

T H E S I S

on

A REVIEW OF THE GENERAL SHOP MOVEMENT
IN INDUSTRIAL ARTS EDUCATION

Submitted to the

OREGON STATE AGRICULTURAL COLLEGE

In partial fulfillment of
the requirements for the

Degree of

MASTER OF SCIENCE

by

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ACKNOWLEDGMENT

The writer wishes to express his appreciation to Professor George B. Cox, Head of the Industrial Arts Department, for his many and valuable suggestions and to the state and city directors of industrial education and supervisors of Industrial Arts throughout the United States for the interest shown and for the information they have furnished so willingly.

APPROVED:

Redacted for privacy

Professor of Industrial Education

In Charge of Major

Redacted for privacy

Chairman of Committee on Graduate Study

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SECTION I

INTRODUCTION

INTRODUCTION

A review of the general shop movement in Industrial Arts Education has long been desired by those interested in the industrial arts program. In view of this expressed need and in view of the general interest in this movement, it is the purpose of this thesis to show the progress of the general shop movement and the history of the plan down to the present time.

It is the feeling of the author that all industrial arts programs can profit by a more efficient set-up. In this study it will be shown that the modern trend in industrial arts is the general shop. Nevertheless, it is hoped that the numerous requests for such specific information pertaining to the general shop will be met in this report. The writer has made an extensive study of the general shop by setting up the general shop in a community and watching its progress for the past four years. In 1928 when this shop was established letters were sent to state officials and directors of industrial arts asking for information, courses of study and bulletins pertaining to the general shop. In order to make a check on the progress and development of the general shop within the past four years, a second questionnaire was sent out in 1932, asking specific questions relative to recent developments, and requesting literature and

courses of study for the more recent programs.

Today as never before it is important to justify the reorganization of the older manual training shops into the present general shops program. The question should be asked, "will this newer organization meet the needs of the community and give the student the best education program for the least cost?"

Tomorrow will see a vast improvement in the general shop situation. The people are beginning to realize that industrial arts work, whether in the general shop, the drawing room, or the more specialized unit shop, has never subscribed so much to the objective of "trade training" as to the broader objective of general education. Just as science work in the secondary schools has for its chief objective the imparting of informational and background material in the realm of scientific discovery, so does industrial arts hold for its greatest objective the building of an understanding, an appreciation and a general knowledge of the realm of industrial work and the products of industry. The one is as important as the other in the scheme of public education for the masses. Science would have little or no application except for industry. Neither could industry have developed without science, nor without people who had a general understanding of the principles and relationships of both science

and industry. A well-rounded education program for boys of secondary school age should include an opportunity for instruction in the field of industry, as well as in the physical and biological sciences, social sciences, and the "three R's".

SECTION II

BEGINNINGS OF THE GENERAL SHOP IN THE UNITED STATES

BEGINNINGS OF THE GENERAL SHOP IN THE UNITED STATES

A. Historical Statement

The general shop is enjoying a recognition that has been acquired through years of industrial arts advancement. The Sloyd, and Russian systems were the early types of shop organization in our schools. The earlier form of shop work or "manual training" involved what is now referred to as the unit shop. One activity, chiefly woodworking, with some drawing usually accompanying it either in the same room or in an adjacent one, constituted the whole manual training program of most early schools. The newer developments in trade and industrial pursuits wherein industry today is extremely diversified, and is dependent upon highly specialized employees, have created a need for general industrial education in the schools which "manual training" did not meet.

The newer plan for meeting these conditions is the revising of the manual training program into what is known as the general shop program of industrial arts. Charles A. Bennett,¹ as early as 1902, presented a statement of objectives and historical development of manual training which carried many of our present-day general shop ideals. Excerpts from his statements follow:

1. Charles A. Bennett, School Review, No. 1 p, Jan. 1902, pp. 40-42.

"The chief function of the secondary school is to help the pupil discover himself.

"If this is the chief or even one of the chief functions of secondary education then it follows that the high school must afford a wide range of opportunity through a variety of studies and occupations. -----

"The manual training high school born in the west and quickly copied in the east and encouraged by private gifts has affected secondary school work in large cities throughout the entire country.-----

"The popularity of these schools has been so marked that there is not a shadow of doubt that they have met a demand which is just as real in the small city as in the large one; which will be just as great in the next generation as in the present one.

"It has come to be a broad general school with emphasis on manual training. Why should not another step forward be taken by removing that emphasis or better by emphasizing each of the particular lines of work to the same degree.

"Reducing or enlarging to fit the size and wealth of the community.

"Specific with reference to manual training and drawing, every township high school should have a room equipped for wood work one for drawing and another for household arts.

"The high school of a city from - 30,000 to 100,000 inhabitants should have a room for wood working equipped for bench work and wood-turning; another for working cold metals such as filing and fitting, bent iron work, hand tool turning and sheet metal work, including metal-spinning; a third room, of smaller size, should be the connecting link between manual training and physics, and be supplied with a few machine tools, a forge, and tools and apparatus for electric construction and testing. In connection with each of these rooms should be a stock, tool room and work room. -----

"A high school for a large wealthy city like Chicago or Cleveland or Boston should contain in addition,

forging, foundry work, and machine tool work."².

With the foregoing statements as a general background, the material on the following page has been constructed to show the historical development that has aided in bringing about the general shop movement of today.

The movement has been a gradual one. Many men of steadfast purpose and unquestioned character have contributed to the long list of worthy objectives and achievements behind it. Each period has produced several outstanding characters. Each character has left an imprint of his personality and his creed.

2. Ibid., p. 42.

B. Chronological Chart

A Historical Development Leading to the General Shop.

Year Contributions to Present Day General Shop Developments.³

2000 B.C. Jews were taught law half day - fathers taught sons
a trade a half day.

1592-1670 Commenius responsible for putting handwork into primary
education.

1712-1778 Rousseau urged the learning of a trade by all children
who had no inheritance of land. Saw in manual arts
education a social and economic value.

1797 Manual labor school was founded at Leith, South Carolina.

1797 The mechanical institute movement in England, Scotland,
and United States.

1824-1865 Technical school movement in the United States.

1838 Boston Farm School established in 1838 on Thompson's
Island.

1841 English Government made grants for Industrial Arts type
of training.

1842 Fichet in France established shop work in the school for
the purpose of giving boys the chance to find themselves.

1842 Germany contributed technical training, in its continua-
tion schools at Munich.

1851 World's Fair in London made it evident that Industrial
products of France and Germany were more interesting.

3. Friese, J. F., Exploring the Industrial Arts, pp. 3-20.

- 1856 Ruskin and Morris launched the Arts and Crafts movement
in England.
-
- 1862 The Morrill Land Grant Colleges. Shops were establish-
ed in colleges.
-
- 1868 Imperial Technical Institute of Moscow, Russia, in-
augurated shop work. Its aim was strictly vocational.
-
- 1870-1872 Otto Salomon established Sloyd System at Naas, Sweden.
-
- 1863 Uno Cygnaeus, Finland, also contributed to the Sloyd
movement.
-
- 1873 Calvin M. Woodward advocated manual training. Consider-
ed the father of manual training.
-
- 1876 Philadelphia Centennial Exposition, Russian exhibit had
a far reaching effect on manual training movement.
-
- 1879 Organization of St. Louis manual training school at
Washington University.
-
- 1882 Frank M. Leavitt of Boston introduced new type of Sloyd.
-
- 1888 Gustaf Larsson also used Sloyd system in Boston.
-
- 1882-1889 Manual training, principally woodwork, with some metal
work and mechanical drawing, had to fight for a place
in American education. During this time the National
Education Association controversy raged.
-
- 1893 Western Teachers Association later Western Arts Asso-
ciation, organized.
-
- 1897 Teacher training established at Bradley Polytechnic
Institute, Peoria, Illinois.
-

- 1899 The Eastern Arts Association was organized.
-
- 1900 International Exposition in St. Louis gave Manual
Training and drawing a new popularity.
-
- 1902 Charles A. Bennett, first professor in manual training
to be appointed in a teacher training institution.
Bradley Polytechnic Institute, Peoria, Illinois.
-
- 1906 The National Society for the Promotion of Industrial
Education organized.
-
- 1914 Federal Commission appointed to study the personnel of
Federal Aid for Vocational Education.
-
- 1917 Smith-Hughes law passed.
-
- 1918 The General Shop idea gradually advanced and came to
direct notice as such in Pittsburg, Pennsylvania.
-
- 1922 Griffith, I. S. and Cox, Geo. B., established related
activity shops in the University of Wisconsin Train-
ing School. Related activity shops were classified
as: General Wood Shop, General Metal Shop, Graphic
Arts Shop.
-
- 1922-1933 During this period the general shop program has been
gaining recognition and favor in the United States.
-

SECTION III

RECENT TYPES OF GENERAL SHOP ORGANIZATION
IN THE UNITED STATES

RECENT TYPES OF GENERAL SHOP ORGANIZATION
IN THE UNITED STATES

A. Terminology Defined

1. Industrial Education, has in the past been defined as that form of vocational education which is designed to teach some industrial occupation or trade. The meaning as it is used today, refers both to teacher-training subjects in organization and methods for industrial arts education, and to general training of any sort within the field of industrial pursuits. It is used as a general term to cover both the industrial arts type and the vocational type of education or training in the industrial field.

2. Industrial Arts Education, includes instruction in a variety of shop activities, based upon practices with, and knowledge of the tools, materials and process of industry. These activities usually include one or more of such subjects as machine shop, sheet metal, auto mechanics, drawing, woodwork, foundry, carpentry, basketry, concrete work, metal crafts, etc. The primary objectives of industrial arts in the secondary school, are listed as:

1. "Exploration in the industrial pursuits for vocational and educational guidance.
2. "A higher degree of intelligence about the problems, processes, and products of industry.

3. "An appreciation of the industrial worker, his problems, and the skill required in his work.
4. "Practical and avocational values for use in the home."¹.

3. Prevocational Shop Work is a term passing into the discard but still used in some quarters to denote a number of shop experiences undertaken to provide the student with a greater understanding of his own potentialities as they might influence future life work. This, in reality, is the aim of general education in the junior high school. The term now more commonly applied is exploratory shop work.

4. The General Shop is a type of industrial arts set-up which includes work with a number of different kinds of materials and occupational activities, usually under the supervision of one teacher in a single room. The major objectives are general educational values and exploration in the field of industry for the purpose of guidance. Several types of general shop organization are outlined below. Any reference to "general shop" in this report will refer to some such an organization.

B. Types of General Shop Organization.²

"The types of shop organization embraced by the general shop cannot be adequately classified as unrelated, since all have points in common and the

1. George B. Cox, An unpublished study, Oregon State College, 1931.

2. Newkirk, L.V., & Stoddard, G.D., General Shop, pp. 12-14.

borderlines are not clear-cut. Rather these shop organizations constitute a family, and the apparent differences are caused by modifications made to meet varied teaching situations. The type of shop organization for a given community is the one that will enable it to carry out a good general shop program with the space, equipment, number of pupils, and teaching staff available.

"For the purpose of objectivity, let us consider the following related shop organization, which have been put forth by shop teachers and supervisors as being suitable for presenting the general shop program under varied conditions:

"(1) Rotation thru a series of related shops. This plan is barred from the small school with limited funds because of the cost of providing and equipping large divisions in separate rooms, but is suitable for schools with a large enrollment and ample space, equipment, and staff. It is good practice to use this plan in large city schools where a general shop is employed. There may be from four to six shops thru which the pupils will be rotated, spending from six to nine weeks in each division. Drawing, electrical work, woodworking, printing, auto mechanics, and sheet metal work are typical instructional divisions in this type of general shop organization. A modification of this system may have three rooms, each containing two instructional divisions supervised by one instructor. This combined type permits the pupils to remain twice as long in each shop as they do under the first arrangement.

"(2) A single large shop, in which the equipment is organized so that the entire class goes thru a number of different related divisions in a given order. For example, first six weeks, drawing; second, sheet metal work; and so on. This shop may have the equipment arranged in two ways: Each division may be located in a separate space and the pupils rotated from section to section of the shop every six or nine weeks; or a similar room may be used so that when a given activity (say metalwork) is to be taught, the metal equipment is put in the foreground, and the entire class instructed in metalwork at the same time. This type of organization requires rearrangement of equipment each time a different division is taught. It is obvious

that this system reflects the related shop rotation plan.

"(3) The comprehensive general shop, which houses a number of small related divisions under the direction of one teacher, is widely used and will give a small community with limited funds an opportunity to offer a rich course in the industrial arts. For example, a comprehensive general shop may have instructional divisions in metalwork, woodwork, auto mechanics, concrete work, plumbing, finishing, and drawing. It may have a printing division in addition to those listed above. -----

"(4) In certain localities the equipment for the different divisions has been mounted on trucks especially equipped for the purpose. The work is so organized that one teacher visits several schools in a single day, thus distributing the burden of supporting one good teacher over several small communities. These are interesting variations, but due to climate, roads, and other conditions, they present numerous difficulties in administration.

"(5) A general shop restricted to one type of material and the trade divisions that have developed around it; for example, woodwork, or metalwork. This is similar to the shop organization discussed under (3) above, except that the instruction centers about one type of material. When this type is called "general" it is modified by a work descriptive of the material; i.e., "general woodshop" or "general metal shop." The shops in the rotation plan may be organized on this basis for junior high school work.

"It is obvious that certain core shop organizations are coming to be orthodox for meeting definite types of teaching situations as they present their varied problems in number of pupils, available space, amount of equipment, and number of teachers. These outstanding types of organization are very suggestive, but it is well to note that the number of possible minute variations is well-nigh unlimited, to a given community. -----

C. General Shop Equipment³.

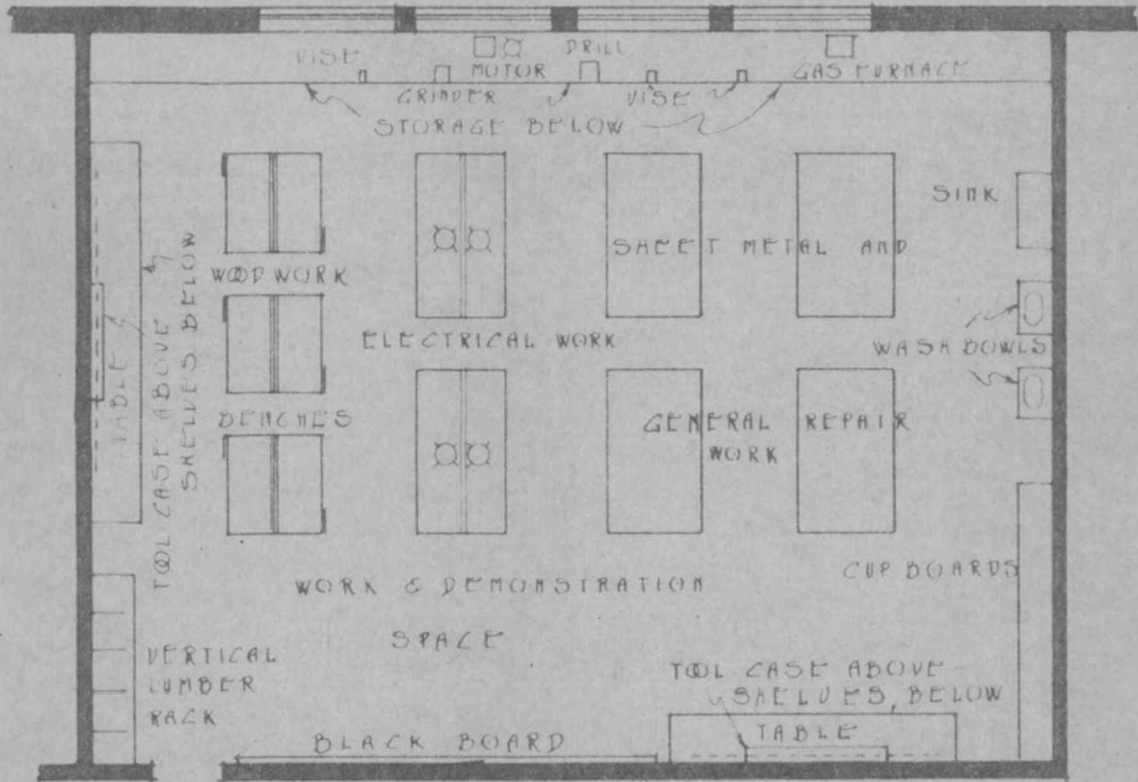
"Two types of equipment for the general shop are most commonly used in practice; first, a shop equipment for single occupation, as woodwork, with supplementary equipment for a variety of additional activities, utilizing woodworking benches for the various types of work. Such equipment may be of original planning or the result of remodeling or adapting existing shops to more general purposes; second, a shop equipment definitely planned for general work for small groups in a variety of industrial activities, varied to some extent by local environment, particularly as distinguishing between urban and rural conditions.

"For the first type the suggested equipments may serve as a basis, and a judicious selection of added equipment may be made from the following suggested equipment for the general shop. This equipment is adapted to use in the general shop planned in Figure 9.

Woodwork

- 6 benches, $3\frac{1}{2}$ feet, with vises
- 6 bench hooks or jack boards
- 1 bevel, 8 inch sliding T
- 1 set auger bits $\frac{1}{4}$ to 1 inch, in case
- 2 bits, $\frac{1}{2}$ inch auger dowel, long
- 2 bits $\frac{3}{8}$ inch auger dowel, long
- 2 bits, $\frac{1}{4}$ inch auger dowel, long
- 2 bits $\frac{4}{32}$ inch twist drill wood
- 2 bits $\frac{5}{32}$ inch twist drill wood
- 2 bits, $\frac{6}{32}$ inch twist drill wood
- 2 bits, $\frac{7}{32}$ inch twist drill wood
- 4 bit handles (chisel handles fitted to bit shanks)
- 1 brace, 8 inch
- 6 brushes, 7 inch counter, good grade
- 1 burnisher, 3 inch
- 2 chisels, 1 inch handled tanged firmer
- 2 chisels, $\frac{1}{2}$ inch handled tanged firmer
- 2 chisels, $\frac{3}{8}$ inch handled tanged firmer
- 2 chisels, $\frac{1}{4}$ inch handled tanged firmer
- 2 clamps, 4 inch malleable
- 2 clamps, 36 inch door
- 6 compasses, pencil

3. Roberts, William E., Manual Arts in the Junior High School, Government Bulletin No. 11, 1924, pp. 83-85.



SUGGESTED PLAN FOR A GENERAL SHOP
ROOM 30' x 40'
SCALE $\frac{1}{8}" = 1'-0"$

- 1 countersink, rose
- 1 divider, 6 inch wing
- 2 files, 8 inch half round bastard
- 1 file, 8 inch mill, safe edge
- 1 file, 5 inch taper slim
- 6 gauges, marking
- 2 glass cutters, point
- 1 gouge, 3/4 inch, tanged firmer, outside bevel
- 1 gouge, 3/8 inch, tanged firmer, outside bevel
- 3 hammers, 7 ounce
- 2 handscrews, 10 inch
- 6 knives, Sloyd 2 $\frac{3}{4}$ inch
- 1 mallet, hickory, 2 $\frac{1}{2}$ by 6 inches
- 2 nail sets, 1/16 inch
- 1 oiler
- 1 oil stone, No. 2 Washita
- 1 oil stone, medium India, 1 by 2 by 7 inches,
 mounted
- 6 planes, 14 inch jack
- 1 plane, 9 inch smooth
- 1 plier, 5 inch flat nose
- 2 putty knives
- 1 plier, 5 inch round nose
- 6 rules, 12 inch, No. 34 $\frac{1}{2}$
- 6 saws, 12 inch handy or cabinet
- 1 saw, crosscut, 22 inch 9 point
- 1 saw, rip, 24 inch 7 point
- 1 saw, turning, 14 inch
- 1 saw, coping, No. J100
- 2 scrapers, 3 by 5 inch cabinet
- 1 screw driver, 8 inch
- 2 screw drivers, 4 inch
- 2 spokeshaves
- 6 squares, 6 inch try
- 1 square, 12 inch try

Electrical Work

- 3 bells, 3 $\frac{1}{2}$ inch
- 1 box assorted fuse blocks
- 1 box assorted fuses
- 1 brass key socket
- 2 buzzers, 3 $\frac{1}{2}$ inch
- 50 feet bell wire
- 6 dry cells
- 3 electric meter cards
- 1 motor, $\frac{1}{2}$ horsepower universal current
- 2 pliers, 6 inch side cutting
- 5 plugs, attachment
- 3 push buttons
- 2 sockets, chain pull

- 2 sockets, key
- 1 socket, two-way plug
- 1 transformer
- 1 wiring board

Metal Work

- 3 6-inch spring dividers
- 3 hacksaw frames, 10 inch adjustable
- 3 ball-pein hammers, 16 ounce
- 3 center punches, $\frac{3}{8}$ inch
- 1 $\frac{1}{4}$ -inch hollow punch
- 1 $\frac{3}{8}$ -inch hollow punch
- 1 $\frac{1}{2}$ -inch hollow punch
- 4 rivet sets, Nos. 2, 4, 6, 8
- 6 scratch awls
- 2 file cleaners
- 2 6-inch slim taper saw files, single cut, with handles
- 4 8-inch second cut mill files, with handles
- 4 8-inch mill smooth files, with handles
- 4 6-inch mill smooth files, with handles
- 2 10-inch hand bastard files, one safe edge, with handles
- 2 half-round files, 8 inch second cut, with handles
- 1 8-inch pipe wrench
- 1 gas soldering furnace
- 2 2-pound soldering coppers
- 2 tin snips, $13\frac{1}{2}$ inch
- 1 tin snip, curved, 14 inch
- 1 blacksmith's anvil, 50 pound
- 1 breast drill, with stand, 3 jaw chuck, 0 to $\frac{1}{2}$ inch
- 1 bar-folding machine, 30 inch
- 1 set forming rolls, 30 inch
- 1 small gas heating forge
- 1 grinder, small, with pulley
- 4 vises, 4 inch machinist's stationary base
- 2 riveting hammers
- 1 iron bench plate
- 1 blow-horn stake
- 1 needle-case stake
- 1 square stake
- 1 hollow mandrel
- 1 squaring machine, 22 inch
- 1 wiring machine, 31 pound

Plumbing

- 1 bell-drum trap
- 1 kitchen sink

1 set kitchen and bath faucets
1 S trap

D. Advantages of the General Shop

Newkirk and Stoddard⁴. outline the following characteristics and advantages of the general shop, several of which make it easy for any community to adopt the general shop plan to some degree.

"Advantages of the General Shop. The following characteristics are to a large degree responsible for the popularity of the general shop in presenting the industrial arts program.

"(1) It is well adapted to the organization of industrial arts content in the light of the general education, exploration, and guidance aims of the junior high school.

"(2) It permits students to be treated as individuals with due respect for their differences in interest and capacity.

"(3) It enables a student to discover his abilities and aptitudes thru manipulation of a wide range of materials, tools, and processes.

"(4) It offers an economical way to gain experience in many activities.

"(5) It makes possible an adequate industrial arts program for the small school.

"(6) It stimulates the setting up of a well-planned shop and a carefully organized teaching content.

"(7) It increases teacher efficiency."

To show the progress of the general shop program during the past four years, and to contrast the current point of view with that prevailing prior to 1928, there

4. Newkirk and Stoddard, The General Shop, pp. 14-15

have been reproduced on the next few pages copies of replies to an informal inquiry sent out from Chico State Teachers College in 1928. A copy of the letter of inquiry concerning the general shop is given below.

While the original inquiry was not intended for use in connection with a study of this sort, the replies will perhaps throw some light on the trend of the general shop movement.

Chico, California
October 30, 1928

Director of Education

Dear Sir:

The Chico State Teachers College has been requested to help Butte County in the preparation of a course of study for the development of the general shops in the Junior High Schools.

In every state the problems are similar, and believing that your state or district can give us information on the general shop, we should like to have your reaction to the general shop program in the following phases:

1. Functions and aims of general shop.
2. Proposed shop lay-outs and plans.
3. Methods used in teaching the general shop work.
4. Any pamphlets or courses of study available.

Very truly yours,

(signed) David F. Jackey,

Director of Ind. Arts Education
State Teachers College
Chico, California

Distribution of Replies

The distribution of these letters of inquiry may be of interest. The following table will show from what states and cities the responses came.

<u>Cities or states</u>	<u>Letters sent</u>	<u>Answers received</u>
Augusta, Maine	1	yes
Austin, Texas	1	yes
Baltimore, Maryland	1	yes
Boston, Massachusetts	1	yes
Bridgeport, Connecticut	2	yes
Bronxville, New York	1	yes
Commerce, Texas	1	yes
Concord, New Hampshire	1	yes
Corvallis, Oregon	2	yes
Dover, Delaware	1	yes
Duluth, Minnesota	2	yes
El Paso, Texas	1	yes
Hartford, Connecticut	1	yes
Harrisburg, Pennsylvania	1	yes
Jefferson City, Missouri	1	yes
Kirksville, Missouri	1	yes
Lansing, Michigan	1	yes
Lincoln, Nebraska	1	yes
Los Angeles, California	1	yes
Long Beach, California	1	yes
Madison, Wisconsin	1	yes
Montpelier, Vermont	1	yes
Nashville, Tennessee	1	yes
Norfolk, Virginia	1	yes
Oklahoma City, Oklahoma	1	yes
Philadelphia, Pennsylvania	1	yes
Pittsburg, Pennsylvania	1	yes
Portland, Oregon	2	yes
Richmond, Virginia	1	yes
Sacramento, California	2	yes
St. Paul, Minnesota	1	yes
San Antonio, Texas	1	yes
San Diego, California	1	yes
Syracuse, New York	1	yes
Springfield, Illinois	1	yes
Trenton, New Jersey	1	yes
Washington, D.C.	1	yes

COPIES OF REPLIES TO INQUIRIES OF 1928

Portland, Oregon
November 27, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

The general shop, as such, in our American public schools has not made good. The plan of giving short term instruction, perhaps from four to six weeks, in any line of mechanical work is not enough. Educational shop instruction that does not carry over to the finish product is doing only half the job and soon resolves itself into a series of unrelated exercises.

Like a problem in geometry this type of manual training soon finds its way to the waste basket and counts little if any toward the permanent education of our boys.

I spent some time in a general shop in a western university a year ago last summer. To me it was a hodge podge of misapplied effort. There were some ten or fifteen trades, they called them, organized in a one-room shop just a little larger than an average school room. Painting, printing, forging, woodworking, electricity, all were operating at the same time. As a Trade Information Center, I would say the effect was only about 50% efficient. There is no place in such a shop for quiet, steady, persistent, plain work wherein the finished product is the final test of practical knowledge gained. It is safe to say here that the educational power and control which produce the best results in adult life come to individuals in no other way.

A well-organized up-to-date Junior High School should have at least four shops, each having its own equipment and instructor occupying a separate room, viz.

Mechanical Drawing room
Woodworking shop
Metalworking shop
Electrical shop

Each of these shops should be more or less general in the scope of work covered; that is, the woodworking

-21-

shop for example, should include bench work for beginners, carpentry, cabinet making and wood-turning.

Occupational and trade information should be a definite part of the instruction offered in each group.

Very truly yours,

(signed) F. M. Groshong

Supervisor of Manual Training

Richmond, Virginia
November 16, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Your letter of November 8, addressed to State Superintendent Hart has been referred to me for reply.

Several attempts have been made to organize a general shop in practical arts and there are two or three now in operation, but I cannot say that they are a great success. I am sorry that I cannot assist you in the study which you are making.

Very truly yours,

(signed) B. H. Van Oot

State Supervisor of Trade
and Industrial Education

Duluth, Minnesota
November 6, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

I have your letter asking for information in regard to our courses of study in Manual Arts. These courses may be purchased at twenty-five cents each.

Wood Turning	-	Seventh Grade
Sheet Metal	-	" "
Woodwork	-	" "
Forging	-	" "
Electricity	-	Eighth Grade
Printing	-	" "
Mechanical Drawing	-	Ninth Grade
Machine Woodwork	-	" "
Pattern Making	-	Tenth Grade
Foundry	-	" "
Machine Shop	-	Eleventh-Grade
Mechanical Drawing	-	Eleventh & Twelfth Grades
Architectural Drawing	-	Tenth Grade
Auto Mechanics	-	Twelfth Grade
Electricity	-	Tenth & Eleventh Grades

Very truly yours,

(signed) George Gregory

Supervisor of Industrial
Education

Pittsburgh, Pennsylvania
November 8, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Your letter of recent date, addressed to Mr. Leavitt regarding General Shop work for Junior High School pupils, has been referred to me for consideration.

We have been conducting General Shop classes in our Junior High Schools for the past ten years, the first of which was equipped for both bench work and turning in wood, bench work and turning in steel, sheet metal work, electric wiring, and printing.

This layout, as you see, called for a teacher of very rich experience, and we have since eliminated printing from our General Shop and made wood working stand out more prominently than the others.

We do not have any literature to send you for the reason that our General Shop courses are usually not exactly the same in every school. Naturally, we stress fundamentals in all the activities and allow the teachers great freedom for initiative. We encourage the building of small models (if possible) which make use of every activity.

This is a rather difficult proposition and is not attended with great success. However, one model that I might mention, electric boudoir lamp, is one that meets the requirements. Other models pertaining to individual activities are:

Book Ends for Sheet Metal
Toy Transformers for Electricity
Tack Hammer with Turned Handle for Machine Shop
Airplane Models for Wood Working

Trusting that this information may be of some help to you, I am,

Very truly yours,

(signed) James R. Glenn
Supervisor of Industrial Ed.

Sacramento, California
November 6, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

I have your letter of October 30th, regarding the junior high school program. We are at this time organizing our shops and formulating our plans and policies along the lines of the home mechanics courses for the 6th, 7th, and 8th grades which are not in the junior high school, and in exploratory work in the 7th, 8th, and 9th grades which are part of the junior high school program. We have no bulletins or outlines at the present time which are of any value to you.

We are at the present time planning a shop for a new school which will have all the grades including the 7th, 8th, and 9th which will constitute the junior high school. Consequently the 5th and 6th grades will be taught in the shop as well as the 7th, 8th, and 9th year courses which constitute the junior high school program. This shop will be equipped ultimately as a general shop from the toy making of the 5th grade to the automobile repair and machine work which will be quasi-vocational. This particular room will have no partitions and the machinery will be as far as possible portable.

I am sorry that I cannot give you more definite information regarding our courses.

Very truly yours,

(signed) Frank C. Vincent

Director of Vocational
Education

Madison, Wisconsin
November 20, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Due to absence from the office, your letter of November 5 has just come to my attention.

I am sorry that we have no printed material on the subject of general shop work in junior high schools in this state. Similar to your case, we are in a stage of transition and no definite material has yet been developed for distribution along this line. It appears, however, to be the coming thing and we hope during the year to accumulate sufficient material to permit us to duplicate it. I expect, however, that it will be almost a year before it will be available and thus would hardly serve you.

Regretting my inability to serve you in this direction.

Very truly yours,

(signed) John Callahan

State Superintendent

St. Paul, Minnesota
November 16, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Your letter of November 7 addressed to Commissioner J. M. McConnell has been referred to me for reply.

We are not in a position to send you anything very illuminating just at present as we are in the process of revising our entire scheme of industrial arts in the junior high school. We are considering the seventh, eighth, and ninth grades, however, as more or less of a unit for promoting a general course through this period which will give pupils an abundance of industrial knowledge as well as experience in a half dozen typical trades and industries. When our revised syllabus in this field is ready for distribution, I shall be glad to send you a copy.

Very truly yours,

(signed) Dean M. Schweickhard

State Supervisor of Trade &
Industrial Education

Corvallis, Oregon
November 24, 1928

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Your letter to the State Department of Education has been referred to us for reply. We, too, are in the process of developing some instructional material for general shop work. In our case we are developing it primarily for teacher-training rather than for Junior High School purposes. It will consequently be of considerably different nature, and will not serve particularly well in your case. It concerns primarily the organization of instruction controls and the manner of handling the class.

Since our program is just developing, and since we have not thus far put our developments into final form, we are a bit hesitant about making statements with reference to a manner of procedure for Junior High Schools in the general shop work. Perhaps as helpful a compilation of information as any will be that published by the United States Bureau of Education in their circular No. 11 for the year 1924. If you will ask for Bureau of Education Circular #11, 1924, Manual Arts for Junior High Schools -- William E. Roberts, I believe you will find some material that will throw light on your particular project. This is a report of a survey conducted by Mr. Roberts on the work being done by the outstanding schools of the country for Junior High School instruction. The survey was made by personal contact rather than by questionnaire, and Mr. Roberts is well qualified to make such a survey. The circular can be had from the Superintendent of Documents at a charge of fifteen cents.

Hoping that this will meet with your requirements,
I am,

Very truly yours,

(signed) George B. Cox

Professor of Industrial
Education

Bridgeport, Connecticut
January 7, 1929

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

The shops in our schools were established originally as woodworking units and functioned strictly as such for several years. As early as 1920, however, equipment and supplies for other types of work were placed in those shops which could be adjusted to a more diversified program. These activities were sheet and cold figure bent metal, home repair, cement work, electricity, and wood turning.

In 1923 we opened in Congress High School a general shop for experimental purposes. The old style individual benches were replaced by large benches where groups might work in a variety of mediums. Aside from an electric drill, a grinder and a bar folder there was no machinery. The pupils came from the first year of high school.

Recently we have established in a small junior high school a general shop unit which more nearly approaches our aim. It is our first shop adequately equipped for this work in the seventh, eighth, and ninth grades. There is no other shop in this school.

We are now planning for our shop work in our new junior high schools, the first of which opens next September. We plan to have as our shop units three general shops and one for instrumental drawing. Work in these will be required of every boy in all three years, two fifty-minute periods per week. This required work will be based upon home problems. Because of election opportunities in the eighth and ninth years for boys desiring more shop work, these shops have been equipped differently in order to give more specialized work in metal in one than in the others, electricity in another, and woodworking in the third.

We are now working upon the course of study for these shops and I shall be pleased to forward a copy when the work is completed.

I am enclosing sketches of various shop units, and an outline of the work done in Congress High School General Shop.

Very truly yours,
(signed) Ernest W. Rider
Supervisor of Manual Training

In a majority of the letters sent out the general shop was being seriously considered, or courses of study were being developed or revised.

Pennsylvania had had the general shop in force for ten years and was very pleased with its progress; Connecticut had successfully established general shop courses since 1920.

Several of the states and cities were inclined to suggest that the general shop had not been well enough developed to warrant any place in their program.

Colleges in Texas, California, Oregon, Missouri, and Nebraska, were establishing courses in general shop work in order to train teachers in that particular line. Activity everywhere pointed to an awakened interest in the possibilities of the general shop. Some comments were against the general shop program but practically all recognized that it was a movement which the future must reckon with and develop or reject as the evidence might dictate.

DEVELOPMENT OF THE GENERAL SHOP PROGRAM IN 1928

Compiled from letters cited previously.

City or State	Type of Shop	Status of Program
California, Long Beach		Committee working on general shop.
California, Los Angeles	Program of general shop suggested.	
California, Sacramento		Not put in form as yet; plans being made for general shop.
California, State Dept.	Plans and specifications worked out for general shop.	
California, San Diego		Course of study being printed.
Connecticut, State Dept.		No information.
Connecticut, Bridgeport	General shop outline complete. Established 1920.	Revising course of study.
Delaware		No information available.
Illinois, Springfield		None.
Maine, Augusta	Manual Arts program	Not sympathetic.
Maryland, Baltimore		Course of study for general shop being formulated.
Massachusetts	Outline for Home Mechanics.	

City or State	Type of Shop	Status of Program
Michigan		General shop courses for Junior High.
Minnesota, St. Paul		Considering general shop program at present.
Minnesota, Duluth		Course of study worked out in favor of general shop unit.
Missouri	No information.	No information.
Nebraska	No data.	
New Hampshire		Try out courses in number of general shops.
New Jersey, Trenton		General shop organized for several years.
New York, Syracuse		Course under revision.
New York, Bronxville		Shop program being developed.
Oklahoma	Manual Training.	No literature covering general shop.
Oregon, Portland	Manual Training.	Not sympathetic toward general shop.
Pennsylvania, Pittsburgh		General Shop work in Junior High for 10 years.
Pennsylvania	Composite.	Great many general shops.
Pennsylvania, Philadelphia	Unit shops, managed to meet the general shop ideal.	

City or State	Type of Shop	Status of Program
Tennessee	None.	None.
Texas, East Texas Teachers College	Shop work and drawing.	No development.
Texas	General shop wood, metal, drafting.	Course of study being revised.
Texas, El Paso	Some general shop.	
Vermont	None.	None.
Virginia, State Dept.	Several attempts to organize.	Not any great success.
Virginia, Norfolk		Working on the general shop idea.
Washington, D. C.	No information.	No information.
Wisconsin, State Dept.		General shop program being formulated.

The foregoing is a compilation of developments as indicated by replies to a letter sent out in 1928 when the general shop was established at Chico State Teachers College. In order to make a check on the progress and development of the general shop within the four years following, a second questionnaire was sent out in 1932, asking specific questions with reference to recent developments, requesting literature whenever available, and courses of study for the more recent programs.

A copy of this later questionnaire and the letter of transmittal, as well as replies to the questionnaire, will be found on the following pages.

STATE TEACHERS COLLEGE
Chico, California

Dept. of Industrial Education

October 23, 1932

Director of Industrial Education

My dear Mr. _____

About four years ago you responded to an informal inquiry from Chico State Teachers College concerning the aims, functions and methods suited to the general shop. The past few years have brought a considerable shift of emphasis in the general shop program, and it seems desirable to contrast the present point of view with that of the past.

As one of those assisting in the earlier study, you can also assist us materially in the present study by giving your present point of view with reference to the general shop movement. As a means of unifying the responses, and also as a means of making your response easier and more direct, will you please use the attached form for expressing your opinions. A self-addressed envelop is enclosed with the questionnaire.

Very truly yours,

(signed) Russell B. Kidder

Director of Industrial
Education

QUESTIONNAIRE TO DIRECTORS OF INDUSTRIAL EDUCATION

1. Does your city or state favor the general shop?
 - a. In the Junior High School? _____
 - b. In the Senior High School? _____
2. Does your city or state have a course of study for the general shop? _____
3. When was the general shop first established in your city or state? _____
4. Has the general shop program increased or decreased in your city or state since 1928? _____
 - a. General shop increased _____ %
 - b. General shop decreased _____ %
5. Please give the names of any city or state bulletins, or other forms of supervisory aids available to your schools.

6. Any of the above mentioned bulletins or forms of supervisory aids that you would send us will be appreciated.
7. Please give any comments that you care to make with reference to the objectives, and probable outcome of the general shop movement. Use reverse side of this sheet if necessary. _____

Reported by _____
Title _____
Address _____

Letters and questionnaires were sent to the directors that answered in 1928, in order to get their present point of view on the general shop movement.

Distribution of Replies

<u>Cities and states</u>	<u>Letters sent</u>	<u>Answers received</u>
Augusta, Maine (State Department)	2	yes
Austin, Texas " "	2	no
Baltimore, Maryland (State Department)	1	yes
Boston, Massachusetts " "	1	yes
Bridgeport, Connecticut " "	1	yes
Bronxville, New York (City Supervisor)	1	yes
Commerce, Texas (Teacher training)	2	yes
Concord, New Hampshire (State Department)	1	yes
Corvallis, Oregon (Teacher training)	1	yes
Dover, Delaware (State Department)	1	yes
Duluth, Minnesota (City Supervisor)	1	yes
El Paso, Texas " "	2	no
Hartford, Connecticut (State Department)	1	yes
Hartford, Connecticut (City Supervisor)	2	yes
Harrisburg, Pennsylvania (State Department)	1	yes
Jefferson City, Missouri (State Department)	2	yes
Kirksville, Missouri (Teacher Training)	1	yes
Lansing, Michigan (State Department)	1	yes
Lincoln, Nebraska " "	1	yes
Los Angeles, California (City Supervisor)	1	yes
Long Beach, California (City Supervisor)	2	yes
Madison, Wisconsin (State Department)	1	yes
Montpelier, Vermont " "	2	yes
Nashville, Tennessee (Teacher Training)	2	no
Norfolk, Virginia (City Supervisor)	1	yes
Oklahoma City, Okla. (State Department)	2	yes
Philadelphia, Penn. (City Supervisor)	1	yes
Pittsburgh, Pennsylvania (City Supervisor)	1	yes
Portland, Oregon (City Supervisor)	2	no
Richmond, Virginia (State Department)	1	yes
Sacramento, California " "	1	yes
Sacramento, California (City Supervisor)	1	yes
St. Paul, Minnesota (State Department)	1	yes
San Antonio, Texas (City Supervisor)	2	no
San Diego, California " "	2	no
Syracuse, New York " "	1	yes
Springfield, Illinois (State Department)	1	yes
Trenton, New Jersey " "	1	yes
Washington, D. C. (City Supervisor)	1	yes

Number of answers received--33. Number not answering--6.

QUOTATIONS FROM LETTERS RECEIVED IN 1932 SHOWING THE TREND
IN THE PRESENT POINT OF VIEW CONTRASTED
BY THE POINT OF VIEW IN 1928

Comments made by directors and state officials on the general shop movement pertaining to the objectives, and a probable outcome of the general shop.

"It seems to be a movement that is gaining favor with the superintendents more rapidly than with the shop teachers. On the other hand it has good points for the teacher as well as bad ones.

"Its weaknesses are probably due as much to inertia on the part of teachers trained in the 'old school' of shop teaching for the sake of skill, as to any other thing. Reorganization of teaching methods and educational aims for exploration and guidance will bring about some more desirable developments."
-----George B. Cox, Professor of Industrial Arts & Director of Engineering Shops, Oregon State College.

"State Supervisor has full supervision of general shop work and is giving personal attention with the assistance of local directors to this work."---
B. H. Van Oot, Supervisor of Industrial Education, State Board of Education, Richmond, Virginia.

"We have a department in Pittsburgh, Research and Curriculum Study, headed by Dr. D. R. Sumstine. All courses of study are worked out in this department with the help of teacher committees. Many of the courses including the general metal, are in the try-out state at present.

"The best feature of the general metal shop is its economy. The worst is the fact that it is very hard to get suitable teachers. While we have no data on the subject, it seems that a modification on the general shop idea of today would be fine in the Senior High as a research laboratory rather than in the Junior High as an exploratory activity."
---Joseph M. Speer, Director of Trade Training, Pittsburgh, Pennsylvania.

"In need of trained teachers; many do not know how to handle a heterogeneous group."---H. W. Schmidt, Supervisor of Manual Arts, Madison, Wisconsin.

"General shop is an excellent device for the small school in teaching a variety of experiences under one teacher. As such it should be promoted, but will probably never have a prominent place in the school of any size, nor beyond the junior high school"---Dean M. Schweickhard, Assistant Superintendent, Public Schools, Minneapolis, Minnesota.

"Greatest handicap is to find teachers really able to teach general shop.

"In schools up to 1000 and having not more than two shops I feel that a general shop is absolutely necessary. In larger schools I have come to favor experience in three, four, or more different specialized shops (one semester or more in each). It is more economical to equip special shops and easier to obtain teachers who are well qualified. There is also less tendency toward duplication of effort.

"After all, a general shop depends, I feel, more than all else upon the teacher and almost any shop with the addition of a small amount of equipment may give the broadest kind of shop experience if it has the right teacher. The best equipped general shop may be distorted by a teacher who is willing to follow some line of his own interest too far."---Ernest W. Rider, Industrial Arts Supervisor, Bridgeport, Conn.

"The Junior High Schools in Duluth are equipped with seven different shops which makes it possible to offer a great variety of work. This is possible because of the size of the schools and the number taking shop work.

"The same holds true for our Senior High School Industrial Arts work. Seven different kinds of shop work are offered. It seems to me general shops are suited to small towns or small schools where shop work is limited to two hours per week. Such classes as I have observed in other cities do not accomplish all they claim because in my opinion the classes are too large."---George Gregory, Supervisors of Industrial Education, Duluth, Minnesota.

Replies received which are of exceptional interest will follow, although the answers submitted in 1928 are not recorded in this thesis.

Concord, New Hampshire
November 10, 1932

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

We believe the general shop will become a more important type of Industrial Arts in this state and others. Better than the unit shop the general shop should contribute to richer exploratory or finding values, to greater avocational opportunities for the development of side line interests, to a wider development of 'handyman' abilities and to a more extensive all around development and industrial intelligence.

Very truly yours,

(signed) Clifton H. Dustin

State Supervisor of
Industrial Education

Los Angeles, Calif.
November 16, 1932

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Mr. Foss R. Brockway of the University of California asked me to answer your questionnaire concerning the general shop program in our city.

We have three general composite shops in our junior high schools. These were established eight or ten years ago, and no new ones have been organized since. Our newest development along this line is a general metal shop, an outgrowth of our auto mechanics which we felt was too limited in scope for the junior high schools. At the present time we have thirteen general metal shops. I am enclosing our course of study which is printed in chart form.

In our city junior high schools we have what might be called unit shops, but we are gradually developing each unit shop into a somewhat broader field of activity representing a number of closely related industrial pursuits. I do not believe the general composite shop will ever gain foothold in the large city junior high schools because it would make necessary the equipping of five or six shops with the same equipment. This would not only mean a duplication, but would not permit the boy to advance very far in any one field of work.

Hoping this information may help you in your survey, I am,

Very truly yours,

(signed) C. E. Nihart

Assistant Supervisor

Trenton, New Jersey
November 2, 1932

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

This will acknowledge receipt of your letter and questionnaire of October 23. I find it difficult to reply to your questionnaire because it appears to require information of the city system. The development of our general shops has occurred to a greater degree in the small-sized cities and towns throughout the state, whereas the city of 75 to 100 thousand and over install in the junior and senior high schools unit shops for printing, woodwork, electrical work, and metal work. Districts ranging from 3 to 30 thousand population have a tendency to conduct the work on a general shop plan. All new districts now equipping shops in this class are required to put in equipment for general shop work. I do not believe that a great change has taken place regarding the aims for this work. However, the aims are more conscientiously fulfilled in that boys carry out a greater variety of operations in a general shop and perhaps the specific aim is to develop amateur mechanical ability in the four or five important courses incorporated in an industrial arts program.

Considerable interest is now being shown in home mechanics. One of the outstanding aims, in my opinion, is to instill in the boy some feeling of pride and interest in the upkeep of the home. This aim is supported in the book, "A Sociological Philosophy of Education", by Dr. Finney in his chapter on Telic Education Relative to the Family.

Yours very truly,

(signed) Robert A. Campbell

Supervisor of Industrial
Education

Hartford, Connecticut
November 5, 1932

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

I wasn't here four years ago when you made an informal inquiry concerning the aims, functions, and methods suited to the general shop in Connecticut. I am, therefore, unable to note definitely the progress which has been made.

The depression has caused a withdrawal of some support from the industrial arts program. There is a tendency, however, in new buildings and new programs to include a general shop set-up instead of the highly specialized machine shops, etc., which are ordinarily included. We have a system of trade schools in Connecticut that takes care of this more technical side of industrial arts and industrial education and we are having an increased demand for the general shop, with a program that includes a constantly increasing number and variety of activities.

I don't know if this will be of any help to you but we are back of the general shop for the most part, rather than the specialized shops that formerly were equipped in all new buildings.

The questionnaire is hard to answer but I have answered it to the best of my ability.

Very truly yours,

(signed) Paul D. Collier

Senior Supervisor of
Secondary Education

Sacramento, California
November 21, 1932

Industrial Education
Chico State Teachers College
Chico, California

Gentlemen:

The State has not set up a definite course of study for the General Shop because we do not want a stereotyped state program of shop instruction. Each institution training industrial arts teachers, and the local supervisors of industrial arts education, have worked out very complicated courses of study applicable to the various communities concerned.

There is a movement on foot, a cooperative arrangement between the state teachers colleges and the state department of education, to develop a shop activity program for elementary teachers which will be more or less along the general shop line, not necessarily with the idea of setting up general shop programs, but to give instruction in a large number of rather diversified activities, in most cases carried on in classrooms with special equipment provided and special efficient instruction.

Very sincerely yours,

(signed) J. C. Beswick

Chief, Bureau of Trade &
Industrial Education

Lansing, Michigan
October 29, 1932

Industrial Education Department
Chico State Teachers College
Chico, California

Gentlemen:

Your question as to the use of General Shop in the Senior High School I have given some thought to. I have the following to say:

1. If it means simply a repetition of junior high work with the same objectives, I do not favor it unless the school is so situated that boys enter senior high without any industrial arts work. For instance, boys might enter from rural schools or parochial schools without any industrial work whatever.

2. My feeling is that it might be continued through tenth grade. After that it should be given a vocational trend and be more specialized.

3. I rather think general shop in the senior high school if sufficient time, say three hours a day, were given to it might become a very valuable kind of vocational industrial preparation. Boys must be able to meet changing conditions and fit into various kinds of work. So I am beginning to think that such a course meets the needs of modern industry, at least in some localities, better than a course training for a single trade; of this I am not sure.

4. I certainly favor a general shop for part-time classes except in rare cases where a boy is employed in some special line and needs special training. In our experience most of the part-time pupils are not so employed.

Very truly yours,

(signed) K. G. Smith

State Supervisor of
Industrial Education

QUOTATIONS FROM QUESTIONNAIRES SENT OUT IN 1932.

"In New York State we are beginning to have very definite ideas regarding the General Shop. In larger communities we have general Woodworking, general Printing, general Metal, general Electricity, etc. In the small communities, we are establishing the regular type of General Shop, giving three or more different kinds of activities. From the point of view of the larger cities, where there is more than one shop in most schools, we are increasing the scope of each type of work so that it will be more inclusive and general, than ever before. Mr. Roy G. Fales of the State Department of Education in charge of Industrial Arts work has outlined the whole program for New York State very definitely and you may obtain information from him."---
Donald M. Kidd, Director, Vocational Education, Syracuse, New York.

"The outcome of the general shop movement is hard to predict. Every shop seems to have different objectives. The community has much to do with setting up the objectives.

"It seems to me that the general shop is going to be the solution of many shop economic problems. If we are trying to offer a variety of opportunities they must be given in one shop, such as the general metal shop, the general wood shop, the general craft shop. In the latter shop, there can be metal craft, jewelry, leatherwork, and maybe block printing. In the woodshop there can be wood carving, turning, some carpentry, cement work, and cabinet making of a nature that will entail the use of the carved pieces or the turned pieces. The general metal shop can have wrought iron work, art sheet metal (by this I mean articles of use such as mail boxes, weather vanes, wall lighting fixtures made of tin, copper, etc.,) some foundry work, electric work that will involve the use of the equipment. The making of small motors, electric engines, etc. The bell wiring, etc, is time wasted in my opinion.

"Along with all of these activities there should be a good visual course offered. This course will show the boys what is going on in the world of industry. Many films are to be had for express charges. In a recent issue of the Industrial Arts and Vocational

Magazine I had an article on this point."---Emerson Wm. Manzer, Supervisor Industrial Arts, Bronxville, New York.

"The principal objective is based on a fundamental of importance, that of finding out the natural bent or inclination of the pupil. Especially the unfortunate youngster who does not care for school subjects, perhaps thru lack of endowed or inherent ability to progress with the normal work of the class.

"We are experimenting with two classes of boys in our vocational schools. Thus far the children show marked ability in mechanical work, and are not only interested and happy, but get considerable school preparation for good citizenship.

"Of course the plan of general shop will have to be sold to the applicant. The organization must take care of the content of related subjects allied with the phases of practical work undertaken.

"We use General Shop Mathematics, Published by D. Van Nostrand Company.

"General Metal Work by Grayson, Published by D. Van Nostrand Company.

"Essentials of Applied Electricity, Published by The Bruce Publishing Company, E. W. Jones,"--- J. Elmer Zearfoss, Director of Manual Training, Washington, D. C.

Complete list of bulletins received from questionnaires
sent in 1928.

Augusta, Maine	None
Austin, Texas	None
Baltimore, Maryland	Five courses of study completed.
Boston, Massachusetts	None
Bridgeport, Connecticut	None
Bronxville, New York	None
Commerce, Texas	State Bulletin on drawing, State bulletin on shop work, State De- partment of Education, (Austin, Texas)
Concord, New Hampshire	Suggested outline of work in Mechanical Arts in the general shop. Bul. No. 142.
Corvallis, Oregon	None at present.
Columbus, Ohio	Ohio State University, Western Arts Ass'n. Bul. Terminology Investigation. Symposium No. Vol. XVII, No. 2, March 20, 1933
Dover, Delaware	None
Duluth, Minnesota	Secondary school curriculum No. C-5. Dept. of Education.
El Paso, Texas	None
Hartford, Connecticut	No bulletin listed.
Hartford, Connecticut.	None.
Harrisburg, Pennsylvania	State Report of Industrial Arts.
Jefferson City, Missouri	None
Kirkville, Missouri	None

Lansing, Michigan	Safety Education in the school shop, Bul. No. 226 (1931). An accident prevention test. Form A. (To accompany Bul. 226) Ind. Ed. Monograph on Elementary Electrical Construction. Bul. No. 224. Outline Course in Elementary Mechanical Drawing for Intermediate and High Schools by E. A. Ferns, Bul. No. 220 revised Oct. 1926. Industrial Arts Monograph on General Industrial Shop and Household Mechanics. Published by Webster H. Pearce, 1932. Outline Course in Elementary Auto Mechanics, by G. R. Correll and R. T. Guyer, Bul. No. 217, 1923. Outline Course in Elementary Woodwork, Bul. No. 218 Rev. 1927.
Lincoln, Nebraska	None available.
Los Angeles, California	Industrial Arts general metal course outline Junior High.
Long Beach, California	No bulletin listed.
Madison, Wisconsin	All bulletins out of print.
Montpelier, Vermont	No publication available.
Nashville, Tennessee	None
Norfolk, Virginia	Course of Study of General Metal. T. G. Rydingsvard, Director Vocational Education.
Oakland, California	General and Home Mechanics Course of Study. Incomplete Job Sheets.
Oklahoma City, Oklahoma	None
Philadelphia, Penn.	Copy of ten years progress in Ind. Education in Philadelphia Public Schools.

Pittsburgh, Penn.	Research in curriculum study. Headed by Dr. D. R. Sumstine.
Portland, Oregon	None
Richmond, Virginia	None
Sacramento, California (City)	None
Sacramento, California	List of Local Supervisors and Directors of Vocational Educa- tion.
St. Paul, Minnesota	Secondary School Curriculum, Bul. No. C-5 Ind. Arts.
San Antonio, Texas	None
San Diego, California	None
Syracuse, New York	None
Springfield, Illinois	None
Trenton, New Jersey	State Bul. for Equipment for Industrial Arts
Washington, D. C.	None
Wilmington, Delaware	None

RECORD OF INFORMATION PERTAINING TO GENERAL SHOP

	Gen. Shop Favorable in Jr. High School	In the Senior High School	Course of Study Available	Gen. Shop first established	Gen. Shop increased	Gen. Shop decreased	Remarks
Augusta, Maine	yes	no	no	---	yes	---	
Austin, Texas							Ind.Arts all
Baltimore, Md.	yes	yes	yes	1924	yes	---	changed to gen. shop
Boston, Mass.	yes	yes	no	1913	yes	---	Organized in Springfield about 1913.
Bridgeport, Conn.	yes	yes	yes	1925	---	yes	
Bronxville, N.Y.	yes	yes	no	1929	yes	---	
Commerce, Texas	yes	---	yes	1923	---	---	
Concord, N. H.	yes	yes	yes	1922	yes	---	
Corvallis, Ore.	yes	no	no	1926	yes	---	
Dover, Delaware							Same as Wilmington
Duluth, Minn.	no	no	yes	---	no	no	
El Paso, Texas							
Hartford, Conn.	none	yes	---	---	---	---	
Hartford, Conn.	yes	yes	no	---	yes	---	
Harrisburg, Pa.	yes	yes	no	1920	yes	---	
Jefferson City, Mo.	yes	yes	no	---	yes	---	
Kirksville, Mo.	---	---	---	---	---	---	
Lansing, Mich.	yes	yes	yes	1925	yes	---	
Lincoln, Neb.	---	yes	no	---	---	---	
Los Angeles, Cal.	yes	---	*yes	---	yes	---	
Long Beach, Cal.	*yes	---	yes	1922	yes	---	
Madison, Wis.	yes	yes	no	1926	yes	---	
Montpelier, Vt.	none	yes	yes	---	none	none	
Nashville, Tenn.							
Norfolk, Va.	*yes	no	no	1927	yes	---	
Oklahoma City, Okla.							
Philadelphia, Pa.	yes	yes	no	1925	yes	---	
Pittsburg, Pa.	*yes	---	yes	1915	yes	---	

RECORD OF INFORMATION PERTAINING TO GENERAL SHOP (Continued)

	Gen. Shop Favorable in Jr. High School	In the Senior High School	Course of Study Available	Gen. Shop first established	Gen. Shop increased	Gen. Shop decreased	Remarks
Portland, Ore.							
Richmond, Va.	yes	yes	no	1928	yes	---	
Sacramento, Cal.	yes	yes	yes	1927	yes	---	
Sacramento, Cal.	yes	yes	no	1922	yes	---	
St. Paul, Minn.	yes	no	yes	1930	yes	---	
San Antonio, Texas							
San Diego, Cal.							
Syracuse, N.Y.	yes	yes	no	1928	yes	---	
Springfield, Ill.	yes	yes	---	---	---	---	
Trenton, N.J.	yes	---	yes	1918	---	---	
Washington, D.C.	yes	no	yes	1931	yes	---	
Wilmington, Del.	yes	no	yes	1928	yes	---	

* General metal shop.

In order to gain information that would assist in establishing a course of study for Oregon, questionnaires were sent to each state department of education by the Department of Industrial Education at Oregon State College. Some of the information obtained was adaptable to this study, particularly that concerning the significance of the general shop in the United States, although the questionnaires were originally compiled for other use. A copy of this questionnaire and the letter of transmittal follow.

OREGON STATE AGRICULTURAL COLLEGE
Corvallis, Oregon

Dept. of Industrial Education

May 19, 1932

State Department of Education
Augusta, Maine

Gentlemen:

The Oregon State Department of Public Instruction has asked our assistance in the preparation of a bulletin designed to aid the small high schools of the state in their endeavor to establish industrial arts as a part of their regular work. Believing that many of the conditions in your state are comparable to the conditions that confront us in Oregon, and believing also that your state has progressed further along these lines than has Oregon, I would like to enlist your cooperation, if it is possible for you to give assistance by means of bulletins or personal reaction.

Your response to the questions on the attached sheet will be greatly appreciated. We shall also be glad to receive copies of any pamphlets, bulletins, or other material which is used by your department for the purpose of setting standards or otherwise assisting in the supervision of industrial arts as it is administered in your state.

Very truly yours,

(signed) Geo. B. Cox

Professor of Industrial
Arts Education

QUESTIONNAIRE TO STATE DEPARTMENT OF EDUCATION

1. Does your state publish a course of study for industrial arts (manual training)?
 - a. In the elementary schools? _____
 - b. In the secondary schools? _____
2. Does the State Department prescribe the types of shop work or is the selection of work left to the individual school? _____
3. Does the 6-3-3 (junior high) or 8-4 (senior high) organization predominate in the schools of your state? _____
4. If the 8-4 plan now predominates, is the 6-3-3 plan increasing in favor or about at a standstill? _____
5. What type of shop organization predominates in these two types of schools? _____
 - a. Junior high,
 - (1) Diversified general shop _____ %
 - (2) Specialized single-activity shop _____ %
 - (3) _____ %

100 %
 - b. Senior high,
 - (1) Diversified general shop _____ %
 - (2) Specialized single-activity shop _____ %
 - (3) _____ %

100 %
6. In the smaller schools, with only one industrial arts teacher, is the preference for,
 - a. Diversified general shop? _____ %
 - b. A single-activity shop of the old "Manual Training" (woodwork & drawing) type? _____ %
 - c. _____ %
7. Is there any uniformity in the amount of industrial arts work offered in the various schools? _____
8. Is greater or less uniformity to be desired? _____
9. Please check the type of industrial arts shop work (not trade work) occurring most frequently in the schools of

your state. Indicate those of greatest frequency with (G); those of average frequency with "A"; those of least frequency with "L"; and those not occurring at all with _____.

_____ Auto Mechanics	_____ Forging & Welding
_____ Concrete Work	_____ Foundry
_____ Crafts Work--	_____ Machine Shop
_____ (Art metal, leather	_____ Sheet Metal
_____ tooling, pottery, etc.)	_____ Plumbing
_____ Design, Applied	_____ Printing
_____ Drawing, Freehand	_____ Woodwork, Elementary
_____ Drawing, Machine	_____ Cabinet Making
_____ Drawing, Architectural	_____ Carpentry
_____ Electricity	_____
_____ Farm Mechanics	_____
_____ Household Mechanics	_____

10. Does the state department attempt to supervise or suggest the fixing of standards for equipment? _____
If so, is the supervision or suggestion in terms of:

- a. Minimum equipment lists? _____
b. Minimum equipment budgets? _____
c. _____

11. Are there suggestions for minimum requirements in floor space, window area, etc.? _____

12. Is there any limitation on the size of school (no. of teachers) below which it will not be advisable to establish industrial arts work? _____
If so, what is the minimum? _____

13. Please give the names of any state bulletins or other forms of supervisory helps available to your schools.

Reported by _____
Title _____
Address _____

Distribution of replies to questionnaires sent out
by Oregon State College, May 13, 1932.

<u>State</u>	<u>Letters sent</u>	<u>Answers received</u>
Alabama	1	yes
Arizona	2	yes
Arkansas	2	yes
California	2	yes
Colorado	2	no
Connecticut	1	yes
Delaware	1	yes
Florida	2	yes
Georgia	1	yes
Idaho	2	yes
Illinois	1	yes
Indiana	1	yes
Iowa	1	yes
Kansas	1	yes
Kentucky	1	yes
Louisiana	2	no
Maine	1	yes
Maryland	2	no
Massachusetts	1	yes
Michigan	1	yes
Minnesota	1	yes
Mississippi	1	yes
Missouri	1	no
Montana	2	no
North Dakota	2	yes
North Carolina	1	yes
New Jersey	1	yes
New Hampshire	2	no
New Mexico	1	yes
Nevada	1	yes
Nebraska	1	yes
New York	1	yes
Oklahoma	1	yes
Oregon	1	tes
Ohio	2	no
Pennsylvania	1	yes
Rhode Island	1	yes
South Carolina	1	no
South Dakota	2	yes
Tennessee	1	yes
Texas	1	yes
Utah	1	yes
Vermont	1	yes
Virginia	1	yes

Washington	1	yes
West Virginia	2	no
Wisconsin	1	yes
Wyoming	1	yes

States answering the questionnaire--39.

TYPES OF SHOP ORGANIZATION FOR JUNIOR AND SENIOR HIGH SCHOOLS
AS REPORTED BY STATE DEPARTMENTS OF EDUCATION
IN THE VARIOUS STATES

State	Junior High School		Senior High School	
	Diversified General Shop	Specialized Unit Shop	Diversified General Shop	Specialized Unit Shop
Alabama	*	*	*	*
Arizona	10	90	10	90
Arkansas	80	20	25	75
California	25	75	small H. S.	
Colorado	*	*	*	*
Connecticut	90	10	10	90
Delaware	10	90	*	*
Florida	10	90	*	100
Georgia	*	100	*	100
Idaho	95	5	80	20
Illinois	*	*	5	95
Indiana	50	50	10	90
Iowa	10	90	10	90
Kansas	*	*	*	*
Kentucky	*	*	*	*
Louisiana	*	*	*	*
Maine	90	10	90	10
Maryland	*	*	*	*
Massachusetts	*	*	*	*
Michigan	*	*	*	*
Minnesota	*	*	*	*
Mississippi	50	50	75	25
Missouri	*	*	*	*
Montana	*	*	*	*
North Carolina	10	90		100
North Dakota	*	*	*	*
New Jersey	80	20	20	80
New Hampshire	*	*	*	*
New Mexico	*	*	*	*
Nevada	*	*	*	*
Nebraska	95	5	95	5
New York	35	65	35	65
Oklahoma	60	40	20	80
Oregon	80	20	10	90
Ohio	*	*	*	*
Pennsylvania	75	25	50	50
Rhode Island	*	*	*	*
South Dakota		100		
South Carolina				100
Tennessee		100		
Texas	75	25	0	100
Utah	90	10	10	90
Vermont	*	*	*	*

State	Junior High School		Senior High School	
	Diversified General Shop	Specialized Unit Shop	Diversified General Shop	Specialized Unit Shop
Virginia	*	*	*	*
Washington	60	40	10	90
West Virginia	*	*	*	*
Wisconsin	40	60	10	90
Wyoming	25	75	10	90

* No figures available.

Note: Figures are in percentage of the two types as compared with the whole number of industrial arts shops in a state.

APPROXIMATE PERCENTAGE OF DIVERSIFIED GENERAL SHOPS
VS. UNIT SHOPS IN SMALL SCHOOLS

State	Diversified General Shop	Unit Shop
Alabama	*	*
Arizona		100
Arkansas	60	40
California	yes	
Colorado	*	*
Connecticut	*	*
Delaware	10	90
Florida	State recommends	Slow to change
Georgia	100	
Idaho	*	*
Illinois	2	98
Indiana	25	75
Iowa	10	90
Kansas	15	85
Kentucky	*	*
Louisiana	*	*
Maine	50	50
Maryland	*	*
Massachusetts	*	*
Michigan	*	*
Minnesota	*	*
Mississippi	yes	
Missouri	*	*
Montana	*	*
North Carolina	yes	Nearly all
North Dakota	Gen. Shop	
New Jersey	100	
New Hampshire	*	*
New Mexico	*	*
Nevada	*	*
Nebraska	100	
New York	50	50
Oklahoma	10	90
Oregon	10	90
Ohio		
Pennsylvania	75	25
Rhode Island	85	15
South Carolina		
South Dakota		100
Tennessee		100
Texas	75	25
Utah	95	5
Vermont	*	*

State	Diversified General Shop	Unit Shop
Virginia	100	
	* Tendency toward household and farm mechanics.	
West Virginia		
Wisconsin	30	70
Wyoming	10	90

* Data not given.

Note: The above chart shows the percentage of diversified one-teacher general shops in the small schools in comparison with the number of unit shops in the schools reported in this study.

FREQUENCY OF OCCURRENCE OF DIFFERENT TYPES
OF SHOP SUBJECT-MATTER AS REPORTED
BY STATE DEPARTMENTS

Type of Shop	Greatest Frequency	Average Frequency	Least Frequent	Not Offered	States Reporting
Auto Mechanics	2	13	12	3	38
Concrete Work	0	8	15	9	40
Crafts Work	0	4	19	9	40
Design	1	4	16	10	39
Drawing, freehand	5	10	9	6	38
Drawing, machine	9	12	7	4	40
Drawing, arch.	6	10	9	5	38
Electricity	7	12	10	3	40
Farm Mechanics	4	14	11	3	40
Household Mechmaics.	3	12	11	5	39
Forging & Welding	1	4	19	8	40
Foundry	0	2	15	14	39
Machine Shop	1	7	16	7	39
Sheet Metal	6	10	11	4	39
Plumbing	1	4	13	14	40
Printing	2	11	14	5	40
Woodwork, elementary	4	27	0	0	39
Cabinet Making	19	9	3	1	40
Carpentry	2	14	10	6	40

Note: Eight states reported no data.

GROWTH OF THE GENERAL SHOP IDEA IN PENNSYLVANIA

While practically all those responding to the questionnaire of 1932 gave a report of increased numbers of general shops in their states, it has been difficult to secure reliable data in absolute figures. The situation is a little more exact in Pennsylvania, however, partly because of a more definite terminology and more adequate records, and partly because Pennsylvania has been a leader in the general shop movement since 1918.

Chart IV shows the distribution of General Shop activities in Pennsylvania from 1928-32. While the total number of shops has increased considerably, the tendency is to increase the number of activities per shop in later years, probably eventually standardizing on four or five activities per shop.

Chart V shows the combinations of shop activities with the number of teachers involved; also the increase or decrease in combinations of activities in the general shop for the past four years.

Chart IV

STATISTICS PERTAINING TO THE GENERAL SHOP
TYPE OF INDUSTRIAL ARTS SHOP
IN
PENNSYLVANIA

School Years
1928 --- 1932

Number of Activities Per Shop	Number of Shops			
	1928-1929	1929-1930	1930-1931	1931-1932
Two	15	9	19	18
Three	7	12	19	17
Four	6	7	15	19
Five	5	3	17	7
Six	-	-	3	2
Seven	-	1	1	3
Eight	-	-	1	1
Nine	-	-	1	-

General Shop Defined

For the purpose of reporting, the general shop is defined as a shop where more than one shop activity is taught by one teacher, in the same shop at the same time.

STUDY OF THE GENERAL SHOP
1928-1932

Teachers					
1928-29	1929-30	1930-31	1931-32	Combinations of 2-activity shops	
4	4	2	7	Woodworking,	Electricity
80	83	109	77	"	Drawing
4	1	7	8	"	Sheet Metal
1	1	2	2	"	General Metal
2	1	1	1	"	Printing
1	-	-	2	"	Machine
1	-	-	-	"	Forge
-	1	-	-	"	Plumbing
-	1	1	-	"	Concrete
-	-	-	2	"	Auto
-	-	2	3	"	Unclassified
1	-	3	-	Electricity,	Auto
1	-	-	1	"	General Metal
1	-	1	2	"	Printing
2	-	2	2	"	Drawing
-	2	1	-	"	Sheet Metal
-	5	3	1	"	Machine
-	-	1	1	"	Plumbing
2	1	4	3	Drawing,	Printing
1	-	-	-	"	Sheet Metal
2	-	1	-	"	Machine
-	-	2	-	"	Unclassified
2	-	2	2	Sheet Metal,	Machine
-	-	-	1	"	Printing
-	-	1	1	Machine,	Auto
-	-	1	-	Foundry,	Printing
-	-	-	1	General Metal,	Unclassified
15	9	19	18	Combinations of 3-activity shops	
1	-	14	25	Woodworking,	Electricity, Drawing
1	5	8	6	"	Sheet Metal
1	-	4	9	"	Gen. Metal
-	1	3	1	"	Machine
-	1	2	-	"	Auto
-	1	2	-	"	Printing
-	-	1	-	"	Home Mech.
1	3	1	2	"	Drawing,
1	-	4	1	"	Printing
-	1	1	1	"	Sheet Metal
-	3	-	4	"	Machine
-	-	1	-	"	Gen. Metal
-	-	-	1	"	Forge
-	-	-	2	"	Concrete
1	-	-	-	"	Foundry
-	1	3	1	"	Printing, Concrete
-	-	2	2	"	Electricity, Machine
-	-	-	1	"	Sheet Metal, Machine
-	-	-	-	"	Foundry

SECTION IV

PROBABILITIES OF THE GENERAL SHOP IN THE FUTURE

PROBABILITIES OF THE GENERAL SHOP IN THE FUTURE

A. Present Objectives as a Guide to Future Probabilities

The general shop has been gaining ground since the war, especially in junior high schools and in the smaller high schools of the rural districts.

The early pioneers in the general shop field have established the background and the method upon which later developments in the field have progressed.

Maris M. Proffitt in Bureau of Education Bulletin No. 30, 1929, did much to pass the idea of the general shop along. William John Cooper, Commissioner of Education when summing up the object of the general shop, in his indorsement of the bulletin and in his letter of transmittal accompanying it, says:¹.

"The general shop as a form of instructional organization for offering work in a variety of shop activities is an outgrowth of the general recognition of the need for providing in the school curriculum exploratory and developmental types of experience for children of approximately junior high age. It also meets an outstanding need for small schools, unable to provide unit equipment and instruction in a number of shop courses, for providing some training in mechanical manipulative processes and for gaining some useful technical knowledge."

Louis V. Newkirk². in his article in the Education Magazine relates the general shop as a modernized type of

1. Proffitt, Maris M., Bureau of Education Bulletin, #30, 1929, frontispiece.

2. Newkirk, Louis V., The General Shop, Education Magazine, Vol. LII, No. 10, June 1932, p. 596.

industrial arts, which will probably have a great deal to do with the industrial arts in the high schools of the future.

"The general shop is the modernized industrial arts concept. It is not fundamentally analogous to a series of unit shops, but is a new concept in the industrial arts with special functions to perform in giving pupils educative industrial arts experiences of a sort which the typical unit shop was never intended to give. It is not just a room with equipment suitable for working several types of materials. It is the reorganization of shop work in the light of modern educational philosophy and research studies of the individual pupils and their needs. In small communities and in small schools in large communities, general shop instruction is usually offered in one room equipped to work several materials. This is commonly known as a comprehensive general shop.

"In the larger schools in the largest cities there is a tendency to attempt the realization of the general shop concept by housing the equipment for working the various materials in separate rooms. For very large schools where it is necessary to have five or six shops in one building, this may be a more conveniently administrative procedure, but it does not give pupils the freedom that the comprehensive type does and may result in a stiff-legged type of instruction.

"The following objectives, while of a fundamental importance for general shop in elementary and junior high schools, are not completely realized in the average shop. In most cases, however, the general shop contributes an important part along with the other subjects of the curriculum.

1. Handyman abilities.
 - a. How to use simple hand tools.
 - b. Making repairs and adjustments about the home.
 - c. Know equipment that is used in the home.
2. Consumer's values and appreciation.
 - a. Quality and value.
 - b. The ability to appreciate industrial products adds interest to life.

3. Guidance. Educational and Vocational.
 - a. Gives pupil opportunity to work with different types of material and tools.
 - b. Industrial and trade information.
4. Leisure time activities.
 - a. Broadening of interests.
 - b. Develops hobbies.
 - c. Home workshops.
 - d. Interest in reading books about industry.
5. Physiological development.
 - a. Offers many pupils their only opportunity to manipulate tools and materials.
 - b. Psychologists believe boys and girls develop better when allowed a good deal of manipulative experiences.
6. Social development.
 - a. Working together.
 - b. Opportunity to help in the care of shop equipment on a cooperative basis.
7. Motivating and vitalizing agency in the school.
 - a. Opportunities for motivating and making realistic the work in social science, English, science, geography, and mathematics.
8. Planning.
 - a. Planning individual work. Well-established habits of analyzing and planning are of value."³.

"The following characteristics of the general shop when viewed together aid in giving a picture of this new Industrial Arts concept.

1. It is usually taught in one room under one instructor.
2. It is often equipped with a variety of tools for working several types of materials.
3. Projects may be undertaken that require the use of several different materials.
4. Pupils given an opportunity to advance at rates in keeping with ability and interests.
5. Arrangement of shop equipment flexible.
6. The objectives of the general shop based primarily on general education.
7. Coordinates information and social habits with a degree of skill.
8. Requires a careful organization of instructional materials, supplies, and equipment.

3. Revised from list submitted by Newkirk in last previous citation.

9. Gives the small school an opportunity to offer a modern industrial arts program with the minimum expense.
10. The general shop teacher must be able to work a number of different materials, and have a good background of cultural, professional, and technical training.

B. Possibilities for Reorganizing Present Unit Shops to Meet the General Shop Objectives

The general shop can be established at a conservative cost by making over the old manual training shop or wood-working shop into one equipped for several activities. This will permit giving a more comprehensive training at no great sacrifice to those small schools already equipped on the old basis. As a means of showing the possibilities of such reorganization, the author wishes to call attention to an article by Stewart F. Ball, on "Reorganizing A Unit Shop Into A General Shop".⁴.

Speaking of the reorganization of unit shops, Mr. Ball says,

"While no two situations of this character are ever exactly alike, the best way to describe what we have done in the process of reorganizing a shop for the purpose of broadening the scope of activities is to present the floor-plans showing two shops 'before' and 'after'.

"Fig. 1 shows the floor-plan of a standard unit wood-working shop, while Fig. 2 shows the layout of the same shop after reorganization. ----- The major items of equipment for these two shops are listed below.

4. Ball, Stewart F., "Reorganizing a Unit Shop Into a General Shop", Industrial Education Magazine, Vol. XXXII, No. 10, pp. 324-326.

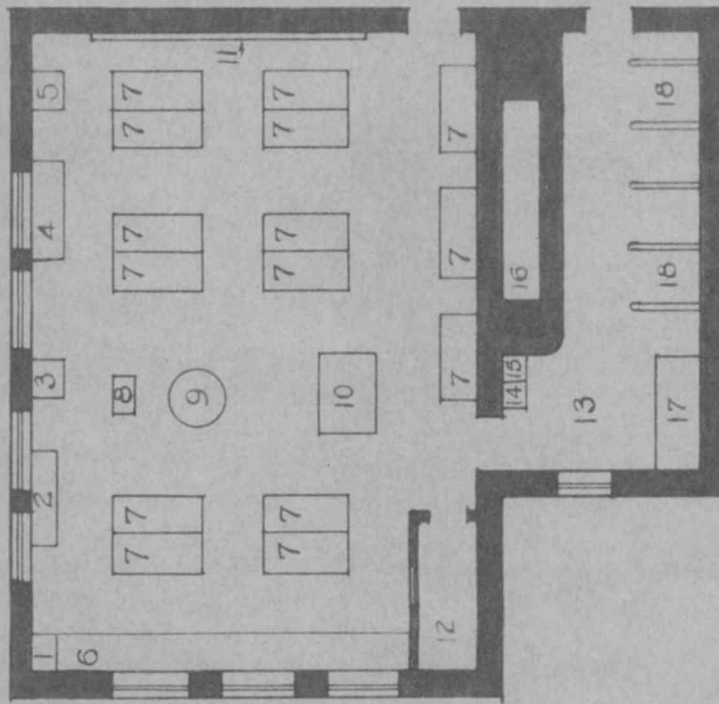


Fig. 2

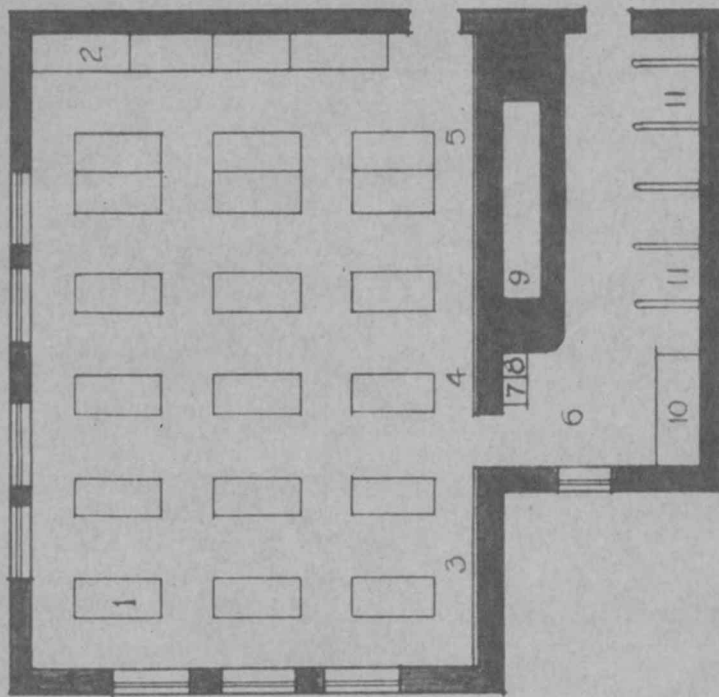


Fig. 1

Equipment for Shop Shown in Fig. 1.

1. 18 Single 8-drawer woodworking benches
2. Storage-cupboard, in four sections
3. Blackboard, 10'0"x4'0"
4. Tool-panel, 7'6"x4'0"
5. Blackboard, 11'0"x4'0"
6. Lumber-storage room, 22'0"x8'0"
7. Saw-box
8. Scrap-box
9. Air-duct
10. Tool-cupboard, 5'4"x2'4"
11. Lumber-rack, 12'0"x3'6"

Equipment for Reorganized Shop
Shown in Fig. 2.

1. Glue-pot
2. Soldering-bench; three soldering-coppers
3. Drill-press
4. Lathe
5. Tool-grinder
6. General work-bench; three machinists vises
and one pipe-vise
7. 15 Standard woodworking benches
8. Anvil
9. Hold-all
10. Band-saw
11. Blackboard, 14'0"x4'0"
12. Section of "house" for practice in carpentry,
electric wiring, plumbing, plastering, and
papering.
13. Lumber-storage room.
14. Saw-box
15. Scrap-box
16. Air-duct
17. Tool-cupboard, 5'4"x2'4"x7'0"
18. Lumber-rack, 12'0"x3'6"

"It is important to bear in mind that these changes were not all made at one time, not even in one year. The changes evolved as our conception of the purposes of the work developed, as the needed funds became available, and as teachers were prepared for the new activities.

"First, let me say, the problem of converting a typical woodworking shop into a general shop is not a difficult one to solve, provided you have a reasonable amount of time, the necessary funds, and a teach-

er who will satisfactorily fill the new roll.

"The reason I emphasize the time element is because I believe the process of changing over from a single-activity shop to a general shop should be a gradual one. The new shop should evolve out of the particular set of conditions and needs of the community (and this applies to the district in the large city as well as to the smaller town); it should not come into existence or be "converted" over night, so to speak, simply because of some principal's obsession, or some new teacher's or director's whim. It is also much more economical to make haste slowly, in a change of this kind, for then fewer mistakes will be made in the section of equipment and layout of the available space and a safer and saner program will be developed."

C. Suggested Plan for Establishing a Small General Shop.⁵

"The accompanying plan for a small general shop offers a constructive suggestion for shop work in a small school where money and space are of first consideration.

"A well-lighted room on the ground floor is desirable for this work. If the school does not contain a suitable room, a building can be constructed or an old shop secured and remodeled. A room approximately 24' x 36' will accommodate classes of 10 to 20 pupils. The equipment needed for its successful operation will cost from \$1500 to \$3000. The plan contains four possible arrangements of courses.

"Practical Mechanics, suggested for the first year, is made up of twelve units and will offer the boys an opportunity for industrial exploration and at the same time develop the handyman ability so valuable about the home. Most of the work in these units can be carried out in various sections of the shop.

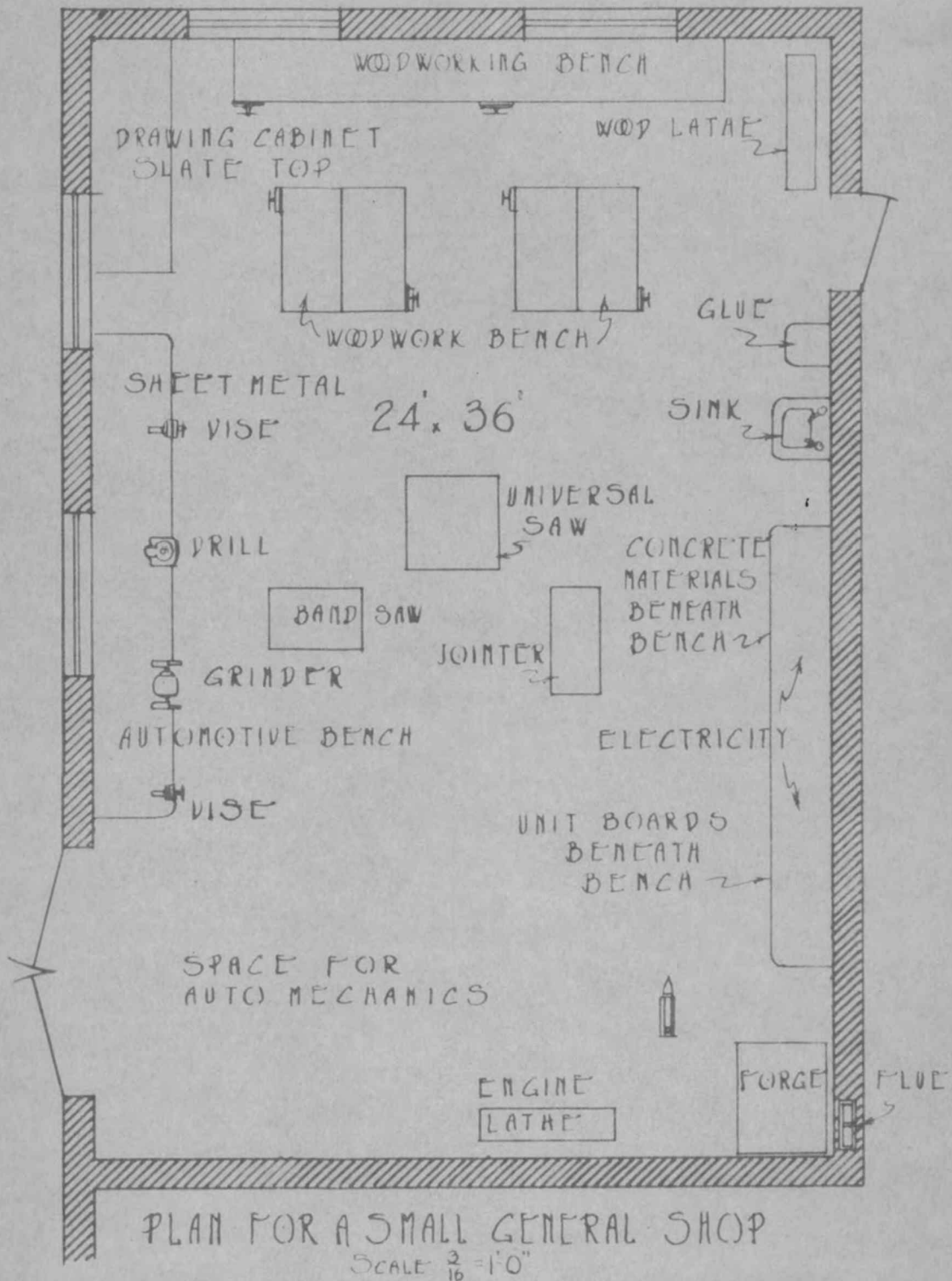
"The cabinet work layout includes four benches and one long carpenter's bench, all with ample drawer space for tools; a small universal saw, a 20" band saw, a jointer and one speed lathe.

"In automobile mechanics, space is provided so that an automobile may be brought into the shop for demonstration purposes and repairs. Motor stands may be stored along the wall when not in use. Necessary equipment includes a chain hoist, bench vise, power grinder, engine lathe, portable electric drill with a bench stand.

"Shop electricity may be carried on at a bench provided for that purpose, and about the shop in general. As considerable work will be done along the lines of electrical repair and maintenance about the school buildings, some time will be spent outside of the shop itself.

"The printing equipment is adequate to produce a small-

5. A suggested outline for work in mechanic arts in the general shop, grades IX - XII, N. H. State Board of Education, Institute Circular #142, December 10, 1929.



sized school paper and a wide variety of printed forms for use in connection with regular school work, such as tickets, programs, menus, posters, blanks, etc. If printing is offered, it should be housed either in a separate room or in a part of the general shop, partitioned off from the other shop activities.

Values.

"Performing these minimum jobs produces at least preliminary training for entering a vocation requiring similar abilities and thereby tends to emphasize an important duty of citizenship; namely, self-support.

"The shifting from exclusively mental work to jobs requiring the use of muscles not ordinarily active in academic subjects tends to contribute to the physical basis of good health of the individual.

"Work in Mechanical Arts provides opportunities for fuller control of certain fundamental processes through the application of arithmetic and drawing, and the reading of printed material bearing on the job. The abilities acquired in the work equip a pupil for more effective participation as a member of a home and include skill, knowledge and helpful interests that may find expression in profitable leisure time activities. See "Cardinal Principles of Secondary Education", U. S. Bureau of Education, Bulletin No. 35, 1918.

Objectives.

"These objectives are applicable to each of the unit courses listed. Possession by each pupil of:

- I. A degree of motor skill in the use of tools and machines sufficient for completing the jobs listed below, with the skill of a handyman rather than that of a journeyman.
- II. Motor skill sufficient to draw simple sketches of jobs to be done.
- III. Knowledge of:
 - A. Principles of operations of tools and machines used.
 - B. Sources of supply and costs of material, tools and machines used.
 - C. Vocational opportunities in the local community and state for the practice of

trades requiring similar abilities.

- IV. A favorable attitude toward manual labor, an interest in labor and laborers of the local community, and ideals of integrity and industry in work with the hands.

Standards.

"Each pupil who completes the unit courses should possess:

1. Handyman's skill in the jobs listed.
2. Knowledge of tools, machines and related vocational opportunities.
3. Wholesome attitudes, interests, and ideals toward manual workers and their labor.

Suggested Subject-Matter and Projects for a
Small General Shop

The preceding material is designed to give a concept of the type of organization that might be followed in establishing a small general shop, especially in revising or reorganizing a small unit shop to meet the aims, ideals, and educational requirements more commonly accepted in present practice. For the purpose of giving a few suggestions about subject-matter and projects suited to general shop teaching, the following material is included, being taken principally from a bulletin published by the Florida State Department of Public Instruction.⁶

Electric Shop

Subject-Matter:

Magnets and Magnetism

Currents

Resistance (Ohm's law and its application)

6. Manual Arts Training for the Junior and Senior High Schools of Florida. A bulletin issued by the State Department of Public Instruction, Tallahassee, Florida, March, 1930, pp. 22-23.

- Conductors and Insulators
- Batteries and Cells
- High and Low Voltage Circuits
- Generators
- Transformers
- Motors and Coils
- Electrical Appliances
- Electrical Apparatus
- Radio

Projects:

- Buzzer
- Toy Motor
- Electric Hot Plate
- Electric Toaster
- Soldering Iron
- Telegraph Set
- Radio Set
- Wiring Low Voltage Circuits
- Wiring 110 Volt Circuits

"Repair jobs may be worked in on the basis mentioned in the discussion of household mechanics and the course of study.

Mechanical Drawing

Subject-Matter:

- Sketching
- Simple Orthographic Projection
- Drawing to Scale
- Dimensioning
- Reading Simple Blue Prints

Projects:

- Freehand Sketches of Shop Projects
- Simple Two and Three View Working Drawings
(Small Shop Projects Drawn Full Size)
- Simple Three View Working Drawings Made to
Scale and Fully Dimensioned
- Simple Detail Drawings with an Introduction
of Sectional Views
- Construction of a Project from a Blue Print

Woodwork

Basic Processes:

- Laying Out
- Sawing
- Planing
- Chiseling
- Boring

Fastening (Joints and Fastening with Nails,
Screws, Glue, etc.)

Preparation of Stock or Project for Finish
Finishing

Projects:

(To be Finished with Paint)

Flower Box

Wash Bench

Trellis

Porch Flower Stand

Milk Stool

Christmas Tree Stand

(To be Painted, Stained or Enameled)

Nail Box

Soap Box

Wall Shelf

Book Ends

Letter Holder

Bird Houses

(To be Shellaced, Stained, Painted, Enameled
or Waxed)

Magazine Rack

Plant Stand

Low Stepladder

Corner Shelf

Radio Cabinet

"Emphasis on tool processes and related information may be made through the addition of other and more difficult projects, and may thus be made to stand out for the boy with whom the school wishes to emphasize such objectives as the pre-vocational training, hand skills, technical information, etc., as shown in the chart on page 9."

Auto Mechanics Shop

Content:

Frames

Springs

Front Axles

Rear Axles

Transmissions

Clutches

Wheels

Brakes

Bearings

Universal Joints

Engines

Types

Relation of Parts
Carburetion
Cooling
Ignition
Batteries
Tires
Bodies and Finish

Shop Jobs

Clean and Lubricate Springs
Adjust Clutch
Align Front Wheels and Adjust Bearings
Clean and Tighten Brakes
Clean Carbon, Grind Valves
Adjust Connecting Rod Bearings
Clean and Adjust Carburetor
Clean Radiator and Cooling System
Drain and Clean Oiling System
Check, Adjust and Clean Spark Plugs (Replace
Faulty Wires)
Clean Battery Terminals, Water, and Tighten
in Box
Remove Tire From Rim and Remount It
Repair a Puncture
Wash, Clean and Polish Car

General Metal - Flat Iron Work (Cold)

Content:

Cutting
Bending
Shaping
Twisting
Drilling
Riveting

Projects:

Ash Tray
Book Ends
Magazine Rack
Table or Bridge Lamp
Footstool or Seat
End Table

Sheet Metal Work

Content:

Use of Layout Tools	Soldering
Use of Cutting Tools	Folding
Preparation and Use of Acid Flux)	Forming
Tinning a Copper	Riveting
	Simple develop- ment Problems

Project:

Templates
Cookie Cutter
Scoop
Match Box
Mail Box
Dust Pan
Tool Box

Concrete

Content:

Source and Manufacture of Cement
Aggregate
Proportioning of Materials (Mixtures)
Mixing
Placing Mixture
Reinforcing
Surfacing
Simple Estimating

Projects:

Concrete Door Stop or
Anchor Weight
Flour Box
Fence Post
Sand Box
Lawn Pedestal
Garden Bench
Side Walks

Equipment Lists^{7.}

"Following are suggested lists of equipment for use in the shops. If the shops were furnished separately, additional equipment would be needed. Since a number of tools can be used interchangeably among the departments they are listed as equipment for one shop only.

Electric Shop

Pliers sidecutting.....	2
Pliers oblique.....	1
Screw Drivers 6-inch.....	3
Screw drivers 4-inch.....	3
Soldering copper 8-ounces.....	1
Door bells.....	2

7. Ibid. p. 23.

Buzzers.....	2
Push buttons.....	2

Wiring Supplies

Ammeter.....	1
Volt meter.....	1
Motor-generator set.....	1
Direct current meter.....	1
Alternating current meter.....	1
Porcelain receptacles.....	12
Switches	
Snap.....	4
3-way.....	2
4-way.....	1
Switch box.....	2
Fuse block.....	2
Knife box.....	2
Split knobs.....	4 doz.
Cleats.....	4 doz.
Tubes Porcelain	
3-inch.....	3 doz.
5-inch	1 doz.
Speed indicator.....	1
Copper wire gauge 5-36.....	1
Blow torch 1 qt. size.....	1
Set steel figures.....	1

General Metal Shop (Machine)

Post drill.....	1
Machinists hammer 1-pound.....	2
Grinder.....	1
Set Taps and Dies 1/8 in. to 1 in. U.S.S....	1
Bench Vise, plain 4-inch.....	1
Bench Vise-combination pipe and metal.....	1
Hack saw.....	1
Round file 10-inch.....	2
Flat file 10-inch.....	2
Outside and inside calipers 6-inch each....	1
Center punch.....	2
Drills 1/16 in. to 3/8 in. by 64ths, ea....	2
Drills 3/8 in. to 1 in. by 8ths, ea.....	1
Combined drill and counter sink 3/32 inch..	2
Machine lathe 12-inch with equipment.....	1

Optional 2nd year.

Set outside Micrometers (note)	
Benches (shop made) (general)	
Lubricating oil can.....	1

Gallon gas can.....	1
Gallon kerosene can.....	1
Bolt cutter.....	1
Set end wrenches.....	1
Waste can (shop made).....	1

Sheet Metal Work

Bench (extra heavy top) 4 ft. x 8 ft.....	1
Stake holder.....	1
Pliers (flat nose).....	6
Hand punch.....	1
Bar folder.....	1
Burring machine.....	1
Turning Machine.....	1
Wiring machine.....	1
Hollow mandrel stake.....	1
Blowhorn stake.....	1
Crimping rolls for turning machine.....	1
Straight snips.....	2
Circular snips.....	1
Setting hammer.....	1
Hand groover.....	1
Cutting nippers.....	1
Scratch awls.....	3
Solid punches.....	1 set
Rivet sets.....	3
Wooden mallets.....	2
Dividers 8-inch.....	1
Soldering coppers 2-pounds.....	2
Handles for coppers.....	2
Plumbers scraper.....	1
Double burner gas furnace.....	1
Necessary supply of metal, solder, flux, and wire.....	

Woodwork (bench tools)

12 inch Jack Planes, iron bottom.....	6
12 inch Back saws.....	6
$\frac{1}{2}$ inch $\frac{3}{4}$ inch socket firmer chisels, ea...	6
Marking gauges.....	6
Bench rules.....	6
Bench brushes.....	6
Wooden Mallets.....	6
Tri squares.....	6

General Tools

18-inch jointer plane.....	1
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Ripsaw, 5 pt. 24 in. 26 in.....	2
Crosscut saws 9 pt. 26 in.....	1
Crosscut saws, 8 pt. 24 in.....	1
Coping asws with extra blades.....	3
Ratchet braces, 10 in. swing.....	2
Complete set auger bits 1/4 in. to 1 in. by 16 ths.....	1
Auger bits, 1/4 in. 3/8 in. 7/16 in.....	2
Counter sink.....	1
Nail sets.....	2
Screw driver bits.....	2
Hand screw drivers, 4 in., 6 in., 8 in., each....	1
Hammers.....	3
Draw knife.....	1
Spoke shave.....	2
Hand scraper blades.....	3
Dividers, 8 in.....	1
Framing square.....	1
Oil stone.....	1
Copper oiler.....	2
Bench grinder.....	1
Electric glue pot.....	1
Malleable iron "C" clamps, 6-inch.....	6
Steel bar clamps, 36 in. 48 in. 60 in., each...	2
Hand screw clamps.....	8

Machinery

One Universal power saw or one hand saw.....	1
Bench jointer 6-inch head.....	1
Note: These and other machines can be added at any time.	

Benches

Wood benches (single vise of best grade).....	6
Note: This item of equipment may be hand- made; installed by class or instructor.	

Concrete

Spades.....	2
Trowels, finishing.....	2
Groover.....	1
Edger.....	1
Pointing trowel, 4-inch.....	1
Supply of wiring and reinforcing materials.....	
Large wash tub.....	1
Ten-quart bucket.....	1

Small garden hose, 15 feet.....	1
Stiff bristle (fiber) brush.....	2

Note: The following equipment can be
constructed in the shop:

Wooden float.....	1
Cement bin.....	1
Sand bin.....	1
Gravel bin.....	1
Mixing box.....	1
Measuring boxes, $\frac{1}{2}$, $\frac{1}{4}$, 1 cu. ft., each.....	1
Material for necessary project forms (lumber, nails, etc.)	
Necessary sand, cement, and gravel for project undertaken.	

Mechanical Drawing

Drafting boards 18 in. x 24 in.....	6
Tee squares 24 inch blade.....	6
Celluloid triangles, 60-30 degree, 8-inch.....	6
Celluloid triangles, 45 degree, 6-inch.....	6
Compass with pen attachment.....	6
Ruling pens.....	6
Boxwood scales.....	6
Blue print frame.....	1
Tables (desk height) 30 in. x 60 in.....	3

Auto Mechanics

Chassis (second-hand).....	1
Set socket-wrenches.....	1
Stillson-wrench, 10-inch.....	1
Monkey-wrench, 8-inch.....	1
Set taps and dies.....	1
Portable lamp and cord.....	1
Valve-lifter.....	1
Valve-grinding tools.....	1
Assorted files.....	6
Pliers 6-inch.....	4
Auto-jack.....	1
Set S-wrenches.....	1
Cold-chisels.....	2
Screw driver 14 inch.....	1
Screw driver 8-inch.....	2
Machinists vise 4-inch.....	1
Wheel-puller.....	1
Set reamers.....	1
Valve-refacing and reseating set.....	1

E. Bibliography of Helpful Materials for the General Shop Teacher.

A list of books, pamphlets and informational material of value to the general shop teacher and student group, listed by the Pennsylvania Department of Public Instruction⁷ and included here for its possible value to readers of this thesis.

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Collins	Amateur Mechanic	Appleton
Jamison, J.M.	Elementary Practical Mechanics	John Wiley & Sons
Johnson	We and Our Work	American Viewpoint Society
Jones, Guy, Pub. Company	Trade Foundations	Jones, Guy, Publishing Co.
Kuns	Automotive Trade Tr.	Bruce
McMurry, Eggers, McMurry	Teaching of Ind. Arts	Macmillan
Popular Mechanics Company	The Boy Mechanic	Popular Mechanics Company
Siepert, A.F.	Bird Houses Boys Can Build	Manual Arts Press
Solar	Bird Houses, Book 1	Bruce
Struck, F.T.	Construction & Repair Work for the Farm	Houghton-Mifflin
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U. S. Dept. of Agr. Bul. No. 844	Birds, Attracting in the Middle Atlantic States	
U. S. Dept. of Agr. Bul. No. 621	Birds Attracting in the Northeastern States	

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<u>Author</u>	<u>Title</u>	<u>Publisher</u>
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Wood & Smith	Prevocational & Industrial Arts	Atkinson, Mentzer & Company
Zerbe	Practical Mechanics for Boys	New York Book Co.

Concrete

Am. Red Cross S.W. Div. St. Louis	Booklet No. 2 Articles in Concrete	
Baxter	Elementary Concrete Construction	Bruce
Campbell-Bayer	Practical Concrete Work for the School and Home	Prang Company
Davidson	Concrete Pottery & Garden Furniture	Munn & Company New York
Portland Cement Ass'n	Colorimetric Test of Sands	
Portland Cement Ass'n	Concrete Foundations	
Portland Cement Ass'n	How to Make & Use Concrete	
Portland Cement Ass'n	Recommended Practice for Portland Cement Stucco	
Portland Cement Ass'n	Standard Specifications and Tests for Portland Cement	

Electrical Work

Burling & Karweik	Elementary Electric Wiring	Bruce
Collins	The Book of Electricity	Appleton
Solar	Radio Craft	Bruce
Timbie	Essentials of Electricity	John Wiley & Son
Willoughby	Lesson Sheets, Elementary Electricity	Manual Arts Press
Willoughby	Practical Electricity for Beginners	Manual Arts Press

<u>Author</u>	<u>Title</u>	<u>Publisher</u>
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Harcourt, R.H.	Elementary Forge Practice	Manual Arts Press

Machine Shop

Colvin & Stanley	Machine Shop Primer	McGraw-Hill
Hartman, H.B.	Machine Shop Practice	Appleton
Palmateer, T.J.	Elementary Machine Shop Practice	Manual Arts Press

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Babbitt	Working Drawings	Henry Holt Co.
Matthewson & Steward	Applied Mechanical Drawing	Taylor-Holden Co.
Temple, H.W.	Practical Drawing	D.C. Heath Co.
Walsh, F.W.	Practical Problem As- signments	F. W. Wash, Oshkosh, Wis.

Plumbing

Dibble, S.E.	Elements of Plumbing	McGraw-Hill
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Printing

Hague	Textbook of Printing Occupations	Bruce
Hammermill	Printing Gets Things Done	Hammermill Paper Co., Erie, Pa.

Sheet Metal

Broemel, L.	Sheet Metal Worker's Manual	Drake
Payne, A.F.	Art Metal Work	Manual Arts Press
Thatcher	Simple Soldering	Spon & Chamberlin

<u>Author</u>	<u>Title</u>	<u>Publisher</u>
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Woodwork

Burton, M.G.	Shop Projects Based Upon Community Prob- lems	Ginn & Company
Crawshaw, F.D.	Problems in Furniture Making	Manual Arts Press
Crawshaw, F.D.	Problems in Wood Turning	Manual Arts Press
Fairham, Wm.	Carpentry for Begin- ners	J. P. Lippincott Company
Griffith, Ira S.	Projects for Begin- ning Woodwork and Mechanical Drawing	Manual Arts Press
Griffith, Ira S. Hyatt	Woodwork for Beginners Furniture Weaving Pro- jects	Manual Arts Press Bruce
Johnson, E.A.	Furniture Upholstery	Manual Arts Press
Johnson	Toys and Toy Making	Longmans
Laughlin, A.P.	Tool Processes in Woodworking	Manual Arts Press
Martey, U.S.	Manual Training Play Problems for Boys and Girls	Macmillan
Moore, H.W.	Manual Training Toys	Manual Arts Press
Miller, C.M.	Kitecraft	Manual Arts Press
Perry, L.D.	Seat Weaving	Manual Arts Press
Peterson, L.C.	Educational Toys	Manual Arts Press
Trades Paper Pub. Co.	Staining, Varnishing and Enameling	
Worst	Problems in Woodwork	Bruce

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California	Directory of Cal. Secondary School Bulletin on statistics of Cal. School, Cal. Junior High Schools, by Proctor and Ricciardi.
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Connecticut	None in print.
Delaware	Standard Equipment for a Manual Training Room, Sept. 2, 1931, 3 sheets.
Florida	Manual Arts Training for the Junior and Senior High, March, 1930.
Georgia	None for Industrial Arts.
Idaho	Bulletin in Preparation.
Illinois	Bulletins No. 212, 239, 214, 240, 241 (available) Illinois School Directory No. 257.
Indiana	State Course of Study in Industrial Arts. Charts for wall records, (available Aug. 1, 1932).
Iowa	None

Kansas	None
Kentucky	None
Louisiana	None
Maine	Basic Industrial Course of Study for the Elementary Grades. July 1, 1925, pp. 1-7.
Maryland	None
Massachusetts	None
Michigan	Standards of Attainment in Industrial Arts for Rural Agricultural and Small High Schools. August 1930, pp. 1-18. Mailing List of Industrial and Industrial Arts Teachers in Michigan, 1931-32. Vocational Education Dept. Special Studies No. 3, June 1927, by Thomas Diamond. Bul. Nos. 224; 218 revised Nov. 1927; 216, 1922; (Building Construction) 220 revised Oct., 1926; (Elementary Mech. Dr.)
Minnesota	(Available) Standards of Graded Elementary and Secondary Schools. Syllabi of Industrial Arts C-5. Introductory Bul. #1.
Mississippi	None
Missouri	None
Montana	None
North Carolina	None
North Dakota	(Available) State Industrial & Normal College, Ellendale, N. D. Industrial Arts Dept. University of N. D. University Station, Grand Forks, N. D.
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SECTION V

CONCLUSION

CONCLUSION

Three methods of approach were used in this thesis; first, the beginning of general shop in the United States. A Historical development leading to the general shop was prepared, tracing various contributions down to the present-day development. It is the hope of the author that this chart will give a pictorial development which will be of help to those seeking information on the progress of the general shop.

Second, recent types of general shops in the United States. Under this section non-conflicting terminology was formulated by making a study of state bulletins, courses of study, and consulting standard texts on the subject of industrial education. This study, by employing exact terminology, has attempted to make clear the meaning and objectives of the general shop in all phases of its present existence.

Aims and objectives are listed, along with specific ways and means of establishing a general shop in any community. This is substantiated from men in the field, by answers to letters, and questionnaires carried over a period of four years.

Equipment lists of the earlier type of general shops are given; also the recent lists of equipment and plans are related for the purpose of aiding in setting up a

better general shop in any community.

Great interest has been shown in general shop movement by all contributors especially the directors of industrial education who answered letters in 1928; then in 1932 nearly all expressed the opinion that a remarkable gain had been made by the general shop in their state or city. The survey of 1932 shows an unmistakable trend in the direction of the general shop.

In order to give information concerning courses most widely used, the 1932 survey furnished data by which the frequency of occurrence of any particular subject might be judged. (Page 62.)

Due to the fact that material is not easy to find and also that few books are available on the general shop, bulletins available from State Departments of Education, and from certain City Systems are listed in detail in this section of the thesis.

Third, the probabilities of the general shop in the future. The general shop has gained ground since the war and is fast becoming a part of every well-organized school; especially at the junior high school level in cities from 3,000 to 100,000 population. In the larger cities the organization is of the unit shop type with the same objectives as the general shop, the pupils being rotated from one shop to the other in order to gain comparable results.

In the third section methods of changing the old manual training shop into the new general shop are related. Courses of study and methods of establishing the small general shop are explained. It is hoped this procedure will be of aid to superintendents, principals, and teachers when it is desirable to make the transformation, and to put this great new type of education at the disposal of adolescent youth, giving them contact with industrial pursuits and materials, and an opportunity to enrich their background for vocational guidance.

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