THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report

of

Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by Lynn Elbert Stockwell for the degree of Master of Arts. They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts.

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Date _____

THE UNIVERSITY OF MINNESOTA

GRADUATE SCHOOL

Report

of

Committee on Examination

This is to certify that we the undersigned, as a committee of the Graduate School, have given Lynn Elbert Stockwell final oral examination for the degree of

Master of Arts

We recommend that the degree of

Master of Arts

be conferred upon the candidate.

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CONTENT OF INDUSTRIAL COURSES FOR BOYS IN THE JUNIOR HIGH SCHOOLS OF THE UNITED STATES AND THE PAST TRAINING OF THE INDUSTRIAL TEACHERS IN CHARGE OF THESE COURSES

A THESIS SUBMITTED TO THE
FACULTY OF THE GRADUATE SCHOOL OF THE
UNIVERSITY OF MINNESOTA

BY

Lynn Elbert Stockwell

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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Chapter 1

INTRODUCTION

The general criticisms of industrial work in our public schools have been; first, that the courses have not been definite and consisted merely of the teachers' ideas without thought as to the standardization of the courses; second, that the teachers themselves did not know in which direction they were going that is they could not give any definite aim for their courses; third, that the teachers have been poorly equipped in subject matter and sadly lacking in professional training.

The purpose of this study is to find some basis by which the validity of these criticisms can be tested. The first point is to find some common and definite grounds for the justification of industrial work in the Junior High Schools of the United States; the second point is to standardize the courses as to processes; and third to find out how well equipped the teachers are, as to school and professional training, teaching experience and trade training and experience. Many industrial teachers and others as well, may question the value of a standardized course of study in the industrial arts, saying that the needs of one locality may not be the needs of another. This is true as far as the problems are concerned. The fundamental processes underlying all industrial work are the same in Minnesota, New York, Texas, California or any other locality. The processes may well be standardized and that is one of the purposes of this study.

The source of material for this study is questionnaires sent to the various Junior High Schools in the United

States. A questionnaire on the past training and experience of the industrial teachers in these schools was sent to 155 cities. Six questionnaires were sent to the same cites as the first one was sent to . Each one represented one industrial course to be studied which was to be filled in by the teacher of that particular course which he was teaching, corresponding to the questionnaire of the same course. The six courses to be studied are, woodworking, mechanical drawing, printing, sheet metal, electricity and auto work. These six courses were selected as a result of a previous study, in which the fact was found, that these courses represented the most commonly offered industrial courses for boys in the Junior High Schools of the United States.

The questionnaire on the past training of the teachers consisted of six parts from which the data were taken. The first part is the present position and yearly salary; second, teaching experience in years; third, trade training in years; fourth, trade experience in years; fifth, school and professional training; and sixth, summer session, correspondence and extension work.

The six questionnaires, up to the outline of the course, are identical. The first part of each consisted of the following groups; number of students in class and ideal number, length of course, general purposes of industrial work for boys, specific purposes of particular course, methods in presenting the work and name of text book. The questionnaires will be found in the appendix. The outline of the course followed these groups. The following notation appeared on the questionnaire dealing with the training of the teachers "Note: Name need not be given." This was done to encourage a more complete and frank statement of the actual situation.

In this study certain terms will be met with frequently which it seems advisable to define. The median appears thruout the study and is used as a measure of the central tendency. The median is that point on a scale which divides the distribution exactly in half, having one half of the cases below and one half above the central tendency. Trade Training is the learning of a trade. The training maybe as an apprentice or it may be as a student in a trade school. Trade Experience is the term used to indicate the number of years spent in the trade as a journeyman. Journeyman is the name given to the man who has completed his training and is working at the trade or has worked at the trade in which he took his training. In computing the number of years in the trade the training and experience are combined. School Training is the training recieved in the elementary and secondary schools. Professional Training is the training given in normalschools, special[1] schools and colleges and universities.

As stated previously in this chapter the purpose of this study is an attempt to bring out more definitely and clearly certain facts regarding industrial work for boys in the Junior High Schools of the United States, in order to meet certain criticisms regarding the industrial work.

1. Stout Institute, Menomonie, Wisconsin
   Bradley Institute, Peoria, Illinois

PART ONE

COURSES OF STUDY

Chapters two to nine

Chapter 2

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOLS OF THE UNITED STATES

When planning a course of study in any subject but more especially in an industrial subject, one must know in just what direction the course is leading or rather, what the aim of the course is. The aims of an industrial course determines to a great extent what the content of the course is to be and the extent and kind of equipment to be used.

The nine aims as set up are shown in the six questionnaires on pages 2 to 7 in the appendix. They are placed on the questionnaire as follows;

1. General Training
2. Vocational Training
3. Preliminary Vocational Training
4. Industrial Information
5. Physical Development
6. Appreciation of Manual Labor
7. Training for Recreation or Hobby
8. Exploratory
9. Relaxation Period

The nine aims were not set down in any definite order on the questionnaire. The instructions for ranking the aims were as follows; Rank in order of importance, most important # 1, next # 2, etc. Cross off those not serving and add any others.

In setting up the criteria for judging the aims for industrial work for boys in the Junior High School, books by experts in the field of industrial work or manual training, were reviewed and the aims most commonly used were selected.

The first aim"General Training" means the training for general educational purposes.[1] This aim deals with, not the training of skilled workers, but with the general training of the boys to increase their outlook and broaden theirdevelopment. The familiarity with several lines of work is emphasized rather than an expertness in one line.

The second aim is " Vocational Training" This aim deals with the training of the boy for a specific vocation. "The need for more practical training is gradually being recognized and schools and courses are becoming somewhat adjusted to meet this need"[2]

The third aim is"Exploratory". Exploratory courses[3] give the boy a chance to try out several lines of work. He browses around to find out which he is best adapted to and which he has the greatestliking for.

The fourth aim is " Preliminary Vocational Training." This means the preliminary work leading up to the specific vocation the boy has in mind. " If we are going to have even the

1. Bennett,Chas. A - The Manual Arts, p43
   Buxton, George F -Manual Training Theory, p 7

2. Ibid p 10

3. Inglis,Alexander - Principles of Secondary Education,chap. 10
   Koos, Leonard V - The Junior High School, p 141

beginnings of industrial education, we must reach those that the trade school never reaches, and in other ways thanthe trade school attempts to reach them. In the beginning it will not be the aim to make finished workman, but it will be the aim to direct the mental activities of the pupils; to interest them in things industrial; to teach them to think in terms of things and terms of processes of construction and thus make them better fitted to take up the work of a specific trade."[1]

The fifth aim is " Industrial Information."[2] This means teaching the industrial subjects for the informational values and not for the skills which could be derived from the work. Industrial information covers such phases as a knowledge of materials, occupations, manufacturing processes and a better understanding of industry in general. Industrial information is a great foundation for effective work in vocational guidance. There is a certain amount of overlapping in this aim and the general training aim but the general agreement is that they are separate aims but very closely related.[3]

The sixth aim is " Physical Development ".[4] Manual

1. Harvey, L.D. -National Society for Promotion of Industrial Education, Bulletin # 10
2. Bennett, Chas. A -The Manual Arts, p44
   Buxton, Geo. F - Manual Training Theory, p 35
3. Ibid - p 35
4. Ibid - p 26
   Pabst, Alwin - Handwork Instruction for Boys, p 93 (Translated from the German by Bertha Reed Coffman)

training or industrial training is a part of the scheme for "organic education" which includes gymnastics, athletics, drawing, music, laboratory work in science, etc. It furnishes opportunities for physical activities not had in the class room.

The seventh aim is the "Development of anAppreciation for Manual Labor." When manual training was first introduced into the public school system of Sweden, Soloman[1] gave the following statement as one of the aims of the work; "To develop an appreciation of rough honest bodily labor." One of the most direct results of industrial work well taught is the ability to appreciate the other fellows job.[2] The American people as a whole have been sadly lacking in the ability to appreciate their neighbors vocation. This lack of appreciation is due perhaps to the fact that their industrial training has been neglected or perhaps entirely omitted. It is Froebel who has told us that "manonly understands thoroly that which he is able to produce". If we accept this as a fact we see that it is only thru mastery of processes, tools and materials, laws of construction, etc. that we can completely understand any masterpiece of art or handicraft.[3]

1. Soloman, Otto - Theory of Educational Sloyd, p
2. Cole, Percival R - Industrial Education in the Elementary School, p35
3. Bennett, Chas. A - The Manual Arts, p 35

The eight aim is training for " Recreation or Hobby "[1] The idea of this aim is to instill in the boy a desire and interest for the industrial work so that he will use it as recreation during his leisure hours. This can be carried out very easily at the present time, with the great interest in radio work, which is rapidly flooding the country. The mounting for tuningcoils, cabinets for sets, wiring of coils, etc are a few of the very good problems coming from the radio work and which the boy can enjoy during his leisure time. Your hear from all sides that the American adult does not know how to play. Here is a most pleasant way for the coming generation to "play" during their leisure hours.

The ninth aim and last one is "Relaxation".[2] Manual Training is a reaction from the overemphasis upon the bookwork. It gives the boy a chance to get the restlessness worn off and to give the cramped muscles, from sitting in poorly constructed desks, a chance to straighten and become rested.

As stated previously in this chapter, no thought was given to a definite rank order when the aims were put on the questionnaire. They were merely jotted hown at random. This was done so as not to influence the returns in any way. The data gathered from the questionnaire is shown tabulated in table # 1.

1. Buxton, George F - Manual Training Theory, p 14
2. Ibid - p 26

   Pabst, Alwin - Handwork Instruction for Boys, p 86 (Translated from the German by Bertha Reed Coffman)

Table 1

The Distribution of the Rankings of General Aims In Industrial Work for Boys in the Junior High Schools of the United States by 166 Industrial Teachers in Junior High Schools Scattered over the entire United States

Aims	1	2	3	4	5	6	7	8	9	Total Rank (weighted)	Median Rank (weighted)	Final Rank
General Training	86	15	21	12	2	1	0	0	0	243	2.04	1
Vocational Training	9	15	10	7	7	7	5	1	1	226	4.14	6
Exploratory	35	28	11	8	6	2	1	4	0	247	3.00	3
Prelim. Voc. Training	16	20	19	14	8	9	1	0	0	270	3.16	4
Industrial Information	5	54	31	24	11	0	0	0	0	337	2.44	2
Physical Development	1	6	3	5	9	6	6	1	1	182	5.40	7
Appreciation of Manual Labor	4	20	22	21	15	9	6	0	0	365	3.40	5
Train. for Recreation or Hobby	0	2	3	4	11	7	9	6	0	237	6.04	8
Relaxation Period	1	2	3	3	0	2	4	1	4	110	6.30	9

Note: Because of the different number of judgments for each aim there is a certain weakness in the tabulation but this method seemed to be the best for the ranking of aims.

One hundred and sixty-six industrial teachers in the Junior High Schools scattered over the entire United States rated the aims. The rank means the order in which each teacher placed the aims. For example, eighty-six teachers ranked aim # 1 as rank order #1, nine teachers ranked aim # 2 as rank order # 1, etc. This explains the method of tabulation. The total rank was arrived at by multiplying each aim by the number of rankings it recieved and adding the products. An example follows;

Aim # 1

Rank		Number of Rankings		Product
1	x	86	=	86
2	x	15	=	30
3	x	21	=	63
4	x	13	=	48
5	x	2	=	10
6	x	1	=	6
7	x	0	=	0
8	x	0	=	0
9	x	0	=	0

Total Rank 243

After this process had been repeated for each aim, the medians were taken for each aim and finally they were given their new or final ranking.

The last column in table # 1 shows the new rank or final rank for each aim as follows;

Aim number 1 recieves the new ranking of 1, aim number 5 recieves rank 2, number 3 recieves number 3 rank, aim number 4 recieves rank 4, aim number 7 recieves ran 5, number 2 recieves rank 6, number 6 recieves rank 7, number 8 recieves rank 8 and aim number 9 recieves the final rank number 9.

In conclusion, the following points have been brot out from the data gathered and the discussion of this data;

1. Industrial teachers for boys in the Junior High Schools have a fairly definite idea as to the aims of their courses, as shown in table # 1.

2. The importance of the various aims, using the judgments of 166 industrial teachers for boys in the Junior High Schools as a basis, are shown by the following rankings;

    1. General Training
    2. Industrial Information
    3. Exploratory
    4. Preliminary Vocational Training
    5. Appreciation of Manual Labor
    6. Vocational Training
    7. Physical Development
    8. Training for Recreation or Hobby
    9. Relaxation Period

3. Of these aims, certain ones were not considered of enough importance to rank, by the majority of the 166 industrial teachers, and were either crossed off as suggested or left blank.

The number of judgments for each aim is as follows;

Aim	Number of Judgments
1. General Training	137
2. Industrial Information	115
3. Exploratory	95
4. Preliminary Vocational Training	87
5. Appreciation of Manual Labor	97
6. Vocational Training	62
7. Physical Development	38
8. Training for Recreation or Hobby	43
9. Relaxation Period	30

From the above figures , it can be plainly seen that the majority of the teachers do not value aims 7, 8 and 9 very highly.

It is safe to assume in conclusion that aims, 1 to 6 represent the aims of industrial work for boys in the Junior High Schools of the United States, at the present time, as based on the judgments of 166 industrial teachers for boys in the Junior High Schools, scattered over the entire United States.

12-21-6M

Chapter 3

MECHANICAL DRAWING

In order to thoroly understand and interpret a course of study one must know what the aims of that course are. The first point to be discussed in this chapter is the aims of mechanical drawing, in the Junior High School, as set forth by 46 teachers of mechanical drawing in Junior High Schools. These 46 teachers represent eighteen States as follows;

State[1]	Number of Teachers
California	2
Colorado	1
Illinois	3
Oklahoma	3
Iowa	1
Indiana	3
Maine	1
Massachusetts	5
Minnesota	7
Michigan	5
Missouri	2
Ohio	1
Texas	1
Virginia	1
Washington	1
Wisconsin	2

The method of tabulation and computation is the same for the specific aims of mechanical drawing as for the general aims of industrial work in chapter 2. Table # 2 shows the distribution of the rankings of the specific aims for mechanical drawing by the 46 teachers of mechanical drawing. According to this group of judges, the specific aims for this course, in rank order are, 1.General Training,2.Skilled Technic, 3. Exploratory, 4. Correlation with other School Subjects, 5. Training for

1. Omitted-New Jersey -- 3 and Kansas -- 4

Avocation or Hobby. According to this group of judges, training for avocation or hobby, is of little value as an aim in mechanical drawing, only 13 teachers ranking it. The other four aims recieved about an equal distribution of rankings.

Table # 2

The Distribution of the Rankings, of Specific Aims in Mechanical Drawing for Boys in the Junior High Schools of the United States, by 46 Teachers of Mechanical Drawing in Junior High Schools, Distributed over the United States as shown on page 13.

Aims	Rank					Total Rank	Median Rank	Final Rank
	1	2	3	4	5			
1. Skilled Technic	9	12	4	2	3	68	2.08	2
2. General Training	27	11	5	0	0	64	1.22	1
3. Exploratory	5	5	9	1	1	51	2.39	3
4. Training for Avoc. or Hobby	0	1	2	7	3	51	3.63	5
5. Correlation other School Sub.	5	11	7	6	2	82	2.66	4

The next point to take up is the number of students in the classes at the present time, as reported by the teachers shown on page 13 and the ideal size of class as each individual teacher would have it. The data for this discussion is shown tabulated in table # 3.

There is considerable difference as to the number of students in the classes at the present time as well as the difference of opinion as to the ideal number of students in a

class.

Table # 3

The Number of Students in Mechanical Drawing Classes at the Present Time and the Ideal Sized Class as Reported by 46 Teachers of Mechanical Drawing in the Junior High Schools of the United States.

	Number of Students in Class					
	10	15	20	25	30	35
Number of teachers reporting Average number of students in classes at the present time.	4	6	18	9	4	2
Number of teachers reporting their opinion of the ideal sized class.	4	9	23	7	0	0

There seems to be a number which the majority agree however is the ideal sized class. Twenty students, according to the judges reporting the data for table # 3, makes an ideal sized class in mechanical drawing. The minimum number of students in a class, as reported, is 10. Two reported as having 10 students in their class. Two teachers reported as having 35 students in a class, the maximum number of students reported. Four teachers reported as having thirty students, nine reported 25, eighteen reported twenty and six reported 15. In reporting the ideal number of students in a class, four reported 10 students, nine teachers reported 15, twenty-three reported 20, seven reported 25 which is the limit as far as this group of judges were concerned.

The next point to be considered is the length of the course. The length of course is divided into three groups, 1. Weeks 2. Number of periods per week 3. Length of period. The

data is found in table # 4.

Table # 4

The Length of Mech. Draw. Courses in Weeks, Number of Periods per Week and the Length of Periods

4A
Number of Weeks

No. of Weeks Length of Course	6	10	12	18	19	20	32	36	38	40	Median
Number of Teachers Reporting Length of Course	2	4	2	9	1	4	1	8	7	4	19.75 weeks

4B
Number of Periods per Week

Number of Periods per Week	1	2	3	4	5	6	Median
NUMBER of Teachers Reporting Number of Periods per Week	6	7	2	2	22	1	4.18 periods

4C
Length of Periods

Length of Periods	40	45	50	55	60	65	70	80	90	Median
Number of Teachers Reporting Length of Periods	4	3	5	2	13	1	2	4	8	60.3 minutes

From table # 4 we find that there is a very great variation in the number of weeks, periods per week and length of periods. The greatest number agreeing upon any one course is 9. Part of the courses run thru the year with a varying number of weeks, others run one semester and still others run thru a six week period. The school year as found in this data varies. The median number, as found in table 4A, is 19.75 weeks for the length of the course. The median number of periods per week, asfound in table 4B is 4.18;

The median length of period, as found in table 40, is 60.3 minutes. The length of period is of course dependant upon the length of the period for the particular school.

The methods of presenting mechanical drawing to a class is the next topic to be discussed. The various methods as stated in the questionnaire are as follows;

1. Text Book in Hands of Pupil
2. Working from Blue Prints
3. Blackboard Demonstration and Lecture

These methods are not set down on the questionnaire in any definite rank order, merely set down at random. The data for this topic are found in table # 5.

Table # 5

Methods	Rank 1	2	3	4	Total Rank	Median Rank	Final Rank
Text Book in Hands of Pupil	13	7	5	2	50	1.86	2
Working From Blue Prints	9	10	9	0	56	1.95	3
Blackboard Demon. and Lecture	20	15	3	0	59	1.32	1
Individual Instruction	5	0	0	0	5	-	-
Class Instruction	2	0	0	0	2	-	-
Working from Objects	4	2	4	1	24	2.33	4

The last three methods are the ones added by the teachers. Four and five recieved so few rankings that they are not comparable to any degree with the other methods. The final rankings by the teachers of mechanical drawing are as follows;

1. Blackboard Demonstration and Lecture
2. Text Book in Hands of Pupil
3. Working from Blue Prints

4. Working from Objects

In practically all of the replies a statement was made to the effect that all three of the methods combined were used and in the case of the four methods all four were used. The emphasis altho was placed, in the majority of cases, on the blackboard demonstration and lecture method, by ranking it first, with the text books and working from blue prints and objects as auxiliary aids.

In close relation to the preceeding topic is the matter of text books. From the data gathered, we find 24 as reporting no text book and 22 as having some sort of a text book. There is no agreement as to the name of the text book used. There are almost as many different text books listed as there are schools reporting the use of them. The matter of the use of a book as a text in mechanical drawing is merely a matter of opinion, no study having been made on the subject, so far as I have been able to ascertain. The data shows that the opinion on the matter of a text book in mechanical drawing is quite evenly divided.

The last topic to be discussed in this chapter is the course of study in mechanical drawing. In setting up the criteria for judging the courses, books by well known men[1] in the field of mechanical drawing were reviewed and the course of study as placed on the questionnaire is a combination of these reviews and my experience, gained thru nine years of teaching mechanical drawing.

1. French and Svenson, Bennett, Crawshaw and Philips

The important question in this topic is the groups of work. The groups as placed on the questionnaire are as follows;

1. Names and Uses of Tools
2. Lettering
3. Conventions
4. Geometric Constructions
5. Free Hand Perspective
6. Orthographic Projection
7. Working Drawings
8. Tracing
9. Blue Printing

The data for the course of study in mechanical drawing are found in table # 6. The outline of the course was left open on the questionnaire so the teachers could add any groups of work they were teaching not listed in the outline on the questionnaire. Such additional courses will be added to table # 6.

Names and uses of tools is taught in 45 of the 46 schools reporting or 97.8 per cent. The second group is lettering which is also taught in 45 of the 46 of the schools reporting or 97.8 per cent. Conventions are taught in 40 of the 46 schools or 89.95 per cent. Geometric constructions have the same percentage as conventions. Free Hand perspective is represented by 26 of the 46 schools or a percentage of 56.52. The practice is evenly divided in regardsto free hand perspective. Orthographic projection recieves 41 of the 46 schools or a percentage of 89.13. Working drawings recieves 44 places out of

Table # 6

Outline of Course in Mechanical as Taught by 46 Teachers of Mechanical Drawing in the Junior High Schools of the United States

Groups of Work	Number of Teachers Reporting Each Group	% of Total Group Reporting
Names & Uses of Tools	45	97.8
Lettering	45	97.8
Conventions	40	86.95
Geometric Constructions	40	86.95
Free HandPerspective	26	56.52
Orthographic Projection	41	89.13
Working Drawings	44	95.65
Tracing	27	58.69
Blue Printing	26	56.52
Architectural Drawing [1]	6	13.04
Machine Drawing [1]	2	4.34
Sketching [1]	5	10.86
Isometric Projection [1]	11	26.08
Cabinet Projection [1]	2	4.34

1. Added by teachers checking questionnaires.

the 46 or a per cent of 95.65. Tracing and Blueprinting recieves 27 and 26 respectively or percentages of 58.69 and 56.52. The additions are represented by very few cases. Isometric projection is placed 11 times for a percentage of 26.08. Architectural drawing has 6 out of the 46 places or a 13.04 per cent. Sketching has 5 places with a percentage of 10.86 and machine drawing and cabinet projection has two places each of the 46 or a percentage of 4.34.

The number of periods per group and the number of sheets were not filled in, in the majority of cases, so cannot be used. The important thing in regard to the course however is to get a definite series of groups of work to be followed.

With the judgments of the 46 teachers of mechanical drawing as a basis, the discussion has brought forward the following points;

1. That the aims for a course in mechanical drawing are very definitely fixed in the minds of the teachers of mechanical drawing.
2. That the main purpose or aim in mechanical drawing is for general educational purposes.
3. That the ideal number of students which should constitute a class in mechanical drawing is 20.
4. That a great many mechanical drawing teachers are teaching classes much too large.
5. That the median course is eighteen weeks long, five periods per week and the periods 60 minutes long.

6. That the three methods of presenting work to a class in mechanical drawing, blackboard demonstration and lecture, text book in hands of pupil and working from blue prints, combined is the best method for presenting the work to a class.
7. That the matter of the use of a text book in mechanical drawing depends on the teachers opinion of the value of a text book for this course.
8. That the outline of the course of study in mechanical drawing, as ranked by the 46 teachers of mechanical drawing, should consist of the following groups;

    Lettering
    Conventions
    Geometric Constructions
    Orthographic Projections
    Working Drawings
    Free Hand Perspective
    Tracing
    Blue Printing

Chapter 4

WOODWORKING

As stated in chapter 3 the first point to discuss in studying a course is the aims of the course. The aims of woodworking as ranked by 52 teachers of woodworking will be taken up. The method of tabulation and computation is identical with the method in chapter 3 so a discussion of it is unnecessary. Table # 7 shows the aims tabulated and the rankings. The range of replies, as to States, is as follows;

California ---- 3
Colorado ------ 2
Illinois ------ 3
Indiana ------- 4
Iowa ---------- 1
Kansas -------- 4
Kentucky ------ 1
Louisiana ----- 1
Maine --------- 1
Massachusetts-- 6
Minnesota ----- 7
Michigan ----- 6
Missouri ----- 1
New Jersey --- 3
Ohio --------- 1
Oklahoma ----- 3
Pennsylvania - 1
Texas -------- 1
Virginia ----- 1
Washington --- 1
Wisconsin ---- 1

The teachers rank the aims in the following order, as shown in table # 7;

1. General Training
2. Exploratory

3. Correlation With Other School Subjects

4. A Skilled Technic

5. Training for Avocation or Hobby

The rankings for the aims in woodworking are more evenly distributed than in mechanical drawing. As can be seen in table # 7 the general training aim still receives first rank with a still greater number of judgments than in mechanical drawing. The rankings for the other aims are shown in table # 7.

Table # 7

The Distribution of the Ranking, of Specific Aims in Woodworking Classesfor Boys in the Junior High Schools of the United States, by 54 Teachers of Woodworking in Junior High Schools Distributed over the United States as shown on page 23.

Aims	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
1. Skilled Technic	5	9	7	5	6	94	3.15	4
2. General Training	38	10	2	0	0	64	1.84	1
3. Exploratory	14	5	8	4	1	69	2.43	2
4. Training for Avoc. or Hobby	0	4	6	7	7	89	3.66	5
5. Correlation other School Sub.	6	12	11	6	2	97	2.56	3

The number of students in the classes at the present time and the ideal number of students per class is the next topic for discussion. The data for this discussion is found in table # 8. Table # 8 shows that the median number of students now enrolled in the classes is 19.5. Roughly speaking 20 students. The minimum number of students per class as reported is 10 and and the

maximum number 30 students. The median being as high as it is shows that a great many industrial teachers are handling large groups. Table # 8 also shows the median number of students for the ideal sized class to be 15.8, approximately 16 students. The median number in the classes as they now are is very close to the median for the ideal sized class. In the judgments, as to the ideal sized class, are found 2 stating the maximum sized class as 24 students and 2 stating the minimumsized class to be 10 students.

Table # 8

The Number of Students in Woodworking Classes at the Present Time and the Ideal Sized Class as Reported by 54 Teachers of Woodworking in the Junior High Schools of the United States.

Class Size	10	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	30	Medians
A	0	2	1	2	5	2	1	9	1	8	2	5	1	8	2	1	1	1	19.5
B	2	6	0	2	12	5	0	6	0	16	0	1	0	2	0	0	0	0	15.8

A. Number of Teachers Reporting Average Number of Students in Classes at the Present Time

B. Number of Teachers Reporting Their Opinion of the Ideal Sized Class

After the size of the class comes the length of the course. This data is found tabulated in table # 9. The median number of weeks as found in table # 9A is 36.75. This means that the median course runs thru an entire school year. In table # 9B the median number of periods per week is found to be 3.78. The median length of period as found in table # 9C is 55.59 or approximately 60 minutes. Then the median length ofthe course as worked out from this data is as follows; 1. Length in weeks, 36,2.Periods

per week, 2 ½, 3. Length of period, 60 minutes.

****

Table # 9

The Length of Woodworking Courses in Weeks, Number of Periods per Week and the Length of Periods as Reported by 54 Teachers of Woodworking in the Junior High Schools of the United States

9A

Number of Weeks

No. of Weeks Length of Course	10	18	20	24	30	36	38	40	46	72	80	Median
No. of Teachers Reporting Length of Course	4	9	2	1	1	11	6	8	1	2	2	36.75

9B

Number of Periods per Week

No. of Periods per Week	1	2	3	4	5	6	7	8	9	10	Median
No. of Teachers Reporting no. Periods per Week	3	15	7	2	18	0	0	1	0	1	2.78

9C

Length of Period

Length of Period	40	45	50	55	60	65	70	80	90	100	120	Median
No. of Teachers Reporting Length of Periods	5	4	2	2	17	2	1	6	5	1	1	55.59

****

Table # 10 shows the value of the various methods of presenting woodwork to a class, in the estimation of the 54 teachers of woodworking. The table shows the result of their rankings as follows;

1. Individual Instruction
2. Class Instruction
3. Blackboard Demonstration and Lecture

4. Working from Blue Prints

5. Text Book in Hands of Pupil

The rankings are fairly evenly distributed with the exception of thetext book in the hands of the pupil, which receives but 36 rankings. Almost without exception the statement was made that a combination of the five was used with the emphasis placed as the rankings show.

****

Table # 10

The Methods of Presenting Woodworking to a Class as Ranked by 54 Teachers of Woodworking in the Junior High Schools

Methods	Ranks 1	2	3	4	5	Total Rank	Median Rank	Final Rank
Text Book in Hands of Pupil	3	4	6	3	10	91	4.09	5
Working from Blue Prints	12	8	7	12	2	107	3.09	4
Individual Instruction	22	17	9	3	0	95	1.75	1
Class Instruction	27	15	8	1	0	89	1.81	2
Blackboard Demmn. and Lecture	6	9	12	11	3	109	2.84	3

****

Following the methods of presenting woodwork to a class comes the text books used in the classes. Table # 10 shows that the use of the text book as a method of presenting work to a class was rather unimportant. A tabulation of the number using a text book shows only 14 out of the 54 replies. "Essentials of Woodworking"[1] is mentioned as the text book used by 10 schools with the other four byfour different authors.

The criteria set up for judging the courses of study

1. Griffith, Ira - University of Wisconsin, Manual ArtsPress, Peoria, Illinois.

was arrived at from reviewing books[1] on woodworking by well known men in the field and from nine years' experience as a teacher of woodwork. The tabulation of the data as to the frequency of appearance is shown in table 11.

Table number 11 shows that all of the processes listed on the questionnaire deserve a place in the course because of their frequency of appearance. One process, that of the dowel joint, was added by three. Modeling was listed by thirty-six judges with a 69% of the fifty-two replies. Uses and care of tools was listed by fifty-two replies either as a separate lesson or incidental or both.

The time allotted to each process was not filled in by enough to make the results valid. The usual notation was "No special amount allotted to each process." The same thing is true of the problems, very few filling in the space provided for the problems. The usual notation appeared as follows "No special problems. Depends on the boy and his interests."

The points which this chapter brings out are listed as follows:

1. Aims for woodwork definite in minds of the teachers.
2. Aims ranked by fifty-two teachers of woodwork as follows:
    1. General training.

1. Griffith, Ira--Essentials of Woodworking.
   Burton, M. G.--Shop Problems Based on Community Problems. p. 308-383.
   King, Chas. A.--Woodwork and Carpentry--Teachers' Handbook.
   Worst, Edw. F.--Problems in Woodwork.

Table # 11.

The Number and the Per Cent of Appearances of the Processes in Woodworking as Placed by Fifty-two Teachers of Woodworking in the Junior High School.

Processes	Number of Appearances		Per cent of Appearances	
	Separate Lesson	Incidental	Separate Lesson	Incidental
Uses and care of tools	40	39	77%	75%
Squaring Stock		52		100%
Chamfering		52		100%
Boring		52		100%
Straight Chiseling		52		100%
Oblique and Curved chiseling		47		90%
Modeling		36		69%
Cross Lap Joint		52		100%
Mortise and Tenon Joint		51		98%
Mitre Joint		52		100%
Dowel Joint		3		6%

2. Exploratory.
3. Correlation with other school activities.
4. A skilled technic.
5. Training for a vocation or hobby.

3. The present median number in each class is twenty while the median for an ideal class, as judged by fifty-two teachers, is sixteen.
4. The length of the course worked out in medians from the data is as follows: Number of weeks--36.75; number of periods--2.78; length of period 55.59 minutes.
5. Methods of presenting the work to a class ranked by the judges as follows:
   a. Individual instruction.
   b. Class instruction.
   c. Blackboard demonstration and lecture.
   d. Working from blue prints.
   e. Text book in hands of pupil.
6. The opinion of the majority is that all of the above combined are used.
7. A text used very little. Most common text "Essentials of Woodworking."--Griffith.
8. The following processes should form a course in woodwork:
   a. Uses and care of tools, either separate lesson or incidental.
   b. Squaring stock.
   c. Chamfering.

d. Boring.

e. Straight chiseling.

f. Oblique and curved chiseling.

g. Modeling.

h. Cross top joint.

i. Mortise and tenon joint.

j. Mitre joint.

9. Processes are so interwoven that time allotted to each could not be specified.

10. Problems depend on the boy and his interests, if involving certain processes.

Chapter 5

PRINTING

Printing, for a comparatively new subject in the public schools, has made considerable progress in the number of schools offering instruction in this course. Of the 54 cities from which satisfactory replies were received, 24 are offering printing as a regular part of their industrial curriculum. The range of replies, asto States, is as follows:

State	Returns	State	Returns
California	1	Michigan	3
Illinois	1	Missouri	1
Indiana	1	New Jersey	2
Iowa	1	Ohio	1
Kansas	1	Oklahoma	1
Kentucky	1	Pennsylvania	1
Maine	1	Virginia	1
Massachusetts	3	Washington	1
Minnesota	1	Wisconsin	1

The aims for printing in the Junior High Schools is found tabulated in table # 12. The discussion of this entire chapter is based upon 24 satisfactory returns of the printing questionnaire. The method of tabulation and computation is the same in this chapter as in the preceeding chapter.

The aims as ranked by the 24 teachers of printing are as follows:

1. General Training
2. Exploratory
3. A Skilled Technic
4. Training for Avocation or Hobby
5. Correlation With Other School Subjects

Table # 12

The Distribution of Rankings of Specific Aims in Printing for Boys in the Junior High Schools of the United States by 24 Teachers of Printing in Junior High Schools Distributed over the United States as Shown on page 32.

Aims	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
A Skilled Technic	2	4	6	0	1	33	2. 81	3
General Training	18	1	2	0	0	26	.73	1
Exploratory	3	4	0	2	0	19	1.81	2
Training for Avoc. or Hobby	4	2	3	2	2	35	3.06	4
Correlation other School Subjects	4	2	4	6	1	49	3.39	5

The rankings vary somewhat in comparison to the preceeding chapters but general training receives first rank. The distribution of rankings is not as evenly apportioned as in the preceeding chapters. Aim number 3 has only 9 rankings out of the 24 which means that the 9 ranked it rather high while the other 15 thought it of little or no importance.

The data concerning the number of students in the courses at the present time and the ideal number of students which should make up a class is shown in table # 13. The median number of students in the classes at the present time is 15.33 while the ideal number of students is represented by the median 15, about 3

less than the present sized class, as represented by the median. There is a great variation in the size of the classes which is determined to a great extent by the equipment. The range of the class sizes is shown in table # 13.

Table # 13

The Number of Students in Printing Classes at the Present Time and the Ideal Sized Class as Reported by 24 Teachers of Printing in the Junior High Schools of the United States.

Class Size	4	6	8	9	10	12	13	14	15	16	18	19	20	24	30	Medians
A	1	0	1	2	0	1	2	2	1	3	4	1	1	2	1	15.33
B	0	2	2	0	3	3	1	0	4	1	1	0	2	3	0	13.00

A. Number of teachers reporting average number of students in classes at the present time.

B. Number of teachers reporting their opinion of the ideal sized class.

The length of course in weeks, periods per week and the length of periods will be taken up and treated in the same manner as in the preceeding chapter. The data for this discussion is found tabulated in table # 14.

In table # 14A is found the median number of weeks as 19.75, which means that the course is approximately one semesterin length. Table # 14B shows the median number of periods per week to be 3. The median length of period is 55.25 mimutes as shown in table # 14C, or approximately 1 hour. The median length of printingcourses in the Junior High Schools, based on the data found in table # 14, is eighteen weeks long, three periods per week and sixty minute periods.

Table # 14

The Length of Courses in Printing in Weeks, Periods per Week and Length of Periods as Reported by 24 Teachers of Printing in the Junior High Schools of the United States.

14 A

Length of Course in Weeks	10	18	20	36	40	70	80	Median
Number of Teachers Reporting Length of Course	2	5	4	3	4	1	1	19.75

14 B

Number of Periods per Week	1	2	3	4	5	10	Median
Number of Teachers Reporting Number of Periods per Week	1	7	2	1	8	1	3

14 C

Length of Periods	40	45	50	55	60	65	70	80	90	120	Median
Number of Teachers Reporting Length of Period	2	2	3	2	4	1	1	2	3	1	55.25

The value of the five methods, according to this group of printing teachers, of presenting printing to a class is shown in table # 15. The table shows the result of the rankings by 24 teachers of printing. The importance of these methods as shown by the rank given them by this group of teachers is as follows;

1. Class Instruction
2. Individual Instruction
3. Blackboard Demonstration and Lecture
4. Text Book in Hands of Pupil

Table # 15

The Methods of Presenting Printing to a Class as Ranked by 24 Teachers of Printing in the Junior High Schools of the United States

Methods	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
Text Book in Hands of Pupil	3	1	2	3	0	23	3.12	4
Working from Blue Prints	0	0	0	0	0	-	-	-
Individual Instruction	10	10	2	1	0	40	1.50	2
Class Instruction	16	4	2	0	0	30	.94	1
Blackboard Demon. & Lecture	5	3	8	2	0	43	2.43	3

Working from blue prints was not given a single rank. Method one, text book in hands of pupil, again receives very few rankings, only nine of the twenty-four. This method seems to be used very little in printing as well as in the preceeding courses studied.

Following the methods of presenting the work to a class closely is the matter of text books. As stated above this method of presenting work to a class was relatively unimportant. Of the 24 teachers reporting printing courses, but seven reported the use of a text book in the class. Six of the seven teachers reported the use of a printing text by Henry[1].

The outline of the course of study was formulated after reviewing books and articles by well known men in the field of printing. The frequency of appearance of the processes in the outline of the course of study, as judged by the 24 teachers of printing, is shown in table # 16.

1. Henry - Printing for School and Shop

Table # 16

The Number and Per Cent of Appearances of the Processes in Printing as Placed by 24 Teachers of Printing in the Junior High Schools of the United States

Processes	Number of Appearances	% of Appearances
Elementary Composition	19	79
Punctuation and Spelling	20	83
Proof Reading	20	83
Principles of Design	12	50
Study of Type Faces	20	83
Job Composition	20	83
Book Composition	10	43
Imposition and Stone Work	20	83
Advertising Composition	14	58
Tabular Composition	14	58
Cost Accounting	7	29
Estimating	9	37
Stock Cutting	17	71
Papers and Inks	15	63
Press Work	3	12
Binding	2	8

Table # 16 shows a great variation in the processes which should go to make up a course of study in printing for the Junior High School. This variation is due in a great measure to the variability of the length of courses. In order to fit the median length of course as found in table # 13, the processes will

be divided into two parts and those processes having the highest percentage of appearances will be included in the course. The reason for dividing the course into two parts, is that the data showed the courses having all the processes in the outline were usually 36 weeks courses or a full school year of work. The course will consist of the following processes, as a result of the selection stated above;

1. Elementary Composition
2. Punctuation and Spelling
3. Proof Reading
4. Study of Type Faces
5. Job Composition
6. Imposition and Stone Work
7. Stock Cutting
8. Papers and Inks

The time allotted to each process overlaps to a great extent so no time could be specificed for each process. The problems or jobs were not specbficed except in such general terms as, public school jobs, school paper, etc.

The data and discussion of this chapter sets forth the following points;

1. The aims for a course in printing are definitely in the minds of the teachers.
2. The aims ranked by the teachers as follows;
   a. General Training
   b. Exploratory
   c. A Skilled Technic

d. Training for Avocation or Hobby

e. Correlation with other School Subjects

3. The present size of class as represented by the median is 15. 33 students and the ideal sized class 13.

4. The length of course represented by medians is 19.75 weeks, 3 periods per week and periods 55.25 minutes long.

5. The importance of the methods of presenting the work as ranked by the teachers is as follows;

a. Class Instruction

b. Individual Instruction

c. Blackboard Demonstration and Lecture

d. Text Books in Hands of Pupil

6. Text Book used very little. "Printing for School and Shop"- by Henry most commonly used text.

7. The printing course should consist of the following processes;

a. Elementary Composition

b. Punctuation and Spelling

c. Proof Reading

d. Study of Type Faces

e. Job Composition

f. Imposition and Stone Work

g. Stock Cutting

h. Papers and Inks

8. Processes so interwoven that specificed time for each process impossible.

9. Problems or jobs are not definite or perscribed but con-

sists of school work as a whole, such as printing the school paper, school reports, letter heads, posters, etc.

Chapter 6

SHEET METAL

Sheet metal work, as well as printing, is a comparatively new subject in our public school system. The sheet metal offers a great many lines of activities in various fields, such as auto body work, boat work, building construction, etc. The sheet metal trade instead of losing ground as a great many trades are is steadily growing.[1]

The range of replies as to States is as follows;

California	2	Massachusetts	1
Colorado	1	Minnesota	2
Illinois	1	Michigan	2
Indiana	1	New Jersey	2
Iowa	1	Ohio	1
Kansas	1	Pennsylvania	1
		Washington	1

The specific aims, of sheet metal work in the Junior High School, are shown in table # 17, ranked by 17 teachers of sheet metal work in the Junior High School. The method of tabulation and computation in this chapter is the same as for the previous chapter.

The aims are ranked, according to the judgments of this group ofsheet metal teachers, as follows;

1. General Training
2. Exploratory
3. Correlation with other School Subjects
4. Training for Avocation or Hobby
5. A Skilled Technic

1. Rehabilitation Monograph- Sheet Metal Work, Joint Series # 46, Federal Board for Vocational Education

Table # 17

The Distribution of the Rankings of Specific Aims in Sheet Metal Work for Boys in the Junior High Schools of the United States by 17 Teachers of Sheet Metal Work in Junior High Schools.

Aims	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
Skilled Technic	7	1	2	3	5	52	3.91	5
General Training	8	6	1	0	0	23	1.39	1
Exploratory	8	2	3	0	0	21	1.62	2
Training for Avoc. or Hobby	3	1	1	3	0	30	3.16	4
Correlation other School Sub.	4	2	4	1	1	29	2.54	3

The rankings are evenly distributed, each aim receiving about an equal number of rankings. The general training aim receives first rank and a skilled technic receives last or fifth rank. The exploratory aim receives second rank, correlation with other school subjects third rank and training for avocation or hobby receives fourth rank. The ranking of the aims by this group of teachers is about the same as the ranking of the aims by the teachers of the other subjects studied.

The number of students in the classes at the present time and the ideal number in the minds of the teachers are shown in table # 18. Table # 18 shows the minimum size of class to be 7 students while the maximum is 30. The ideal sized class as reported by the teachers is, minimum sized class 10, maximum sized class 24. Both minimum and maximum classes represented by two cases. The median sized class as they now are is 17 students and the median sized ideal class is 16.75. The medians are practically the same for the classes at the present time and for the ideal

Table # 18

The Number of Students in Sheet Metal Classes at the Present Time and the Ideal Number per Class as Reported by 17 Teachers of Sheet Metalin the Junior High Schools of the United States

Class Size	7	10	12	14	15	16	18	20	21	22	24	25	26	28	30	Medians
A	1	0	0	1	2	1	3	1	1	1	1	1	0	1	1	17
B	0	2	2	1	0	4	2	3	0	0	2	0	0	0	0	16.75

A. Number of teachers reporting average number of students in clases at the present time.

B. Number of teachers reporting their opinion of the ideal number of students per class.

The length of course, in number of weeks, periods per week and length of period , is treated in the same manner as inthe preceeding chapter. The data for this topic is shown in table # 19. Table # 19 shows that the median length of course in weeks is 19.16. The median number of periods per week is 3.5 and the median length of period is 75.25 minutes. This shows that the median course runs through one semester or 19 weeks, the periods are 75 minutes long and there are 3.5 periods per week. This makes a total of 84.1 hours spent in the sheet metal course, as shown by the median length of course.

The next point in this chapter is the matter of presenting the work to a class. This data is shown in table # 20. The table shows that the individual instruction method of presenting work to a class again receives first place in the final rankings by this group of sheet metal teachers. The second rank is the class instruction method. Third rank is working from blue prints, fourth rank is blackboard demonstration and lecture and the fifth rank is working from text books in the hands of the pupil. The

Table # 19

The Length of Courses in Sheet Metal Work for Boys in the Junior High School, in Weeks, Periods per Week and Length of Periods as Reported by 17 Teachers of Sheet Metal Work in the Junior High Schools of the United States.

19A

	Number of Weeks										
Length of Course in Weeks	6	9	10	18	19	20	38	40	46	57	Median
No. of Teacher Reporting Length of Course	1	1	2	1	2	3	1	2	1	1	19.16

19B

	Numberof Periods per Week				
Number of Periods per Week	2	4	5	10	Median
Number of Teachers Reporting No. of Periods per Week	7	1	6	1	3.5

19C

	Length of Periods								
Length of Periods	40	50	55	60	80	90	100	140	Median
Number of Teachers Reporting length of Period	2	1	2	2	2	4	1	1	75.25

****

Table # 20

Distribution of Rankings of Methods of Presenting Sheet Metal Work to a Class by 17 Teachers of Sheet Metal Work in the Junior High Schools of the United States

Methods	Rank					Total Rank	Rank Median	Final Rank
	1	2	3	4	5			
Text Book in Hands of Pupils	2	0	2	3	0	30	4.16	5
Working from Blue Prints	5	4	2	3	0	37	3.09	3
Individual Instruction	7	5	2	0	0	23	1.55	1
Class Instruction	10	1	1	1	1	24	2.00	2
Blackboard Demonstration & Lecture	4	1	5	2	0	29	2.56	4

text book method again receives very few rankings, seven out of the seventeen. The rankings for the other methods are fairly evenly divided. The methods of presenting sheet metal to a class as ranked by the group of teachers is as follows;

1. Individual Instruction
2. Class Instruction
3. Working from Blue Prints
4. Blackboard Demonstration and Lecture
5. Text Book in Hands of Pupil

Two returns show the use of a text book in the hands of the pupil out of the 17 returns. These two use the same text book, "Essentials of Sheet Metal Work" by Daugherty.

The criteria for setting up the outline of the course in sheet metal work was arrived at by reviewing books and articles on sheet metal by men in the field. The outline was taken, in the main, from a bulletin[1] issued by the Federal Board for Vocational Education.

The frequency of appearances of the processes in the course of study, as scored by this group of judges is found in table # 31. In the table the fact stands out that every process receives more than 70 % of the rankings. Riveting was added by two teachers but this process is considered a part of other processes so is not taught as a separate lesson.

1. Rehabilition Monograph - Joint Series # 46, Sheet Metal Work, Federal Board for Vocational Education.

Soldering and tapering forms receives 100 % Of judgments on the returns. The other percentages of appearance are shown in table # 21.

Table # 21

The Number and Per Cent of Appearancesof the Processes in Sheet Metal as Ranked by 17 Teachers of Sheet Metal Work in the Junior High Schools of the United States

Processes	Number of Appearances	% of Appearances
Soldering	17	100.00
Folding Edges and Seaming	16	94.00
Grooving in Cylindrical Work	14	82.4
Double Hemmed Edge	14	82.4
Wire Edge	15	88.8
Notching and Burring	14	82.4
Double Seaming and Raising	13	76.5
Tapering Forms	17	100.00
Radial Developments	12	70. 6
Parallel Constructions	12	70.6
Intersections	12	70.6
Mitre Constructions	13	76.5

The discussion of the data gathered in this chapter brings out the following points;

1. Aims of Sheet Metal Work Definitely in Minds of the Teachers;
2. Aims Ranked by the Teachers as follows;
   a. General Training
   b. Exploratory

c. Correlation with other School Subjects

d. Training for Avocation or Hobby

e. A Skilled Technic

3. The median number of students in classes at the present time is 17 while the ideal number of students per class, in the opinion of the teachers, is 16.75.

4. The median length of course is as follows;

19.16 Weeks

3.5 Periods per Week

75.25 Minutes Length of Periods

5. Methods Ranked as to importance as follows;

a. Individual Instruction

b. Class Instruction

c. Working from Blue Prints.

d. Blackboard Demonstration and Lecture

e. Text Book in Hands of Pupil

6. Opinion of the judges that method e should not be used.

7. The following processes seems to be worthy of a place on the course outline because of their frequency of appearances on the returns;

a. Soldering

b. Folding Edges and Seaming

c. Grooving in Cylindrical Work

d. Double Hemmed Edge

e. Wire Edge

f. Notching and Burring

g. Double Seaming and Burring

h. Tapering Forms

i. Radial Developments

j. Parallel Constructions

k. Intersections

l. Mitre Developments

8. Problems are not definite, depends a great deal upon the circumstances when the course is given.

9. No definite amount of time alloted to each problem.

Chapter 7

ELECTRICITY

Coursesin electricity have been in the public schools for some time but have not been a part of the industrial curriculum. The courses usually have been given in the science departments and it has not been until the last few years that it has become a course in the industrial department. Previously the courses were theory, almost entirely, but now theory and practice is combined with the emphasis placed upon the practical side.

The range of replies, as to States, is as follows;

California ----	2	New Jersey ----	3
Iowa ----------	1	Ohio ----------	1
Kansas --------	2	Pennsylvania --	1
Minnesota -----	2	Washington ----	1
Michigan ------	1		

The aims for electricity as ranked by 15 teachers of electricity in the Junior High School are shown tabulated in table # 22. The method of tabulation and computation is identical with the other chapters.

In table # 22, in the last column is found the final rankings of the specific aims in electricity. The exploratory aim receives first rank. The general training aim receives second rank. Third rank goes to the skilled technic aim. Correlation with other school subjects receives fourth rank and training for avocation or hobby aim receives fifth rank.

Table # 22

The Distribution of the Rankings of Specific Aims in Electricity for Boys in the Junior High School by 15 Teachers of Electricity in the Junior High Schools of the United States

Aims	Rank 1	2	3	4	5	Rank Total	Median Rank	Final Rank
Skilled Technic	3	2	1	1	1	19	2.83	3
General Training	9	5	1	1	0	26	1.40	2
Exploratory	9	2	2	0	0	19	1.12	1
Training for Avocation or Hobby	2	0	4	1	2	28	3.00	5
Correlation with other School Sub.	2	2	3	2	1	28	2.88	4

The number of students in the course is the next point to be considered in this chapter. The data for this discussion is found in table # 23. Table # 23 shows the minimum sized class to be 14 at the present time, according to the 15 teachers of electricity. The maximum sized class is found to be 30 students. Table # 23 also shows that two teachers reported their estimate of an ideal sized class as 10, the minimum, while two teachers reported twenty-five as their idea of an ideal sized class, which is the maximum as far as this group is concerned. The median sized class at the present time is 20 while the median sized ideal class is 19.30 students, as shown in table # 23. This table shows that a great many teachers are handling oversize classes.

Following the number of students in the classes comes the length of course. The length of course will be discussed under the three heads, Number of Weeks, Number of Periods per Week and Length of Period. The data for the discussion is found in table # 24. In table #24A the median length of course in weeks is found to be 19.87

weeks. Table # 24B shows the median number of periods per week to be 3.75 periods. Table # 24C shows the median length of period to be 60 minutes. From the data gathered, we find the median length of course to be as follows; 20 weeks long, 4 periods per week and the periods 60 minutes in length.

Table # 23

The Number of Students in Electricity Classes at the Present Time and the Ideal Sized Class as Reported by 15 Teachers of Electricity in the Junior High Schools of the United States

	Number of students in class												
	10	12	14	15	16	20	21	22	24	25	28	30	Medians
No. of Teachers Reporting no. of Students in classes at present time.	0	0	1	1	2	3	1	1	1	2	1	1	20
No. of Teachers reporting their opinion of ideal sized class	2	1	0	0	2	5	0	0	1	2	0	0	19.30

****

Table # 24

The Length of Course in Electricity for Boys, in Weeks, Periods per Week and Length of Periods in the Junior High Schools of the United States as Reported by 15 Teachers of Junior High School Electricity

24A

Length of Course in Weeks	6	10	18	19	20	36	38	40	42	Median Weeks
No. of Teachers Reporting no. of Weeks										19.87

24B

No. Periods per Week	1	2	3	4	5	10	Median no. of Periods per Week
No. Teachers Reporting Periods per Week	1	4	1	2	6	1	3.75

(Table # 24 continued on page 52)

Table # 24
(continued)

240

Length of Periods	45	55	60	80	90	Median Length of Period 60 minutes
No. of Teachers Reporting Length of Periods	3	1	5	4	2	

****

The methods of presenting electricity to a class is the next point for discussion. The data as gathered from the 15 returns is found tabulated in table # 25.

Table # 25

The Distribution of the Rankings of Methods of Presenting Electricity to a Class of Boys in the Junior High School of the United States

Methods of Presenting Electricity to a Class	1	2	3	4	5	Total Rank	Median Rank	Final Rank
Text Book in Hands of Pupil	1	1	2	0	1	14	3.66	5
Working from Blue Prints	2	1	2	3	0	22	3.08	4
Individual Instruction	4	5	2	0	0	20	1.60	2
Class Instruction	8	4	1	1	0	23	1.43	1
Blackboard Demonstration & Lecture	2	4	2	3	1	33	3.04	3

Class instruction receives first rank with individual instruction a very close second. Blackboard demonstration and lecture receives third rank, working from blue prints receives fourth rank and text book in hands of the pupil receives fifth or last rank. The text book in the hands of pupil again receives few rankings, but 5 of the 15 rankings. The distribution of the rankings for the other methods are fairly evenly distributed.

Four of the 15 returns reports the use of a text book in electricity. Two have the same book, which is "Essentials of Electricity" by W. H. Timble and the other two each have different texts.

The matter of the use of a text book in courses in electricity, according to this group of judges, restswith the individual instructor and is of lessor importance.

The course of study in electricity as checked by the 15 teachers of electricity, is the next topic for discussion. The tabulation of the data for the course of study is found in table # 26.From table # 26, the following groups of work stand out as being most commonly given , as reported by the 15 teachers;

Groups of Work	Number of Schools Reporting
Bell Wiring	14
Principles of Electricity	13
Interior Wiring	11
Annunciator Wiring	9
Telephone	7

Three teachers added the manufacture of household appliances and two teachers addedradio work. The great variance in length of the course makes a great deal of difference in the number of groups of work offered.

The small number of cases makes it rather difficult to draw any valid conclusions but from the data collected the following points seem to be an indication of what a greater number of cases would show;

1. The aims of electricity in the Junior High School , as ranked by the teachers, is as follows;
   a. Exploratory
   b. General Training
   c. Skilled Technic
   d. Correlation with other School Subjects
   e. Training for Recreation or Hobby
2. The ideal size of a class in electricity, according to the 15 judges,is 20 students.

Table # 36

Outline of Courses in Electricity as Taught by 15 Teachers of Electricity in the Junior High Schools of the United States

Groups of Work	Number of Total Group Reporting	% of Total Group Reporting
Bell Wiring	14	93.33
Principles of Electricity	12	80
Principles of D C Motors & Generators	5	33.33
Principles of A C Motors & Generators	4	23.33
Annunciator Wiring	9	60
Interior Electric Wiring	11	73.33
Armature Winding	4	23.33
Switchboard Wiring	4	23.33
Storage Batteries	5	33.33
Electric Meters, Repair & Reading	6	40
Telephone	7	46.66
Electrical Testing Instruments	3	20
Radio Work[1]	2	13.33
Mfg. of Household Appliances[1]	3	20

[1]Added by teachers.

3. The median length of course based on the data received is, 30 weeks long, 4 periods per week and periods 60 minutes long.
4. The Teachers' judgment of the importance of the methods of presenting electricity to a class are shown ranked as follows;

   a. Class Instruction
   b. Individual Instruction
   c. Blackboard Demonstration and Lecture
   d. Working from Blue Prints
   e. Text Book in Hands of Pupil

5. A text book in electricity is not commonly used, according to the data gathered from the replies.
6. The course of study, based on the judgments of the teachers, would consist of the following groups;

   a. Bell Wiring
   b. Principles of Electricity
   c. Interior Electric Wiring
   d. Annunciator Wiring
   e. Telephone

Chapter 8

AUTO WORK

Auto work in all probability is the newest of the industrial subjects, in the Junior High School. The discussion of this chapter will be based upon only 10 returns. Of this group of teachers replying to the questionnaire, but ten of them were teaching auto work. The reason for the small number of schools offering auto work as a part of their curriculum is the comparatively short time in which the work has been a part of the public school program of studies.

The range of replies, as to States, is as follows;

California -------	2	Minnesota ---------	2
Illinois ---------	1	Michigan ----------	2
Kansas ----------	2	Washington --------	1

The specific aims for auto work as ranked by the ten teachers of auto work, reporting, are shown tabulated in table # 27. The method of tabulation and computation is the same as the preceeding chapter. Because of the small number of cases, nothing definite can be taken from table # 27. The rankings of the 10 judges are shown but in all probability the order would be changed, with a greater number of cases. The 10 teachers of auto work rank the aims in the following order;

1. Exploratory
2. Skilled Technic
3. General Training
4. Training for Recreation or Hobby
5. Correlation with other School Subjects

Table # 27

The Distribution of the Rankings of Specific Aims in Auto Work for Boys in the Junior High Schools of the United States by 10 Teachers of Auto Work in the Junior High School

Aims	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
Skilled Technic	2	3	1	0	0	11	1.58	2
General Training	4	2	2	0	0	14	1.75	3
Exploratory	4	2	0	0	0	8	1.	1
Training for Recreation of Hobby	2	0	1	2	0	13	3.18	4
Correlation with other School Sub.	1	0	1	0	1	9	4.10	5

The distribution of the rankings in table # 27, column rank 1, shows a tendancy as to what a greater number of cases would bring out.

The number of students in the classes at the present time and the ideal number of students in a class is shown tabulated in table # 28.

Table # 28

The Size of Classes at the Present Time and the Ideal Sized Classes in Auto Work as reported by 10 Teachers of Auto Work in the Junior High Schools of the United States

	Size of Class 8	10	12	16	18	20	25	Medians
No. Teachers Reporting Actual Class Size	0	2	2	3	0	0	1	12
No. Teachers Reporting Ideal Sized Class	1	3	3	1	1	1	0	10.5

While nothing decisive can be taken from the data in table # 28, the median of the ideal sized class is lower than the median for the classes as they now are. This would tend to indicate that the teachers feel that their classes are too large.

The matter of the length of course will not be taken up as in the previous chapters because of the few cases and because of the fact that no two courses have the same course length. The courses runs from 6 weeks in length to 72 weeks in length. The number of periods per week ranges from 5 to 10 with the majority of cases at 5. The length of period ranges from 45 minutes up to 120 minutes. Very little can be taken from this data because of the small number of cases.

The methods of presenting auto work to a class will be tabulated as in the preceeding chapter. The tabulation of this data is found in table # 29.

Table # 29

The Methods of Presenting Auto Work to a Class as Ranked by 10 Teachers of Auto Work in the Junior High Schools of the United States

Methods	Rank 1	2	3	4	5	Total Rank	Median Rank	Final Rank
Text Book in Hands of Pupil	2	0	1	2	0	13	3.18	4
Working from Blue Prints	0	0	0	0	1	5	5.	5
Individual Instruction	4	3	1	0	0	13	1.41	1
Class Instruction	3	3	2	0	0	15	1.75	3
Blackboard Demonstration & Lecture	4	0	1	1	0	11	1.50	2

Two of the teachers failed to rank the methods, leaving only 8 from which the data could be taken. The rankings of the methods by the 8 teachers are as follows;

1. Individual Instruction
2. Blackboard Demonstration and Lecture

3. Class Instruction

4. Text Book in Hands of Pupil

5. Working from Blue Prints

Method number one ranks high as it does in the other subjects studied. The other methods are mixed up considerably in comparison to the rankings given to the methods in the other courses studied.

Two cases reported the use of a text book in the auto work course and each had a different text.

The outline of the courses of study was made out after reviewing books and articles on auto work[1] and personal interviews with teachers of auto work. The data for this outline is shown tabulated in table # 30.

Table # 30 shows that the above processes, with the exception of tire and radiator repair and storage batteries, have a place on all of the returns which could be used.

It is very obvious that no definiteor decisive conclusions can be drawn from this data because of the few cases. It is the intention of the writer to simply present the data without drawing any conclusions.

1. Glenn, Everett G - Establishing an Automotive Course, Industrial Arts Magazine, Dec. 1921, p461 - Jan.1922,p3

Table # 30

The Number and Per Cent of Appearances of the Processes in Auto Work as Placed by 8 Teachers of Auto Work in the Junior High Schools of the United States

Processes	Number of Appearances	% Of Appearance
Engines	8	100
Carburetors	8	100
Ignition	8	100
Cooling Systems	8	100
Starting and Lighting Systems	8	100
Clutch	8	100
Transmission	8	100
Rear Axle Drive	8	100
Running Gear	8	100
Tire Repair	4	50
Radiator Repair	4	50
Gas Engine Science	8	100
Storage Batteries	5	62.5
Pleasure Cars, Upkeep and Repair	8	100

Chapter 9

Comparison and Summary of Chapters 3 to 8

The first point in comparison is the aims of the courses. The general training aim receives first rank in the following courses: Mechanical drawing, woodworking, sheet metal and printing. The exploratory aim receives first rank in electricity and auto. Beyond this place there is no general agreement as to the rank order of the other aims. Very few rankings were given to training for a vocation or hobby, which indicates that the teachers' opinion of the value of this aim is rather low. The general agreement, however, shows that the teachers regard the general training aim as the primary aim in industrial work for boys in the Junior High School.

The number of students which should constitute a class, in the opinion of the teachers of the courses, varies. The range of opinions is from 10 pupils up to 20 with the median as 16. This data and discussion shows that a great many of the teachers are teaching classes a great deal larger than the median sized class as reported by the teachers on the questionnaire.

There is rather close agreement of the medians on the length of course. With the exception of one course the median is approximately 19 weeks, for the length of the course in weeks. The median number of periods per week for the six courses is 3 and the median length of periods is 60 minutes. Taking the courses singly there is a great variation which is accounted for partially

by the different length of school year periods, etc.

The agreement is again close, in the matter of methods of presenting the work to a class. The general agreement is that class instruction comes first with individual instruction second. According to the data, the text book in the hands of the pupil, ranks fifth and is given comparatively few rankings. The general comment by the teachers after ranking the methods was to the effect that a combination of all five methods was used.

The text book, used as a text, is not the common practice in industrial work for boys. Very few schools, taking all of the courses combined, reports the use of a text book. A great many, reporting the use of a text book, also adds that it is to be used for reference only.

The results of the checking of the outline of courses by the teachers, shows that the teachers have the processes very definitely in mind. The problems and the amount of time given to each problem differed with the boy and that length of time spent on each problem depended upon the rate of speed at which the boy worked.

PART TWO

PAST TRAINING OF THE TEACHERS

Chapters Ten to Thirteen

PART TWO

Chapter 10

SCHOOL AND PROFESSIONAL TRAINING

The idea prevalent that industrial teachers are poorly prepared is the reason that chapter ten, School and Professional, Training, has been studied. It is very important that industrial teachers be fully prepared, perhaps more so at this time than at any previous time in the history of the United States. The rapid strides made in industry and the increasing significance of vocational education in our public school system makes it imperative that the industrial work in our public schools be put on as real and firm a basis as possible. In order that this situation may be realized the teachers must be well prepared.

The question often arises as to which is the better industrial teacher, the skilled artisan or the professionally trained teacher. A great many educators contend that the artisan is the better teacher because of his skill gained in the trade and his vast knowledge of the trade while others claim that the trained teacher is better, even tho knowing a great deal less about the trade than the artisan, because of his ability to present the work logically and clearly. When manual training was first introduced as a public school subject in Sweden the same question arose and was tried out by Soloman.[1] The result was that the skilled artisan without professional training was dropped and the regular

1. Soloman, Otto--Theory of Educational Sloyd, Chapter p.

teachers were given a course in the trade they expected to teach and put in the places formerly held by the skilled artisans. During the World War, just past, the United States suffered a serious shortage of men industrial teachers because of the large numbers called into the service. Rather than drop the industrial work, skilled tradesmen were put in the industrial departments to take the place of the teachers called to the service. This was a general practice at that time. A Supervisor of Manual Training in one of the largest cities in the middle west made this statement concerning the tradesmen employed by him in the emergency "Of the five tradesmen employed by me during the war period only one came thru as a successful teacher in all respects. I think the reason for this man's success lies in the fact that he had had teaching experience before he entered his trade work."

A very important criterion of a successful teacher is the amount of training and the extent of training the teacher has had for the position he is filling. As a rule good teaching is the result of extensive and good training. The general agreement in regards to this question is that "Adequate preparation usually means good teaching."[1] Another indication of the successful and conscientious teacher is the amount of training in service he is doing and his touch with problems in education.

The data as tabulated will show what the present practice is in employing industrial teachers for boys, as to school and pro-

1. U. S. Bureau of Education Bulletin # 29 - 1916

fessional training. The data gathered is shown tabulated in table number page .

The divisions or groups of training have been set up as follows; Elementary School, Only, High School Not Graduates, All High School Graduates, High School Graduates Only, One Year Normal or Special School, Normal or Special School Graduate,[1] One Year College or University, Two Year College or University, Three Year College or University, Bachelor's Degree, Advanced Degree. The data for the training in service is shown in amount of summer session work, correspondence work and extension work taken by the teachers. This data is shown tabulated in table number page .

All cases not reporting entrance to or completion of the High School or any other higher institution were classed in the group "Elementary School Only." The next group was the "High School, Not Graduates." This group included all of the cases which had attended high school but had not completed the regular four year course leading to a diploma. The next group "All High School Graduates" consists of all the rest of the groups combined, high school graduates only, one year normal or special school, normal or special graduate, one year college or university, two year college or university, three year college or university, bachelor's degree and advanced degree. The "All high school graduate " group was put in so as to make it possible to compare this group with the cases not having had any high school training. The grouping above

1. Two Year Course required for diploma.

the high school is clear enough and quite definite without further explanation.

In discussing the data on school and professional training no definite or standard requirements can be set up as this study covers a number of States and the requirements vary with the State. The general or most common requirements for industrial teachers will be set up. The State of Minnesota requires her industrial teachers to have two years special training beyond the high school.[1] This means that they must be high school graduates. Special certificates are issued however which tends to break down any good the higher requirements for certification may have done.

Out of the three hundred replies but two hundred and seventy-two could be used. Of this number there are forty who have had no high school training whatsoever. This figure translated into per cent means that fourteen and seven tenths per cent of the entire group have had no high school training. Forty-two cases have entered high school but have not completed the course. This gives a per cent of fifteen and one tenth per cent of the entire group. This group was not divided into years because it was thought that there is very little difference between one, two and three years in the high school. All high school graduates composes the largest group. It is represented by one hundred and ninety cases and is sixty-nine and eight tenths per cent of the total number of cases. This group includes groups four to ten inclusive as shown in the table on school and professional training. Those who have

1. State of Minnesota--Department of Education, Bulletin, January 1922 on "Law and Rules Governing Certification of Teachers." p. 18

Table # 31

School and Professional Training

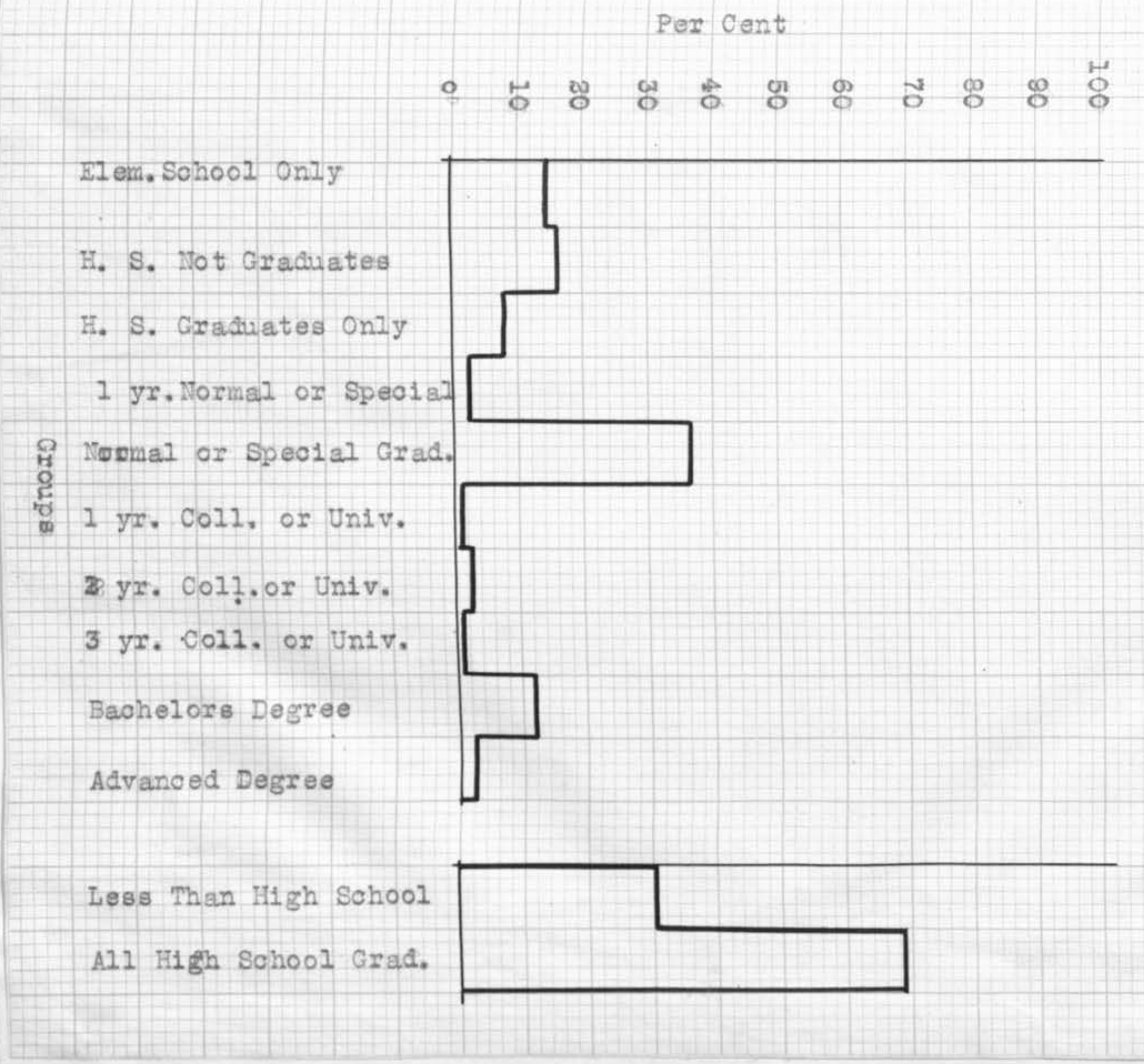
		Number of Cases	Per Cent of Entire Group
1.	Elementary School, Only	40	14.7
2.	High School, Not Graduates	42	15.14
3.	High School Graduates, Only	23	8.4
4.	One Year Normal or Special School	7	2.5
5.	Normal or Special School Graduate	99	36.4
6.	One Year College or University	4	1.4
7.	Two Year College or University	10	3.6
8.	Three Year College or University	14	1.4
9.	Bachelor's Degree	36	13.2
10.	Advanced Degree	7	2.5
	Total	272	99.3

1.	All Less than High School Graduates	82	30.14
2.	All High School Graduates	190	69.86
	Total	272	100.00

Diagram 1

School and Professional Training

Relation of each group to the entire group in per cent



graduated from the high school only are a small group, being represented by only twenty-three cases with a eight and four tenths per cent of the entire group. Seven cases have had but one year in a normal or special school. This makes but two and five tenths per cent of the entire group. The largest separate group is the group having completed a two year normal or special school course. As stated before in this chapter this group represents the general standard for certification of industrial teachers. It is composed of ninety-nine cases making thirty-six and four tenths per cent of the total number. The group having had but one year in a college or university is represented by only four cases which makes one and four tenths per cent of the entire group. This group is closely allied to the group having had but one year in a normal or special school. The next group, two years in college or university, compares with the normal or special school graduates. Ten cases are found in this group making a three and six tenths per cent of the large group. There are but four in the three year college or university group which makes one and four tenths per cent of the entire group. There are thirty-six cases having a Bachelor's Degree. This represents thirteen and two tenths per cent of the large group. But seven have advanced degrees which makes two and five tenths per cent of the entire group.

We find in the table on school and professional training that one hundred and sixty-seven cases have had some advanced training beyond the high school. This is sixty-nine and eight

Table # 33

School and Professional Training

Training in Service

Kind of Work	Number of Cases
Correspondence Courses	30
Extension Courses	68
Summer Session Work	73
Doing Nothing	103
Total	274

171 cases or 62.4 per cent of the entire group have taken part in some form of "Training in Service."

The data does not show when the training was taken so for that reason it can be used only as an indication, that the teachers have done something to improve themselves in service.

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tenths per cent of the total number of cases. This is an excellent showing but there is still room for improvement. The elementary school only and the high school not graduates groups in all probability represents the older teachers.

From the above discussion and the table of school and professional training one can say that the industrial teachers for boys in the Junior High Schools are fairly well prepared to teach the industrial subjects. In spite of all that has been said regarding the preparation of industrial teachers, their training seems to be as well founded as the ordinary teacher.[1] Although ranking about on a par with teachers as a whole this group is somewhat lower in training than the male teachers in the Junior High School, as a whole. The median years of training for male Junior Teachers, as a whole, is 7.4 years beyond the elementary schools.[2] Another point in conclusion is that the industrial teachers are fully awake to the need of more and better preparation, as shown in the table on summer session work, correspondence work and extension work.

1. Selke, Erich--Master's Thesis - Teachers of Minnesota--Unpublished. N.E.A. Report on Teachers' Salaries, 1919--E. S. Evenden, Teachers' College, Columbia University.

2. National Committee for Chamber of Commerce Cooperation with the Public Schools. Know and Help your Schools, p. 23, table 13.

Chapter 11

TEACHING EXPERIENCE

In discussing the training of a teacher the number of years experience as a teacher must follow the amount of school and professional training the teacher has had. The data gathered, relative to teaching experience will be found in table # 33.

The larger cities, where the better and greater number of Junior High Schools are located, as a rule, require that the applicant for a teaching position in their school system have some previous experience in teaching. Usually two years are required.[1] This shows very clearly the need of experience in teaching. The experience must be had but the larger cities would rather have the smaller cities do the seasoning.

Previous experience, in the majority of cases, goes hand in hand with better teaching. As the teacher gains additional experience he becomes more sure of himself and the subject he is teaching and so will be able to present his subject more clearly and forcefully. His confidence in himself increases and he attacks and solves new problems more easily and readily.

From the table of teaching experience is found that the column "Years of Experience" starts at one year. The reason for

1. Massachusetts Department of Education, Bulletin # 5,1921-Junior High School Manual,p 40 - 41, Committee of Fifteen appointed by the Commissioner of Education.

not having a number of years experience column for no years was that only one case stated the fact that this was his first year of teaching experience.

From table # 33, we find that the greatest number of cases are at five and seven years experience. The number of cases having had five years of teaching experience is twenty-six and the number having had seven years of experience is also twenty-six. The next greatest number of cases appears at one year. The number in this group is twenty-four. Twenty-two cases are found to have had eight years teaching experience. Eighteen have had two years experience and those having had ten years experience are also represented by eighteen cases. At three years experience the number of cases goes down to sixteen. Thirteen cases represent the group having had twelve years teaching experience. Those having had nine years experience are also represented by twelve cases. The number of cases having had eleven years experience is ten. For fourteen and fifteen years experience there are nine cases each. Eight cases each represent the groups having had thirteen and sixteen years experience. The next highest group is those who have had but four years experience, there being but six cases in this group. Two cases are found to have had twenty-three years of teaching experience. Seventeen to twenty inclusive, twenty-two, twenty-seven, twenty-eight and forty-two years of experience are represented by one case each.

From the preceeding discussion of the data gathered, one point stands out very clearly and that is that all but one of the cases, as stated previously in this chapter, have had some

Table # 33

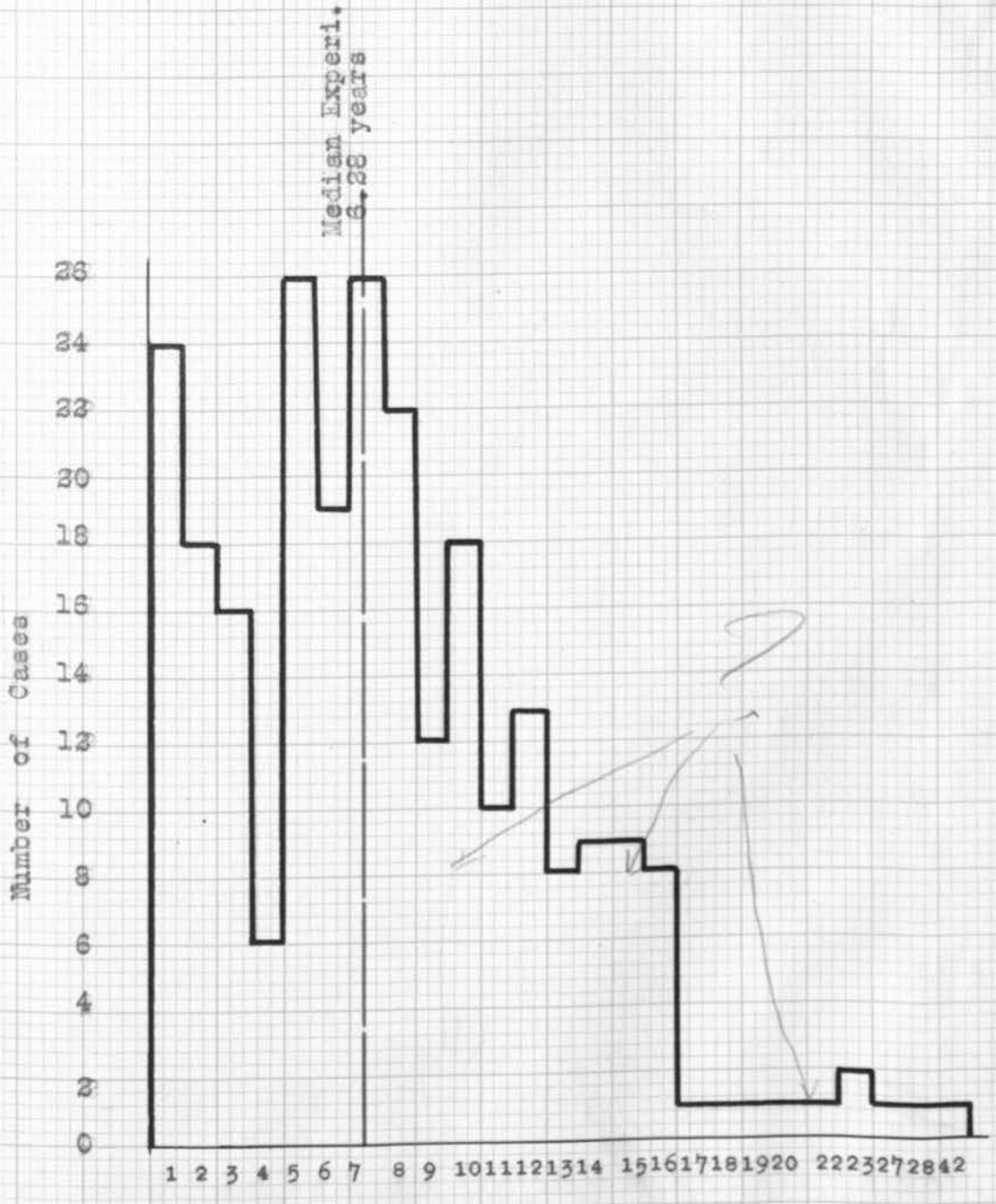
Teaching Experience

Years of Experience	Number of Cases
1	24
2	18
3	16
4	6
5	26
6	19
7	26
8	22
9	12
10	18
11	10
12	13
13	8
14	9
15	9
16	8
17	1
18	1
19	1
20	1
22	1
23	2
27	1
28	1
42	1
6.28 years	274
Median Experience	Cases

Diagram 2

Teaching Experience

Distribution of cases for number of years teaching experience



teaching experience, varying from one years experience up to the greatest number of years, forty-two.

In table # 33 on teaching experience is found that the median number of years teaching experience is six and twenty-eight one hundreths years. This is practically the same, except for slight variations, as found in several other studies,[1] for teachers as awhole. This group ranks slightly lower in teaching experience than for the entire group of male teachers in the Junior High School. The median number of years experience for the male teachers as a whole, in the Junior High School,is six and eighty-nine hundreths.[2]

The reason that practically all of the cases have had some teaching experience may be due to the fact that when the Junior High Schools were established the teachers for them were taken directly fom the grades and so of course had had some teaching experience. Again it may be that the school system does not take in inexperienced people, as is the case in Minneapolis where two years previous experience is required for entrance to a teaching position.

Something must be done to increase the teaching temure of industrial teachers in the Junior High School. The present

1. Coffman, L. D - The Social Composition of Teaching Population, Bulletin # 41, Teachers' College, Columbia.
   Evenden, E.S - N. E. A. Report on Teachers' Salaries, 1919.
2. National Committee for Chamber of Commerce Co-operation With The Public Schools - Know and Help Your Schools, p27 table 15.

salaries, if maintained at the level where they now are, may tend to increase the industrial teachers' tenure of teaching. Again the recognizing of the teachers' job as a profession and elevating it to the plane where it rightfully belongs will also have a great effect on the teaching tenure.

From chapter ten and from the preceeding pages of this chapter, the fact can be seen that the industrial teachers in the Junior High Schools measure up fairly well to teachers as a whole,[1] altho not quite up to the standard of male teachers in the Junior High Schools as a whole.[2]

The next chapter will take up the trade training and experience of industrial teachers in the Junior High School which will not be comparable to any phase of the academic teachers' life, so the comparison between the industrial teacher and the academic teacher must end with this chapter. The next chapter will tend to show that the industrial teacher because of this extra trade training is better fitted than the academic teacher, providing the school and professional training are equal.

1. Evenden, E.S - N. E. A. Report on Teachers' Salaries, 1919
2. National Committee for Chamber of Commerce Co-operation With the Public Schools - Know and Help Your Schools, p 27 table 13.

Chapter 13

TRADE TRAINING AND EXPERIENCE

Before discussing the data for this chapter there must be a definite understanding of what is required of the industrial teacher or rather what he must know in order to be a successful teacher.

He must be familiar with the subject matter to be presented, he must have a good understanding of the youthful mind and especially the adolescent boy, he must know that there are definite methods of learning and presenting materials and must know how to use them, he must understand class management and be able to discipline judicially and he must be able to take some part in the extra-school activities of the boys.[1]

The first point in the discussion has a direct bearing on this chapter, "The teacher must be familiar with the subject matter to be presented." The question arises as to how the knowledge of the subject matter can be best obtained. There are two methods of getting trade training, in trade schools and in the trade itself.[2] The general concensus of opinion is that the skilled workman knows more about the subject matter and has a greater skill in tool manipulation than the trained teacher has.

1. Smith, H.J - The Need of Training, Industrial Arts Magazine June 1921, p 314
2. Ibid

Why, because he has been in the trade and has had to meet real situations and has had to solve them himself. If this be true, it is very essential that the industrial teacher have a trade contact besides his school and professional training. The question of whether the trained teacher is better than the skilled artisan without teacher training is a very important one. The discussion of this topic will not be taken up in this study as it falls outside of the study. The question was merely stated to show the importance of trade training in the opinion of various people. This chapter deals with the necessity of some trade training along with the school and professional training.

The data for this chapter is shown in table # 34. The diagram shows graphically the facts as shown in table # 34, on trade training and experience. From the table is found the range of experience in years. The range is from 0 years up to 42 years. The cases are grouped because of the small number of cases for certain years of experience. This was done to make them comparable with the other figures. From table # 34 is found the fact that 86 per cent of the entire group or 235 cases out of 271 have had some sort of trade experience ranging from one year up to forty-two years. Thirty-six have had no trade training and experience whatsoever. This group represents 13.34 per cent of the entire group of teachers reporting, a very small percentage. There are 34 who have had 1 and 2 years trade experience. The group having

Table # 34

Trade Training and Experience

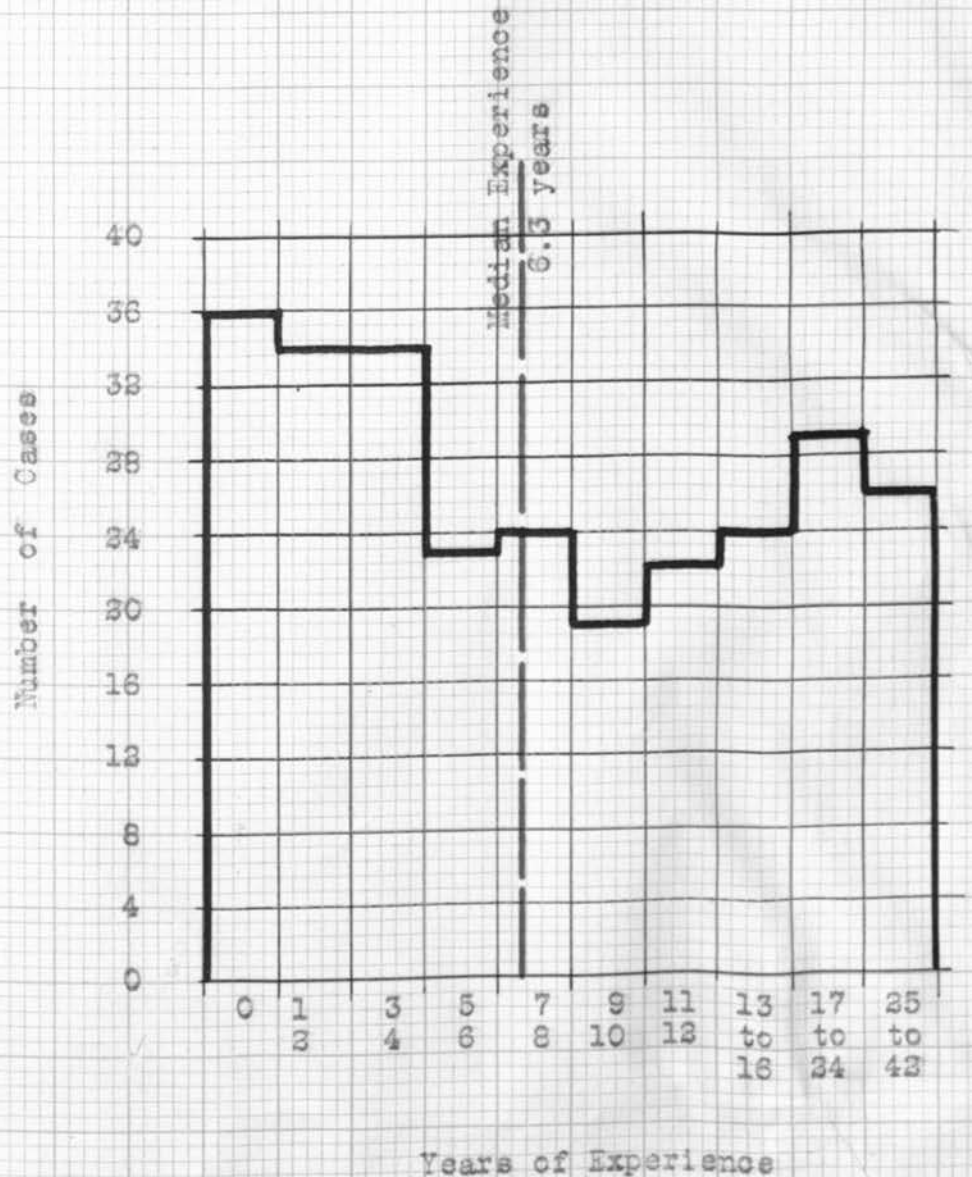
Years of Experience	Number of Cases	Per Cent of Total Group
0	36	13.24
1 & 2	34	12.55
3 & 4	34	12.55
5 & 6	23	8.48
7 & 8	24	8. 85
9 & 10	19	7.04
11 & 12	22	8.12
13 - 16	24	8.85
17 - 24	29	10.71
25 - 42	26	9.59
6.3 years	271	99. 98
Median Experience	Total Number of Cases	Total Per Cent

86.76 % of the entire group have had some trade experience

Diagram 3

Trade Training and Experience

Distribution of cases for number of years trade training and experience



had 3 and 4 years trade experience is also represented by 34 cases. Those having had 5and 6 years trade experience is represented by 23 cases. The 7 and 8 year group has a total of24 cases which is also true of the group having 13 to 16 years of trade experience. The group having had 9 and 10 years trade experience is represented by 19 cases. The group 11 and 12 years experience is represented by 22 cases, 17 to 24 by 29 cases and 25 to 42 by 26 cases.

The median trade training and experience is 6.3 years. This small median is due to the greater number of cases for the lesser number of years trade experience.

This chapter shows that 86 percent of the entire group have had some sort of trade connection. If trade experience is essential for the successful industrial teacher, and that is the concensus of opinion, then the industrial teachers in this study are meeting the requirements. The content of the chapter can be summed up in a single sentence, as follows; The majority of industrial teachers for boys in the Junior High School as found in this study, have had some trade training or at least have had a direct trade contact. By trade contact is meant the working in a trade not to acquire skill in tool manipulation but to get a greater insight into industrial processes and conditions. This can be done outside of school hours as well as during vacation periods. This additional trade training will make the industrial teacher much better qualified to teach the industrial subjects because of the greater skill acquired and the greater insight into the subject.

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Chapter 13

SALARIES

The increasing demand is that industrial teachers must secure more training and better training. Does the public reward them sufficiently for this additional training? Does it pay them to secure more training when they can get about the same salary for just meeting the requirements? Are teachers given additional increases for teaching experience? Is teaching experience worth much and just how much is it worth? Again does trade experience have a direct bearing on the salaries of industrial teachers? Does it pay to spend additional time in the trade. These are the questions which this chapter will attempt to answer.

The teaching fitness of this group of Junior High School industrial teachers for boys has been shown in chapter ten, eleven and twelve. The next step is to show what relationship there is between teaching fitness and salary.

The salary question is a very important one and doubly so now because of the agitation to cut teachers' salaries generally. Almost everyone will admit that the teachers' salaries are now where they should have been years ago. If salaries are reduced it will mean that the better teachers will leave the teaching profession and go into other lines of work, leaving the inferior teachers to carry on this very important work. In order to keep these men in the teaching work salaries must not be cut.

In order to more clearly present the salary situation, the discussion will be divided into three parts, as follows:

1. Relation of School and Professional Training to Salary
2. Relation of Teaching Experience to Salary
3. Relation of Trade Training and Experience to Salary

The data for the first topic "Relation of School and Professional Training will be found in table # 35. The diagram found on page 89 represents graphically the facts as shown in table #35.

The first point we gather from the table is the range of salary. The extremely low point in the salary range is $1200 and the extremely high point is $3350. This range is for the entire group of two hundred and seventy-two cases. The maximum salary for each group runs almost the same. The range in the maximum salaries is from $2800 to $3350. The minimum salary shows a very great variation. The group representing those who were in the elementary school only has a minimum salary of $1300 and the group representing those who entered High School but did not complete there has a minimum of $1400. This shows an increase of $100 for very little additional training. The next group is the group having all the High School graduates in it and this group has a minimum salary of $1200. This shows a drop, as far as minimum salaries go, of $200 for the additional High School training. The next group goes up $100 with a minimum salary of $1300, still $100 behind the group who had entered High School but had not completed their course. This variation continues throughout the different groups as is very evident in table # 35. When one looks at the medians for the various groups the first impression which one gets is that very little

relationship is shown between the median salaries for the different groups. If the six groups, Elementary School Only, High School Not Graduates, All High School Graduates, Normal or Special School Graduates, Bachelors' Degree and Advanced Degree, are considered one sees a certain relationship. The groups together with their medians are given below.

Elementary School Only	$2099
High School Not Graduates	2200
All High School Graduates	2350
Normal or Special Graduates	2350
Bachelor's Degree	2375
Advanced Degree	2550

There are very few cases in the Advanced Degree group but in all probability a greater number of cases would tend to raise the median. From the tabulation above it is evident that there is a slight increase for increased amount of training. From the above discussion the fact is brought out that there is a relationship between School and Professional Training but it is not very marked. It would seem that the statement by Coffman[1] "differences in people are more responsible for differences in salaries than are differences in training," is borne out by the figures in this study.

The next topic "Relation of Teaching Experience to Salary" is found in table # 36. The diagram for this table is found on page90. The diagram brings out the facts appearing in the table more clearly and quickly.

1. Coffman, L. D.--The Social Composition of the Teaching Population, p. 46.

As in the preceeding paragraph the first point to discuss is the range of salary for the various years of teaching experience. The range for the entire is from $1200 to $3350. The maximum range remains practically the same as it did in the preceeding discussion, the range being from $2500 to $3350. The slump to $2500 is for the group having had four years teaching experience. This slump is in all probability due to the small number of cases for this group. The next lowest maximum is $2850 which is the same as the lowest maximum salary for the School and Professional group. There is one other maximum in the $2000 group, it being $2900. All the rest fall over the $3000 mark. The minimum salary varies but there is a slight increase, dropping back in a few cases as the years advance and taking sudden shoots here and there. When looking over the column showing the median salaries, one sees practically the same relationship as shown in the discussion of salary range. The median for the entire group is $2300 which is about the yearly salary for the group having had seven years teaching experience.

As in the case of School and Professional Training, there is a slight increase for increased number of years teaching experience. This same fact was brought out by E. Selke[1] in a study on the "Teachers of Minnesota." The above discussion shows that there is a slight relationship between Teaching Experience and Salary.

1. E. Selke - Unpublished Masters Thesis, Univ. of Minn. 1923.

The data for the third topic "Relation of Trade Training and Experience to Salary", is found in table # 37. The graphic illustration of this table is shown on page 91°. The maximum salary range is practically the same as for the preceeding two topics, it being from $2800 to $3350. The minimum salary range shows no relationship whatsoever. The minimum salary for no years trade experience is $1200, for one and two years $1600, for five, six seven and eight years $1300, for nine and ten years $1500 and so on going up and down in rather a hit and miss fashion. The median salaries bears out the same relationship as shown in the minimum salary column.

It is very evident from the above discussion that there is no relation whatsoever between trade training and experience and salary. Trade training and experience does not affect the salary rating of Junior High School industrial teachers for boys, altho it is a most important part of the industrial teachers training as brought out by Smith[1] in a discussion on the need of training for industrial teachers.

The following conclusions can be drawn from the preceeding discussion, tables and diagrams based on the data gathered from the questionnaires:

1. Teachers are not rewarded additional sums to any great extent for additional training. The increases are very slight in light of the tremendous cost of professional training.

1. Smith, H. J. --The Need of Training--Industrial Arts Magazine, June 1921, p. 214.

2. Experience does not bring the returns one would expect to find in other professions with like conditions.
3. Trade training and experience does not affect the salary rating at all.

In light of these conclusions, the answers to the questions; Does the public reward teachers sufficiently for additional training? Are teachers given additional increases for increased number of years of teaching experience? etc., in the introduction to this chapter would be negative.

All this tends to indicate that salaries are given for the job and not because of special fitness of the teacher. Coffman's[1] statement referred to in this chapter previously bears out the thought expressed in the previous sentence. Such a situation is most discouraging to the teacher about to enter the profession. Two things can be done to change this state of affairs, first, educate the public as to the importance of the public school system and the great importance of well trained teachers and second, see that boards (State and local) and administrators uphold the standard requirements for teachers. This means that no special certificates should be issued. Salaries for this group as a whole are very good and rank above the average teacher of the United States.[2]

1. Coffman, L. D. The Social Composition of the Teaching Population. p. 46.
2. N.E. A. Report on Teachers' Salaries, 1919--E. S. Evenden, Teachers' College Columbia University.

Table # 35

Relation of School and Professional Training to Salary

Number Cases	Training	Salary Range	Median Salary
40	Elementary School Only	$1300 to $3250	$2099
42	High School Not Graduates	1400 to 3250	2200
23	High School Graduates Only	1300 to 3250	2100
7	1 yr. Normal or Special School	1700 to 2800	2000
99	Normal or Special Grad.	1500 to 3350	2350
4	1 yr. College or Univ.	2000 to 2250	2099
10	2 yr. College or Univ.	1600 to 2400	2099
41	3 yr. College or Univ.	1600 to 2800	2400
36	Bachelor's Degree	1600 to 3350	2375
7	Advanced Degree	2000 to 3250	2550
82	Less than High School Graduates	1300 to 3250	2149
190	All High School Graduates	1200 to 3250	2350

Diagram # 4

Relation of School and Professional Training to Salary

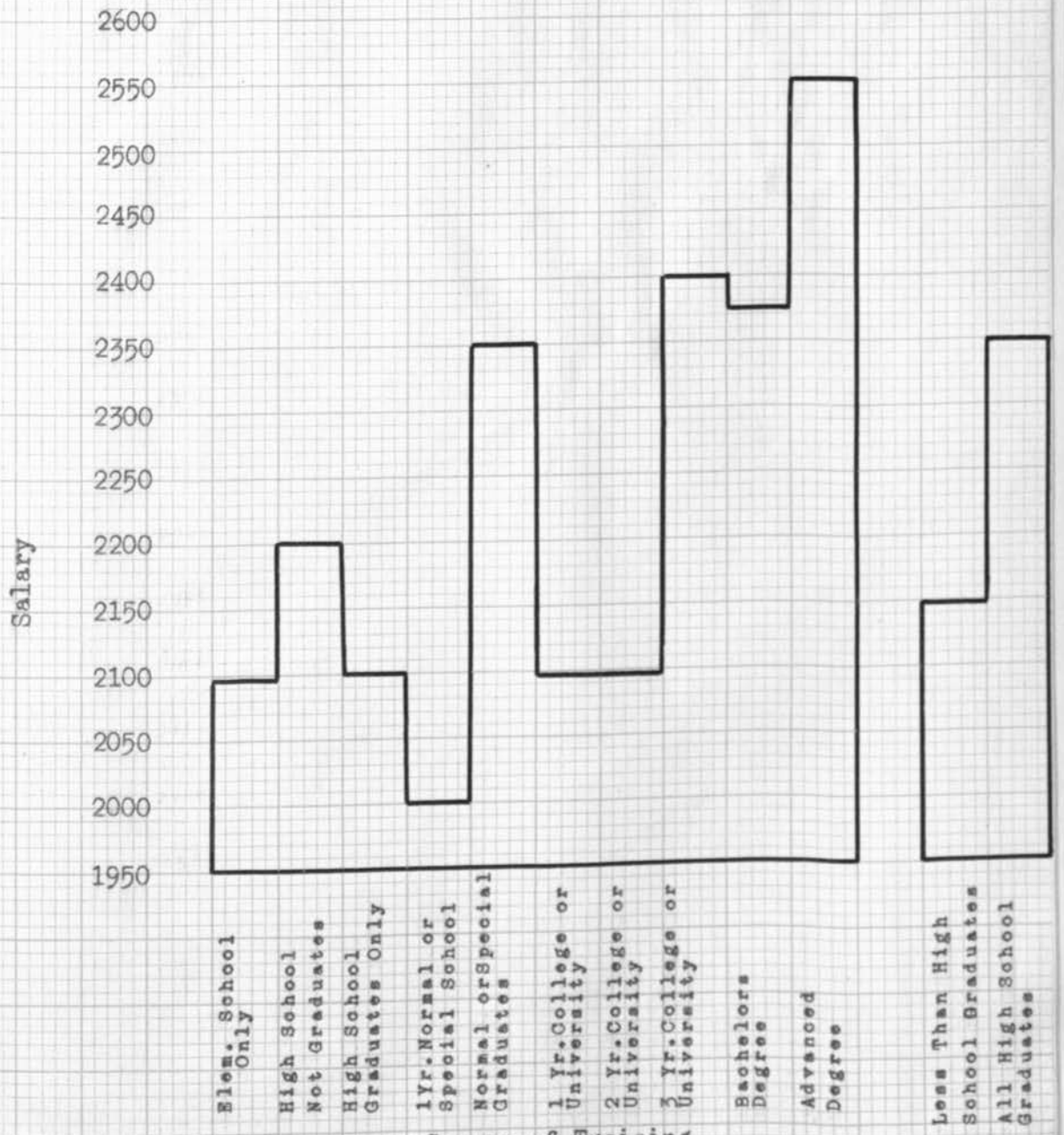


Table # 36

Relation of Teaching Experience to Salary

Number of Cases	Years Experience	Range of Salary	Median Salary
24	1	$1200 to $3100	$1700
18	2	1300 to 2850	1950
16	3	1400 to 2900	2050
6	4	1600 to 2500	2000
26	5	1500 to 3150	2099
19	6	1600 to 3250	2000
26	7	1900 to 3250	2399
22	8	1900 to 3250	2499
12	9	1900 to 3250	2800
18	10	1900 to 3250	2400
10	11	2100 to 3250	2600
13	12	1900 to 3350	2600
17	13 to 14	1600 to 3250	2649
16	15 to 16	1900 to 3350	2650
10	17 to 42	2200 to 3250	2900
274 Total Cases	6.28 years Median Experience	$1200 to $3350 Salary Range for Entire Group	$2200 Median Salary for Entire Group

Diagram # 5

Relation of Teaching Experience to Salary

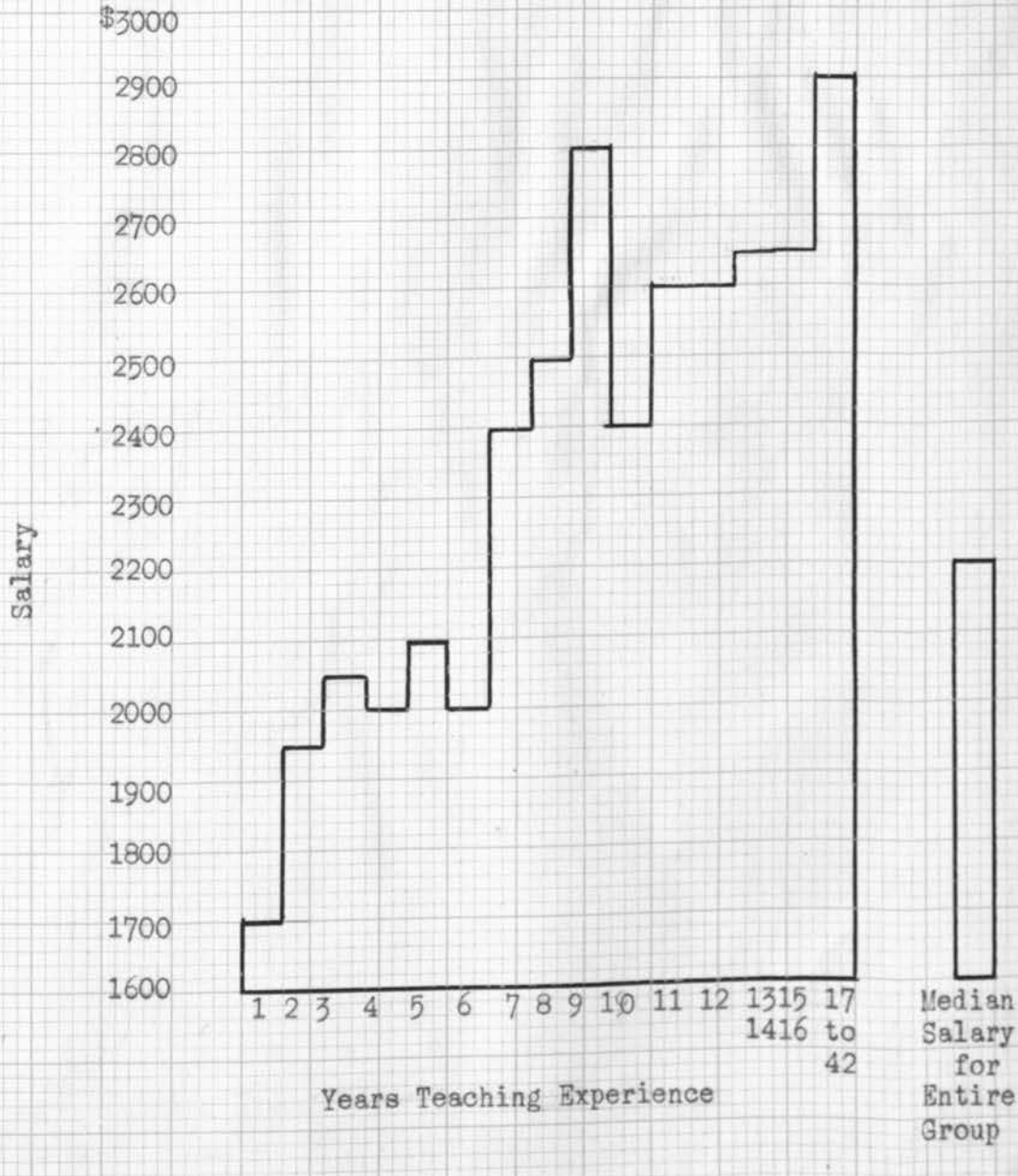


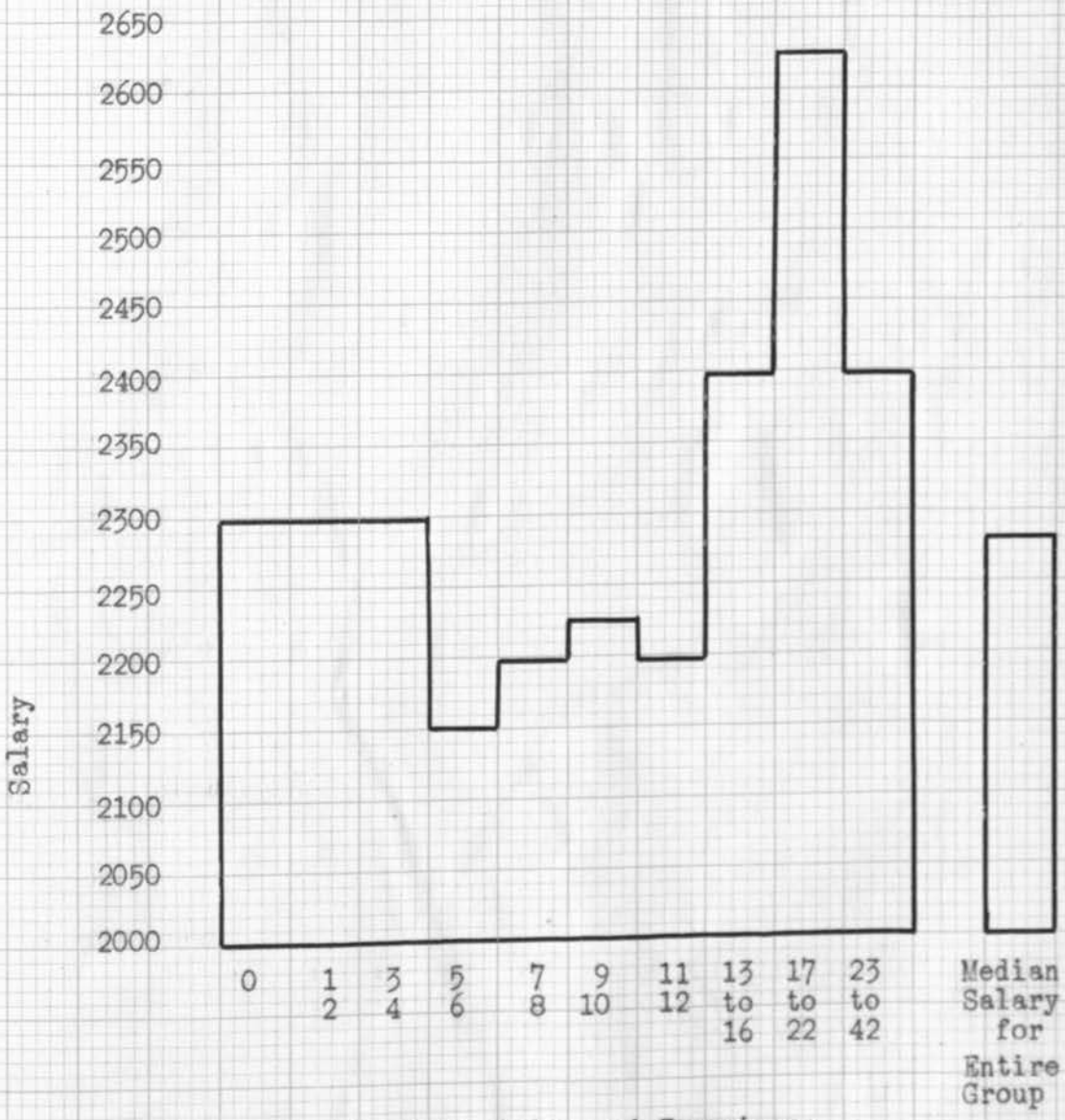
Table # 37

Relation of Trade Training and Experience to Salary

Number of Cases	Years Experience	Salary Range	Median Salary
36	0	$1200 to $3250	$2299
34	1 2	1600 to 3350	2299
34	3 4	1600 to 2900	2299
23	5 6	1300 to 3350	2150
24	7 8	1300 to 3250	2199
19	9 10	1500 to 3250	2225
22	11 12	1300 to 2800	2199
24	13 to 16	1700 to 3250	2399
29	17 to 22	1500 to 3250	2625
26	23 to 42	1300 to 3250	2399
271	6.3 years	$1200 to $3350	$2280
Total Cases	Median Experience	Salary Range for Entire Group	Median Salary for Entire Group

Diagram # 6

Relation of Trade Training and Experience to Salary



GENERAL SUMMARY AND CONCLUSIONS

Chapter Fourteen

Chapter 14

GENERAL SUMMARY AND CONCLUSIONS

The introduction to this study stated certain criticisms of industrial work in the public schools and that the purpose of the study was to find some basis by which the validity of the criticisms could be tested.

The general criticisms were as follows;
The courses have not been definite and consisted merely of the teachers' ideas without thought as to standardization.
The teachers could not give definite aims for their courses.
The teachers were poorly equipped in subject matter and sadly lacking in professional training.

The first criticism does not seem justifiable in light of the data collected and tabulated in chapters 3 to 8, relative to the content of the courses. The outline of the courses shows a general agreement as to the processes which should be included in a course of study, in industrial work. This tends to indicate that the teachers have a rather definite course in mind. If the agreement on processes had not been so general, then this conclusion would not stand the test.

The second criticism, as well as the first, does not seem to have a basis for its justification. Chapter 2 shows that the teachers have a fairly definite idea as to the aims of industrial work in general. They state in rank order their

opinion of the aims, as to their value. Again in chapters 3 to 8, we find the teachers stating and ranking the specific aims for a particular course. If they are able to do this, then in all probability they have the same ideas in mind when planning and teaching their courses.

There is justification for the third criticism, that the teachers are poorly equipped in subject matter and sadly lacking in professional training. The industrial teachers in the United States,(Junior High School) are below the total male teaching staff in the Junior High School, as far as school and professional training is concerned.[1] They have not had as many years of teaching experience[2] as the total male teaching staff of the Junior High School but they do have the trade experience which the others have not had. Chapter 12, on "Trade Training and Experience", shows that 86 per cent of the entire group have had some sort of actual work in the trade, either as an apprentice or as a journeyman. The The general opinion on the matter of obtaining knowledge in an industrial subject, is that it can be best obtained by actual participation in the trade.[3] Again the median number of years trade experience for this group of teachers is 6.3. According to this data and in view of the above statement, regarding the acquiring of trade knowledge, this group of teachers are as a whole well

1. National Committee for Chamber of Commerce Co-operation With Public Schools- Know and Help Your Schools, p 23 table 13
2. Ibid - p 27 table 15
3. Smith, H. J - The Need of Training, Industrial Arts Magazine, June 1921, p 214

equipped in subject matter.

The next point, that of the school and professional training of the teachers, is a debatable one. In chapter 10 we find that 30 per cent of this group of teachers have not graduated from a high school. Again we find 8.4 per cent of the group who are high school graduates only, which means that about 40 per cent of the entire group have had no professional training. In light of these facts, there is certainly a basis for the criticism of the professional training of industrial teachers in the Junior High School. When compared with the total male teaching staff of the Junior High School, we find the industrial teachers falling short, in professional training but when compared with teachers as a whole we find that their training is about on the same level. Of course the opinion today is that teachers as a whole are not very well trained, professionally. From chapter 10 we find that the median years training is 2 years beyond the high school or in other words a graduate of a Normal school or a Special school. In light of this fact it would seem that the first requirement for the training of industrial teachers in the Junior High School, would be that he be a graduate of a four year high school course or the equivalent. The second requirement should be that he be a graduate of a Normal or Special School with his major in industrial work. The Normal or Special School course should not be less than 2 years in length. Additional years of training and experience should be rewarded by special salary increases, so as to keep the better and more progressive teachers in the teaching profession.[1] All should be

1. National Committee for Chamber of Commerce Co-operation With Public Schools- Know and Help Your Schools, p 32

strongly advised to complete the work for a Bachelors' Degree, this in light of the forty-three teachers having Bachelors' and advanced degrees. Additional compensation should be given for self improvement in service.[1] It is very important that all teachers keep up with the advance in modern education. The data in chapter 10 shows that a great percent of the group have taken some training in service.

Industrial teachers in the Junior High School should be required to have previous teaching experience prior to entering the Junior High School, at least two years. This is because of the nature of the boy at adolescence. The teacher must know the boy, especially during this period, his physical and mental changes, his interests and must have a keen interest in the boy in general. This understanding and interest in the boy comes about only by actual work with the boy and a study of the child at adolescence. Therefore it is very important that the teacher have some experience in handling boys before coming to the Junior High School as a teacher.

In order to understand his subject thoroly, the teacher must have an intimate knowledge of the content of the subject he is teaching. The best way in which to gain this knowledge is by actual participation in the trade itself. This experience can be gained during vacation periods or before entering the teaching profession and after having had his school and professional training. After having taken his school and professional training so he will analyze his job in terms of teaching, as he is learning the trade.

1. Ibid - p 27& 28

The following should be the standard requirements for industrial teachers in the Junior High School at the present time based on the data found in chapters 10, 11 and 12;

1. Graduate of a four year High School or equivalent
2. Graduate of a two year Normal or Special School
   a Major in Industrial Education
3. Must have at least two years teaching experience, prior to entering the Junior High School
4. Must take some training in service each year
   a Summer Session Work
   b Correspondence Work
   c Extension Work
5. Must have some previous trade experience in the trade he is to teach and must keep in direct contact with the trade while teaching

One may know all about the content of the course of study that there is to know yet if the training of the teachers is not known one cannot tell whether the coursesare well taught or not. As stated previously in this study, good teaching is usually the result of good and extensive training. Therefore if we know the content of the courses and the training of the teachers we have a very good basis for judging the value of the courses.

We have found that the school and professional training of the industrial teachers in the Junior High School is below the other male Junior High School teachersand that the industrial teachers median salary is about $600 above the median

salary of male teachers in the Junior High School.[1]

In light of the preceeding statement it would seem that the standards as set up in chapter 14 should be adhered to without deviation. Standards as set up by cities and States should not be lowered by the issuance of special certificates, waiving requirements, etc anymore than is done for the academic teacher receiving a much smaller salary. The requirements as set up for academic teachers should not be any higher than for industrial teachersor in other words the industrial teacher must be as fully equipped in school and professional training as the academic teacher.

1. Ibid - p 18 chart 2

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APPENDIX

School.....City.....State.....

Present Position.....Yearly Salary.....

Teaching Experience:

Number of Years	Position	Place	Salary

Trade Training:

Number of Years Apprenticeship or School

Trade Experience as Journeyman:

Number of Years Trade

School and Professional Training:

High School

Grad. Yes...No...If not a grad. state no. of years in attendance.....

Name of High School.....

Normal or Special School.....

Diploma.....No. of Years....Name of School.....

College or University

Degree.....Name of School.....No. or Years.....

Summer Session Work - Total number of weeks not included above and name of institution.

Correspondence Work - Names of institutions and courses.

Courses you have had special preparation in (Please check and add others not in this list

...Woodwork	...Mechanical Drawing	...
...Sheet Metal	...Auto Work	...
...Electricity	...Printing	...
...Carpentry	...	...
...Forge Work	...	...

Note: Name need not be given.

WOODWORKING

Name of School.....City.....

Exact Title of Course.....

Average no. of Students per Section.....Ideal No.....

Length of Course: Weeks.....Periods per Week.....Length of Period: Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:

(Rank in order of importance, most important #1, etc., cross off those not serving and add any others)

....General Training
....Vocational "
....Exploratory
....Preliminary Vocational Training
....Industrial Information
....Physical Development
....Appreciation of Manual Labor
....Training for Recreation or Hobby
....Relaxation Period
.....
.....
.....

SPECIFIC PURPOSES OF THIS COURSE: (Rank as above)

....A Skilled Technic
....General Training
....Exploratory
....Training for Avocation or Hobby
....Correlation With other School Subjects
.....
.....
.....

METHODS IN PRESENTING THE WORK: (Rank as above)

....Text Book in Hands of Pupil
....Working from Blue Prints
....Individual Instruction
....Class Instruction
....Blackboard Demonstration & Lecture
.....
.....

Name of Text Book if Used as a TEXT.....

OUTLINE OF COURSE.

(Check items you teach and add any others you teach not listed below)

A. Uses and Care of Tools....(Separate Lesson..... or Incidental.....)

B. Processes:	No. of Periods	Problem
1. Squaring Stock	.....	.....
2. Chamfering	.....	.....
3. Boring	.....	.....
4. Straight Chiseling	.....	.....
5. Oblique & Curved "	.....	.....
6. Modeling	.....	.....
7. Cross Lap Joint	.....	.....
8. Mortise & Tenon Joint	.....	.....
9. Miter Joint	.....	.....
10.	.....	.....
11.	.....	.....
12.	.....	.....
13.	.....	.....
14.	.....	.....

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

MECHANICAL DRAWING

Name of School.....City.....

Exact Title of Course.....

Average No. of Students per Section.....Ideal No.....

Length of Course: Weeks.....Periods per Week...Length of Period: Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:

(Rank in order of importance, most important #1, etc., cross off those not serving and add any others)

....General Training
....Vocational "
....Preliminary Vocational Training
....Exploratory
....Industrial Information
....Physical Development
....Appreciation of Manual Labor
....Training for Recreation or Hobby
....Relaxation Period
.... _____
.... _____

SPECIFIC PURPOSES OF THIS COURSE (Rank as above)

....A Skilled Technic
....General Training
....Exploratory
....Training for Avocation or Hobby
....Correlation with Other School Subjects
.... _____
.... _____
... _____

METHODS IN PRESENTING THE WORK (Rank as above)

....Text Book in Hands of Pupil
....Working from Blue Prints
....Blackboard Demonstration & Lecture
.... _____

Name of Text Book if Used as a Text _____

OUTLINE OF COURSE

(Check items you teach and add any others you teach not listed below)

Items	Number of Sheets	Number of Periods
1. Names and uses of Tools	.....	.....
2. Lettering	.....	.....
3. Conventions	.....	.....
4. Geometric Constructions	.....	.....
5. Free Hand Perspective	.....	.....
6. Orthographic Projection	.....	.....
7. Working Drawing	.....	.....
8. Tracing	.....	.....
9. Blue Printing	.....	.....
10. _____	.....	.....
11. _____	.....	.....
12. _____	.....	.....
13. _____	.....	.....
14. _____	.....	.....

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

PRINTING

Name of School.....City.....

Exact Title of Course.....

Average no. of Students per Section.....Ideal No.....

Length of Course: Weeks....Periods per Week.....Length of Period:Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:
(Rank in order of their importance, most important #1, next #2 etc, cross off those not serving and add any others)

....General Training
....Vocational "
....Exploratory
....Preliminary Vocational Training
....Industrial Information
....Physical Development
....Appreciation of Manual Labor
....Training for Recreation or Hobby
....Relaxation Period
.....
.....

SPECIFIC PURPOSES OF THIS COURSE: (Rank as above)

....A Skilled Technic
....General Training
....Exploratory
....Training for Avocation or Hobby
....Correlation with other School Subject
.....
.....

METHODS IN PRESENTING THE WORK: (Rank as above)

....Text Book in Hands of Pupil
....Working from Blue Prints
....Individual Instruction
....Class Instruction
....Blackboard Demonstration and Lecture
.....
.....

Name of Text Book if used as a TEXT.....

OUTLINE OF COURSE

(Check items you teach and add any others you teach not listed below)

Items	Number of Periods	Job
1. Elementary Composition	.....	.....
2. Punctuation & Spelling	.....	.....
3. Proff Reading	.....	.....
4. Principles of Design	.....	.....
5. Study of Type Faces	.....	.....
6. Job Composition	.....	.....
7. Book Composition	.....	.....
8. Imposition & Stone Work	.....	.....
9. Advertising Composition	.....	.....
10. Tabular Composition	.....	.....
11. Cost Accounting	.....	.....
12. Estimating	.....	.....
13. Stock Cutting	.....	.....
14. Papers & Inks	.....	.....
15.....		
16.....		
17.....		
18.....		

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

SHEET METAL

Name of School.....City.....

Exact Title of Course.....

Average no. of students per section.....Ideal No.....

Length of Course: Weeks.....Periods per Week.....Length of Period:Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:

(Rank in order of importance, most important #1, next, #2 etc, cross off those not serving and add any others)

....General Training
....Vocational "
....Exploratory
....Preliminary Vocational Training
....Industrial Information
....Physical Development
....Appreciation of Manual Labor
....Relaxation Period
....Training for Recreation or Hobby
.....
.....
.....

SPECIFIC PURPOSES OF THIS COURSE: (Rank as above)

....A Skilled Technic
....General Training
....Exploratory
....Training for Avocation or Hobby
....Correlation with other School Subjects
.....
.....
.....

METHODS IN PRESENTING THE WORK: (Rank as above)

....Text Book in Hands of Pupil
....Working from Blue Prints
....Individual Instruction
....Class Instruction
....Blackboard Demonstration and Lecture
.....
.....

Name of Text book if used as a TEXT .....

OUTLINE OF COURSE

(Check items you teach and add any others you teach not listed below)

Items	Number of Periods	Problem
1. Soldering	.....	.....
2. Folding Edges & Seaming	.....	.....
3. Grooving in Cylindrical Work	.....	.....
4. Double Hemmed Edge	.....	.....
5. Wire Edge	.....	.....
6. Notching & Burring	.....	.....
7. Double Seaming and Raising	.....	.....
8. Tapering Forms	.....	.....
9. Radial Developments	.....	.....
10. Parallel Constructions	.....	.....
11. Intersections	.....	.....
12. Miter Constructions	.....	.....
13.....		
14.....		
15.....		
16.....		

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

ELECTRICITY

Name of School.....City.....

Exact Title of Course.....

Average number of Students per Section.....Ideal No.....

Length of Course: Weeks.....Periods per Weeks....Length of Period: Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:
(Rank in order of importance, most important #1, next #2 etc, cross off those not serving and add any others)

.....General Training
.....Vocational "
.....Exploratory "
.....Preliminary Vocational Training
.....Industrial Information
.....Physical Development
.....Appreciation of Manual Labor

....Training for Recreation or Hobby
....Relaxation Period
.....
.....
.....
.....

SPECIFIC PURPOSES OF THIS COURSE: (Rank as above)

.....A Skilled Technic
.....General Training
.....Exploratory
.....Training for Recreation or Hobby
.....Correlation with other School Subjects

METHODS IN PRESENTING THE WORK: (Rank as above)

.....Text Book in Hands of Pupil
.....Working from Blue Prints
.....Individual Instruction
.....Class Instruction

.....Blackboard Demonstration and Lecture
.....
.....

Name of Text Book if used as a TEXT.....

OUTLINE OF COURSE

(Check items you teach <u>and add any others</u> you teach not listed below)

Item	Number of Periods	Problem
1. Bell Wiring	.....	.....
2. Principles of Electricity	.....	.....
3. " of D.C.Motors & Generators	.....	.....
4. " " A C " & "	.....	.....
5. Annunciator Wiring	.....	.....
6. Interior Electric Wiring	.....	.....
7. Armature Winding	.....	.....
8. Switchboard Wiring	.....	.....
9. Storage Batteries	.....	.....
10. Electric Meters, Repair & Reading	.....	.....
11. Telephone	.....	.....
12. Electrical Testing Instruments	.....	.....
13.....		
14.....		
15.....		
16.....		

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

AUTO WORK

Name of School.....City.....

Exact Title of Course.....

Average No. of Students per Section.. .....Ideal no.....

Length of Course: Weeks..... Periods per Week.....Length of Period: Minutes.....

GENERAL PURPOSES OF INDUSTRIAL WORK FOR BOYS IN THE JUNIOR HIGH SCHOOL:
(Rank in order of importance, most important #1, next #2 etc, cross off those not serving and add any others)

....General Training
....Vocational "
....Exploratory
....Preliminary Vocational Training
....Industrial Information
....Physical Development
....Appreciation of Manual Labor
....Training for Recreation or Hobby
....Relaxation Period
.....
.....

SPECIFIC PURPOSES OF THIS COURSE: (Rank as above)

....A Skilled Technic
....General Training
....Exploratory
....Training for Avocation or Hobby
.... Correlation with other School Subjects
.....
.....

METHODS IN PRESENTING THE WORK: (Rank as above)

....Text Book in Hands of Pupil
....Working from Blue Prints
....Individual Instruction
....Class Instruction
....Blackboard Demonstration and Lecture
.....
.....

Name of Text if Used as a TEXT.....

OUTLINE OF COURSE

(Check items you teach and add any others you teach not listed below)

Items	Number of Periods	Problem
1. Engines	.....	.....
2. Carburetors	.....	.....
3. Ignition	.....	.....
4. Cooling Systems	.....	.....
5. Starting & Lighting Systems	.....	.....
6. Clutch	.....	.....
7. Transmission	.....	.....
8. Rear Axle Drive	.....	.....
9. Running Gear	.....	.....
10. Tire Repair	.....	.....
11. Radiator Repair	.....	.....
12. Gas Engine Science	.....	.....
13. Storage Batteries	.....	.....
14. Pleasure Cars, Upkeep & Repair	.....	.....
15.....		
16.....		
17.....		
18.....		

Note: If you have a printed description of this course I would like to receive a copy in addition to the above information.

RANGE OF QUESTIONNAIRE RETURNS

Cities of 100,000 population or over

Cities	No. of J.H.S.	Grades Included
Los Angeles, Cal.	8	7-8-9
Grand Rapids, Mich.	4	7-8-9
Jordan, Minneapolis, Minn	1	7-8-9
St. Louis, Mo.	1	7-8-9
Newark, N. J.	3	7-8-9
Cincinnati, Ohio	1	7-8-9
Cleveland, Ohio	17	7-8-9
New York City	14	7-8-9
Pittsburg, Pa.	2	7-8-9
Spokane, Wash.	3	7-8-9

Cities of 30,000 to 100,000 population

Pasadena, Cal.	1	7-8-9
Berkeley, Cal.	4	7-8-9
Decatur, Ill.	1	7-8
Quincy, Ill.	3	7-8-9
Sioux City, Iowa	2	7-8-9
Kansas City, Kansas	1	7-8-9
Wichita, Kansas	1	7-8-9
Lexington, Kentucky	1	7-8-9
Brockton, Mass.	8	8-9
Chelsea, Mass.	3	7-8-9
Lynn, Mass.	2	7-8
Somerville, Mass.	3	7-8-9-10
Kalamazoo, Mich.	3	7-8-9
Duluth, Minn.	4	7-8-9
Trenton, N. J.	2	7-8-9
Roanoke, Va.	1	6-7-8
La Crosse, Wis.	5	7-8

Cities of 10,000 to 30,000 population

Elkart, Ind.	1	6-7-8
Kokomo, Ind.	1	7-8
Peru, Ind.	1	7-8
Hutchinson, Kansas	1	7-8-9
Shreveport, La.	1	7-8
Auburn, Maine	1	8-9
Arlington, Mass.	1	7-8
Leominster, Mass.	1	7-8
Battle Creek, Mich.	1	7-8
Ironwood, Mich.	1	7-8
Sault Ste. Marie, Mich.	1	7-8
Mankato, Minn.	1	7-8-9

RANGE OF QUESTIONNAIRE RETURNS
(continued)

Cities of 10,000 to 30,000 population

Cities	No. of J.H.S.	Grades Included
Hannibal, Mo	3	7-8-9
Bridgeton, N. J.	1	8-9
Tulsa, Okla.	1	7-8-9
Austin, Texas	1	7-8
Kenosha, Wis.	2	7-8-9
Muskogee, Okla.	2	7-8-9

Cities of 5,000 to 10,000 population

Cripple Creek, Colo.	2	7-8-9
Grand Junction, Colo.	1	8-9
Macomb, Ill.	1	7-8-9
Hartford City, Ind.	1	7-8-9
Mount Vernon, Ind.	1	7-8-9
Salina, Kansas	1	7-8-9
Negaunee, Mich.	1	7-8-9
Fergus Falls, Minn.	1	7-8-9
New Ulm, Minn.	1	7-8
Red Wing, Minn.	1	7-8-9
Rochester, Minn.	1	6-7-8
Oklahoma City, Okla.		