluation of the Physique. The age distribution at the time of the first grade measurement is given in Table I. The largest number of students were 6 years 4 months of age with most of the remainder ranging from 5 years 10 months to 6 years 9 months of age. The number of students measured was two hundred, one hundred

of which were boys and one hundred girls. The table charts the results
of the combined group of boys and girls.

TABLE I

AGES OF BOYS AND GIRLS AT FIRST GRADE MEASUREMENT

Ages (Years and Months)	Number	Per Cent
5.10	18	9.0
5.11	17	8.5
6.0	18	9.0
6.1	19	9.5
6.2	12	6.0
6.3	12	6.0
6.4	26	13.0
6.5	15	7.5
6.6	18	9.0
6.7	13	6.5
6.8	13	6.5
6.9	10	5.0
6.10	4	2.0
6.11	3	1.5
7.3	1	0.5
7.5	1	0.5
TOTAL	200	100.0

The age distribution at the time of the eighth grade measure-
ment is given in Table II. The largest number of students were 13
years 4 months of age. Most of the remainder ranged from 12 years
10 months through 13 years 8 months with the omission of 13 years
2 months of age. These results are of the same two hundred indi-
viduals which were measured in the first grade.

TABLE II

AGES OF BOYS AND GIRLS AT EIGHTH GRADE MEASUREMENT

Ages (Years and Months)	Number	Per Cent
12.8	1	0.5
12.10	14	7.0
12.11	14	7.0
13.0	15	7.5
13.1	16	8.0
13.2	8	4.0
13.3	10	5.0
13.4	22	11.0
13.5	14	7.0
13.6	16	8.0
13.7	12	6.0
13.8	12	6.0
13.9	9	4.5
13.10	8	4.0
13.11	6	3.0
14.0	3	1.5
14.1	2	1.0
14.2	4	2.0
14.3	2	1.0
14.4	4	2.0
14.5	2	1.0
14.6	2	1.0
14.7	1	0.5
14.9	1	0.5
15.3	1	0.5
15.7	1	0.5
TOTAL	200	100.0

Table III gives a picture of how the children upon first
measurement fall into the various physique channels. By charting
only a single measurement on the graph, one can make at least a
partial estimate of a child's physique. It remains provisional until
a second measurement has been established creating a trend toward a

determined channel. Thus, according to Table III, any point line in channels A_3 and A_2 represents a subject of the stocky (S) type. A point in the A_1, M, and B_1 channels represents a subject of the good (G) category. A point in B_2 channel represents a child whose physical status can be considered only fair (F), that is, in doubt but not yet so greatly in doubt as a point in B_3 which is borderline (B). In A_4 channel and above are those of increasing grades of obesity beginning, perhaps, with the stout or overly plump (O). In B_4 channel and below are those whose physical status is poor (P).

TABLE III

FIRST MEASUREMENT OF CLASSIFICATION OF CHILDREN BY
GRID PHYSIQUE TYPE AND SEX

Sex	Misc.	A4	A3	A2	A1	M	B1	B2	B3	B4	TOTAL
No. Boys	0	3	2	9	27	23	26	8	1	1	100
No. Girls	3	0	3	10	8	30	28	13	5	0	100
Totals	3	3	5	19	35	53	54	21	6	1	200

Table III reveals that 71 per cent of the 200 children measured fall into what is termed the (G) or Good group, 12 per cent fall into the (S) or Stocky group, 3 per cent fall into the (O) or Obese group, 10.5 per cent fall into the (F) or Fair group, 3 per cent fall into the (B) or Borderline group, and 0.5 per cent fall into the (P) or Poor group.

In Table IV, which deals with the last measurement of each child in the eighth grade, one can see how the percentages have varied. This reveals that a certain percentage of the children have changed from the channels in which they began.

TABLE IV

LAST MEASUREMENT OF CLASSIFICATION OF CHILDREN BY
GRID PHYSIQUE TYPE AND SEX

Sex	Misc.	A4	A3	A2	A1	M	B1	B2	B3	B4	TOTAL
No. Boys	3	3	6	5	11	22	22	18	8	2	100
No. Girls	2	3	7	11	17	17	15	16	11	1	100
Totals	5	6	13	16	28	39	37	34	19	3	200

Table IV reveals that 52 per cent of the 200 children measured fall into the (G) or Good group, 14.5 per cent fall into the (S) or Stocky group, 5.5 per cent fall into the (O) or Obese group, 17 per cent fall into the (F) or Fair group, 9.5 per cent fall into the (B) or Borderline group and 1.5 per cent fall into the (P) or Poor group.

Examples of three subjects in the (O) or Obese group are given in the case studies to follow.

CASE STUDY OF SUBJECT F49

It was found that at the time this girl was 9 years, 2 months of age, she had thyroid trouble. She was given a basal

metabolism test and is taking a thyroid extract. Her A_4^+ channel reading was quite regular until the age of 8 years, 2 months, at which time she gained weight going even farther beyond her A_4^+ channel. After the discovery of her need for thyroid extract, in a period of one year she changed to the A_4 channel, remaining quite constant in her reading from there on. Her auxodrome reading is above the 2 per cent level, revealing that she is developing ahead of her age schedule. At the 100th developmental level, this girl's actual age is 6.11 years and she possesses a developmental age of 11.6 years. Thus, the difference between the actual age and the developmental age is 4 years 7 months.

CASE STUDY OF SUBJECT M107

This boy's channel reading is quite irregular. From 7 to 9 years of age he changed from channel B_3 to channel A_2. He has no glandular defect. His father is quite large in physique and the family is served enormous meals. This boy's overweight problem is not due to any physical factor, but doubtless has an emotional basis. He feels a loss of love and so eats constantly to compensate for this loss. He is frustrated and insecure. At the 100th developmental level, this boy's actual age is 9.2 years and he possesses a developmental age of 11.6 years. Thus, the difference between the actual age and the developmental age is 2 years 4 months.

Name. **Puter, Georgiana**

DATE OF BIRTH **July 11, 1942**

THE WETZEL GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
— A Guide to Individual Progress from Infancy to Maturity —

No. **F 48**

M ♀

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6-2	34	127	94
1949-50	7-2	36.3	129.5	101
1950-51	8-2	43	137.1	119
1951-52	9-2	47.7	139.9	129
1952-53	10-2	52.8	150	142
1953-54	11-2	59	156.5	154
1954-55	12-2	66.6	165.1	167
1955-56	13-2	69	166	171

PHYSIQUE CHANNELS

A₄ A₃ A₂ A₁ M B₁ B₂ B₃ B₄

ISODEVELOPMENTAL LEVEL LINES

BASAL METABOLISM—Cal / Day; Fuel Needs = 2 × Basal

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)

BOYS   GIRLS ------

BOYS   GIRLS

WEIGHT   Pounds   Kilos

Centimeters   Inches   HEIGHT

CHRONOLOGICAL AGE   Years

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American Copyright Union (1910)

TOLERANCE LIMITS
DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS

Obese	A₄
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄

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Name Bergmann, David

DATE OF BIRTH Sept. 22, 1942

GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
— A Guide to Individual Progress from Infancy to Maturity —

No. 102

♂ F

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6	21.5	1199	49
1949-50	7	22.3	127	55
1950-51	8	28.5	131	79
1950-52	9	34.5	1335	99
1952-53	10	36.9	1402	105
1953-54	11	45.3	146	126
1954-55	12	44.9	150	126
1955-56	13	44.9	1548	137

PHYSIQUE CHANNELS

A₀ A₁ A₂ A₃ M B₁ B₂ B₃ B₄

ISODEVELOPMENTAL LEVEL LINES

WEIGHT   Pounds   Kilos

HEIGHT   Centimeters   Inches

BASAL METABOLISM—Cal./Day Fuel Needs = 2 X Basal

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS

CHRONOLOGICAL AGE   Years

BOYS   GIRLS

CASE STUDY OF SUBJECT M147

This boy is an albino. He has enlarged cervical glands.
All the members of the family are quite obese. From 7 years, 2 months
of age to 8 years, 2 months of age he changed from channel A_2 to
channel M. From 8 years, 2 months of age to 9 years, 2 months of age
he changed from channel M to channel A_4, gaining 10.4 kilograms and
1.5 centimeters. His auxodrome development followed closely his
channel development. This boy likes to eat, thus explaining his
excessive gain in weight beginning at 10 years, 2 months of age.
At the 100th developmental level this boy's actual age is 8.9 years
and he possesses a developmental age of 11.6 years. Thus, the dif-
ference between the actual age and the developmental age is 2 years,
9 months.

Table III shows that approximately 17 per cent of the
children should have required medical investigation and supervision
during their first grade year, while Table IV reveals that 33.5 per
cent of the children will require medical investigation and super-
vision now. The subjects in channel B_2 or Fair group are of special
interest. It has been found that physicians cannot agree by more
than 50 per cent on medical ratings of children in this channel,
although they agree among themselves on 94 per cent of subjects in
all other channels. For this reason a child in the Fair or B_2 channel
should routinely become the subject of examination in order to
determine whether heredity and background account for the child

Name McClurg, Michael

DATE OF BIRTH June 22, 1942

AL-147

GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
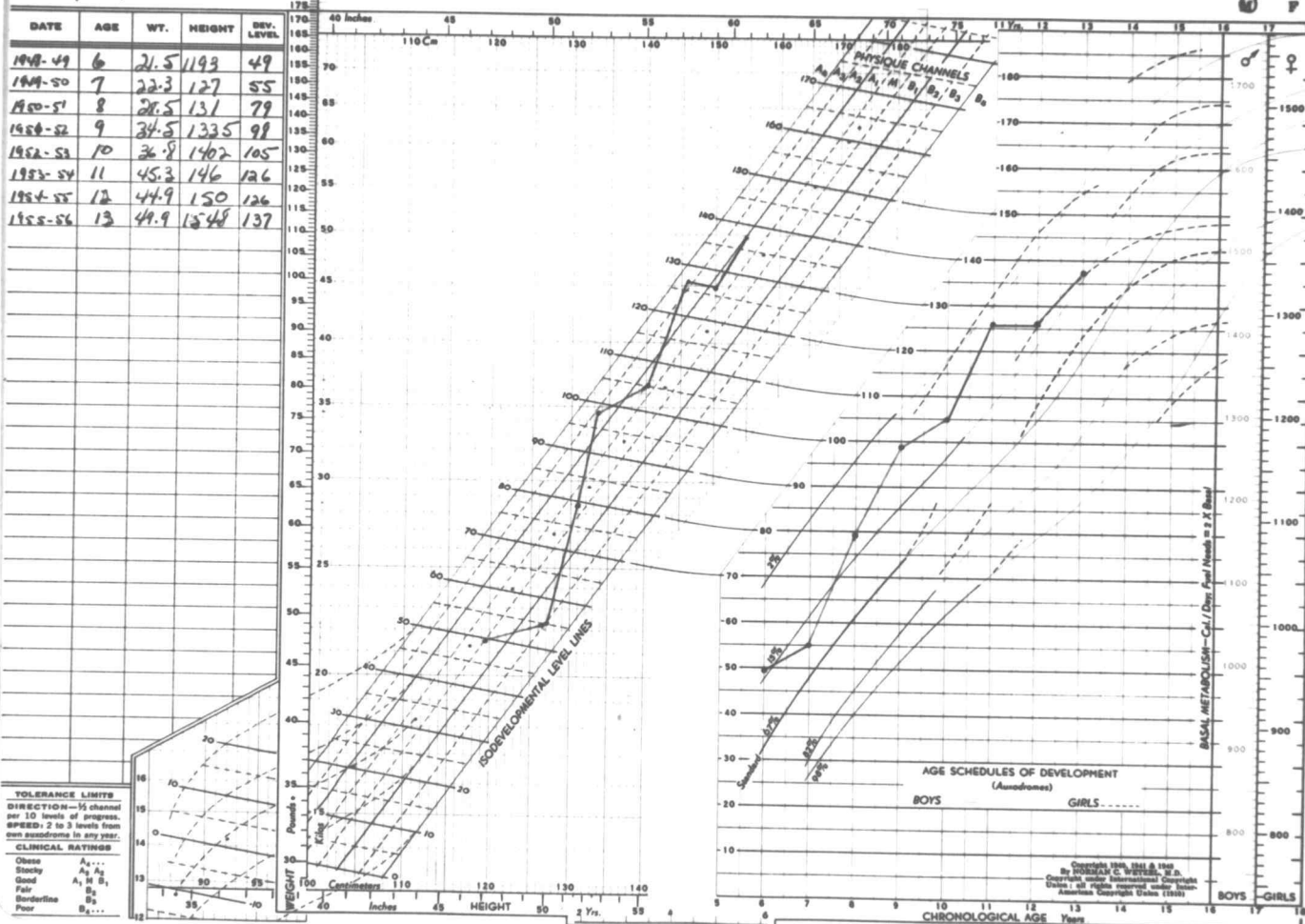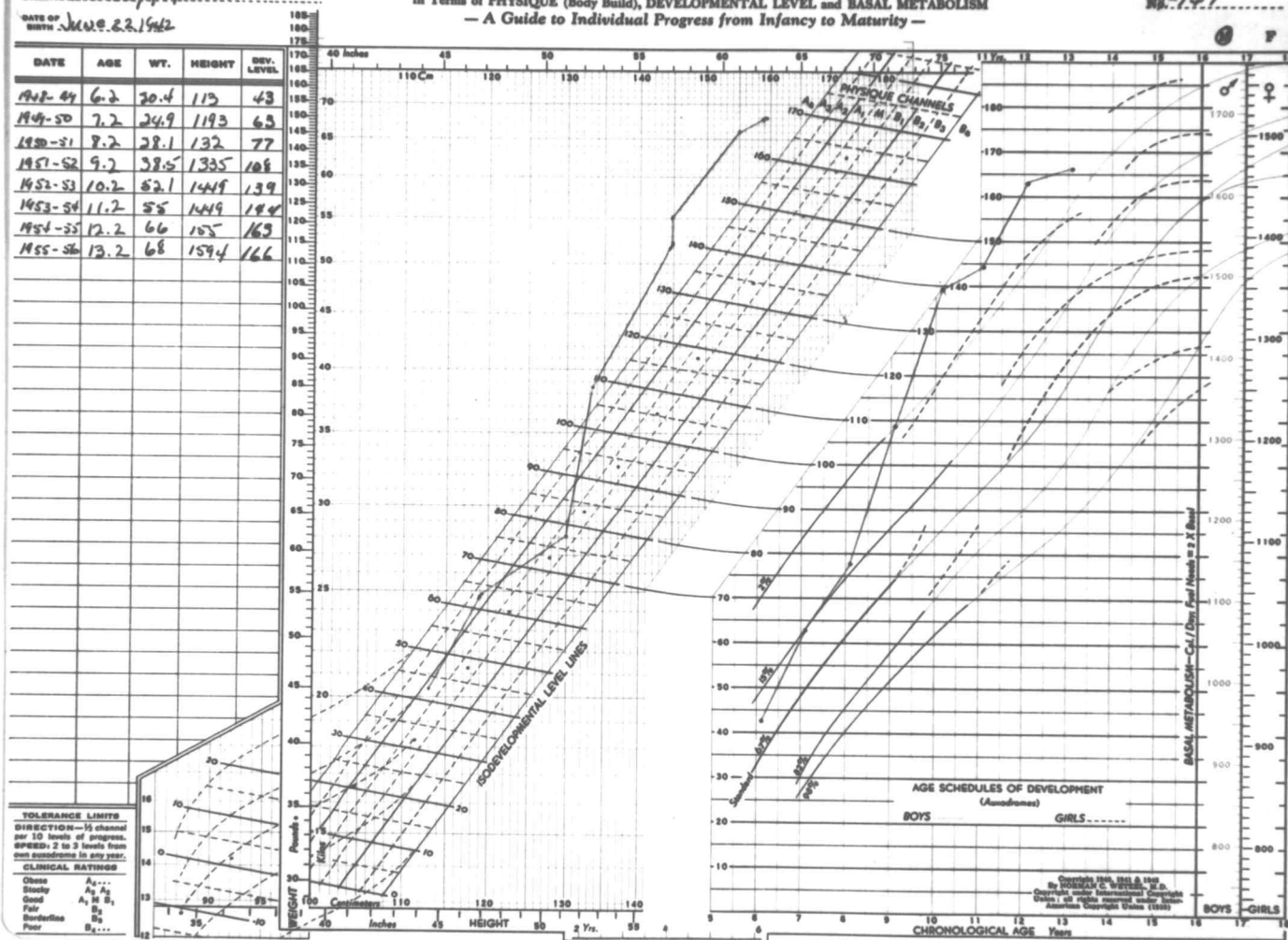### — A Guide to Individual Progress from Infancy to Maturity —

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6.2	20.4	113	43
1949-50	7.2	24.9	1193	63
1950-51	8.2	28.1	132	77
1951-52	9.2	38.5	1335	108
1952-53	10.2	52.1	1449	139
1953-54	11.2	55	1449	144
1954-55	12.2	66	155	163
1955-56	13.2	68	1594	166

PHYSIQUE CHANNELS

ISODEVELOPMENTAL LEVEL LINES

BASAL METABOLISM—Cal./Day, Fuel Needs ≅ 2 X Basal

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)

BOYS   GIRLS ....

TOLERANCE LIMITS
DIRECTION—½ channel
per 10 levels of progress.
SPEED: 2 to 3 levels from
own auxodrome in any year.

CLINICAL RATINGS

Obese	A₄...
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄...

WEIGHT   Kilos   Pounds

HEIGHT   Centimeters   Inches

CHRONOLOGICAL AGE   Years

BOYS   GIRLS

being there or whether disease is at work. Similar warning holds true for the borderline group or B_3's. Those falling in the B_4 or Poor group require not merely examination but treatment as well. Those in or above the A_4 channel need watching to prevent their going beyond the outer channel and also to remedy their obesity.

Table V compares the Klamath Falls results with Dr. Wetzel's "world standards", E. N. Scramlin's survey in Muncie, Indiana, the British Columbia study and the Wetzel Grid survey in Toronto, Ontario. The Klamath Falls study produced the following results: the results of the first grade measurement do not compare at all with the results of the other studies. For example, Dr. Wetzel's findings in channels A_1, M, and B_1 produced a percentage of 61.6 while the Klamath Falls percentage was 71.0. The findings of the British Columbia study were most similar to the Klamath Falls study, that being 69.3 per cent. Results of the last measurement in the Klamath Falls study showed that there was a higher percentage in the B_2 group than in any of the other studies. This percentage was 17.0 while Dr. Wetzel's was 13.9. All the other fell below that number except the Muncie, Indiana survey which was 14.2. In the A_1, M, and B_1 groups the percentage of the Klamath Falls study was only 52.0, falling far below that of Dr. Wetzel's standard which was 61.1 per cent.

TABLE V

COMPARISON OF RESULTS KLAMATH UNION HIGH
SCHOOL FRESHMAN STUDY WITH OTHER SURVEYS

	University District	Muncie Indiana	British Columbia	Dr. Wetzel	First Grade Findings Klamath District	Freshman Findings Klamath District
(A) Physical Status						
A4 and Above	7.1	6.8	3.5	6.8	3.0	5.5
A3 and A2	15.	15.5	11.7	9.4	12.0	14.5
A1, M, and B1	65.8	59.5	69.3	61.6	71.0	52.0
B2	10.1	14.2	11.8	13.9	10.5	17.0
B3	1.1	3.5	3.3	5.9	3.0	9.5
B4 and Below	0.5	0.5	0.4	2.4	0.5	1.5
(b) Auxodrome						
On and above 2% Auxodrome	8.8		5.0	2.0	6.5	10.5
On and above 15% Auxodrome	40.6		41.7	15.0	52.5	40.0
On and above 67% Auxodrome	71.9		82.3	67.0	83.5	74.5
On and above 82% Auxodrome	94.9		96.1	82.0	99.5	96.5
On and above 98% Auxodrome	98.0		98.3	98.0	0.0	100.0
Below 98%					100.0	0.0

Evaluation of the Developmental Level. Physical develop-
ment is measured on the grid by means of the isodevelopmental lines.
Two subjects, both of whom have arrived at level 100, no matter
how or in which channel, are considered as being on the same
developmental level. Table VI is a comparison of the Klamath Falls
students with the subjects of Dr. Wetzel's survey at the 100th
isodevelopmental level. In the A_1, M, and B_1 groups, the Klamath
Falls results were 58.6 per cent as compared to 61.6 per cent in
Dr. Wetzel's survey. In the A_3, A_2 groups the Klamath Falls results
were 12.7 per cent as compared to 9.4 per cent in Dr. Wetzel's
survey. In the A_4 and above group, the Klamath Falls results were
2.5 per cent as compared to 6.8 per cent in Dr. Wetzel's survey,
showing that there was less obesity at this level in the Klamath
Falls students than in the subjects of Dr. Wetzel's survey. In the
B_2 group, the Klamath Falls results were 18.3 per cent as compared
to 13.9 per cent in Dr. Wetzel's survey. In the B_3 group, the
Klamath Falls results were 6.1 per cent as compared to 5.9 per cent
in Dr. Wetzel's survey. In the B_4 and below group, the Klamath
Falls results were 1.5 per cent as compared to 2.4 per cent in Dr.
Wetzel's survey showing that there was a smaller percentage of
Klamath Falls students than subjects of Dr. Wetzel's survey in the
borderline or poor classification. In the B_2 group the Klamath
Falls students proved to have a higher percentage than Dr. Wetzel's
subjects. However, this group of students will need close observation
to see that no physical defects develop.

TABLE VI

COMPARISON OF RESULTS OF KLAMATH UNION HIGH SCHOOL
FRESHMAN STUDY WITH DR. WETZEL'S SURVEY AT THE 100TH
DEVELOPMENTAL LEVEL LINE

		Dr. Wetzel Per Cent	Klamath Falls Per Cent
(A)	Physical Status		
	A_4 and above	6.8	2.5
	A_3 and A_2	9.4	12.7
	A_1, M, and B_1	61.6	58.6
	B_2	13.9	18.3
	B_3	5.9	6.1
	B_4 and below	2.4	1.5
(B)	Auxodromes		
	On and above 2% auxodrome	2	5.1
	On and above 15% auxodrome	15	47.9
	On and above 67% auxodrome	67	83.1
	On and above 82% auxodrome	82	97.8
	On and above 98% auxodrome	98	99.8

Tables VII and VIII deal with the developmental level in age schedule. It may be said that curves display advanced, normal and retarded patterns of developmental progress and may be taken to show how physical development proceeds with respect to age during its channel course on the grid. An example of an abnormal result is the tendency for an auxodrome which has been following one of the more advanced courses to fall behind its expected schedule by a year or more. This may be the first sign of physical trouble and may appear even before the child's developmental curve has departed from its own channel. Case study No. M192 is an example of retarded development.

This boy is retarded in development by 11 months.

CASE STUDY OF SUBJECT M192

This boy's record reveals one great irregularity in channels between the ages of 9 and 10. This was due to some emotional disturbance as stated on his health record card. From 10 to 11 he gained only .5 centimeters and no kilograms. He did not appear well but no evidence was visible that any physical factor was at fault. From the 11th to the 12th year he did not gain in height but gained 5 kilograms. He is now back in channel B_1 but his auxodrome reading is only in the 82 per cent. At the 100th developmental level this boy's actual age is 12.5 years and he possesses a developmental age of 11.6 years.

Case study No. F29 is an example of advanced development. It indicates that the girl is 4 years, 2 months in advance of normal development.

CASE STUDY OF SUBJECT F29

When this girl was measured in the first grade it was found that she was large for her age both in height and weight. She was not overage, her age being 6 years, 9 months. Subsequent measurements showed her to continue in the area above the A_4 channel. Her auxodrome or age development reading reveals that she is developing above the normal, consequently she is quite large. She has no glandular defects and is under no medical supervision as far as is

Name McKune, Larry   GRID for Evaluating PHYSICAL FITNESS   No. My 12
                                in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
DATE OF Aug 16, 1942   — A Guide to Individual Progress from Infancy to Maturity —   M   F
BIRTH

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6	18.5	113	33
1949-50	7	20.8	118	46
1950-51	8	24.4	1245	63
1951-52	9	25.5	1295	68
1952-53	10	27.2	143	78
1953-54	11	27.2	1435	78½
1954-55	12	32.1	1435	94
1955-56	13	36.2	1471	106

PHYSIQUE CHANNELS

ISODEVELOPMENTAL LEVEL LINES

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS ------

BASAL METABOLISM — Cal. / Day Fuel Needs = 2 × Basal

TOLERANCE LIMITS
DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS
Obese   A₀....
Stocky   A₁ A₂
Good   A₁ M B₁
Fair   B₂
Borderline   B₃
Poor   B₄....

CHRONOLOGICAL AGE Years

BOYS   GIRLS

26

THE WETZEL GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
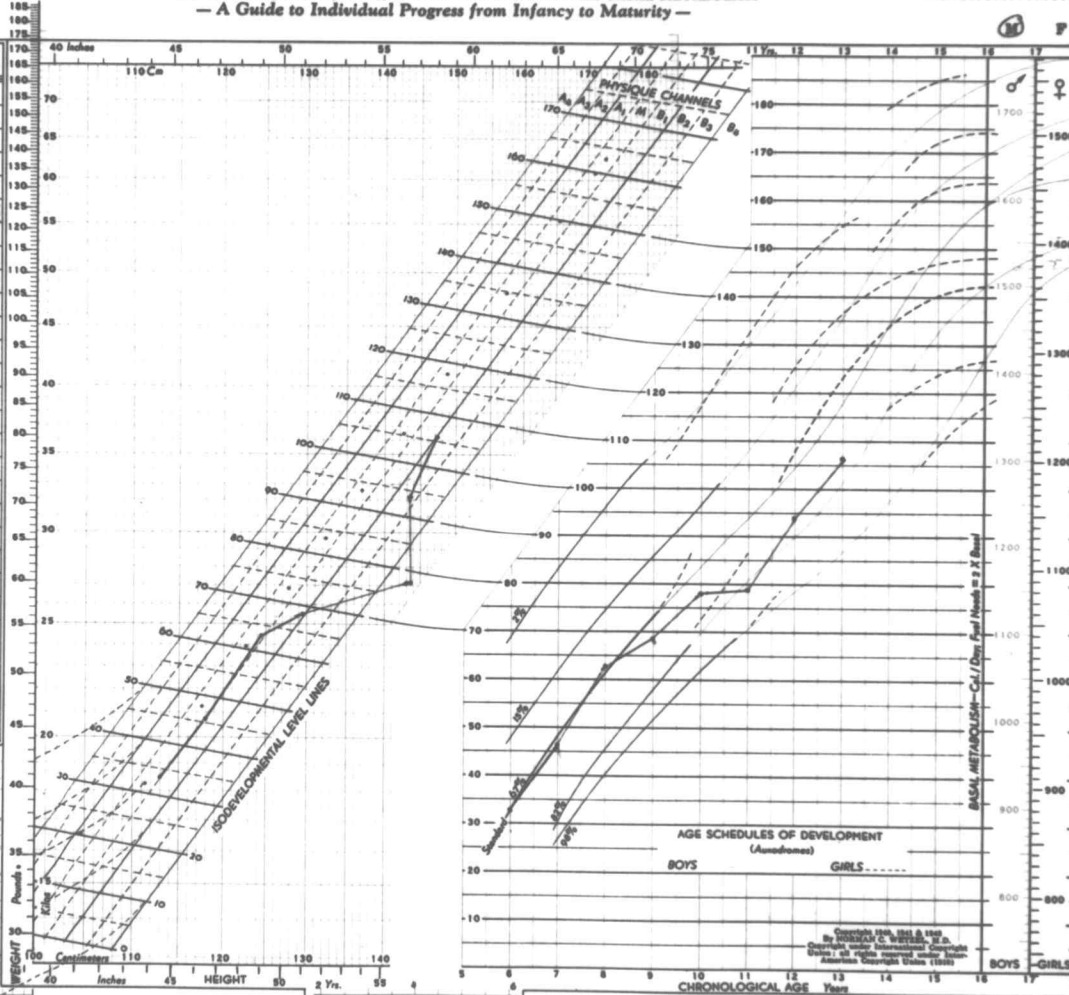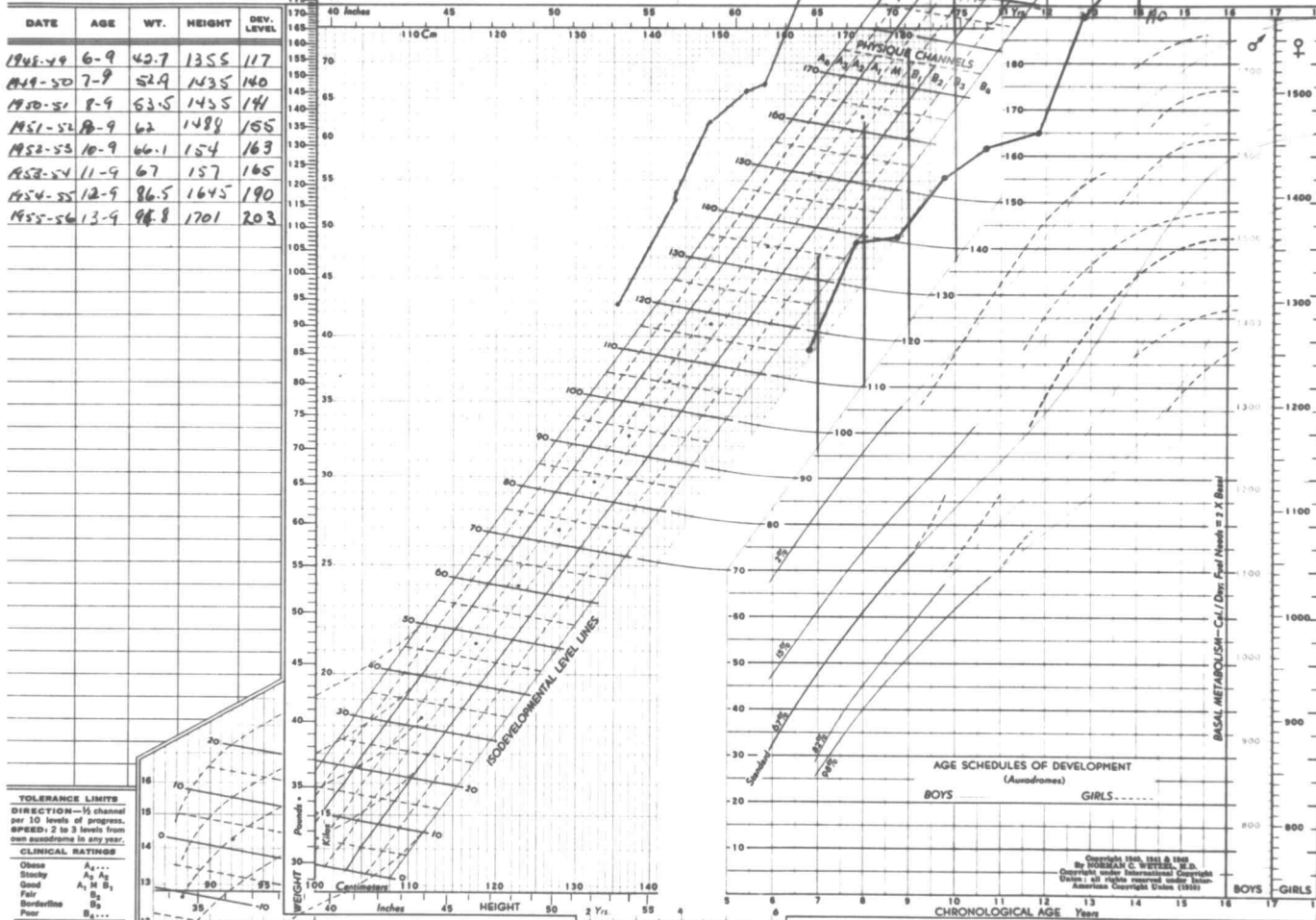— A Guide to Individual Progress from Infancy to Maturity

Name Johnson, Mary

No. F.22

DATE OF BIRTH December 12, 1941

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6-9	42.7	1355	117
1949-50	7-9	52.9	N35	140
1950-51	8-9	53.5	1435	141
1951-52	9-9	62	1488	155
1952-53	10-9	66.1	154	163
1953-54	11-9	67	157	165
1954-55	12-9	86.5	1645	190
1955-56	13-9	94.8	1701	203

TOLERANCE LIMITS
DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS
Obese	A₄...
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄...

ISODEVELOPMENTAL LEVEL LINES

PHYSIQUE CHANNELS

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS ....

BASAL METABOLISM—Cal./Day, Fuel Needs = 2 X Basal

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CHRONOLOGICAL AGE Years

known. At the 160th developmental level, this girl's actual age is 10.5 years and she possesses a developmental age of 14.7 years. The reason the 160th developmental level is being used is that when this girl began school she was past the 100th developmental level. The difference between the actual age and developmental age is 4 years, 2 months.

Case study No. M178 is an example of irregular development.

CASE STUDY OF SUBJECT M178

Both of this boy's parents are tall and thin. At the time of the first measurement he was in channel B_3 and from there moved toward the left until at the age of 9 years, 8 months (3 years time) he was in channel A_4. He remained in channel A_4 for two years and then moved toward the M channel where he concluded at the age of 13 years, 8 months. At the 100th developmental level this boy's actual age is 8.1 years and he possesses a developmental age of 11.6 years. Thus the difference between the actual age and the developmental age is 3 years, 5 months.

Case study No. M126 is another example of irregularity in channel and auxodrome development.

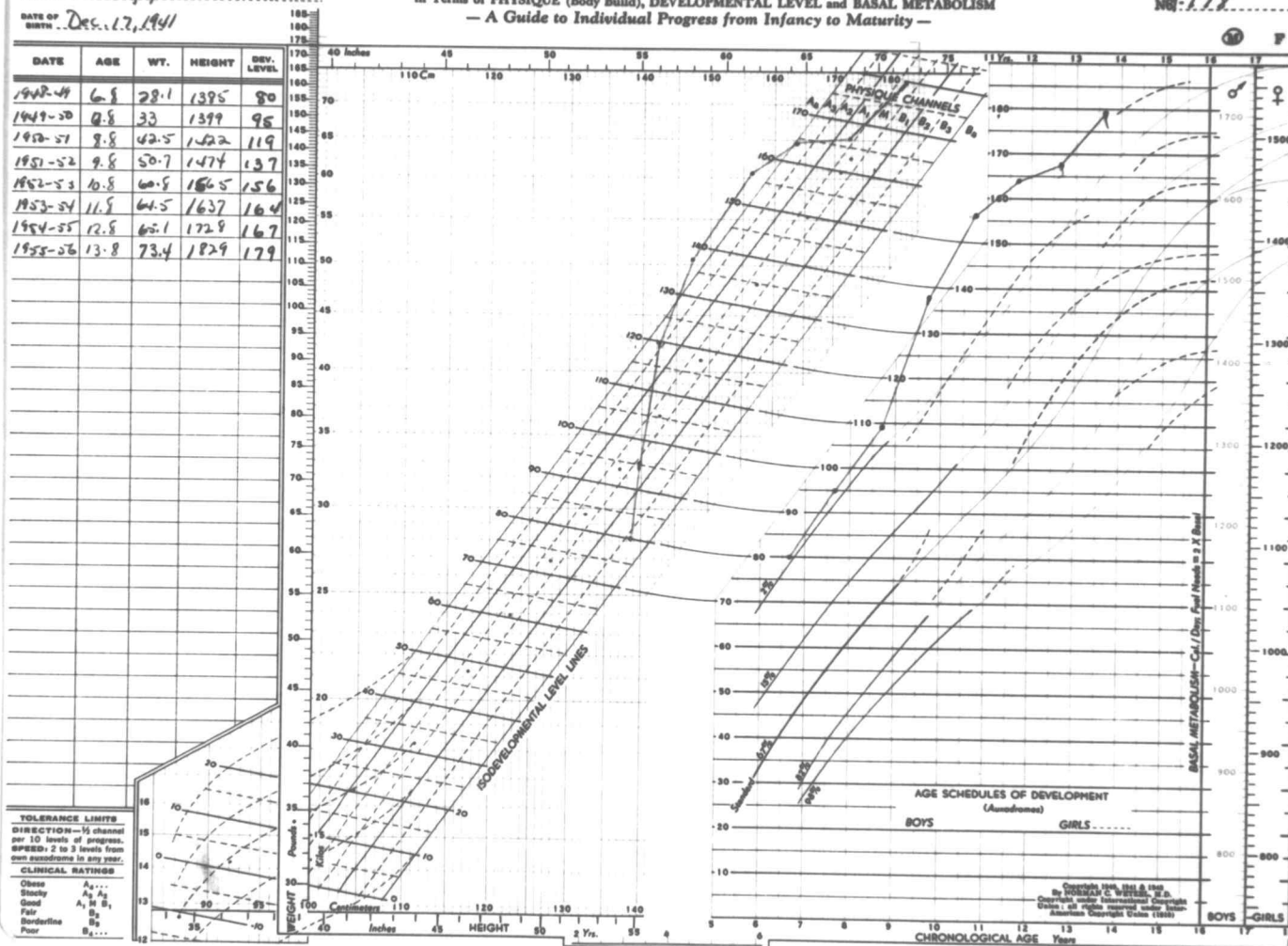## CASE STUDY OF SUBJECT M126

This boy has no physical defects or glandular trouble to cause his irregular channel development. At the 6th year measurement he is in M channel. From 6 to 7 years of age he moves to channel A_2.

GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
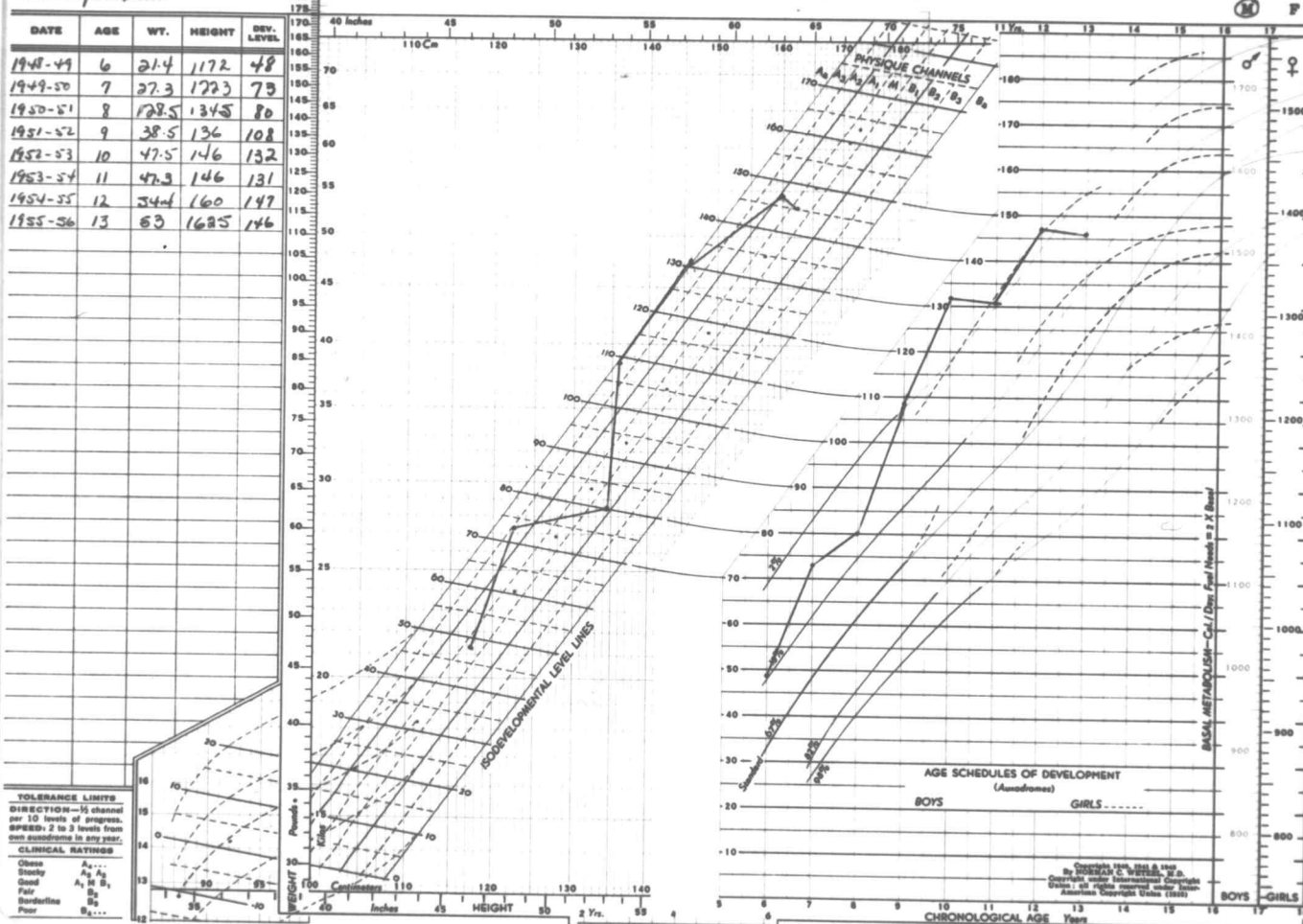— A Guide to Individual Progress from Infancy to Maturity —

Name: Insley, Nichols

Date of Birth: Dec. 17, 1941

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6.8	28.1	1395	80
1949-50	7.8	33	1399	95
1950-51	8.8	42.5	1522	119
1951-52	9.8	50.7	1574	137
1952-53	10.8	60.8	1665	156
1953-54	11.8	64.5	1637	164
1954-55	12.8	65.1	1729	167
1955-56	13.8	73.4	1829	179

TOLERANCE LIMITS

DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS

Obese	A₄...
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄...

PHYSIQUE CHANNELS

ISO-DEVELOPMENTAL LEVEL LINES

BASAL METABOLISM—Cal./Day, Fuel Needs = 3 X Basal

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS

CHRONOLOGICAL AGE Years

WEIGHT

HEIGHT

BOYS   GIRLS

29

GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
— A Guide to Individual Progress from Infancy to Maturity —

Name Groseclose, Richard

DATE OF BIRTH Aug. 22, 1942

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6	21.4	117.2	48
1949-50	7	27.3	127.3	73
1950-51	8	128.5	134.5	80
1951-52	9	38.5	136	108
1952-53	10	47.5	146	132
1953-54	11	47.3	146	131
1954-55	12	54.4	160	147
1955-56	13	63	162.5	146

TOLERANCE LIMITS
DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS

Obese	A₄
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄

PHYSIQUE CHANNELS

ISODEVELOPMENTAL LEVEL LINES

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS ------

BASAL METABOLISM—Cal./Day. Fuel Needs = 2 X Basal

HEIGHT

CHRONOLOGICAL AGE Years

From 7 to 8 years of age he moves to channel B_1. From 8 to 9 years of age he moves to channel A_3. From 10 to 11 years of age he lost 2 kilograms and grew 0 centimeters. At age 13 he was back in the M channel. His auxodrome development is quite irregular. At the 100th developmental level this boy's actual age is 8.8 years and he possesses a developmental age of 11.6 years. Thus, the difference between the actual age and the developmental age is 2 years, 10 months.

Table VII shows the number of students measured in the first grade which fall into each auxodrome curve. In the auxodrome on and above 2 per cent there are 13 students. On or above the 15 per cent auxodrome there are 92 students. On or above the 67 per cent auxodrome which is normal there are 62 students. On or above the 82 per cent auxodrome there are 32 students. No students fall on or above the 98 per cent auxodrome. Below the 98 per cent auxodrome there is one student. This table, compared with Table VIII, shows that the percentages of students are more evenly distributed in Table VIII.

TABLE VII

FIRST MEASUREMENT OF CLASSIFICATION OF CHILDREN
BY SEX AND AUXODROME DEVELOPMENT

Sex	On or Above 2%	On or Above 15%	On or Above 67%	On or Above 82%	On or Above 98%	Below 98%	Totals
No. Boys	8	50	31	11	0	0	100
No. Girls	5	42	31	21	0	1	100
Totals	13	92	62	32	0	1	200

Table VIII deals with the last measurement of the children. In this table, 21 students are on or above the 2 per cent auxodrome as compared to 13 students in Table VII showing that upon the last measurement there are more children advanced in age development. There are 60 students on or above the 15 per cent auxodrome, revealing a decrease of 16 per cent from the first measurement. There are 68 students on or above the 67 per cent auxodrome, this being only a difference of 3 per cent from the first measurement. There are 44 students on or above the 82 per cent auxodrome, this being an increase of 6 per cent over the first measurement. There are 7 students on or above the 98 per cent auxodrome which is an increase of 3.5 per cent over the first measurement. There are no results below the 98 per cent auxodrome.

TABLE VIII

LAST MEASUREMENT OF CLASSIFICATION OF CHILDREN
BY SEX AND AUXODROME DEVELOPMENT

Sex	On or Above 2%	On or Above 15%	On or Above 67%	On or Above 82%	On or Above 98%	Below 98%	Totals
No. Boys	13	24	38	21	4	0	100
No. Girls	8	36	30	23	3	0	100
Totals	21	60	68	44	7	0	200

Evaluation of the Basal Metabolism. The basal metabolism
erected on the right hand scale on the grid is aligned directly to
the developmental levels. Basal metabolism may now be figured
simply, the only step required being to read the value of heat output
that corresponds to the developmental level. With this simple step
no correction is needed in body size, physique or age. This method
helps to find the normal and abnormal states of metabolism that can
be made with greater accuracy and less uncertainty than before.
Basal metabolism can be estimated from the developmental level alone,
without correction of any kind, and wholly independent of a child's
physique. Two individuals in different channels may have the same
standard heat production as long as they are in the same developmental
level and in good health. Heat production is concerned only with
the soft tissues and not the bones. For every step of developmental
advancement the amount of real energy used by all the subjects of

like sex is the same. For example, in case study No. F18, the 100th developmental level will be used to compute the maximum daily caloric intake and the average daily caloric intake. The 100th developmental level is aligned with the basal metabolism of 1175. Taking two times this amount gives a maximum daily caloric intake of 2350. Taking 1.8 times 1175 gives an average daily caloric intake of 2115.

CASE STUDY OF SUBJECT F18

This girl's growth in the physique channel is quite irregular, deviating toward the B_1 channel one year and toward the A_1 channel the next year. The only reason found to account for these deviations is that she has an off and on period of being a "tomboy" and a "lady". During these periods of feeling like a lady, she diets in order to lose weight. Her health is good. At the 100th developmental level, this girl's actual age is 9.1 years and she possesses a developmental age of 11.6 years. Thus, the difference between the actual age and the developmental age is 2 years, 5 months.

The heat production scale used with the developmental levels enables one to find an estimate of the daily caloric intake required in regular and special diets. Case study No. F37 is that of a diabetic girl. It reveals that if she did not have this condition she would have the same daily caloric intake as the subject in case study No. F18. Because of the diabetic condition, this girl has difficulty following her diet which gives her the same daily caloric intake as

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Name *Estrada, Laura*

DATE OF BIRTH *July 16, 1942*

No. *F-18*

M ♀

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6-1	23.6	119.5	54½
1949-50	7-1	22.8	119.5	57
1950-51	8-1	26.9	131	74
1951-52	9-1	30	132.1	84
1952-53	10-1	34	144.9	99
1953-54	11-1	40	144.9	114
1954-55	12-1	47.1	157.9	134
1955-56	13-1	55	159	147

TOLERANCE LIMITS

DIRECTION— ½ channel per 10 levels of progress.
SPEED— 2 to 3 levels in any year.

CLINICAL RATINGS

Obese	A₄...
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄...

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)
BOYS   GIRLS ......

PHYSIQUE CHANNELS

ISODEVELOPMENTAL LEVEL LINES

CHRONOLOGICAL AGE Years

35
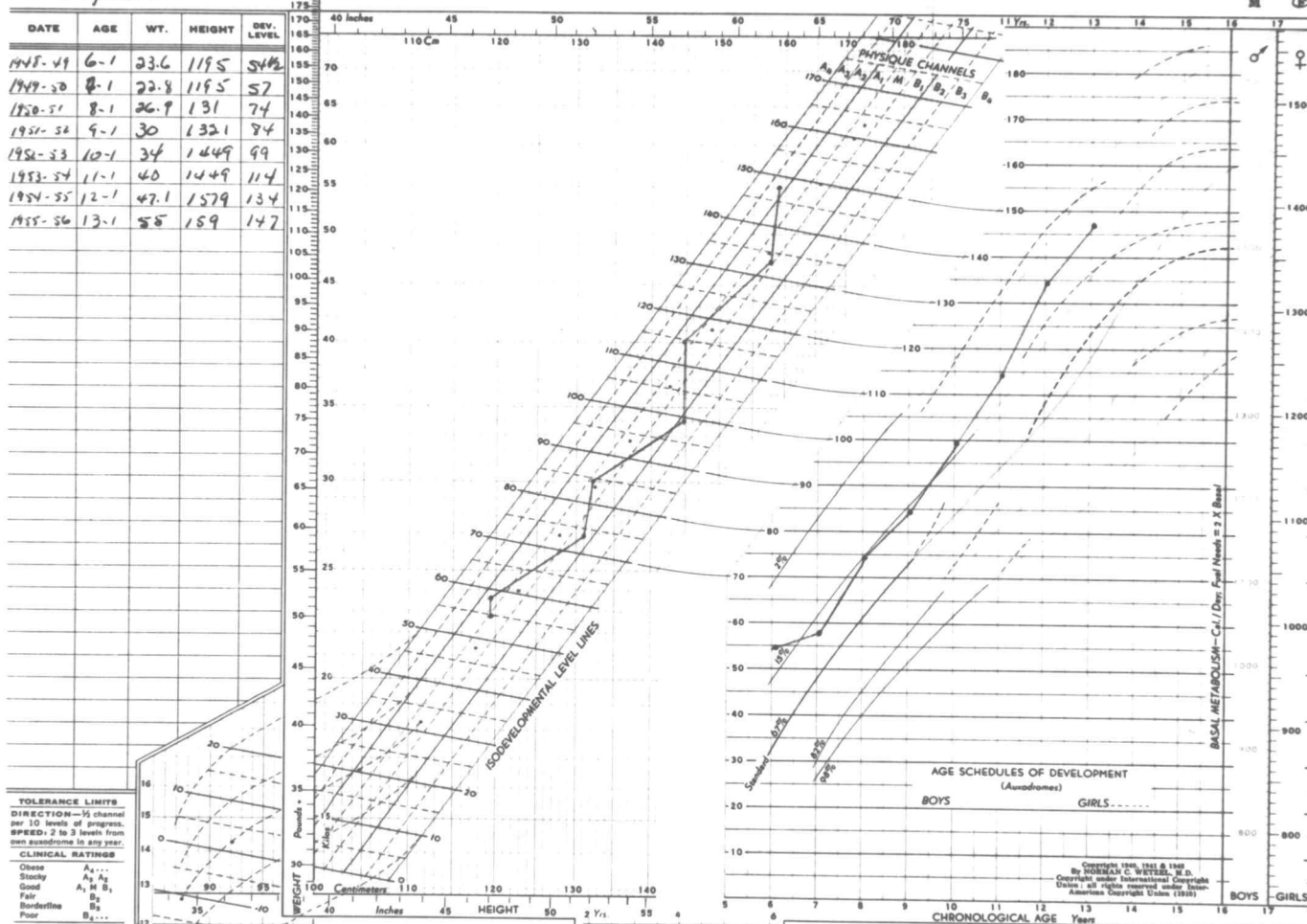
any other girl at the 100th developmental level.

CASE STUDY OF SUBJECT F37

At the time of the first measurement, it was discovered
that this girl was a diabetic. Between the time of the 8 years, 6
months measurement and the 9 years, 6 months measurement, the girl
changed from channel A_1 to channel B_3. The cause of this was due to
an insulin reaction which is quite common in her. Her blood sugar
content is not too regular and it is difficult for her to stay on the
diet. More exercise would undoubtedly help in alleviating her
problem. At the 100th developmental level, this girl's actual age
is 9.4 years and she possesses a developmental age of 11.6 years.
Thus, the difference between the actual age and the developmental
age is 2 years, 2 months.

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No. F 37

Name Lubke, Joyce
DATE OF BIRTH March 7, 1942

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6-6	29.5	127	82
1949-50	7-6	31.9	1321	90
1950-51	8-6	37.1	1399	106
1951-52	9-6	53.1	150	98
1952-53	10-6	37.1	1525	109
1953-54	11-6	47.1	1651	134
1954-55	12-6	53	164	146
1955-56	13-6	564	1685	153

TOLERANCE LIMITS
DIRECTION—½ channel per 10 levels of progress. SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS
Obese — A₄
Stocky — A₃ A₂
Good — A₁ M B₁
Fair — B₂
Borderline — B₃
Poor — B₄
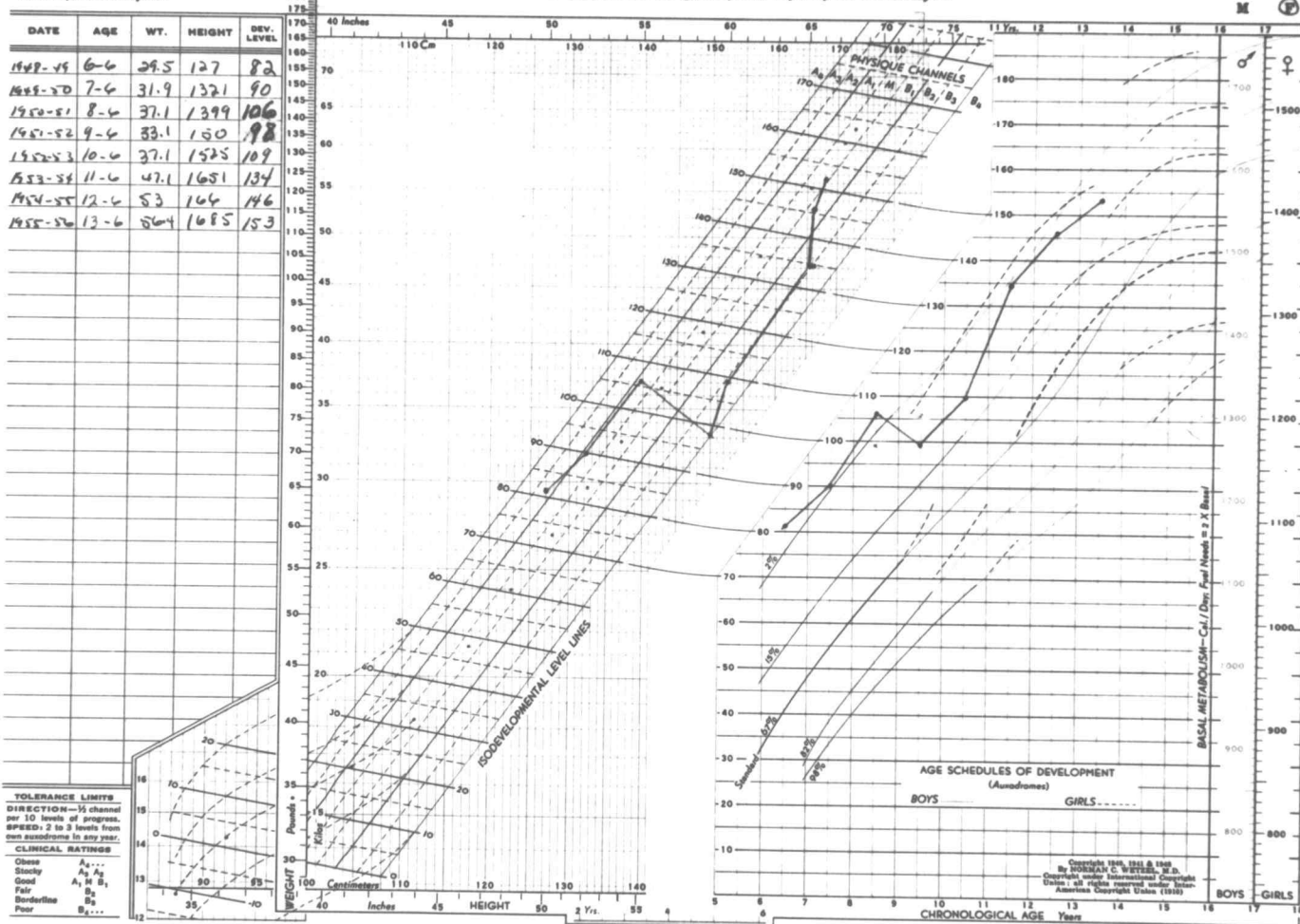
CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Data found in the preceding chapter represent the study of
two hundred individuals of the freshman class of 1956-1957 of
Klamath Union High School, Klamath Falls, Oregon. The height, weight
and age of these individuals was taken from the health record cards
and plotted on the grids. A simple, objective method for evaluating
physical condition is the basis of the use of the grid. When the
height, weight and age are plotted on the grid, the direct estimate
of physique (body build), developmental level, nutritional grade,
physical status and relative age advancement are obtained independently
of each other. This is a great deal of information given out by the
grid. However, from any given set of observations there is much
information that is obviously disregarded. The only items that the
grid explicitly is concerned with are growth, development, physique,
nutritional grade, physical status, age schedule, maturation, basal
metabolism, caloric needs, and net progress. Thus, the grid will
not reveal pathologic conditions. For example, a student may appear
to have excellent body build, but may have a brain tumor or any other
disease.

Tables I and II give the number in each age group, and
the percentages of those age groups when measured in the first and
eighth grades respectively. The children were grouped according to

chronological age. Data in these tables indicate that the highest percentage of students fell in the age bracket that was about average for the respective grade. The largest percentage of the entering first grade children were neither excessively old nor excessively young, the average being 6 years, 4 months of age.

Tables III and IV have to do with the grouping of the children into various channel types such as A_1, B_2, etc. These channels represent the good, fair and other classifications. Data in Table III indicate that 71 per cent of the students were in the A_1, M, and B_1 channels. This means that 71 per cent of the children measured in the first grade followed a normal growth pattern. In Table IV, the group of 71 per cent had declined to only 52 per cent, this being the measurement taken in the eighth grade. A number of factors may be the cause of this decrease -- poor diet, various diseases, and the socio-economic status of the families. Concerning the socio-economic status, some of the families of the district live in slum areas. In family income, living conditions and social standards, the remainder varies from low to moderate. About 3 per cent of the children were in the borderline group in first grade and this percentage had increased to 915 per cent in the eighth grade. Some of the children changed channels during the time between the first and last measurement and consequently may have fallen into this borderline channel.

Table V is a composite record of five studies -- Dr. Wetzel's "world standards", E. N. Scramlin's survey in Muncie, Indiana,

the British Columbia study in British Columbia, Canada, the Wetzel
Grid survey in Toronto, Ontario and the Klamath Falls study in
Klamath Falls, Oregon. The percentages in each study varied from
Dr. Wetzel's "world standards". This difference may be due to the
number of subjects used in each study. Also, the various sections
of the countries in which the surveys were made may influence this
difference in percentages.

Table VI enables one to compare the results of the Klamath
Falls study with Dr. Wetzel's survey at the 100th developmental level
line. This concerns both the physical status and the auxodrome
development. The percentages in each study in the physical status
section were quite similar. In the auxodrome development section,
the Klamath Falls results differed considerably from those of Dr.
Wetzel's. From these data one can conclude that 52 per cent of the
students in the Klamath Falls study are developing ahead of their age
schedule. Some 31.1 per cent of the children follow a normal growth
pattern according to the grid.

Tables VII and VIII concern the developmental level in age
schedule. From Table VII it is observed that a great many of the
children have a developmental age far above their actual age which
means that they are developing in growth ahead of their normal devel-
opmental level. From Table VIII one observes that there were only
40.5 per cent of the children in the combined 15 per cent and above
and 2 per cent and above groups while in Table VII figures indicate
that 52.5 per cent of the children are in these two combined groups.

It would appear that a number of the children had reached their stage of puberty and consequently their rapid age development is tapering off.

The new grid method of determining the basal metabolism, without correction of any kind, enables one to find basal heat production from the developmental level attained by the given subject. This new method enables the layman, with the proper directions, to compute the basal metabolism of a given subject. Children on the same developmental line will have the same daily caloric intake. For example, one case of chronic bronchitis and a couple of cases of heart disease were noted. The conditions had been known for some time and were under adequate supervision and treatment, the children responding and adapting themselves so well that their growth patterns were normal. Thus, their daily caloric intake will be the same at the 100th developmental level, no matter which physique channel they are in.

From this study several general conclusions can be made. There are indications in this study that the parent and the school can obtain data indicating the child's physical status. The Wetzel Grid is a relatively simple device which is well adapted to school health work. The grid, when properly used, is useful as a method of screening individuals for clinical examination. It is not designed to discover pathological conditions, but it readily identifies individuals who deviate from their normal course of development. In addition to being of practical help in appraising the

status of the individual student, the grid can be used to determine how a group of youngsters compares with national norms.

Recommendations from the findings in this study are as follows. First, all students should have a Wetzel Grid made at the time they enter grade school, and the grid for each student should be kept until the student has been graduated from high school.

Second, all elementary school teachers should have a briefing in the use of the Wetzel grid. Third, the grid should be used along with the health record card or by itself become the health record card for the school system. Fourth, the plotting of the grid should be done by the school nurse or secretary. This would be done after the teacher has recorded the height, weight and age of the child. Fifth, the school nurse, or other qualified person, should act as a consultant in assisting the classroom teacher to interpret the profile recorded on each grid.

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APPENDIX A

OREGON SCHOOL HEALTH RECORD CARD

(FOR USE OF CARD SEE HEALTH SERVICES MANUAL, REVISED 1951)

NAME OF PUPIL _____ M ___ F ___ BIRTH _____, 19 ____

LAST   FIRST   SEX   MONTH   DAY   YEAR

ADDRESS _____ TEL. NO. _____

PARENT OR GUARDIAN _____ OCCUPATION: OF FATHER _____ OF MOTHER _____

SCHOOL YEAR	GRADE	SCHOOL	HEIGHT IN INCHES 1ST / 2ND	WEIGHT IN POUNDS 1ST / 2ND	VISION TEST BOTH EYES	R	L	TEETH DECAYED	IRREG-ULAR	HEARING R	L	ANNUAL HEALTH SUMMARY (SEE HEALTH SERVICES MANUAL FOR INSTRUCTIONS)	DAYS ABSENT
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						
					W 20/	W 20/	W 20/						
					WO 20/	WO 20/	WO 20/						

IMMUNIZATIONS	INITIAL	BOOSTERS			TESTS AND OTHER IMMUN.		RESULT	AUDIOMETRIC TEST—HEARING LOSS DATE	SPEECH RANGE (%)	HIGH TONE (DECIBELS)
SMALLPOX	19	19	19	19	TUBERCULIN	19	RESULT	DATE	SPEECH RANGE (%)	HIGH TONE (DECIBELS)
DIPHTHERIA	19	19	19	19	CHEST X-RAYS	19	RESULT	19	R L	R L
WHOOPING COUGH	19	19	19	19		19	19	19	R L	R L
TETANUS	19	19	19	19		19	19	19	R L	R L

DATE	PHYSICIAN'S RECOMMENDATIONS AND NURSE'S REPORT NAME OF FAMILY PHYSICIAN _____

HISTORY OF PAST AND CURRENT ILLNESS, ACCIDENT, DISABILITY, AND ABSENCE

OBSERVATIONS BY TEACHER

	SCHOOL YEAR	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
	GRADE IN SCHOOL															
EYES	STYES OR CRUSTED LIDS															
	INFLAMED EYES															
	CROSSED EYES															
	FREQUENT HEADACHES															
	SQUINTING AT BOOK OR BLACKBOARD															
EARS	DISCHARGE FROM EARS															
	EARACHES															
	FAILURE TO HEAR QUESTIONS															
ORAL CAVITY	INFLAMED GUMS															
	INFLAM. OF LIPS, CHEEKS, PALATE															
	FAULTY ORAL HYGIENE															
NOSE AND THROAT	PERSISTENT MOUTH BREATHING															
	FREQUENT SORE THROAT															
	FREQUENT COLDS															
GENERAL CONDITION AND APPEARANCE	FAILURE TO GAIN WEIGHT															
	EXCESSIVE GAIN IN WEIGHT															
	DOES NOT APPEAR WELL															
	TIRES EASILY															
	POOR MUSCLE COORDINATION															
	POOR POSTURE															
BEHAVIOR	EMOTIONAL DISTURBANCES															
	SPEECH DEFECT															
	TWITCHING MOVEMENTS															
	UNDUE RESTLESSNESS															
	SHYNESS															
	NAIL BITING															
	EXCESSIVE USE OF LAVATORY															
	EXCESSIVE DROWSINESS															
	POOR FOOD HABITS															

CODE   √=DEFECT   T=UNDER TREATMENT   C=CORRECTED   R=REFERRAL   NT=NO TREATMENT NEEDED

APPENDIX B

GRID for Evaluating PHYSICAL FITNESS
in Terms of PHYSIQUE (Body Build), DEVELOPMENTAL LEVEL and BASAL METABOLISM
— A Guide to Individual Progress from Infancy to Maturity —

Name Munjar, Sidney Gerald

DATE OF BIRTH Jan. 16, 1942
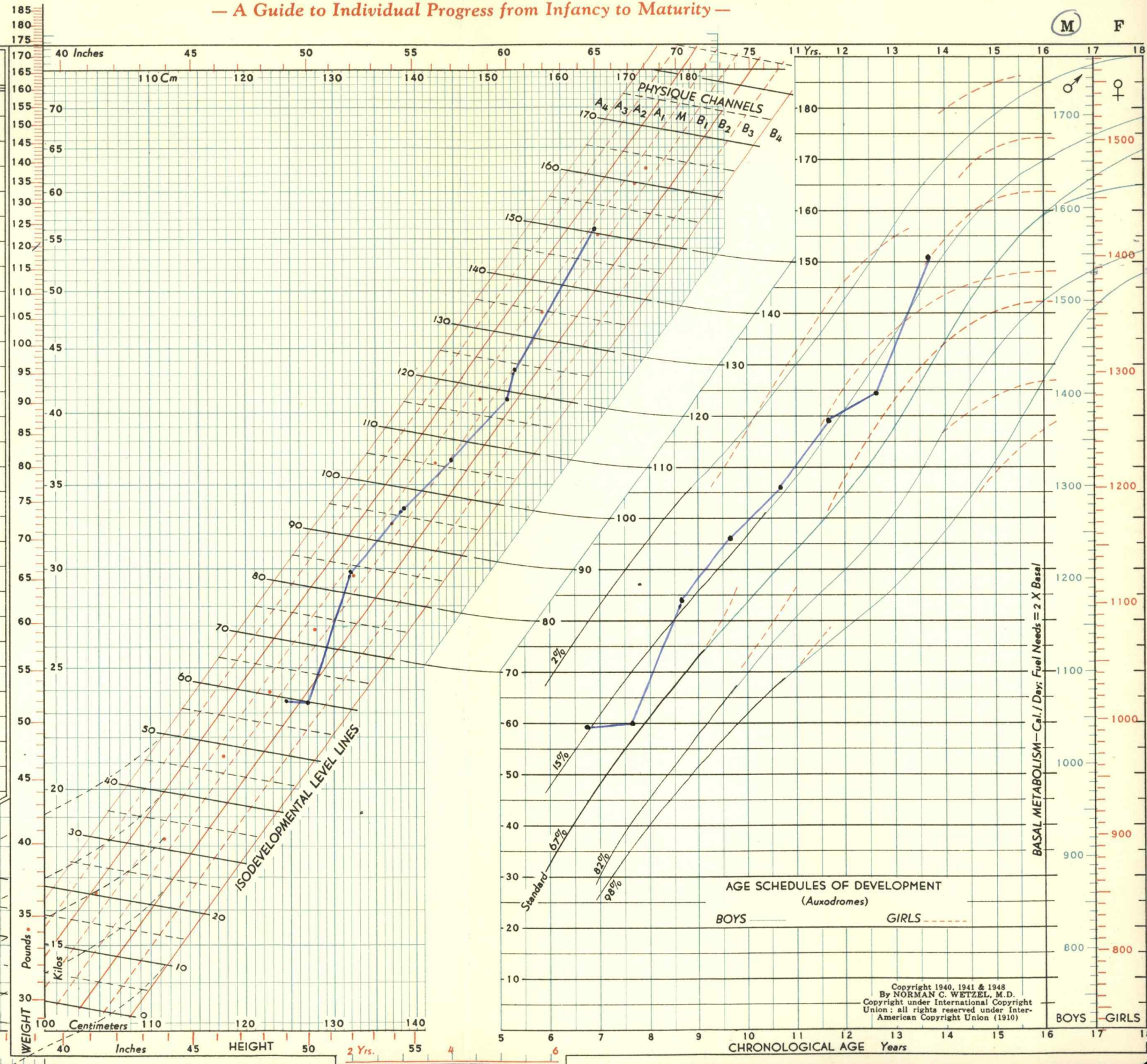
No. M-194

Ⓜ F

DATE	AGE	WT.	HEIGHT	DEV. LEVEL
1948-49	6-8	23.5	124.5	59
1949-50	7.8	23.5	127	60
1950-51	8-8	29.9	132	84
1951-52	9-8	33.5	138.5	96
1952-53	10-8	36.7	144.9	106
1953-54	11-8	41	152.2	119
1954-55	12-8	43.3	153.4	124
1955-56	13-8	56	165	151

PHYSIQUE CHANNELS

A₄ A₃ A₂ A₁ M B₁ B₂ B₃ B₄

ISODEVELOPMENTAL LEVEL LINES

BASAL METABOLISM—Cal./Day; Fuel Needs = 2 X Basal

AGE SCHEDULES OF DEVELOPMENT
(Auxodromes)

BOYS   GIRLS

Standard

2%
15%
67%
87%
98%

TOLERANCE LIMITS

DIRECTION—½ channel per 10 levels of progress.
SPEED: 2 to 3 levels from own auxodrome in any year.

CLINICAL RATINGS

Obese	A₄ ...
Stocky	A₃ A₂
Good	A₁ M B₁
Fair	B₂
Borderline	B₃
Poor	B₄ ...

WEIGHT   Pounds   Kilos

Centimeters   Inches   HEIGHT

2 Yrs.   4   6

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BOYS   GIRLS

CHRONOLOGICAL AGE   Years

Name: MUNJAR, Sidney Gerald School(s): KFJH   No. M-194

Address(es): _____ Parent or Guardian: _____ Tel. _____ (M)/F

VISUAL ACUITY

Date	R	L	Date	R	L
1948 49	w9 20/30	w9 20/30	1954 55	20/70	20/70
1949 50	w9 20/20	w9 20/30	1955 56	20/10	20/15
1950 51	w9 20/20	w9 20/20			
1951 52	w9 20/20	w9 20/20			
1952 53	w9 20/10	w9 20/18			
1953 54	w9 20/15	w9 20/20			

Date / Month / Day / Year / Grade

DATE	Month											
	Day											
	Year	1948	49	50	51	52	53	54	55	56		
GRADE		K	1	2	3	4	5	6	7	8	9	10	11	12

PHYS. STATUS: Grid / Clin.
PHYS. PROG.: Direct. / Speed

PHYSICAL FINDINGS

- Skin
- NOSE - Obstr.
- EYES (see also V. A.) R / L / Other
- EARS (see Hear.) R / L
- TEETH Temp. / Perm.
- Tongue & MM.
- Tonsils
- Cerv. Glands
- Thyroid
- Heart
- " (M)
- Lungs
- Abdomen
- Hernia
- Genit.
- Posture
- Orthoped.
- Nerv. Syst.
- Speech Def.   "F"/
- Endocrine

MENTAL

- M. A.
- IQ
- PLR

DISEASES – SURGERY – ACCIDENTS

FLUOROSCOPIC – OTHER TESTS – EXPLAIN

PHYS. ED. – GYM. CONSENT ___ No ___ ATHL. CONSENT ___ No ___
- Tests
- Athletics

HOME CONDITIONS

- Econ. Tenth
- Management

ACTION: FOLLOW – NOT FOLLOW – CORRECTIONS

- Parent Consult.
- Co-operation

CODES: Positive +, ++, +++ Negative O Questionable ? Defect X
Defect Corrected ⊗   G - Good, F - Fair, P - Poor

Hearing (Audio)

Date	Hearing (Audio)
	R
	L
	R
	L
	R
	L

SPECIAL ATTENTION - Mark X

1. GROWTH-NUTRITION
   - Simple Mal.
   - Obesity
   - Allergy
   - Anemia
   - Diet
   - Fatigue
   - Habits
   - Home
   - Infections
   - Tonsils
2. VISION
   - Muscle Imbal.
   - Hyperopia
   - Myopia
   - Lateral-Domin.
   - Color Blind
3. HEARING
4. CARDIAC
   - Rheum.
   - Murmur
   - Congen.
5. ORTHOPEDIC
6. MENTAL
   - M. A.
   - IQ
   - _____
   - _____
   - Major Work
   - Exceptional
7. NEURO-PSYCH.
   - Rorschach
   - Reading Dis.
   - Speech Def.
8. MISCELLANEOUS
   - Diabetes
   - Epilepsy
   - Ringworm
   - _____

FAMILY - Nationality

F;	L	D
M;	L	D
B		
S		

PREVIOUS DISEASES

Chickenpox 43		Whoop. C. 44		Typhoid	
Measles 43		Diphtheria		Polio	
Ger. Meas.		Rheumatism		Tbc	
Scarlet F.		Heart		Pneum.	
Mumps 50		Smallpox		Tonsillitis 48	

IMMUNIZATIONS / TESTS

Whoop. C.		Dick	
Diphth. 50 - 52 - 55		Schick	
Tetanus 50 - 52		Re-Schick	
Vaccination sm 52		Tbc	
" Scar Typhoid 52		(+)	(—)

PROGRESS NOTES — Explain positive (+) findings & defects (X); give dates:

1950 Frequent headaches, Emotional Disturbances, undue Restlessness.