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A BASIS FOR THE ESTABLISHMENT OF THE GRAPHIC ARTS AREA IN THE GENERAL SHOP

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ABSTRACT

This study is a proposal to include the graphic arts area in the general shop.

A brief history of the general shop is given along with its evolving philosophies, and data showing the close relationship of the graphic arts to these philosophies.

An analysis is made of the industrial arts objectives, as set forth by the American Vocational Association, and how the graphic arts contribute to the fulfillment of these objectives is indicated.

Contributions of the graphic arts to the general education of the student are given and substantiating data and charts presented. It must be noted that the study made by Hansburg in this respect must not be construed as conclusive evidence, but rather indicative of the results of work carried on in the graphic arts area.

Exploratory experiences in linoleum block printing, silk screen printing, the dry point process, and an experiment in papermaking are detailed and justification given to warrant their being included in the program.

The limitations of the study are discussed in the summary and conclusions chapter.

A floor plan of a proposed general shop is included in Appendix C. Appendix B is a list of tools and equipment necessary to carry out the various phases of work to be included in the graphic arts area, and Appendix D consists

of several projects suitable for students at this level and are adaptable to any graphic arts program.

Throughout the study, the writer attempts to show that the graphic arts area has many potentialities in supporting the general shop philosophies, and is worthy of being included in the composite general shop.

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ALL THESE TRUST IN THEIR HANDS[1]

The wisdom of a scribe cometh by his time of leisure:
And he that is less in action, shall receive wisdom.

With what wisdom shall he be furnished that holdeth
the plough,
And that glorieth in the goad,
That driveth the oxen therewith, and is occupied in
their labours,
And his whole talk is about the offspring of bulls?
He shall give his mind to turn up furrows,
And his care is to give the kine fodder.

So every craftsman and workmaster that laboureth night
and day,
He who maketh graven seals,
And by his continual diligence varieth the figure:
He shall give his mind to the resemblance of the
picture,
And by his watching shall finish the work.

So doth the smith sitting by the anvil and consider-
ing the iron work.
The vapour of the fire wasteth his flesh,
And he fighteth with the heat of the furnace.
The noise of the hammer is always in his ears,
And his eye is upon the pattern of the vessel he maketh.
He setteth his mind to finish his work,
And his watching to polish them to perfection.

So doth the potter sitting at his work,
Turning the wheel about with his feet,
Who is always carefully set to his work,
And maketh all his work by number:
He fashioneth the clay with his arm,
And boweth down his strength before his feet:
He shall give his mind to finish the glazing,
And his watching to make clean the furnace.

All these trust to their hands,
And every one is wise in his own art.
Without these a city is not built.
And they shall not dwell, nor walk about therein,
And they shall not go up into the assembly.

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[1] Holy Bible, Douay Translation (Baltimore, Maryland: John Murphy Company, 1914), Ecclesiasticus, Chapter 38, p. 748.

Upon the judges' seat they shall not sit,
And the ordinance of judgment they shall not under-
stand,
Neither shall they declare discipline and judgment,
And they shall not be found where parables are
spoken:
But they shall strengthen the state of the world,
And their prayer shall be in the work of their craft.

CHAPTER I

INTRODUCTION

Introduction To The Problem

In most general shops in schools today the four areas of general wood, general metal, general electricity, and crafts are commonly found. Each one has found a place there because of some specific need or needs. Changes in any educational system are slow to come about and nearly always take place after a need has arisen. In few instances do educational systems, or educators, anticipate needs but rather they fulfill the need after the demand has arisen. So it is with the general shop. It has evolved to meet changing needs in our society and demands of industry.

The general shop has evolved through the years not to provide courses suitable for developing a great deal of skill, but rather to provide an opportunity for exploratory experiences in several fields of work. It could aptly be called the beginning of vocational guidance.

If the foregoing listed subjects of woodworking, metalwork, electricity, and crafts provide these exploratory experiences, and meet the needs of the pupils, why will the graphic arts not be suitable to include in the curriculum? The potentialities of the graphic arts as a desirable field of work in the general shop are great.

There is no other field of the industrial arts which affects our daily lives so deeply as the graphic arts. The books we read, the daily newspaper and its advertisements, our magazines and periodicals for leisure time reading, pictures of beauty that provide atmosphere for our homes and offices, cards of any kind for any occasion which can convey our feelings of joy or sorrow over many thousands of miles, and above all, the multitudinous array of forms in the business world that enables employers and employees to maintain accurate financial records and thousands of other business matters. These, of course, are only a few of the ways in which the graphic arts enters into our everyday living. There is hardly a phase of our life that is not affected directly or indirectly by the graphic arts.

If, then, the fundamental purpose of the general shop is to provide exploratory experiences in several fields to better enable the student to live in our complex society of today and to understand something of our industrial structure, the graphic arts should be included in the curriculum of the general shop and definitely have a place in the general shop.

As stated before, the potentialities of the graphic arts as a field of work in the general shop are great. A single course in printing, if given properly, can fulfill all of the objectives of the industrial arts which are spoken of and written about a great deal, but about which little is actually done. For instance, pride of good workmanship,

appreciation of good design, consumer education, interest in industrial life, development of elementary skills and others, may all be included in the graphic arts program just as they are, or can be, included in any of the four fields usually found in general shops. The graphic arts area, if included in the general shop curriculum, will not only contribute as much to these objectives as the other areas, but will contribute extensively to the general education of the student. Just how the graphic arts can do this will be shown in the succeeding chapters.

Statement of the Problem

An attempt will be made in the following chapters to validate the thesis that the graphic arts area has a definite place in the general shop curriculum. More precisely, it will attempt to substantiate with available data the title of the study, "A Basis For The Establishment Of The Graphic Arts Area In The General Shop." A brief history of the general shop will be given in Chapter II along with the philosophies of its educational value. The objectives of industrial arts are considered and their relationship to the graphic ars presented. A few of the graphic arts related fields will be discussed and an attempt will be made to show the educational value of each. Much emphasis will be given to the informational content of the graphic arts. Some of the simpler processes will be explained such as linoleum block printing,

the dry point process, and the silk screen process. Substantiating data will be presented to validate these processes being included in the program. A list of tools and equipment and a floor plan for a general shop including the graphic arts area will be included in the appendix.

Definition of Terms

General Shop: The term general shop in the ensuing chapters shall mean the composite type of general shop. A shop in which two or more areas of work are carried on under the supervision of one instructor. The marked trend toward the use of the general shop for teaching industrial arts is clearly shown from the report of a government survey conducted by Dr. Maris M. Proffitt.[2]

> This type of shop is still most popular in large High Schools. On the other hand, the general shop is equipped for a large variety of work to be carried on simultaneously under the direction of one teacher. In various localities school shops range all the way from one extreme to the other. Administrators are insisting that woodwork alone no longer meets the requirements of an industrial arts program, even in small schools. Therefore, the only solution for the small school seems to be in the development of a comprehensive general shop.

The Objectives of Industrial Arts: There are perhaps as many different sets of objectives for industrial arts as there are textbooks written on the subject. However, when

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[2] M. M. Proffitt, "Industrial Arts, Its Interpretation in American Schools" (United States Department of the Interior, Department of Education Bulletin, No. 34, 1937, Washington, D.C.) p. 51.

they are evaluated, it will be found that each author had the same thing in mind, expressing his conceptions in a little different manner. Through modification, interpretation, and evaluation, all of these numerous objectives can be expressed in the twelve as set forth by the American Vocational Association.[3] For purposes of this study, these objectives will be used:

1. To develop in each pupil an active interest in industrial life and in methods of production and distribution.

2. To develop in each pupil the ability to select, care for, and use properly the things he buys or uses.

3. To develop in each pupil the appreciation of good workmanship and good design.

4. To develop in each pupil an attitude of pride or interest in his ability to do useful things.

5. To develop in each pupil a feeling of self-reliance and confidence in his ability to deal with people and to care for himself in an unusual or unfamiliar situation.

6. To develop in each pupil the habit of an orderly method of procedure in the performance of any task.

7. To develop in each pupil the habit of self-discipline which requires one to do a thing when it should be done, whether it is a pleasant task or not.

8. To develop in each pupil the habit of careful, thoughtful work without loitering or wasting time.

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[3] Standards of Attainment In Industrial Arts Teaching, American Vocational Association, Washington, D.C., 1937, p. 12.

9. To develop in each pupil an attitude of readiness to assist others when they need help and to join in group undertakings.

10. To develop in each pupil a thoughtful attitude in the matter of making things easy and pleasant for others.

11. To develop in each pupil a knowledge and understanding of mechanical drawing, the interpretation of the conventions used in drawings and working diagrams, and the ability to express his ideas by means of a drawing.

12. To develop in each pupil elementary skills in the use of the more common tools and machines, and a knowledge of the methods of procedure in tasks frequently encountered by the average man, together with a knowledge of the working qualities and characteristics of some of our most used materials.

Graphic Arts: Few laymen have any conception of the graphic arts processes. The customer who orders only ten copies of a printing order thinking this should simplify the printer's work is, in all probability, expressing the average person's knowledge of what is involved in producing a piece of printing. Not only do few people have any conception of the processes, few have any idea of the immensity and magnitude of the industry itself. Rated the second largest industry in the United States, it employs one-third of the number of salaried employees in American industries.[4] Today, more printing matter is produced in twenty-four hours than

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[4] E. B. Dunton, Career Opportunities in the Printing Industry (Elizabeth, New Jersey: American Type Founders, 1950), p. 9.

was manufactured in twelve months a hundred years ago, and this, the twentieth-century, may aptly be called the golden age of printing.[5]

Throughout this study, the term graphic arts shall mean "those expressions of art produced by printing from various kinds of blocks, plates, or type, as etching, dry point, lithography, wood and linoleum block printing, rotogravure, offset, letter press, and all other forms of printing."[6]

A more exacting definition of the graphic arts is given by Webster.[7] The definition reads, "Of or pertaining to the arts or painting, drawing, engraving, and any other arts which pertain to the expression of ideas by means of lines, marks, or characters impressed on a surface."

Any attempt to show the relationship of these graphic arts, as defined, to the general shop and its philosophies must be preceded by an analysis of those philosophies. Chapter II will be devoted to a brief history of the general shop and its philosophies.

Need for the Study

Table I is indicative of the need for such a study. It

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[5] Joseph Lasky, Proofreading and Copy-Preparation (New York: Mentor Press, 1946), p. 1.

[6] Carter V. Good, Editor, Dictionary of Education (New York: McGraw-Hill Book Co., Inc., 1945), p. 30.

[7] Webster's Collegiate Dictionary (Springfield, Mass.: G. and C. Merriam Co., 1944), Fifth Edition, p. 435.

is a comprehensive list of all the towns in Kansas having a general shop in the industrial arts program in one or more of the schools in that town. The table further shows the population of the town, and indicates whether or not the general shop curriculum includes printing.

The data were obtained from the files in the State Department of Education, Topeka, Kansas, Division of Curriculum, Special Education, and Instruction. A sample copy of the High School Principal's Organization Report, from which the data were taken, is included in Appendix A. All reports examined were for the 1951-1952 school year.

An analysis of Table I reveals that of the 157 schools in Kansas which have general shops, only ten offer printing as an integrated part of the general shop curriculum, or 6.36 per cent. The data further reveal that all such shops are located in towns having 12,000 population or more, with the exception of the Kansas School For the Deaf at Olathe, which has a population of 5,062. This indicates that only the larger towns such as Wichita, Kansas City, Arkansas City, and Hutchinson have a graphic arts program in their general shop curriculum.

Thus, it is evident that such a program as the one proposed in this study is not common to the general shops in Kansas which is sufficient justification for this study being made.

TABLE I

GENERAL SHOPS IN KANSAS WITH REFERENCE TO GRAPHIC ARTS UNIT

Town	Population	Printing	
		Yes	No
Abbyville	147		X
Agra	378		X
Arcadia	965		X
Arkansas City	12,811	X	
Arlington	426		X
Arma	1,771		X
Atchison	12,114		X
Athol	253		X
Baldwin City	1,308		X
Baxter Springs	5,086		X
Bellefont	100		X
Bentley	205		X
Bern	196		X
Blue Mound	444		X
Bluff City	233		X
Bogue	135		X
Brewster	330		X
Burden	575		X
Burlington	2,271		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Burr Oak	456		X
Burrton	787		X
Caney	2,694		X
Canton	662		X
Cedar Vale	835		X
Chase	278		X
Cheney	669		X
Chetopa	1,756		X
Claflin	607		X
Climax	129		X
Coffeyville	17,631		X
Coldwater	1,021		X
Columbus	3,743		X
Coolidge	135		X
Copeland	244		X
Corning	247		X
Courtland	304		X
Cuba	351		X
Delphos	734		X
Denison	240		X
Dodge City	11,530		X
Dorrance	397		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Effingham	514		X
El Dorado	11,798		X
Elk City	592		X
Ellinwood	2,141		X
Elsmore	203		X
Emporia	13,824		X
Erie	1,346		X
Esbon	255		X
Eudora	911		X
Eureka	3,665		X
Fall River	287		X
Galva	384		X
Garnett	2,556		X
Glen Elder	544		X
Hamlin	183		X
Havana	172		X
Hays	7,205		X
Healy	230		X
Hesston	414		X
Hillsboro	1,847		X
Hoisington	4,200		X
Holyrood	754		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Hudson	235		X
Hutchinson	30,797	X	
Independence	11,627		X
Ingalls	151		X
Jarbalo	68		X
Jetmore	766		X
Kansas City (Rosedale)	192,103		X
Kansas City (Sumner High)		X	
Kansas City (Wyandotte)		X	
Kansas City (Kansas School for the Blind)			X
Kendall	150		X
Kingsdown	150		X
Kinsley	2,112		X
Kiowa	1,115		X
Lewis	397		X
La Crosse	1,566		X
Lebo	475		X
Lehigh	216		X
Levant	160		X
Liberal	8,333		X
Lincoln	1,584		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Lincolnville	222		X
Longton	456		X
Lorraine	177		X
Lost Springs	216		X
Lyons	4,112		X
Madison	987		X
Manhattan (Jr. High)	13,485	X	
Manhattan (Sr. High)		X	
Mayetta	222		X
Meade	1,322		X
Merriam	1,238		X
Miltonvale	724		X
Montezuma	327		X
Moran	495		X
Morganville	220		X
Mullinville	342		X
Mulvane	1,251		X
Munden	114		X
Neosho Rapids	154	X	
Netawaka	201		X
Olathe (Kansas School for the Deaf)	5,062	X	

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Olathe (Sr. High)			X
Olsburg	175		X
Oskaloosa	670		X
Oswego	2,740		X
Paola	3,975		X
Park	200		X
Pawnee Rock	339		X
Piedmont	182		X
Piper	128		X
Pittsburg (Roosevelt Jr. High)	25,326		X
Pittsburg (College High)			X
Potter	150		X
Prescott	238		X
Radium	100		X
Reading	252		X
Republic	420		X
Riverton	1,200		X
St. John	1,731		X
St. Paul	767		X
Saffordville	40		X
Sawyer	250		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
Scott City	3,138		X
Sedgwick	900		X
Selden	450		X
Shawnee	794		X
Spring Hill	650		X
Sterling	2,500		X
Syracuse	1,903		X
Thayer	546		X
Tonganoxie	1,200		X
Topeka	100,000		X
Tribune	1,007		X
Turner	600		X
Ulysses	2,500		X
Valley Falls	1,304		X
Vermillion	305		X
Victoria	1,010		X
Vinland	75		X
Walton	212		X
Washington	1,552		X
Wellington	8,043		X
Welda	200		X
Weskan	205		X

TABLE I (Cont'd)

Town	Population	Printing Yes	Printing No
West Mineral	401		X
Whitewater	563		X
Wichita (Robinson)	201,000	X	
Wichita (High School North)		X	
Wichita (Planeview High)			X
Wilson	1,011		X
Winchester	382		X
Woodbine	212		X
Woodston	278		X

To further indicate the general lack of printing at the junior high school level in Kansas, the following figures are presented.[8]

In the years 1948-1949, there were 7,893 students enrolled in general shop courses for a full year in Kansas at the junior high school level. Of this number only 793 students were enrolled in printing, or 10.05 per cent.

These figures are not too much in disagreement with the data in Table I.

[8] U. S. Office of Education. "Offerings and Enrollments in High School Subjects, 1948-50" (Biennial Survey of Education in the United States, 1948-50, Ch. 5. Washington: Government Printing Office, 1951), p. 62f.

CHAPTER II

THE EVOLUTION OF THE GENERAL SHOP AND ITS UNDERLYING PHILOSOPHIES

To better understand the purpose of this study, it is desirable that a brief history of the general shop be considered in this chapter. Its known history will be traced along with the philosophies of educational movements which contributed to the growth of the general shop.

The general shop has grown in importance and educational value concurrently with the development of the junior high school. It is closely allied to the educational aims and objectives of the junior high school. Any consideration, therefore, of the historical aspects of the general shop must begin with a review of the concepts and influences underlying the development of the junior high school.

Relationship of the General Shop to the Junior High School

In his study of the "peculiar functions" of the junior high school in 1927, Koos[1] found the five functions ranking highest in frequency of appearance in their replies were: (1) retention of pupils, (2) economy of time, (3) recognition of individual differences, (4) exploration for guidance, and

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[1] Leonard V. Koos, The Junior High School (New York: Harcourt, Brace and Howe, 1920), pp. 4-5.

(5) vocational education. Most writers and authorities in the industrial education field today will generally agree that all five of these concepts are basic principles upon which the general shop is established. More emphasis is placed upon "exploration for guidance", however, than any of the other four. Throughout the history of the junior high school to the present a major emphasis seems to have been "exploration", and it is, therefore, not surprising to find a corresponding stress on exploratory purposes in the early diversified programs of shop experiences that later came to be called "general shops". It must be emphasized that the leaders of industrial education, at the time Koos' study was made, expressed other educational ends, as well as exploration, in advocating the diversified program of shop work.

As this concept of exploration grew in importance as an educational need for boys of the seventh, eighth, and ninth years of school, it became quite clear to many leaders that the curricular content of these shop programs was inadequate. At this stage of the development of the general shop, the curriculum usually consisted of a course in woodworking and drafting, and possibly one in metal. This, the leaders decided, was too narrow an offering and much attention was given to a careful re-examination and re-evaluation of the manual training programs inherited from the closing decades of the nineteenth century. The controversial issues which arose as a result of this critical analysis of the then prevalent manual training program raged strongly for many years.

Proposed Changes in the Existing Educational Philosophies

As a result of the re-evaluation, the emphasis shifted from a predominantly academic curriculum to one which included courses to help prepare the students for occupational employment, and better fit them to live in the then changing society. Thus, in effect, the general shop was to be used to acquaint the students with some of the basic industrial practices and an attempt made to correlate these activities with everyday life. In another manner, to institute courses in the school curriculum that had some meaning and practicality.

In an article written in 1909, Charles F. Smith proposed that productive machines be classed under five heads according as they are used for food, clothing, shelter, transportation, and communication. He further suggested what should be studied and made in the shop under each classification. For example,

> Under shelter may be considered machines used in building construction and in the production of building materials. Among these are the excavating machine, derrick, crane, and elevator. Materials may be studied under separate heads, as iron and steel, lumber, brick, and tile, paints, stone and glass. Under this head we may also place the electrical, heating, and lighting apparatus.... The best opportunities under the head of communication seem to be in the construction of telegraph and telephone instruments, paper, and bookmaking, printing and photography.[2]

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[2] C. F. Smith, "Industrial Training in the Grade Work-Shop," Manual Training Magazine, X (April, 1909), 316.

This definitely is a different approach to the consideration of the function, character, and aims of educational shop courses from the manual-training, or manual arts, courses then predominant in the schools. These manual-training courses consisted of a series of exercises which were usually arranged in the order of simple to the more complex. They were not designed to furnish the student with any practical "carry-home" projects, but rather to develop a reasonable amount of skill in the use of the elementary hand tools. For example, the beginning student in woodwork would first learn how to square a board. Then the student learned to saw the board to length and gradually progressed until he was eventually cutting mortise and tenon joints, turning useless spindles on the lathe, and performing other operations using this useless exercise method as a means of learning to use the basic hand and machine tools. After the exercise was completed, the student received the instructor's approval, or disapproval, and immediately threw the piece of work away and started on the next exercise. At a meeting of the National Education Association in 1889, this type of training was described variously as "unnecessary, of small value, immoral, materialistic, sordid, ridiculous, and in the interest of caste."[3]

As already pointed out, this exercise method was clearly

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[3] L. A. Williams, Secondary Schools For American Youth (New York: American Book Company, 1944), p. 82.

incompatible with the movement then gaining momentum to introduce into the shop courses practical material and to emphasize the exploratory aspect of the general shop in the junior high school.

This concept of exploration in the junior high school shop was invariably accompanied by the idea of an enrichment of the "educative" or informational content of the courses. This led to many controversies over the fact that to introduce informational subject matter into the shop work was, to some degree, defeating the purpose of the principles upon which the shop was included in the curriculum. The strongest theory advanced by the opposition was that of giving the student a textbook to read was in direct conflict with his original purpose in being in the shop. The student wanted to use his hands, to build something, to create, and not to study academically.

No definite data are available on the subject, but perhaps at this point in the development of the general shop, a compromise was reached by both sides of this controversy.

It apparently was agreed that the emphasis was to be on the exploratory factor and incidental material on the understanding of the processes, the social and economic aspects, the materials and products of industry, and occupational opportunities.

Thus, as the educational philosophies changed from the manual-training concept, or exercise method, to the idea of a diversified shop program, the general shop was introduced to

fill this need. This diversified program was intended to give the boy a chance to discover his likes and dislikes, through departmental work and varied activities differentiated to meet variabilities on the part of the pupils, to give him industrial insight and intelligence; to provide an easier transition from the elementary to the secondary period and thus eliminate, to some extent, the loss of pupils from school. By comparing these objectives of the general shop with those found by Koos[4] to be "peculiar functions" of the junior high school, it can readily be seen that the two, though worded differently, are almost synonomous. By comparison it can also be seen how closely allied the general shop was to the junior high school and the whole educational philosophy of the school at that time.

In 1918, Professor G. F. Buxton, then of The Stout Institute, wrote:[5]

> For several months the matter of teaching many kinds of work in public school shops rather than a few only, has been discussed in the 'Open Questions' department of the Manual Training Magazine. The purpose of this letter is to point to a goal toward which industrial-arts instruction seems to be tending, and apparently must tend in the years just ahead of us. This tendency is in the direction of offering an acquaintance with a variety of industrial occupations as a part of the program of the junior high school, enabling a boy to find himself and helping

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[4] See supra, p. 17.

[5] G. F. Buxton, In "Open Questions", Manual Training Magazine, XIX (April, 1918), 285.

> him somewhat in choosing his future occupation. The introduction of many kinds of work is not proposed for the development of a considerable degree of skill in each of the several mechanical trades. It is urged, however, for an understanding of the elements of several trades while carrying on regular school studies. In every case it is advised that sufficient time be provided for each subject for a grasp of its meaning, for a detailed analysis of selected phases of it, and for practice in certain of its operation.

Buxton, in this one article, summed up the theories advanced concerning the advantages of the general shop. He also pointed out some of its limitations, though they are not expressly implied in the article. Predicting the tendencies of industrial-arts training, Buxton was quite accurate.

Objections to the Introduction of the General Shop

Like all other educational changes, the general shop theory was not accepted by all industrial-arts teachers and administrators as the complete answer to the problem of offering a diversified shop program. There was much controversy concerning the relative values of the general shop and the plan of rotating pupils among several unit shops. Other leaders continued to argue for the values of thorough work in woodwork or metalwork as contrasted with what they called "brief contacts" with numerous industrial materials and processes. Their objection was similar to the saying, "A jack of all trades, but a master of none."

However, those who fostered this argument were

overlooking the fundamental principle of the general shop; that being exploration, with no attempt made to develop any appreciable degree of skill. There was one factor in the growth of the general shop that had nothing to do with any of the arguments presented thus far and that was the element of economy. There was a growing tendency to incorporate the general shop where only one shop could be provided in the smaller schools. There were several factors contributing to this growing popularity of the general shop in the smaller schools. One factor was the economy of the program. The fact that a reasonably elaborate general shop program could be set up in the place of an equally elaborate unit shop program for considerably less money was definitely a point in the program's favor. Another element that was often the deciding factor of including the diversified shop program was the matter of building space. Where separate rooms were needed for the unit shops, or at least they were preferred, the general shop was included in one room. The matter of having to pay only one teacher to supervise such a program appealed to many budget-wise administrators. The diversified shop program was the answer to all these controversial issues for the administrators of small schools with limited funds for setting up an industrial-arts program.

Kenneth V. Carmen,[6] in a study made in 1922, found that

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[6]K. V. Carmen, "Results of an Inquiry Concerning Certain Phases of Junior High School Industrial Arts," Industrial Arts Magazine, IX (July, 1922), 251.

a majority favored the diversified shop program in which all phases of instruction were carried on in one room under the supervision of one instructor in smaller communities up to 15,000 population. Carmen's study further revealed that separate shops were favored in cities from 15,000 to 50,000.

Regarding the factor of having one teacher supervise a program that might ordinarily take four or five, there was also much controversy. Administratively, it was almost perfect. The one-teacher shop was economical in both the salary and equipment aspects. The matter of hiring a replacement teacher was relatively a simple matter, and although the burden of keeping records was increased as far as the instructor was concerned, it was simplified in the administrative sense.

Although the program was administratively ideal, there were those who advocated the program was pedogogically unsound. That is, the difficulties encountered by a teacher who attempted to teach several different areas of industrial-arts at the same time in the same shop were appalling.

Concerning this argument against the general shop, Charles R. Bennett made the following statement at a Manual-Arts Conference of the Mississippi Valley in 1923.[7] "In the discussions of the general shop, the statement was made that at its best, today, the general shop reduces teaching to assigning problems and checking results and at its worst it

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[7] C. R. Bennett, Editorial Comment, Industrial Education Magazine, XXV (February, 1924), 207.

is 'damaging chaos.'" Bennett further indicated that the one-teacher diversified shop program could be made effective but it was not effective at that time.[8]

The Emergence of the Term "General Shop"

It is difficult to trace the exact origin of the term "general shop" and it is more difficult to attribute its first usage to any one individual. However, its first appearance in the title of an article recorded by Reader's Guide is that of Earl L. Bedell's, "Household Mechanics and the General Shop," in 1923.[9] The program was described, in a general way, as early as 1917, but the name "general shop" first appeared in 1923.[10]

Bedell published another article in 1923, "Methods of Teaching in a General Shop." The author of both articles undoubtedly used the terms "Household Mechanics" and "General Shop" as synonomous terms.

David Snedden and William E. Warner, writing in 1927, in discussing the theory of Russell and Bonser, which they referred to as "The Industrial-Social Theory, or The Russell-Bonser Plan," pointed out that, "It was established and tried out by Dr. Bonser in 1910 in the Speyer School. The first

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[8] Ibid, p. 207.

[9] A. B. Mays, "Notes on the Historical Aspects of the General Shop," Industrial Arts and Vocational Education, XXXIX (April, 1950), 139-142.

[10] "Association News," Industrial Arts and Vocational Education, XL (February, 1951), 4A.

published course of study on this basis of organization was included in the Speyer School Curriculum published in 1913."[11] Snedden and Warner further stated, "As a result, there was created a new type of shop known as a general or composite industrial shop."[12]

From these data, it can be determined that the term was used in a vague way as early as 1910 and came into more wide acceptance around 1923. The specific use and definition of the term can also be established at about this same time, 1923.

Summary

The foregoing data on the development of what may be called the general shop idea, and of the gradual acceptance of this type of shop organization cannot be construed to be a complete history of the modern general shop. What has been attempted, however, has been to justify a few general conclusions with reference to the changing educational philosophies that produced this means of teaching industrial arts. It has been shown that the general shop is closely associated with both the objectives of the junior high school and the teaching procedures. The traditional manual-training shop with its exercise method of teaching did not fit into this growing educational need and declined in importance and number.

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[11] Mays, op. cit., p. 141.

[12] Ibid.

That the emphasis was clearly being placed upon individual differences, acquaintance with a wide range of industrial materials and products for their consumer values, and particularly upon the exploratory aspect, implied that a shop, or shops, be provided that consisted of a diversified program of offerings. Also, the desirability of making this type of program available to pupils in small schools that could not have more than one shop suggested inevitably a shop in which one teacher taught pupils to work in several media in the same room at the same time. Most administrators favored this type of program on the basis of economy of money, space, and personnel. The rise of the general shop was not a rapid thing but rather a very slow concept to gain favoritism and was beset by many obstacles. Among those who opposed the general shop were many who stated it was economically sound but pedogogically unsound. There were others who believed it to be of little value on the basis "there was little use in learning something about several fields of industrial work and very little about any one in particular." These controversial issues were well summarized in a statement Denman Kelley made in 1925.[13] He wrote: "The latest child which has been born into the educational family has been christened General Shop, and the infant is just now at the stage when he is making much noise and disturbing the peace of a good many of his neighbors." It is true that this

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[13]Denman Kelley, "The General Shop as a Junior High School Activity," Industrial Arts Magazine, XIV (April, 1925), 171.

"infant" did "disturb the peace of a good many of its neighbors," but like all infants, it eventually got its own way and grew up amid all the clamoring and opposing factions attempting to inhibit its growth to become one of our modern educational programs of industrial-arts.

There are still numerous unsolved problems concerning this type of shop, and the remaining chapters of this report will deal with one of these problems. In view of the generally recognized objectives of the junior high school, the diversified shop program seems the only logical way to effectively fulfill the objectives of industrial arts and the role belonging to industrial arts in such a school.

A more detailed analysis of the objectives of industrial arts will be made in Chapter III and an attempt will be made to show the relationship of the graphic arts area to the general shop. The role the graphic arts plays in fulfilling these objectives will be shown and also how this area contributes toward the general education of the pupil.

CHAPTER III

CORRELATING THE INDUSTRIAL ARTS OBJECTIVES AND THE GRAPHIC ARTS

Any undertaking by human beings that is of consequential value must have a definite objective, or set of objectives, to obtain any reasonable amount of success. This fact may be applied to a small women's club in a rural town or to the largest industrial concern in the United States. Each must have a goal to be reached. Without any definite objective or reason to be in existence, neither the members of the women's club nor the officials of the large industrial concern know what they are striving to achieve. Not having any clearly defined objectives and a systematic program leading to the fulfillment of those objectives, in almost every instance the result will be confusion, poor leadership, poor co-operation, lack of participation, and above all, a feeling of "uselessness" on the part of the participants. This last point is especially true of some of the instruction which takes place in our high school classroom and industrial arts shops.

In order to most effectively conduct an industrial arts shop course, the instructor must have definite objectives in mind. He should also have a clearly defined, well organized course of study. Without one or both of these, the instructor's efforts are doomed to failure. The students soon learn whether or not the instructor has a definite goal for them to

achieve, and if they are aware of it, they will feel that whatever work they do is a step forward in reaching this goal. However, if the instructor's methods of teaching are haphazard and not well organized, the students soon feel a sense of uselessness. They complain of "not getting much out of the course." This effect will lead to a laxity of interest on the part of the pupils. In turn, this loss of interest will lead to disciplinary problems and poor co-operation between students and instructor. From this it may be seen that educational objectives are essential to proper instruction, good class organization, and student interest.

The essence of this fact has been known to educators throughout history. John Amos Comenius, Francis Bacon, John Locke, Jean Jacques Rousseau, Benjamin Franklin, Johann Freidrich Herbart, and Herbert Spencer all had definite objectives for education which were formulated to conform to their educational philosophies.

As stated by Rudyard Bent and Henry Kronenberg, Comenius' objective was to, "Become learned in the sciences, pure in morals, trained in piety, and in this manner instructed in all things necessary for the present and for the future life."[1]

Bacon stressed the "refinement of the standards of living, enrichment of pupils' minds, and teaching to live happily together."[2]

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[1] Rudyard K. Bent and Henry H. Kronenberg, Principles of Secondary Education (New York: McGraw-Hill Book Co., Inc., 1941), p. 55.

[2] Ibid.

Locke's objectives were partly mis-interpreted in the past but furthered the formal discipline method of teaching. He placed great emphasis upon self-denial, moral training, mental training, and placed learning after virtue, wisdom, and breeding.[3]

Rousseau advocated that the objective of education should be to teach for the present needs of pupils rather than for the future needs. His fundamental aim was to preserve the natural goodness of the hearts of the students and to form a society in harmony with them.[4]

In contrast with Rousseau's objectives, Benjamin Franklin proposed education should teach everything "most useful and ornamental."[5] It was his idea that youth be instructed in true merit, or an inclination to serve mankind, one's country, friends and family.

Herbarts' objectives were, to a great extent, in accordance with Franklin's. His chief aim was "morality," meaning good character and social adjustment. Of secondary importance was "many-sidedness of interests."[6]

Spencer formed his objectives through an analysis of human life. His analysis of activities which were selected to prepare one for complete living were:[7] (1) self

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[3] Ibid.

[4] Ibid.

[5] Ibid.

[6] Ibid.

[7] Ibid.

preservation, (2) vocations, and (3) rearing and disciplining children.

The Seven Cardinal Principles Of Secondary Education

From the foregoing objectives, as advocated by notable leaders of education in the past, it may be seen that there was much disagreement and many conflicting conceptions of the purpose of education. It was left to the Commission on the Reorganization of Secondary Education to form a comprehensive, functional, and influential formulation of objectives for secondary education in 1918 which have remained unchanged and intact to this day. They were entitled the Seven Cardinal Principles of Secondary Education. They are:[8]

1. Health
2. Command of fundamental processes
3. Vocation
4. Worthy home membership
5. Citizenship
6. Worthy use of leisure
7. Ethical character

These are rather vague in their meanings for there will be different interpretations by educators what constitutes "worthy home membership," "citizenship," and "health". Further, no indication is given as to the manner in which these objectives are to be realized.

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[8] Ibid, p. 60.

The Need For A Set Of Objectives Applicable To The Industrial Arts

It became apparent to the leaders of industrial education that although these Seven Cardinal Principles were of great value, they were not specifically applicable to the industrial arts field. The American Vocational Association assumed the responsibility of formulating a set of objectives which would directly apply to industrial arts. It was a time-consuming job and several years elapsed before a set of objectives was finally adopted. The final report of the committee of the American Vocational Association listed the twelve objectives defined in Chapter I.[9]

It must be noted at this point that each of these objectives is preceded by the words "to develop." This implies that they were formulated specifically on a teacher fulfillment basis. That is, they were not constructed by the members of the committee to depend upon any particular curriculum, or program, for realization of fulfillment, but rather the responsibility was placed directly with the instructor.[10]

Definite correlation between the graphic arts and these objectives will be made in the remaining pages of this chapter. In some instances, not only will a correlation be

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[9] See supra, p. 5.

[10] Standards of Attainment in Industrial Arts Teaching, American Vocational Association, Washington, D.C., 1937. p. 10.

made, but specific examples will be cited in order to show how the graphic arts contribute to the general education of the student.

Application of the Industrial Arts Objectives to the Graphic Arts

To Develop in Each Pupil an Active Interest in Industrial Life and in Methods of Production and Distribution. Without an understanding of the magnitude of the industry with which he is familiarizing himself, the student of printing is blind to the opportunities, careers, and potentialities which it possesses. It is, therefore, necessary to include in this proposed general shop graphic arts course a degree of instruction in related trade information. The topic itself has a great number of possibilities and there are several approaches that can be used to advantage.

Related Industries: One very favorable and popular method is the showing of films of industrial printing establishments, such as newspapers and large publishing firms. Films of related industries may be shown such as the forestry industry, the paper industry, or the type foundry processes. Excellent film titles may be obtained by writing to the Department of Education, American Type Founders, 200 Elmora Avenue, Elizabeth B, New Jersey. Through this medium, the student is able to see some of the industrial processes and better understand the inter-dependency of our industrial

network. Although films are not the complete answer to fulfilling this objective, they are of invaluable assistance.

Career Opportunities: Through a series of classroom sessions, the students can also be made aware of the many job opportunities and career fields in the printing industry. By knowing there are jobs such as compositor, pressman, linotype operator, stoneman, proofreader, binder, cutter, foreman, salesman, advertising specialist, and the myriad other job opportunities, the students' work should become more meaningful to him. Instead of feeding a press just for the sake of doing something, the student will realize that what he is doing is done in thousands of commercial plants in exactly the same manner. He perhaps will realize too that learning to perform the job with a reasonable amount of dexterity may provide him with a source of income in future years. His work will become purposeful and meaningful.

Wages and Hours: An important factor in developing this interest in industry is to provide the students with some information pertaining to the wages and hours of workers. Table II,[11] shown on the following page, if presented to the class would give a graphic representation of the trend of wages and hours in the printing industry from 1911 to 1949.

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[11] E. B. Dunton, Career Opportunities in the Printing Industry (Elizabeth, New Jersey: American Type Founders 1950), p. 11.

TABLE II

AVERAGE UNION WAGES AND WEEKLY HOURS
IN THE PRINTING TRADES 1911-1949

Year	Hourly Wage	Weekly Hours	Year	Hourly Wage	Weekly Hours
1911	$ .42	49.7	1930	$ 1.06	44.5
1912	.43	49.7	1931	1.06	44.5
1913	.43	49.6	1932	1.06	43.0
1914	.44	49.6	1933	.99	42.6
1915	.44	49.6	1934	1.02	40.4
1916	.45	49.6	1935	1.05	39.8
1917	.46	49.6	1936	1.08	39.6
1918	.50	49.6	1937	1.11	39.4
1919	.62	49.6	1938	1.15	39.2
1920	.79	48.1	1939	1.16	39.1
1921	.87	45.2	1940	1.18	39.0
1922	.87	45.0	1941	1.19	39.0
1923	.90	44.8	1942	1.24	38.9
1924	.95	44.6	1943	1.28	39.0
1925	.96	44.6	1944	1.31	39.0
1926	.98	44.6	1945	1.33	39.0
1927	1.01	44.6	1946	1.56	38.0
1928	1.03	44.6	1948	1.97	37.3
1929	1.04	44.5	1949	2.22	37.3

It shows a steady increase in wages and decrease in hours with the exception of 1933 when wages dropped to .99 cents per hour. It would be preferable to have mimeographed copies made of this table and thereby provide each student with a copy for his, or her, personal use.

Thus, it may be seen that by presenting this material at opportune times, a genuine interest may be aroused in the students concerning these various phases. The information should not be presented all at once or in any manner that would impair the shop routine, but at intervals, and most important, at a time when the information is needed. If carried out in this fashion, this program will, in all respects, fulfill this objective.

To Develop in Each Pupil the Ability to Select, Care For, and Use Properly the Things He Buys or Uses. Of all the deficiencies of our educational system, none is as glaring as the lack of consumer education. Every person in the United States is a consumer of industrial products. However, few people are wise consumers. There is tangible evidence on the streets of our cities, on our highways, in our homes, and elsewhere of the lack of understanding on the part of the average layman relative to the care and maintenance of his possessions. This is particularly true of the younger people who mis-treat automobiles and drive them with no respect for their limitations.

It should be a prime consideration of the industrial arts instructors to inculcate within these younger people this

sense of wise selection and proper use of the things they buy and use. Through the graphic arts several contributions may be made in this direction and will be discussed in the following paragraphs.

Shop Equipment: There is almost universal agreement among shop instructors that there is no substitute for quality with respect for shop tools and machines. School-shop equipment will be subjected to abuse and mal-treatment that it would not ordinarily receive by an operator versed in its operation and limitations. By equipping the graphic arts area of the general shop with recognized, quality equipment, the student soon becomes accustomed to working with good equipment. He can be made to realize that fine printing cannot be produced with inferior equipment and materials. It should be pointed out to the student by the instructor that this principle is applicable to merchandise he buys for his personal use. In this manner, the desired carry-over to everyday life of this principle can be realized.

Preventive Maintenance: Concurrent with good shop organization is a program of preventive maintenance. Equipment in the graphic arts shop such as presses, motors, saws, paper cutter, and other machines necessary to producing a printed job, requires periodic maintenance for efficient operation. Motor commutators must be cleaned, saw blades sharpened, presses oiled, and the paper cutter blade sent off for precision

sharpening. With the exception of the latter, the students should take an active part in the preventive maintenance program.

Especially adapted to the graphic arts is the student-foreman type of program. After the students become oriented to the shop routine, the instructor appoints students to act as foremen in the various divisions of the shop. This would include the pressroom, composing room, and bindery. Each foreman would be responsible for efficient operation of his division giving help when needed and assisting in student problems. Of major importance, however, would be the foreman's responsibility for care and maintenance of the equipment in his department. With the aid of a chart made by the instructor indicating machines and parts of machines needing either monthly, semi-monthly, weekly, or daily maintenance, the foreman can tell at a glance what has to be done in the way of preventive maintenance on any given day.

The foreman should assume the initiative, but the students working under him should carry out the actual work. A new foreman should be selected each week and in this manner each student will be given an opportunity to supervise the work and participate in this program of dealing with and assisting others.

If such a program is carried out faithfully in the graphic arts shop, the importance of proper care and maintenance of equipment will be impressed upon the students. They can be

further made to realize that this applies to anything they themselves possess.

Advertising: There is no better medium than the graphic arts to teach the essentials of advertising. Closely associated with consumer education is the factor of advertising. Through a number of classroom meetings, the instructor can impress upon the students what constitutes a good advertisement and how to recognize a poor advertisement. By accumulating a few examples of each, the instructor can also graphically show the students advertisements that are well designed, vividly worded, and, above all, based upon facts. On the other hand, he can present advertisements that are poorly designed, loosely worded, and are nothing more than meaningless blurbs.

Student participation in this area could be in the form of bringing to class several examples of what they believe to be poor advertisements and good advertisements. They could be obtained by looking through any magazine on the market. Classroom discussion should follow and the merits of each advertisement pointed out, along with its base characteristics. If even a small number of the students become more conscious of the potentialities and limitations of advertisements, such instruction would not be in vain.

Inaugurating such a program in the graphic arts would be of great value in instilling in the students the desired ability to select and choose wisely among the countless products

on the market.

To Develop in Each Pupil the Appreciation of Good Workmanship and Design. "Inasmuch as design is one of the essential constituents of a piece of printing, the teaching of design cannot be divorced from the teaching of printing."[12]

Preceding any working knowledge of the graphic arts processes must be a knowledge of design as applied to the graphic arts. To expect a student to do commendable work without a basic understanding of what constitutes good design is comparable to expecting the student of machine-lathe work to turn threads without any previous instruction.

A fundamental conception of the principles of design is essential to the student of printing.

In use today are such terms as impressionistic, modernistic, functionalism, and others which are vague descriptions of pieces of art. Such terms are not readily applicable to the graphic arts.

There are, however, certain qualities of design which are essential to any piece of printing and should be understood by the students of printing. Instruction should be in the form of class discussion and examples of each principle demonstrated by the instructor. The following illustrates:

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[12] Laurence G. Cutler, "An Approach to the Problem of Design for the Teacher of Printing" (unpublished master's thesis, Kansas State Teachers College, Pittsburg, 1948), p. v.

The Principles of Design[13]

1. Alternation--using two elements alternately, quite frequently a large element and a small one. Rarely successful with three or more.

2. Radiation--the effect produced by having a design radiate from a common center which forms a point of interest or attraction.

3. Parallelism--an effect produced by placing straight edged lines parallel to each other. This also applies to circles and curves when placed concentric to each other. An important element to achieve repose, organization, and rhythm with curved lines.

4. Variety--the use of elements of a varying character in order to avoid monotony in the design. It is the opposite of the principle of similarity.

5. Similarity--this means keeping the various elements of the composition sufficiently like each other to avoid too great contrasts. Similarity and variety should be regarded as opposite but desirable qualities which must be balanced for the best results.

6. Opposition--produced by lines or rhythms at right angles to each other as the lines in windows, doors, walls, or pieces of furniture. Usually a distinction is made between opposite and conflict. Lines in conflict suggest a turmoil or strife within the design which thereby usually loses its sense of unity.

7. Transition--the gradual change in direction between lines in opposition such as corner ornaments in border designs. Transitional elements are present at the change from earth to sky, or water to shore. Small accents frequently serve as transitional elements.

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[13] Ibid, pp. 17-19.

8. Tangential curves--the reversal of curves at the point of tangency.

9. Rhythm--that sense of motion or movement which is produced by repetition of forms, spaces, and directions.

10. Rhythmic variation--the repetition of a shape or rhythm in a series gradually diminishing in size or tone.

11. Interlacing--the intertwining, lacing, weaving, or braiding of elements in a regular appearing and disappearing band or border.

12. Dominance--that procedure which makes for the prominence of certain elements in a design. It may constitute lines, shape, colors. Dominance should not be confused with emphasis. An object may be dominant yet not emphasized, and may be emphasized yet not dominant.

13. Recurrence--shapes or colors which recur in the same form or with slight modifications.

14. Subordination--making certain elements or areas subordinate to the main element usually by diminution of size, tone, or the placement, or other treatment to give less prominence and attraction. It is the opposite of dominance.

15. Contrast--the use of unlike elements in a design in such a manner that the unlikeness brings about a reinforcement as in contrasting colors and sizes.

16. Emphasis--very closely related to dominance in that portions are strengthened in order to make them prominent or forceful. Size, tone, and isolation aid in giving emphasis. Dominance and emphasis may be placed in the same design, and each may be assigned a different element.

17. Accents--small attractive spots used to create a center of interest or attraction. Quite frequently in typographic design, emphasis and accents are used in conjunction. Although departing from the usual conception, italic type may be said to be a form of accent

rather than emphasis. Capitals emphasize, whereas italic accents. Used in another sense, accents form a transitional element as a small ornament placed between two units of copy.

18. Balance--the sense of equilibrium or repose produced by equal attraction between opposite elements. Bisymmetrical balance is attained by making direct opposites come to repose by making them alike. Asymmetrical balance is the sense of repose given to unlike elements much in the same manner that physical balance is achieved. These two forms of balance are quite frequently called formal and informal, sometimes regular and irregular.

19. Unity--the logical adjustment of the several elements of a design which gives a singleness of purpose, oneness, or a sense of harmony or artistic reasonableness.

Understanding the principles of design is not enough. The student must apply them in his work and utilize them to best advantage in pieces of printing before it can be said that knowledge of the principles of design is inherent.

Realization of this objective is readily possible through the teaching of these principles of design and the application of them by the students in their work. Fundamentals of "good workmanship" are concurrent with the teaching of these principles.

To Develop in Each Pupil An Attitude of Pride or Interest in His Ability to Do Useful Things. Human nature being what it is, there is little doubt that seeing one's name in print affords a degree of personal pride. Whether one's name appears in a newspaper, a program, on a personal letterhead, or calling card, the effect is still achieved.

Presumably, the student who enrolls in a course in the graphic arts is somewhat ignorant of the processes which are involved in producing a piece of printing. After basic instruction is completed concerning the lay of the case, hand composition, justification, and spacing, the student will probably want to print some personalized stationary, or calling cards.

His first task is to design the desired piece of printing. As there is little design involved in a calling card other than the selection of the type face, the letterhead will be used for illustrative purposes here. The student must work out in detail what he wants to appear on the letterhead. He must also choose a type face, which is consistent with the design and effect desired. Choosing a proper kind and color of paper which is in agreement with the color of ink to be used is of prime importance for harmonious unity of the completed project.

Following this procedure through step by step, the student takes increased pride and added interest as the job nears completion. The culmination of all his efforts is in the presswork. Here the student must be exacting in his measurements, precise in his adjustments, and accurate in all aspects of register and impression. There is no place for guesswork or chance in this phase of printing the letterhead.

Of great importance in the fulfillment of this objective is the over-all pleasure the student derives from seeing the job through from idea to printed reality. The feeling of

accomplishing something worthwhile and beneficial is, to say, the least, a natural need of youth. And, this intuitive want is given an opportunity for expression through the graphic arts medium. The very processes themselves demand an exacting sense of workmanship leading to an eventual sense of accomplishment and degree of pride on the part of the student in his ability to perform those operations necessary to producing a piece of printing.

To Develop the Feeling of Self-Reliance and Confidence in the Pupil's Ability to Deal With People and to Care For Himself in Unusual or Unfamiliar Situations. Incorporating the graphic arts in the general shop would provide ample opportunity for the fulfillment of this objective. The objective itself is rather broad and entails several things. Reducing the objective to simple terms it is found to mean, "mastery of machines and tools, and the ability to cope with emergencies."

Each piece of printing the student undertakes is a challenge to both his skill and his ingenuity. From the embryonic stage of planning to the eventual "trial impression" the student is beset by situations which call for resourcefulness. For example, if the form fails to lift in the chase, the student must examine the form and determine why it will not lift. The cause may be a short line, a long line, a form that is not "square", or any number of things. Should the student fail to comprehend what the trouble is, assistance

should be given, but until that time it should be his responsibility to look up the form.

There are several steps necessary in the presswork which are challenging enough in normal situations but when the situation is complicated by large forms, or multi-color forms, then the student must call forth all the skill and ingenuity at his command. For example, the student has to know what to do when the form in the press is printing high in one or several areas and low in others. The process of obtaining an even impression is often a time consuming one and in which patience, skill, and judgment are essential.

Developing a feeling of self-reliance and coping with unusual situations is a part of the graphic arts. No two jobs require the same treatment and each presents new problems. The writer is not an advocate of "formal discipline" but to state that if these traits of confidence, resourcefulness, and self-reliance are developed within the graphic arts, they will undoubtedly appear in the student's dealing with people is not an untrue statement.

<u>To Develop in Each Pupil the Habit of an Orderly Method of Procedure in the Performance of any Task</u>. Analysis of a piece of printing will reveal that, although there is some variation, there are numerous, basic operations that must be performed to produce that piece of printing. Further analysis will reveal that many of these operations remain constant from job to job, and that they must be performed in a logical,

sequential manner to maintain efficiency.

Again assuming that the students have mastered the fundamentals of hand composition and elementary skills, they are then ready to learn the various steps necessary to complete a job and most important, the order in which they must be performed. There are actually only three major phases. They are: composition, presswork, and any necessary bindery operations. However, there are many steps within the operations connected with each of these phases. They must be followed in a sequential manner and to deviate is impractical.

The sequential steps necessary in the ordinary job of printing are:

1. Planning the job. (Includes the selection of type, paper, ink, and a detailed drawing of the job.)

2. Hand composition (Setting type, pulling a proof, and making corrections.)

3. Figuring stock required.

4. Cutting stock.

5. Locking up the form. (Placing form in chase, assembling furniture, planing, testing for lift, and making adjustments.)

6. Inking the press.

7. Placing form in the press.

8. Makeready. (Involves regulating impression, positioning and sealing the gage pins, setting the grippers, and adjusting ink distribution.)

9. Feeding the press.

10. Removing form from press.

11. Washing the press.

12. Distribution of type and materials.

Perhaps all of the aforementioned operations will not appear in every job, but by following the job through completely, they will appear in the order given. Instruction in each of these steps must be given as they arise and much emphasis placed upon the importance of performing the step at that particular time. For example, it may be noted that "inking the press" is the step preceding "placing the form in the press." This is necessary, as placing the form in the press before inking will permit accumulations of ink to form in many of the tiny depressions in the type face. This will necessitate removing the form and washing it before the work is resumed.

Thus, the graphic arts affords ample experiences to develop within the student this desired habit of performing any given task in a systematic and methodical manner.

To Develop in Each Pupil the Habit of Self-Discipline Which Requires One to do a Thing When it Should be Done, Whether it is a Pleasant Task or Not. It may be seen that the preceding list of operations necessary to completing a job of printing, contains some tasks which might be construed to be "drudgery" on the part of the student. Nevertheless, these tasks must be performed and carried out in the order given.

Outstanding among them would be the "washing of the press."

Perhaps the most dis-liked task in any print shop is this one. Not only is it the most arduous but it is unequivocally the dirtiest job one must perform in the print shop. The student is faced with this job upon completing the press run, unless there is another job to follow immediately which requires the same color of ink. Care must be exercised by the student to make sure there are no traces of ink left either on the disc or on the rollers. If so, this ink will blend with the next color of ink placed on the disc, and if it is in sufficient amounts, it will lead to a discoloration giving an un-true color.

Distribution of type and materials is another dreaded task among students of printing. It is looked upon as being a task of useless activity requiring no appreciable skill or knowledge. To the contrary, distribution of type is quite essential to good shop organization and management. It is quite disagreeable to the student who must stop work and begin searching through galleys of "dead" type for a particular letter, just because another student did not distribute his type upon the completion of the job.

Although there are few tasks to be performed in the graphic arts which might be termed "unpleasant", there are sufficient tasks of such a nature that contributions consummating this objective are not difficult to discover.

<u>To Develop in Each Pupil the Habit of Thoughtful Work Without Loitering or Wasting Time</u>. Referring to the student

foreman type of shop organization previously described,[14] suitable contributions to this objective may be made through this method.

The foreman of each division of the graphic arts shop is held responsible for the efficient operation of his particular division. He soon learns that each division is dependent upon another and that poor organization in one area will lead to loss of time in another. For example, the foreman of the pressroom is dependent upon the foreman and personnel of the composing room for proper flow of work. The interdependency of one area upon the other is soon realized by the students in each area and a certain amount of pride is exhibited by the students in the contributions they make toward the ultimate completion of the job, no matter how small their part may be.

Teamwork, co-operation, group participation, industry, and a value of time may all be stressed in the graphic arts area, and should be emphasized for maximum efficiency.

Realization of this objective is then shown to be possible through the medium of the student-foreman type of program. Rotation of foremen each week makes it possible for all students to have an opportunity to acquire this habit of "thoughtful work without wasting time."

To Develop in Each Pupil an Attitude of Readiness to

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[14] See supra, p. 40.

Assist Others When They Need Help and to Join in Group Undertakings. Attitudes are rather difficult to measure but not hard to discern. Students who are backward and hesitant to take an active part in class activities are easily detected by an alert instructor. Every effort should be made by the instructor to overcome this fear of groups and re-direct the introversive tendencies of the student.

Providing ample opportunities for group participation, the graphic arts can do much toward the fulfillment of this objective. Unless the student is working on a personal project, he is seldom engaged in any individual activity. Rather, he is contributing, in whatever phase of the work he is engaged, a portion of the work necessary for completing the job. Student A is responsible for setting the type, B, for locking up the form, C for the presswork, and D is held accountable for any bindery operations. Mention must be made of the fact that students A, B, C, and D, are not working entirely alone in each of the jobs cited but rather are working in co-operation with other members of the class who also make definite and important contributions to the job.

The preventive maintenance program is another example of group activity. All students should participate in this necessary phase of the shop work and derive from it a sense of doing something useful while co-operating with the group. Participation by all students in the graphic arts shop is not an incidental and occasional thing. It is an integral part

of the routine and a necessary factor.

Development of the other aspect of this objective, "readiness to assist others when they need help" is accomplished through this medium of group participation.

Referring again to students A, B, C, and D, student B may have difficulty in locking up a particularly large form and calls upon Student A for help. Co-operating in this manner, the difficulty is overcome. If not, the instructor should give needed assistance. In another instance, student C, who is the pressman, encounters trouble in the makeready. Seeking assistance, he asks student B for advice and if B knows what is to be done, he may either perform the job himself or direct student C in the necessary steps.

Instructors in the graphic arts should urge students to seek advice from fellow students on problems of design, composition, or other technical problems. The student seeking advice may be more apt to confide in another student concerning a problem than he would with the instructor. And, he may receive as much, or more, satisfaction.

Execution of this objective is a natural function of the graphic arts and is an innate constituent of the program.

To Develop in Each Pupil the Thoughtful Attitude of Making Things Easy and Pleasant For Others. Graphic arts students often become careless in their work and cause inconvenience and loss of time for other students. From the very first day the student uses the type case, he becomes aware of

the importance of exact distribution of type. To pick up wrong font letters, or mis-placed characters, while setting type is quite discouraging. The type cases in the graphic arts shop are for the combined use of all students and the fact must be impressed upon each student that it is his responsibility to keep each case "clean." By so doing, the work of others is made easier and far more pleasant.

One favorable method of reaching this objective is to assign each student a type case for his personal use during the course. With few exceptions, other students will not use the case and it is entirely the responsibility of the student to keep the case clean and in order. He knows that if he becomes careless in his distributions, he will be the one to suffer for his mistakes. In his use of the other type cases in the shop, the student will exercise a greater amount of caution in distributing and setting type, knowing the value of a clean case.

Proper care and storage of the hand tools and equipment used in the graphic arts such as sticks, line gages, quoins and quoin keys, wooden furniture, and spacing material must be impressed upon students. If all are kept in their proper places and in order, the work of all students is far more pleasant and easier. "A place for everything and everything in its place" is a good slogan for any shop, but such a slogan is a necessity for the graphic arts shop. With such a philosophy of shop organization, the instructor and students together reap its benefits of pleasant working conditions and

efficiency.

To Develop in Each Pupil a Knowledge and Understanding of Mechanical Drawing, the Interpretation of Conventions Used in Drawings and Working Diagrams, and the Ability to Express His Ideas by Means of a Drawing. It is not a primary function of the graphic arts to "develop a knowledge and understanding of mechanical drawing." However, the "ability to express an idea by means of a drawing" is given great emphasis. To say that the graphic arts does not completely fulfill the objective and therefore is unworthy of consideration is a fallacious statement. Partial contribution of a subject to any, all, or any part of the objectives warrants curricular consideration.

It has been emphasized that before any student of the graphic arts undertakes a job of printing, he must first have a working knowledge of layout and design principles. The student must portray his ideas by means of a drawing giving all necessary information relative to the job. This would include type style and size, page size, kind of paper, color of ink, and any special instructions. This is known as the job specification sheet and is placed in the job-tracer envelope for routing through the various departments. Without this, the pressman would have little conception of where to position the type or what color of ink to use. The drawing affords all of the information necessary for expediting the job.

Developing this ability to express ideas by means of drawings is an integral part of the graphic arts shop practice. It is among the first things the student must learn to do and is re-current in almost every job he undertakes. The ability is more predominant in some students than others and needs little development. In others, their efforts must be guided and, at times, re-directed to realize the fulfillment of this portion of the objective.

To Develop in Each Pupil Elementary Skills in the Use of the More Common Tools and Machines. Explanation of the manner in which the graphic arts contributes to this objective has been divided into three major headings. They are: (1) trade tools, (2) common tools, and (3) elementary trade operations.

Trade Tools and Machines: Basic skill must be developed in the proper use of the following common trade tools and machines:

1. Composing stick
2. Line gage
3. Make-up rule
4. Hand proof press
5. Hand press
6. Manual paper cutter
7. Slug cutter

Knowledge in the proper use of the aforementioned tools

and equipment is universally necessary in the processes of completing a job of printing. They are acquired through proper demonstration by the instructor and supervised follow-up work.

Common Tools: Use of the more common tools is often necessary in the graphic arts. Particularly in the maintenance of equipment, but such tools are used in the pressroom to make necessary adjustments. For example, end wrenches are used to position the grippers and make needed adjustments on the roller trucks.

Some of the common, basic, hand tools found in any graphic arts shop are:

1. Pliers (Including long nosed and duck-bill)
2. Screwdrivers
3. Box wrenches
4. End wrenches
5. Hammers (Ball pean and claw)
6. Files

With the exception of wrenches and pliers, skill in the other hand tools are not essential to ordinary shop practices but may be acquired through other shop activities.

Elementary Trade Operations: Acquiring an appreciable degree of skill in the use of the common trade tools, the student is required to perform certain necessary operations. Each is designed to develop and strengthen one or more of the desired skills. A partial list follows:

1. Learn the case
2. Plan a job
3. Set type
4. Take a proof
5. Read proofreaders' marks
6. Justify a line
7. Dump a stick
8. Tie up a form
9. Distribute type
10. Clean a case
11. Lock up a form
12. Ink press
13. Feed a press
14. Change tympan
15. Set gage pins
16. Make-ready
17. Figure stock
18. Cut stock

The foregoing list must not be construed to be a complete analysis of operations found within the graphic arts. It is, however, a fairly complete listing of the operations found common to most jobs of printing.

Ability to perform these operations, on the part of the pupil, necessitates skill in the use of both the common trade tools and tools common to various trades.

An attempt has been made in this chapter to show the

correlation between the graphic arts and the industrial arts objectives. Greater contributions are made toward some of the objectives than others, but it has been clearly shown that the graphic arts contributes directly to the fulfillment of all the objectives.

In the following chapter, data will be presented that show the manner in which the graphic arts contributes to the general education of the student. Further, the relationship of the graphic arts to academic subjects will be shown.

CHAPTER IV

THE EFFECT OF PRINT SHOP ACTIVITIES UPON SPELLING AND READING COMPREHENSION

Attention was given in the preceding chapter to the contributions printing affords in the fulfillment of the Industrial Arts Objectives. The fact that printing does contain opportunities permitting the reaching of these objectives was clearly shown. However, this one aspect alone is not sufficient to warrant the graphic arts being included in the general shop, however significant a factor. Of importance, however, are the contributions printing makes toward the general education of the student; particularly in spelling and reading ability. The presentation of data included in this chapter will be divided into two sections: (1) the effects of print shop activity upon spelling, and (2) the effects of print shop activity upon reading comprehension.

The Effect of Print Shop Activities Upon Spelling

Many parents today complain of the fact that the schools are not placing enough emphasis upon this phase of education. They advocate more stress being placed upon the traditional "three R's" and it is sadly true that many of our children are deficient in this respect. The blame for this condition cannot be placed upon one particular thing. Many factors are present which can aid or hinder the situation such as student

intelligence, and amount of instruction received.

The results of a survey conducted by Buford E. Fisher, Superintendent of Schools, Chanute, Kansas, in December, 1951 indicated that parents are very much concerned about this problem of placing more emphasis upon spelling, writing, and other mechanics of English.[1]

A printed questionnaire, along with a printed letter of transmittal, was distributed to the children through the principals of the various schools. Self addressed, stamped envelopes were sent with each questionnaire and thus all replys were returned direct to the superintendent's office. Those bearing written comments from parents were noted by the superintendent, and then all questionnaires were tabulated by a group of Future Teachers in the Junior College Education Department.

"I've had children in Chanute's public schools for fourteen years and this is the first time I've been asked for an opinion. Thanks."; and "We appreciate the effort you and your staff are making to interest parents in improving our schools" are examples of comments that demonstrate the good public relations that came from the survey.

As noted in Mr. Fisher's letter of summation, "Improved public relations was not our purpose in conducting the survey, but it turned out to be a very valuable by-product."

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[1]Data supplied the writer by Buford E. Fisher, Superintendent of Schools, Chanute, Kansas, March 9, 1952.

A total of 900 questionnaires was sent out, and through support by the Parent Teachers' Association and the press, more than sixty per cent were returned.

The final tabulations indicated that the parents of children in the Chanute Public Schools thought more emphasis should be placed respectively upon (1) moral instruction, (2) spelling, (3) writing ability, and (4) religious education.

Of noteworthy importance was the fact that the parents answering this questionnaire believed that the fundamentals of writing and spelling should be included in all courses wherever possible and not just in specialized classes for that specific instruction.

The results further indicated that "Satisfactory" was checked two to one over "Greater Attention" and seventeen to one over "Less Attention."

Table III shows the complete data for the survey. A sample copy of the questionnaire is included in Appendix A.

TABLE III

RESULTS OF A SURVEY CONDUCTED IN DECEMBER, 1951
TO DETERMINE PARENT'S ATTITUDES TOWARD
CURRICULUM IMPROVEMENTS IN THE CHANUTE CITY SCHOOLS

Subject or Aspect of The School Program	Greater Attention	Satis-factory	Less Attention
English Language - Oral	169	273	1
English Language - Written	104	333	1

TABLE III (Cont'd)

Subject or Aspect of The School Program	Greater Attention	Satis-factory	Less Attention
Arithmetic and Mathematics	135	319	
Spelling	235	222	
Handwriting	231	218	1
Reading	175	279	
Health Education	122	312	10
Physical Education	63	340	31
Science	40	367	12
Music	49	370	7
Religious Education	218	217	13
History	45	349	26
Geography	84	328	11
Sex Education	191	194	46
Art	37	364	24
Homemaking	135	281	4
Industrial Arts	53	329	21
Foreign Languages	64	252	83
Consumers Education	93	272	13
Discipline	215	231	1
Guidance	192	229	3
Moral Instruction	253	185	
Civic responsibility	178	235	3
Parent Education	192	212	

TABLE III (Cont'd)

Subject or Aspect of The School Program	Greater Attention	Satis-factory	Less Attention
Summer Playground	204	188	19
Homework	97	289	47
Competitive athletics	35	290	77
Recreational activities	72	298	38
Scholastic standards	84	298	23
Vocational Education	121	290	7
Adult Education	128	247	8
Junior College	88	282	9
Salaries of personnel	154	213	8
Teacher efficiency	169	245	1
Report to parents	214	226	3
Reduction of school taxes	93	255	44
Total	4732	9832	595

It is not the contention of the writer that the graphic arts can entirely correct this deficiency in spelling and writing found in some students today, but rather to state that the contributions of the graphic arts in helping to relieve this situation are of sufficient importance to justify and warrant its being included in the general shop on the junior high school level.

Few known studies concerning the contributions the

graphic arts make toward spelling and reading improvement have been made. However, the study made by Henry Hansburg in 1933 and 1934[2] was notable for the results obtained.

The investigation was made in Public School 75, Queens, New York. It is a school for dull-normal and maladjusted children. Types of students enrolled in the school included educationally retarded, mentally deficient, emotionally maladjusted, truants, dull-normals, foreign born, reading and arithmetic handicapped, and speech defectives.

Considering the types of pupils enrolled, most of the instruction was on an individual and small group basis.

It was believed by Hansburg, who was employed as a psychiatrist in the school, that there was a noticeable improvement in a number of the students in spelling and reading ability who were enrolled in printing.

To substantiate his belief, he conducted four experiments. The results indicated that print shop activity does have a positive effect upon spelling and reading ability. However, this series of four experiments alone is not sufficient evidence to say conclusively that all students who take printing will improve in this aspect. The experiments are also indicative that more investigation should be done in this field.

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[2] H. Hansburg, An Experimental Study of the Effect of the Use of the Print Shop in the Improvement of Spelling, Reading and Visual Perception (Teachers College Contributions to Education, No. 776. New York: Teachers College, Columbia University, 1939), Chapters II and IV.

A brief summary of each of the four experiments is given in the succeeding paragraphs.

The First Experiment

Standardized tests were given to all the students enrolled in the school to determine such factors as mental age, intelligence quotient, and chronological age.

On the basis of these tests, an experimental group and a control group were selected. The experimental group being composed of students taking printing and the control group composed of non-printers.

The first experiment consisted of six paragraphs with key spelling words included in each paragraph. All six paragraphs were dictated to both the experimental and control groups and the spelling scores computed. The median score for the experimental group was 21.2 and the control group median was 20.7. This indicates the two groups were fairly well equated.

Over a period of two weeks the experimental group set the six paragraphs up in the print shop. The control group did not study the paragraphs in any manner.

At the end of the two week period the six paragraphs were again dictated to the students and the spelling scores tabulated.

The median score on the second test for the experimental group was 24.5. The control group median was 21.3.

The ratio of 3.2 may be regarded as sufficiently significant in indicating the typesetting group made greater improvement than the control.

The Second Experiment

To determine the reliability of such an experiment, the test was repeated.

The same six paragraphs were again set up by the experimental group in the print shop, allowing two weeks for them to complete the typesetting.

At the end of the two week period the paragraphs were again dictated to both groups and the spelling scores computed. These scores were subtracted from the scores of the previous test to determine improvement, if any.

The experimental group median score was 26.2, and the median for the control group was 22.8. These scores show a ratio of 3.4 improvement for the experimental group.

Apparently, repeating the same material and extending the time did not affect the reliability of the results as the critical ratios obtained in both experiments are practically the same. i.e. 3.2 and 3.4.

The Third Experiment

This experiment was essentially the same as the first and second experiments but differed in the manner of presentation. The test consisted of one hundred words arranged in

order of difficulty in ten paragraphs, with ten words in each paragraph. Instead of dictating the material to both groups in paragraphs, the key spelling words were dictated in list form to possibly lessen the factor of fatigue.

As in the previous experiments, the words were dictated to both groups and the scores computed. The median score for the experimental group was 59.2, and the median score for the control group was 58.4. Again, this indicates the two groups were closely equated.

Two weeks were allowed for the experimental group to set the ten paragraphs up in the print shop. All key spelling words were underlined in the students' print shop copy.

At the end of the two week period the one hundred words were again dictated to both groups and the scores tabulated. The median score for the experimental group was 65.6 and the median score for the control group was 59.8. The high critical ratio of 4.2 may be partially due to the fact that the key spelling words were underlined for the typesetting group, and in this manner they were brought to their attention.

However, the experiment indicates the general improvement in spelling ability which results from setting up paragraphed material in the print shop.

The Fourth Experiment

Similar methods of experimentation were used in conducting this experiment. The test material consisted of only

forty words arranged in paragraphs in order of difficulty. Only one key spelling word was included in each paragraph.

The forty paragraphs were dictated to both groups and the spelling scores computed. The median score for the experimental group was 17.1 and the median for the control group was 17.2.

Deviating from the usual two weeks time limit, the experimental group was allowed six weeks to set up the forty paragraphs. No underlining system was used in this experiment.

At the expiration of the six week period, the forty paragraphs were again dictated to both groups.

The median score for the experimental group on this test was 21.9 and 19.1 for the control group. The improvement made by the experimental group is highly reliable, as shown by the critical ratio of 5.5. It is more reliable than that obtained by any of the preceding experiments.

Whatever the reason, or reasons, may be, the data which have been presented indicates that printing does have a definite effect upon spelling improvement. Table IV is a summation of these data.

TABLE IV[3]

SUMMARY OF SPELLING IMPROVEMENTS
FOR THE FOUR EXPERIMENTS

Experiment	No. of Boys	No. of Words	No. of Par.	D*	SDD	D/SDD
First.....	32 pairs	60	6	2.7	0.85	3.2
Second.....	32 pairs	60	6	2.9	0.85	3.4
Third.....	38 pairs	100	10	5.0	1.18	4.2
Fourth.....	26 pairs	40	40	2.9	0.53	5.5

*D represents the mean number of words which the experimental groups learned above those learned by the control group.

The constant improvement of the experimental group over the control group is undoubtedly due to the opportunities afforded in print shop activities for exercising the rules of grammar, punctuation, and spelling. The process of constantly checking the material, examining the type set, proving, rechecking, and making corrections would contribute to this improvement in spelling as corroborated by the four experiments. Of greater importance, however, is the fact that printing demands a knowledge of the fundamentals of English. The pupil realizes that he cannot do good work without that knowledge. He is driven to the dictionary to learn how to divide a word, or to a manual of style for some forgotten rule

[3] Ibid, p. 32.

of punctuation. This searching for what he wishes to know in order to make direct application of it helps the student remember the general rule as well as the practical application.

In all his academic work the student is trained in the correct use of English forms, but the training in the print shop is far more effective, because failure to know the form and apply the rule results in much unnecessary work, which the pupil must do in order to obtain the result he himself desires.

Such activity as this seems to explain quite plausibly the improvement in spelling shown by students of printing.

The foregoing experiments must not be construed as conclusive evidence that print shop activity will always effect this type of correlation but merely indicative of its relationship to other academic subjects.

The Effect of Print Shop Activity Upon Reading Comprehension

The problem that now suggests itself is whether the same activities, as carried out in the previous experiments, might not conceivably have some effect upon the students' ability to read and comprehend written material.

Hansburg constructed a reading comprehension test composed of material from books which were in daily use in the school. The fact that the students were familiar with the material was not significant as the scores were to be used

for comparative purposes only.

The initial reading comprehension test consisted of eighty paragraphs arranged in order of difficulty. After each paragraph a question was inserted concerning the material in the paragraph, and below this five possible answers were given. The student was to underline the correct answer to the question.

Construction of the test was such that any student could get at least a few correct and no student could get a perfect score.

The test was given to the entire student body and on the basis of the scores, three groups were selected. One group was the experimental group. Another was the curricular group which came in contact with the material in the test in their regular academic work quite frequently. The third group was the control group which was barred from seeing the test material again until the final test.

Six weeks were allowed for the experimental group to set the eighty paragraphs up in the print shop. The curricular group worked with the material in academic courses during this period, but the control group had no more to do with the material.

At the end of the six week period, the same test was given again to the three groups.

The median scores were as follows:[4]

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[4] Ibid, p. 70.

	Initial Test	Final Test
Experimental	40.1	46.1
Curricular	39.0	42.3
Control	39.6	43.5

The above data indicate that the experimental group had made a reliable improvement in reading ability over that of the curricular and control groups.

Apparently, then, the way in which printing can afford opportunity for improvement in reading comprehension is through the practice in the continuous reading and re-checking of the material.

Whether this ability to read, and comprehend what has been read, will carry over to everyday life is a matter for speculation. But the fact that English teachers expect their oral instructions to be remembered and applied in everyday reading is not questioned.

Why, then, will not these oral instructions of other teachers be more effective if the student is actually using them and applying them in purposeful work? There can be no doubt that the student must apply the various grammatical rules in his work in printing. Punctuation and sentence structure become more meaningful to the student by constantly using the rules of grammar. The student also becomes conscious of infractions of these rules by meticulously seeking errors in the type he has set.

Thus, the data presented in this chapter indicates that by including the graphic arts in the general shop, the students

may gain valuable experience not only in the printing trade, but also experience which is in conjunction with their academic subjects. Specifically, these are: English, spelling, and reading. These three media of expression are ones which the student will employ in all the affairs of his life. His success, or failure, in his school work and future life will largely depend upon his ability to utilize these media correctly, and to their fullest advantage.

It must be concluded that if the graphic arts can assist the student in becoming more proficient in the use of the English language, both written and oral, then its being included in the general shop of the junior high school is worthy of consideration.

CHAPTER V

PRINTING PROCESSES TO BE INCLUDED IN THE GRAPHIC ARTS AREA

In order to lessen the possibility of exploitation by teachers and administrators, it is recommended that the equipment necessary for demonstrating the letterpress, planographic, and intaglio methods of printing be kept on a hand operated basis and of a minimum nature.

Another reason for doing this is to keep the equipment on a level with the students. That is, the students at the junior high level are not so apt to fully grasp the meaning and operation of highly technical equipment.

For this reason, the media of linoleum block, silk screen, and dry point are recommended for general shop instruction.

Suitable examples which illustrate these three basic printing processes, and are appropriate for general shop instruction, must be utilized. They are found in the media of linoleum block, silk screen, and the dry point printing processes. Each of these processes is adaptable to general shop instruction as the material cost, instruction, and space requirements are all at a minimum.

The students are better able to understand the peculiarities of each process by performing the operations themselves, and will take more pride and interest in their work

by doing so.

An explanation of these processes follows and each one's adaptability to general shop instruction shown.

Linoleum Block Printing

Block printing is one of the earliest forms of graphic reproduction and illustrates the letterpress process of printing. i.e., printing from a raised, inked, surface.

Materials: Battleship linoleum is recommended for use in this type of work as it is easy to cut and more durable than inlaid or glazed linoleum. It may be purchased either un-mounted or mounted on a type high block. The latter is preferred, being easier to handle while cutting.

Gouges, knives, and veining tools may be procured from any art supply store. Sets may be purchased having individual cutting tools with permanently attached handles, or a series of blades which are interchangeable in one handle. The latter is less expensive than the permanent type and just as satisfactory.

If the matter of cost is extremely important, very economical tools for linoleum block cutting may be made from discarded umbrella ribs. The ribs should first be cut into three inch lengths. A satisfactory handle may be made by turning one on a lathe or by whittling. A hole is bored in the end of each handle slightly smaller than the umbrella rib. The rib is then driven into the handle about one inch

and securely fastened. Tempering is done by heating the tip to a cherry red and then plunging it into cold water. The tip may be shaped to any desired kind of gouge or V-shaped veining tool while red hot. To sharpen the tool, it is first rough ground on a power grinder and then given a beveled edge. The final sharpening is done on a smooth oil-stone, removing the burr on the inside of the tool with the edge of a slip-stone.

Linoleum block cutting tools made in this manner are very economical and quite satisfactory for instructional purposes.

Other miscellaneous materials needed for linoleum block cutting are: (1) carbon paper and tracing paper for transferring the design, (2) several soft-lead pencils, (3) thumb tacks, and (4) a suitable press for printing the design. Either a hand pilot press or a screw-type bookbinding press is suitable.

Transferring the Design: After the student has selected a design he wishes to reproduce, it must be transferred to the linoleum block. The simplest manner in which this may be accomplished is by placing a sheet of carbon paper face down against the block and placing the design on top of the carbon paper. For best results, the carbon paper and design should be fastened to the sides of the block with thumb tacks or tape to prevent slipping. The lines of the design are then traced with a stylus or hard-lead pencil, transferring the design

from the carbon paper to the face of the block. Care must be exercised in using this method regarding lettering. If there is any lettering in the design, and it is transferred in this manner, the letters will appear in reverse on the block. To avoid this, any lettering must first be traced on a piece of tracing paper. The tracing paper is then turned over, placed in position on the block, and traced in the same manner as the design. By turning the tracing paper over, the letters are actually traced in reverse and will print correctly in the finished design.

If the student wishes to make an original design, the transferring of the design may be facilitated by making the drawing with a soft-lead pencil. The design is then placed face down upon the block and securely fastened with thumb tacks. The back of the paper is then rubbed, or burnished, with the bottom of a spoon, or other suitable burnishing instrument. The same result may be obtained by covering the back of the paper upon which the original drawing is made with red chalk and tracing it.[1]

Regardless of which of the above methods is used, it is desirable to trace over the lines on the linoleum block with black India ink. The detail must be made clear. All portions of the block which are to be cut away may be painted white. Thus, the student can see, before he begins cutting,

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[1] A. Marinaccio and B. N. Osburn, Exploring the Graphic Arts (Scranton: International Textbook Co., 1944), p. 99.

how the final print will appear.

Cutting the Block: The actual cutting of the block is not difficult. However, there are some points involved in cutting the block which should be explained and demonstrated to the student before he begins cutting to obtain best results.

The work of cutting is simplified by firmly fastening the block to the work table by means of a clamp. This prevents the block from turning or slipping and a steady, even stroke may be made with the cutting tool. One disadvantage to fastening the block with a clamp is that the clamp may obstruct arm and wrist movements making cutting difficult. More preferable is the use of a bench stop or a jig to hold the block while cutting. This facilitates cutting as the block is not actually fastened down and may be lifted and turned to any desired position while cutting.

The first step in the actual cutting is to carefully outline the design with a small, veining tool. An important point in cutting the block is to make all cuts holding the cutting tool at an angle to the traced line of the design. This will leave a beveled edge, or a shoulder, and strengthens the printing surface of the block. If deep, straight, right angle cuts are made, the edge of the printing surface is liable to break off after a number of impressions have been made.

After the design is outlined with the veining tool, a

gouge is used to cut away the larger non-printing portions of the design. Cuts should be of a uniform depth, preferably just above the burlap backing of the linoleum.

Ragged edges and uneven lines must be smoothed, and any other defects corrected. A proof of the cut may be taken at this point and used as a guide in smoothing uneven lines and making corrections.

Printing the Block: If the linoleum is mounted on a type high block, it may be locked up in a chase, in the same manner any other type form, and printed in the hand pilot press. Prints may be obtained from un-mounted linoleum by using a screw-type bookbinding press, or other similar type of press. Inking is accomplished by means of a brayer, or composition roller, which distributes the ink evenly over the surface of the block. Satisfactory prints may also be obtained by the use of a discarded washing machine wringer. The wringer should be mounted securely to a table and the rollers adjusted to the proper heighth to accommodate the thickness of the linoleum and paper. For best results, however, the pilot hand press is recommended.

By exercising care in cutting, and utilizing the principles mentioned above, fine reproductions may be made from linoleum blocks. The students can utilize the linoleum block printing method on any type of holiday card, monogrammed stationary, or any other type of personalized printing project.

Due to its wide adaptability, low cost, and simplicity,

the linoleum block method of printing is appropriately suited to graphic arts-general shop instruction.

Silk Screen Printing

There is no printing process more versatile than the silk screen method. It is applied to printing on toys, lamp shades, silk fabrics, posters, glass, china, wood, cork, felt, metals, metallic foil, and cellophane. Other uses are made of the process, but these are the most common. Silk screen printing is an example of the planographic method of printing, or printing from a flat surface. It is rapidly becoming an important industry with widespread uses.

To serve as an exploratory function in the graphic arts area of the general shop, the silk screen method is ideal. The equipment used is the same as that used by most silk screen printing firms, and the techniques and processes are identical. Actually, there are three different methods of silk screen printing. They are: (1) the stencil method, (2) the tusche method, and (3) the photographic method.[2] For the purpose of simplicity of instruction and cost, the stencil method should be used in the general shop program.

Materials: A printing frame of wooden construction is the most important piece of equipment needed to produce silk screen work. Its size will vary with the type of work being

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[2] H. Sternberg, Silk Screen Color Printing (New York: McGraw-Hill Book Co., 1942), p. 10.

produced but a frame having 18"x24" inside measurements would be adequate. The frame should be constructed of light-weight, well-seasoned wood, with strong joints at the corners.

A piece of medium mesh silk (48 meshes per lineal inch)[3] is then stretched taut over the frame and tacked securely to the sides of the frame. The edges and sides of the frame should then be coated with shellac to hold the silk securely in place.

One edge of the frame is then fastened to a table top, or a board larger than the frame, with two pairs of loose-pin hinges. This type of hinge facilitates the removal of the frame for cleaning.

Other miscellaneous items needed for silk screen printing are: stencil material, adhering liquid, a stencil knife, several colors of screen process paint, a squeegee, and a bottle of removing liquid.

Making the Stencil: The stencil material is a thin transparent material attached to a layer of translucent paper. A piece of this stencil material is cut to the actual size of the copy to be reproduced, and is fastened over the copy, film side up. Thumb tacks or masking tape may be used to fasten the stencil material to the copy and cutting board. A very sharp stencil knife is then used to cut out the design, being extremely careful to cut through the film only and not through the translucent backing paper. As an area, or letter,

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[3] Ibid. p. 16.

is cut away with the knife, the thin top film should be carefully lifted with the point of the knife and stripped away from the backing paper.

After cutting the stencil, it is then placed, backing paper and all, film side up, under the printing frame in a position parallel to the sides of the printing frame. A magazine or newspaper should be placed underneath the stencil material to force close contact between the film and the silk. A small cloth saturated with the adhering liquid is then rubbed quickly over the area of silk covering the film. Darkening of the film usually follows indicating it has adhered to the silk. When the entire area of the stencil material has adhered, it should be allowed to dry about fifteen minutes. At the end of this time, the frame may be raised and the backing paper stripped from the film. All open spaces surrounding the stencil are then blocked out with masking tape and adhesive paper to prevent these areas from printing. Masking tape is also fastened to the inside of the screen around the edges of the silk to prevent ink from working in under the frame. When this is done, the stencil is completed, and the student is ready to print.

Printing: Registering the paper to be printed is accomplished by placing a piece of the stock beneath the stencil, and positioning it as closely as possible with the eye. Strips of cardboard are then tentatively fastened to the board with masking tape to be used as guides for accurate

positioning of the stock. Two such strips on the left edge of the sheet and one strip at the bottom are usually sufficient.

A quantity of silk screen paint is then poured along one edge of the stencil, preferably the bottom edge. Silk screen paint differs from ordinary printing ink as it is actually a paint instead of an ink, and is about the consistency of thick cream. Enough paint should be poured to be sufficient to "roll up" in front of the squeegee for several copies. The squeegee is then set squarely on the screen above the paint, and drawn firmly to the lower end of the frame. This action forces the paint through the open parts of the stencil and through the mesh of the silk to the paper beneath the frame. The frame is then raised, and the copy withdrawn. If any corrections are necessary in positioning, the cardboard guides, they can be moved and then firmly glued to the board. This process of pouring the paint on the screen, drawing the squeegee over the screen surface, and removing the printed copy is repeated until the desired number of copies has been made. Due to the consistency of the paint and its rather slow drying qualities, each printed copy must be laid out separately to dry to prevent offsetting. Silk screen copies cannot be stacked one on top of another to dry.

Upon completion of the printing, the silk screen must be washed and cleaned. First clean out all paint. Then apply some of the removing liquid to the face of the silk and

allow it to stand a few minutes. The thin stencil film may then be stripped off. All masking tape and adhesive paper should be removed from the screen and the screen thoroughly cleaned with the removing liquid. All traces of paint must be removed or it will dry on the silk and mar the meshed surface preventing good reproduction on future jobs.

Thus, it may be seen that the silk screen process is quite adaptable to the graphic arts area in a general shop. The limited space, low cost of materials, its versatility, and simplicity of instruction are all important factors in favor of its being included.

The Dry Point Process

Fascinating results may be obtained with this method of reproduction easily and without any appreciable degree of skill. It illustrates the intaglio process or printing from a sunken surface. It requires no special equipment.

Materials: Either engraver's sheet copper or celluloid may be used to make a dry point engraving. The dry point needle may be purchased commercially or one may be made from a phonograph needle mounted in a hardwood handle. If a phonograph needle is used, the point must be honed to an exceedingly sharp point to secure the effect this method of reproduction depends upon. Other than the copper, or celluloid, and the dry point needle, no other special materials are necessary. If celluloid is used, it should be from .02 to .05 inches

thick.[4]

Transferring the Design: The same principles of transferring the design to the material may be utilized as described previously.[5] However, by using celluloid this process is simplified. By placing a piece of tracing paper beneath the original design and a piece of carbon paper, carbon side up, beneath this, the design is transferred to the under-side of the tracing paper in reverse. The tracing paper is then placed beneath the celluloid, fastened with masking tape, and the student is ready to begin cutting.

Cutting the Dry Point: The basic principle of cutting a dry point engraving is to scratch the surface, or plow a furrow, leaving a burred, raised, edge on each side of the engraved line. This burr prints with a characteristic fuzzy or shadowy effect giving the same effect as a photograph which is slightly out of focus. The burr may be removed in places where the student desires a sharp, fine, line. In areas where a solid black effect is desired, cross-hatching is utilized. The closer the cross-hatched lines are to each other, the darker the effect. If the student is using copper, he must be instructed to exercise care in using the needle-point stylus. The surface of the copper should only be scratched and not gouged, as is done in linoleum block cutting.

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[4]A. Marinaccio and B. N. Osburn, op. cit., p. 137.

[5]See supra, p. 78.

Printing: The surface of the dry point engraving is coated with the desired color of ink, applying the ink rather heavily. Then, the surface is wiped clean with a lint-free cloth. This action forces the ink down into the scratched lines of the design. After wiping clean with a rag, a final cleaning with the heel of the palm of the hand is advised. This removes the ink from the areas which are not to print. The plate is then placed in position in the press and the paper placed on top of the plate. Best results may be obtained if a felt "blanket"[6] is placed over the paper. Great pressure must be exerted on the face of the plate, regardless of the type of press used, to force the paper down into the inked lines. The ink sticks to the surface of the paper and is drawn out of the depressions of the plate when the paper is removed.

This process has only one limitation and that is the small number of impressions which can be made from a dry point plate. The pressure which must be exerted upon the face of the plate soon breaks down the burred edges, and the engraving loses its primary characteristic of fuzziness and somewhat blurred detail.

Including the three foregoing processes in the graphic arts area of the general shop affords the student an opportunity to observe the principles of each process and better

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[6]A piece of felt material approximately one-fourth inch thick. Its use assures more even pressure distribution and a better resulting print.

understand its advantages and limitations. By selecting the desired design to be reproduced, and making the necessary plate, or stencil, himself, the student is fulfilling the primary objective of the general shop, which is exploration. He is, at the same time, gaining a valuable understanding of the three basic printing processes.

The linoleum block, silk screen, and dry point printing processes must not be construed as separate entities in the graphic arts area. Rather, they should be regarded as supplemental to the student's regular print shop activities. By having a knowledge of each method, the student will know which one is most suited to a particular piece of printing.

There can be little doubt that each process described in this chapter is a valuable contribution to the student's printing education, and should be included in any graphic arts-general shop program.

CHAPTER VI

THE LETTERPRESS PROCESS, AND AN EXPERIMENT IN PAPERMAKING

The Letterpress Process

Attention was given in the preceding chapter to the silk screen, linoleum block, and dry point processes. Their relationship to any graphic arts course should be of an exploratory nature and to a degree, supplemental to the letterpress process because it is the oldest of the modern methods of printing, and despite the advances in other methods it still predominates in volume and is superior in many of the effects it produces.[1]

Letterpress printing is produced from an inked surface in relief, such as a piece of type. The printing surface is made by cutting away all the parts that are to remain unprinted, allowing the figure, or letter, to stand out in relief. Ink is deposited on this relief surface by means of composition-rubber rollers, while the ink, in turn, is deposited on the paper under pressure to complete the printing.

The linoleum block technique is an example of letterpress printing and was described prior to application of the letterpress process to the general shop-graphic arts area because

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[1] A. Marinaccio and B. N. Osburn, Exploring the Graphic Arts (Scranton: International Textbook Co., 1944), p. 99.

the student who is first given an opportunity to make a linoleum block and follow through with the various stages in reproducing a design by this method will have a clearer understanding of the letterpress process. He will better understand the nomenclature of type and ornaments, their uses and limitations. For this reason, it is well to give instruction in linoleum block technique prior to instruction in typesetting and letterpress printing in a general shop-graphic arts course.

Materials Needed: Equipment and materials needed for letterpress printing should be kept at a minimum in a general shop-graphic arts course. There are several reasons for this. Of great importance would be the cost of such equipment. Such pieces of equipment found in larger school plants, such as cylinder presses and Linotypes, cost as much as $15,000 to $20,000. Equipment of this type is out of the question in equipping such a shop as proposed in this study. A list of equipment and supplies for the graphic arts area is given in Appendix B.

Another reason for keeping letterpress equipment on a relatively small scale and of a minimum nature is to prohibit the use of the shop and equipment for production purposes. School administrators, and teachers, are prone to look upon the school print shop as a means of satisfying their needs for ruled forms, pamphlets, personal stationary, and other printed media. Due to this exploitation, instruction is sacrificed for production. However, by keeping the equipment of the

general shop-graphic arts area on a hand operated basis and of a minimum quantity, this factor of exploitation will be nullified.

There is still another reason for equipping the graphic arts area in such a manner. It is to fulfill the exploratory function of the general shop. No attempt should be made in such a course to develop any appreciable degree of skill. Therefore, complicated and expensive equipment should be eliminated. For example, the hand operated Pilot Press, chase size 6½x10, performs the same function, and gives just as good results, as a fully automatic, 12x18, Kluge Press. The student is able to grasp the meaning of the basic principles of the process, which is all that is intended.

Specifically, the materials and equipment needed for acquainting the student with the letterpress process are:[2]

1. One Pilot Press, hand operated, chase size 6½x10, with at least two chases.
2. One, Chandler and Price, 26½" hand operated paper cutter.
3. Assortment of reglets and wooden furniture.
4. Eight quoins, cam-spring action type.
5. One planer, 8", and wooden mallet.
6. Two quoin keys.
7. Six aluminum alloy, black enameled, Rouse, line gages.

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[2] American Type Founders Printers Catalog, American Type Founders, Elizabeth, New Jersey, 1950.

8. Six, six inch, Rouse composing sticks, pica scaled.

9. One, 30", imposing stone, steel top.

10. Assortment of leads and slugs ranging from six picas to thirty picas in length.

11. Two type cabinets, double style.

12. Assortment of types.*

Methods of Instruction: Perhaps the most difficult task for the beginning printing student to master is committing to memory the California Job Case. However, learning the case should be the first thing the student is required to do. He should be given a printed card depicting the case and showing the location of letters, characters, and figures. With this card, the student can study at home and in his leisure time, and not stand idly about during his class hour.

After the student has gained proficiency in the use of the case, he is then instructed in the methods of hand composition. By following printed examples, the student learns to set type matter flush right, flush left, and centered. He should also be given instruction in setting poetry, staggered indentions, and other exercises designed to increase the students' proficiency in hand composition. Proofs should be taken of each exercise and pasted in the student's scrapbook.

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*See Appendix B for complete specifications on styles and sizes of type.

Concurrent with the student's practice in hand composition, is the instruction in the nomenclature of a piece of type, and brief descriptions of some of the more common type faces, their particular uses and limitations. Figure 1

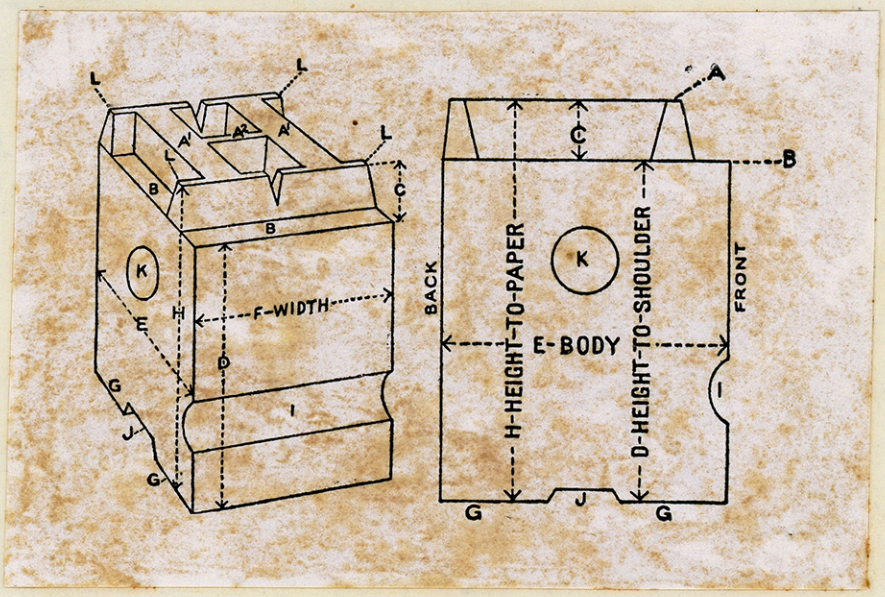

Figure 1

Nomenclature Of A Piece Of Type

illustrates a piece of type and the nomenclature which pertains to it. It is suggested that a large drawing be made similar to Figure 1 for the purpose of group instruction. This information may be made more meaningful to the students if a large dummy of a piece of type is used. It can easily be made from a piece of light wood about 3" square and approximately 20" long. The letter can be cut out on a jig saw and glued to the top of the block. Other distinguishing marks such as the nick and the pin-point can be added and the whole block painted a light grey color to give a realistic metal

effect. A teaching aid such as this would be extremely helpful in stressing the nomenclature of type.

The student should now be given an opportunity to design, set, and print some personal project. Utilization of some of the principles of design discussed in Chapter III should be encouraged and constructive criticisms made by the instructor during the period of designing and setting up the project.

After the type has been set, proofed, and corrections made, the student is then ready to lock the form up for the press. The culmination of all the students' efforts is in the presswork. It involves accurate measurements, careful judgment, and co-ordination of the eyes and hands.

A group demonstration explaining the steps involved in the presswork is quite suitable. This should, however, be followed by subsequent individual instruction as needed. Here, in the presswork, the student is able to apply all of the principles of letterpress printing and further understand the process. He sees the rollers distributing the ink over the face of the type; he sees the type meeting the paper under pressure, and the resulting inked impression; and he is able to see the resulting poor print caused by too much impression, or not enough, which he must correct by adjusting the amount of "packing."

The finished job will undoubtedly serve to give the student a great amount of personal pride and satisfaction for he has indeed created something useful and worthwhile.

Thus, the graphic arts student is introduced to the letterpress process of printing. It is important that he becomes familiar with this type of printing for it affects his daily life more than he might realize. The newspaper, which he usually reads for enjoyment only, is printed by this method, and so are his textbooks, boy scout magazines, and the myriad of other printed media which enter into his daily life at one time or another.

Samples of suitable projects which will illustrate the letterpress process to the student are given in Appendix D.

An Experiment in Paper Making

The making of paper by hand, although an ancient art, has been found to have an interesting effect on students. There is something fascinating about the process and all students of printing should be given an opportunity to participate in this activity.

Equipment needed is simple, inexpensive, and easily obtainable and although the steps in making paper by hand are somewhat limited, they are similar in many respects to those used in industry.

Mixing the Pulp: The first step is to obtain a quantity of clean, white, rags. These should be cut up into half-inch squares and then macerated in a mortar and pestle, or ground with some other blunt instrument until they become fibrous. After this is done, the pulp is placed in a galvanized

tub of sufficient depth to allow the screen to be dipped into it.

Processing the pulp requires a ratio of about one part pulp to ten parts water.[3] It is preferable to let this pulp mixture stand over night to allow it to become thoroughly soaked, and to reach the proper, creamy, consistency. The pulp is then ready to be molded.

Molding: Molding the pulp requires a light, wooden frame with a brass screen stretched taut over it. The screen should have thirty to forty wires per square inch for best results.[4] Before dipping the screen in the pulp, the mixture should first be stirred with a wooden paddle, always having the fibers in suspension, floating at the surface of the water. The wire screen frame is then dipped edge down into the pulp. When the screen is well below the surface, it should be turned horizontally and carefully drawn out of the water. As the water drains from the screen, the screen should be gently shaken back and forth several times to cause the fibers to intertwine and thereby form a stronger sheet of paper.

Removing the pulp from the screen is done by placing a piece of felt, the same size as the inside dimensions of the

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[3] J. M. Fontana, "A Dry Point Etching on Handmade Paper," Industrial Arts and Vocational Education, XL (May, 1951), 210.

[4] A. Marinaccio and B. N. Osburn, op. cit., p. 186.

frame, on top of the pulp. The back of the felt should be gently rubbed with the finger-tips to assure even adherance of the felt to the pulp. Too much pressure, however, will force the fibers through the screen and the pulp will not draw away from the screen properly. In removing the felt, one corner of the felt is raised and slowly drawn towards the opposite corner of the frame. The pulp will draw with the felt. If the pulp seems to break as it comes off the screen, place the felt back down on the screen, and repeat the rubbing with the finger-tips.

Drying: When the desired number of sheets are obtained, they should be stacked one on top of the other. This stack of felts, with alternate water-soaked sheets may be placed on any press or machine that will apply an amount of pressure sufficient to squeeze out the water. Each sheet may then be removed, placed upon a dry piece of felt, and pressed again.

Finishing: Finishing the paper is done by placing each sheet separately, between pieces of heavy linen and placing under heavy pressure. Drying may be facilitated by ironing the linen covered sheets with a flatiron. Many different effects, or finishes, can be obtained in this manner, such as leatherette or burlap, by using the corresponding materials.

Sizing: Handmade paper which is to be used for letter-press or for printing etchings or engravings does not need to be sized. However, if it is to be used for writing, it

is necessary to seal the pores with a size so that the writing fluid will not spread through the fibers. This is done by melting a half-dozen sheets of gelatin in a pint of hot water with a half-ounce of alum added.[5] The size can be applied with a brush, sprayed on with a spray gun, or the sheet can be dipped into the solution while it is still warm. A thin coat of the liquid will adhere to both sides of the sheet which seals the pores when dry. The paper should then be hung, vertically, to dry.

Combining the Letterpress Process and Handmade Paper

A most unique effect can be achieved by combining letterpress and paper making. By setting the copy that is to be reproduced in a type such as Caslon Oldstyle Italic or Cloister Black, a harmonious effect is reached between paper and type face. It would be most incongruous to combine a modernistic, sans-serif, type with the handmade paper.

If the student desires to reproduce a quotation, verse, creed, or other short piece of prose, a large initial letter should be used for the first letter of the first word of the text. This initial letter should be printed in a separate color but it is not mandatory. A red initial letter with the rest of the type printed in black is a desirable combination. The effect produced, when viewed by a layman, would be of an

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[5] Ibid, p. 189.

antique nature, or resembling the type of printing that was done in the last century.

The completed project may then be framed by the student and, if desired, hung in his home as a valuable, artistic piece of work that can be treasured as a keepsake for many years. His pride in the piece of work is more than justified, for he has indeed created something useful and worthwhile, which is one of the prime objectives of such a course in the graphic arts.

CHAPTER VII

INFORMATION RELATING TO PAPERS, THEIR QUALITIES AND USES, TO BE INCLUDED IN THE GRAPHIC ARTS INSTRUCTION

Closely associated with the experiment in papermaking, described in the previous chapter, is instruction relating to the more common kinds of papers, their specifications, qualities, and uses. The student of printing in the general shop should not be expected to comprehend all the kinds of papers and their uses, as this would entail a great deal of instruction and would utilize more time than should be given to the subject.

However, the graphic arts student should be given basic instruction in a few of the more common papers he will come in contact with in his work in the shop. Preceding this instruction should be a brief lesson on the history of paper to form a background for the student on the evolution of paper, and a better understanding and appreciation of paper.

The History of Paper

By about 3,000 B.C., the Babylonians, who inhabited the rich valley between the Tigris and the Euphrates rivers known as the Plain of Babylonia, had invented a system of record keeping which was called cuneiform writing, a name derived from the Latin words cuneus, meaning wedge, and forma, shape.

Cuneiform writing consisted of wedge-shaped characters and modified hieroglyphics which were impressed or punched by means of a stylus into lumps of soft clay. These then were hardened by baking and were used in keeping records and carrying on correspondence with the Egyptians. From these cuneiform records has come evidence of a civilization antedating the Egyptians; this civilization had been using crude written language and records as early as 6,000 B.C.[1]

As progress continued toward the development of a usable alphabet, the need arose for a medium more suitable and durable than stone and clay tablets for record keeping.

The discovery by the Egyptians of the first paper, papyrus, helped to relieve the situation. They found that the pith of a tall reed which grew along the Nile River could be treated, pressed out into sheets, and made into an excellent material for conveying written messages. Papyrus withstood decay for long periods of time and, if handled carefully, this first paper was well adapted to the keeping of important records.

The oldest papyrus rolls which have been found were taken from mummy cases dating from about 3,500 B.C.

Europe was denied papyrus because of the conquest of Egypt by the Arabs. During the so-called "Dark Ages," which continued almost without interruption from the fifth to the

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[1]Albert A. Sutton, Design and Makeup of the Newspaper (New York: Prentice-Hall, Inc., 1948), p. 4.

twelfth century, knowledge was practically stamped out by war, suspicion, ignorance, and superstition. Many written records were destroyed and little was done to further the art of papermaking.

The Greeks and Romans, who were without this writing material called papyrus, wrote their messages on tablets covered with wax, and the Romans developed new kinds of writing materials. One, made from the skins of sheep and goats, was known as parchment; another which was made from calf skin was called vellum. Both were expensive but very durable and have remained in use to some extent ever since.

The year A.D. 105 is usually the date set for the invention of paper.[2] In that year Ts'ai Lun, of China, reported his discovery of paper to the Emperor. Before this time, writing in China was done on bamboo or on pieces of silk, but neither material proved satisfactory.

After Ts'ai Lun's discovery of the invention of paper, the art spread gradually westward, reaching Egypt about A.D. 900; Spain in 1150; Italy about 1270; and Germany in 1390.[3]

Papermaking took its rightful place as one of the great inventions of Man and its ever-increasing demand produced better and faster means of producing it.

The following is a brief account of the papermaking

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[2]Dard Hunter, Papermaking, The History and Technique of an Ancient Craft (New York: Alfred A. Knopf, 1947, p. 50.

[3]Ibid, p. 61.

processes which developed after the art spread to Europe.[4]

1100 Paper first made in Europe.

1494 First mill started in England.

1690 Rittenhouse started first American Paper Mill at Roxborough, near Philadelphia.

1798 Louis Robert of France invented the Fourdrinier Machine

1809 John Dickinson of England invented the Cylinder Machine.

1827 First Fourdrinier Machine set up in United States.

1840 Ground wood invented in Germany by Keller, whose observations of wasp's nests inspired the idea.

1854 Soda Pulp invented in England by Watt and Burgess.

1866 Sulphite Pulp invented by Tilghman in the United States.

1882 Sulphite Pulp first made by C. S. Wheelwright of Providence, Rhode Island.

1884 Sulphate Pulp invented by Dahl.

1886 Ground wood first made at Curtisville, Mass., by Pagenstecher.

1890 By this time a new paper industry had been built up in the United States.

1933 America produced half of the paper output of the World.

1950 America the largest producer and consumer of paper in the World.

With this rather brief account of the history of paper-making, the student is afforded a background for better

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[4]Morten A. Gundersen, "A Proposed Course of Study for Teaching Paper Technology in Relation to Printing in the Vocational Shop" (Unpublished master's thesis, Kansas State Teachers College, Pittsburg, 1951), p. 15f.

understanding some of the papers found to be in common use today.

The students' contacts with the various kinds of printing papers will be rather limited, but in such an elementary course in the graphic arts he will, in all probability, deal with; (1) bond papers, (2) cover papers, and (3) newsprint.

Bond Papers

The students' experiences in dealing with bond paper will probably be in the form of printing some personalized stationary. He should be instructed in the various kinds, sizes, and finishes of bond papers so as to make wise selections in his choices.

Bond papers are packaged in reams consisting of 500 sheets. The most common size is 17x22 to facilitate cutting four 8½x11 sheets out of one sheet of bond paper. This is the most used stationary size.

The common weights of 17x22 bond paper are thirteen, sixteen, twenty, and twenty-four pound. The basic weight is twenty pounds. By the "weight" of paper is meant the weight per ream (500 sheets) or 1000 sheets. Thus, 500 sheets of 17x22 bond paper would weigh twenty pounds, 1000 sheets of bond the same size would be doubled to forty pounds.

Bond papers are manufactured to be used in printing by the letterpress method. The better grades of bond paper are used for business and social letterheads, envelopes, deeds

and other legal certificates. Other grades are used for office forms, price lists, and circular letters.

Best results are obtained if a special bond ink is used in printing. This is due to a hard sizing on the surface of the paper to make it suitable for writing. Sizing does not permit the ink to penetrate the fibers of the paper, thus the ink used must be of a type that will dry by oxidation (action of the air) rather than by penetration.

The more common colors of bond papers are: (1) white, (2) buff, (3) canary, (4) pink, (5) blue, and (6) green.

Being given this information, the graphic arts student has a basic understanding of the sizes, weights, colors, and printing characteristics of bond papers, and will be better enabled to make proper selections of type and paper to produce the desired harmonious effect.

Cover Papers

As the name implies, cover papers are used for covers, or outside bindings, on pamphlets, booklets, programs, and paper bound bulletins. Cover stock is also used for tickets, placards, and other jobs requiring a paper that is reasonably stiff and resistant to handling. Wood pulp, hemp, jute, rags, and other fibers are used in making cover papers to make them stronger and tougher in order to wear, fold, and stand up under rough treatment.

Cover stock is available in a wide range of colors,

weights, and finishes, including antique, ripple, crash, laid, wove, plate, and imitations of wood, marble, leather, and other materials having peculiar grains or finishes. Unique effects may be achieved by utilizing cover papers having these various imitation finishes described.

The common sheet sizes of cover papers are 20x26, 23x35, 26x40, and 35x46, and are available in twenty-five, thirty-five, forty, fifty, sixty-five, eighty, ninety, and one-hundred pound weights.[5]

Cover papers are usually packaged in cartons which is a unit of paper stock packed in a single carton or box and is sold at a lower unit price than is charged for less than a carton of the same stock.

The versatility of cover stock makes it adaptable to many jobs of printing and can be used either on hand fed platen presses or automatic cylinder presses.

Some of the projects listed in Appendix D are printed on various cover stocks and are examples of the manner in which the graphic arts student becomes acquainted with cover stocks.

Newsprint

One of the cheapest papers on the market today is newsprint. It is used primarily, as the name implies, to print the thousands of newspapers which are delivered to homes all

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[5] Ibid, p. 40.

City .....
School .....
County .....
District No. .....
If Rural or C S D. If city give street address

STATE OF KANSAS
DEPARTMENT OF PUBLIC INSTRUCTION
ADEL F. THROCKMORTON, State Superintendent

School Year 195__—195__
Date Received .....
Class (Last Year)
(A-B-C-M)

HIGH SCHOOL PRINCIPAL'S ORGANIZATION REPORT

DUE AT THE OFFICE OF STATE SUPERINTENDENT OF PUBLIC INSTRUCTION OCTOBER 15, EACH YEAR

ADMINISTRATION

SUPERINTENDENT ..... Salary .....
Years in present position, including current year .....
Years experience in elementary school ..... H. S .....
Check the type of Administrator's Certificate held.
PROVISIONAL ADMINISTRATOR'S CERTIFICATE .....
DATE OF EXPIRATION .....
LIFE ADMINISTRATOR'S CERTIFICATE .....
PRINCIPAL ..... Salary .....
Years in present position, including current year .....
Check the type of Administrator's Certificate held.
PROVISIONAL ADMINISTRATOR'S CERTIFICATE .....
DATE OF EXPIRATION .....
LIFE ADMINISTRATOR'S CERTIFICATE .....
BOARD OF EDUCATION (Give name of each member):
President .....
Clerk .....
Treasurer .....
.....
.....
.....

SCHOOL ENROLLMENT

List only grades in your organization

Year	(a) High School			(b) Elementary School	
	Boys	Girls	Total	Grades	Grades
7				Kindrg'n	
8				1	5
9				2	6
10				3	7
11				4	8
12					
P. G.					
Total					

Number of high-school students from outside the high-school district:
Boys ..... Girls ..... Total .....
Number of high-school pupils from outside the county:
Boys ..... Girls ..... Total .....

INFORMATION REGARDING LAST GRADUATING CLASS

In Higher Institutions			In Gainful Occupations		
	Boys	Girls		Boys	Girls
State University			Trades		
Agricultural College			Farming		
Teachers College			Business		
Other Colleges			Teaching		
Commercial Schools			Nursing		
Junior College in the County			At Home		
			Military		
Junior College in Other Counties			Unknown		

Number of students graduated from your high school last spring:
Boys ..... Girls ..... Total .....

ORGANIZATION

This form, printed on yellow paper, will be used for junior high schools organized as distinct and separate units.

Population of city ..... Area in square miles of district .....
Valuation of district for current year .....
Bonded debt .....
Mills levied: For general operation .....; for indebtedness .....
Current budget for high school:
* Operation expenses ..... Capital outlay .....
TYPE OF ORGANIZATION (As recognized by State Department of Public Instruction):
Underscore plan used. 8-4, 6-6, 6-3-3, 6-2-4, 6-4-4, 6-3-3-2.
State any change you wish in above type of organization .....
.....
HIGH SCHOOL—Organized under what law: (Underscore):
Community, Rural, City 1, City 2, C S D, Private
Underscore the length of your class periods—40 min.; 60 min.
Length of all laboratory periods ..... Number per week .....
How many units do you require for graduation? .....
.....

* For High School only.

Number of Pupils Carrying for Credit

Less than 4 units	4 units	5 units	More than 5 units

SIZES OF CLASSES

No. pupils in class	1–5	6–10	11–15	16–20	21–25	26–30	31–35	Over 35
No. of Classes								

School accepting credit from nonaccredited schools thereby jeopardize their own accreditation.

On what basis do you admit students from other schools to advanced standing in your school? .....
What grade is required for passing? .....
Are accurate, complete, and cumulative records kept for each student?
.....
Do you use textbooks adopted for high schools? .....
Date of opening of school this year ..... 19.....
year ends .....; length of school term in days .....

FACULTY

	Men	Women
Number High-school Teachers		
Highest Annual Salary		
Lowest Annual Salary		
Average		

(In the above statements do not include salaries of superintendent or principal or any faculty member who devotes one-half of his time to administrative or supervisory duties.)

LIST OF COURSES OFFERED FOR CREDIT TOWARD GRADUATION

SCHEDULES FOR GRADES 7-8 WILL BE FILLED OUT BY SIX-YEAR HIGH SCHOOLS ONLY

SCHOOLS MAINTAINING A JUNIOR HIGH SCHOOL WILL MAKE A SEPARATE REPORT

REQUIREMENTS: Grades 9-12

1. To majors of three units each.
   a. First major, English. *b.* Second major, 3 units of one of the remaining groups.
2. Two minors of two units each. One must be in social science unless social science is a major.
3. One half unit of American Government including Constitution of the United States.
4. One unit of American History.
5. One unit of Mathematics.
6. One unit of Laboratory Science.
7. One unit of Physical Education.

Indicate only those subjects which are offered this year

		Grade in Which Subject is Offered This Year	
		1st Sem.	2d Sem.
Group I English. *Required In addition to the required English Major A Minor may be taken in this Group	*7th Grade English		
	*8th Grade English		
	*English I		
	*English II		
	*English III		
	English IV		
	Language Arts		
	Speech		
	Dramatics		
	Forensics		
	Journalism		
Group II Mathematics. *Required **One of these required	*7th Grade Mathematics		
	*8th Grade Mathematics		
	**9th Grade Math. (Algebra I)		
	Algebra II		
	Plane Geometry		
	Solid Geometry		
	**General Mathematics		
	Trigonometry		
	**Commercial Arithmetic		
Group III Social Science. *Required	*7th Grade Social Science		
	*8th Grade Social Science		
	Citizenship		
	Vocations		
	World History		
	World Geography		
	Ancient History		
	Modern History		
	*American History		
	*American Government, Including Constitution of the U. S.		
	Economics		
	Sociology		
	International Relations		
	Psychology		
	Guidance		
	†Driver Education		
Group IV Sciences. *Required **One of these required	*7th Grade Science		
	*8th Grade Science		
	**Practical Laboratory Science		
	General Science		
	Physical Geography		
	Agriculture (Gen.)		
	**Biology		
	**Physics		
	**Chemistry		
	Physiology		
	Aeronautics		

		Grade in Which Subject is Offered This Year	
		1st Sem.	2d Sem.
Group V Languages.	Latin I		
	Latin II		
	Latin III		
	Spanish I		
	Spanish II		
	French I		
	French II		
	German I		
	German II		
Group VI Business Education	Arithmetic		
	Bookkeeping I		
	Bookkeeping II		
	Business English		
	Geography (Commercial)		
	Law		
	Penmanship		
	Shorthand I		
	Shorthand II		
	Typewriting I		
	Typewriting II		
	Junior Business Training		
	Secretarial Practice		
	Salesmanship		
	Office Practice		
	Part-time Training		
Group VII Industrial and Vocational Subjects. *Required. #Three units of Voc. Agriculture or three units of Voc. Home Economics will meet the Science Requirement.	*7th Grade Home Economics		
	*8th Grade Home Economics		
	Home Economics I		
	Home Economics II		
	Home Economics III		
	*7th Grade Manual Training		
	*8th Grade Manual Training		
	Woodwork I		
	Woodwork II		
	Mechanical Drawing		
	General Shop		
	Auto Mechanics		
	Printing		
	#Voc. Agriculture I		
	Voc. Agriculture II		
	#Voc. Home Economics I		
	Voc. Home Economics II		

Indicate only those subjects which are offered this year

† One-half unit

Daily Program for ________ Senior High School

*Hour

List teachers alphabetically TEACHERS	1st Period Length of Rec. | Study Subject	No. in Class	2nd Period Length of Rec. | Study Subject	No. in Class	3rd Period Length of Rec. | Study Subject	No. in Class	4th Period Length of Rec. | Study Subject	No. in Class	5th Period Length of Rec. | Study Subject	No. in Class	6th Period Length of Rec. | Study Subject	No. in Class	7th Period Length of Rec. | Study Subject	No. in Class	8th Period Length of Rec. | Study Subject	No. in Class

* Hour (9:00-9:40, etc.)

Fill in carefully. Be sure that the enrollment by classes, length of study and recitation periods, and names of subjects taught are given.

....HIGH SCHOOL

ST TEACHERS ALPHABETICALLY Give full name. Do not use initials. Married women should include maiden name, f certificate was issued prior to marriage. NAME	KANSAS CERTIFICATE Kind (State exact title of certificate) (Degree) (Life) Life D. Sp. in (............)	Date of Expiration Mo.	Date of Expiration Yr.	Annual Salary	Years Experience (Include this year) This School	Years Experience (Include this year) Other Schools	Name of High School in which Teacher Taught Last Year
Example: Ward, Lucy Belle (Leslie).................. Last, First, Middle, (If married woman) Maiden	(Degree)	June	1953	$4,200	2	8	Goff
erintendent....................................							
ncipal							

In giving the kind of certificate held, use the abbreviations enclosed in parentheses.

Certificates issued by the State Superintendent of Public Instruction—Degree Certificate (Degree); Life Degree Certificate (Life); Special Certificates good for teaching the branch
fied (Sp. in__________________).

Issued by Kansas State Teachers College—Life Diploma granted on completion of the B. S. Degree in Education prior to July 1, 1947 (Life D.).

‡ This column is to be filled out only for teachers of mathematics, foreign languages, and commerce in A & B Schools. In C schools list all H. S. Units in field.

Teachers and administrators must meet all qualification requirements by October 15.

SCHOOL YEAR, 195.....-195.....

COLLEGE TRAINING		SCHOLASTIC PREPARATION (Information is to be secured from official College transcripts)							
Name of College	Degrees Held and Dates Issued	Subjects Taught in High School This Year	Sem. Hours in Subject	‡H. S. Units in Field	Sem. Hours in Field	Subjects Taught in High School This Year	Sem. Hours in Subject	‡H. S. Units in Field	Sem. Hours in Field
Marymount	B. S. '40	Algebra	10	1½	30	Physics	8		40
Kansas University	M. A. '44	Geometry	5	1	30	General Science	3		40
		Trigonometry	5	0	30				

EDUCATIONAL PROGRESS

What additions or changes have been made in your high school since September 15 of last year in—

(1) Building and grounds?

(2) Equipment?

Laboratory?

Library?

Shop?

Home Economics?

Business Education?

(3) Teaching force?

Number of new staff members..... Number inexperienced.....

Give reason for any excessive turnover of teachers .....

.....

.....

(4) Courses of study?

Total units offered this year.....

Subjects added this year.....

.....

Subjects dropped this year.....

.....

List subjects alternated but not offered this year .....

.....

TRANSPORTATION

How many buses are owned by the district?.....

How many pupils are served by the buses?..... Cost per pupil? .....

How many pupils are transported by other means?..... Cost per pupil?.....

How many miles are traveled daily by the buses? .....

How many miles in the longest route?.....

What is the longest time any one pupil is on bus? .....

If both (1) secondary pupils and (2) elementary pupils are conveyed, how many of each? (1).....

(2).....

Does the bus driver have other school duties?..... If so, what?.....

HEALTH AND PHYSICAL EDUCATION

1. Name of school nurse, if one is employed.....

.....

2. Do you have school lunch service? If so, is it sponsored locally or with federal funds?.....

How many pupils are served daily?.....

3. How many semesters of physical education do you require of boys?.....; of girls?.....

4. Do you have an organized and functioning intramural program for boys?.....; for girls?.....

5. Is everyone required to participate in either the major athletic or in the intramural program?.....

6. Is your school a member of the State High School Activities Ass'n?.....

7. Does the school own a separate athletic field, if so, how many acres?.....

What grades are enrolled? Maximum size of class?

Boys..... Girls..... Boys..... Girls.....

No. of minutes per week? Minimum size of class?

Boys..... Girls..... Boys..... Girls.....

Does the school have a director of physical education?

(a) For boys.....

(b) For girls.....

Who coaches athletic teams?

Boys..... Girls.....

.....

.....

MATTERS OF SPECIAL INTEREST TO THE ADMINISTRATION

School.....

City.....

GENERAL POLICIES, PLANS, AND PROCEDURES

Records and Pupil Accounting

1. Are school records kept in fireproof safe or vault?.....
*2. Do all teachers have proper certificates?.....
3. Is an official transcript of each teacher's college preparation kept on file?.....

(By an official transcript is meant the institutional credit records certified by the registering officer of the higher institution, and carrying the seal of that institution).

4. Have these official records been used as basis for reporting on teacher training in this report?.....
5. Are official transcripts checked before employing and assigning teachers?.....
6. Do you have a complete inventory of all equipment?.....
7. Is the inventory kept in fireproof safe or vault?.....
8. Is a permanent system of individual pupil records maintained?.....
9. Check the items of information recorded on the individual pupil permanent record cards: School marks.....; Intelligence test scores.....; standardized test results.....; health, character, personality and other ratings.....; record after leaving school.....
10. Check the record forms used: Registration card.....; program card.....; health record.....; attendance record.....; guidance record.....; activities record.....

* This means a valid certificate in force at the beginning of the school year, or as of October 1.

EDUCATIONAL OUTLOOK

Do you have a PTA?..... Other similar organization?.....
Are all teachers members of the Local Teachers' Association?.....
State Teachers' Association?.....
National Educational Association?.....
Kansas Association of Secondary School Principals (for Superintendent or Principal).....
Is the attitude of the community conducive to the best interest of the school?.....
Does the board elect school employees **only** on recommendation of the administrative head of the school system?.....
Does the community extend a cordial welcome to the teachers to become a part of the community life of the community?.....
Do teachers become members of the local clubs or society of the community?.....
Are teaching defects and weaknesses discussed with the individual teacher in order that the teacher may remedy such weaknesses?.....
Is dismissal of teachers looked upon as a last resort in the improvement of instruction?.....
Are teachers notified of reemployment or dismissal in due time?.....
Does the administration plan in terms of a long time educational program?

a. Is tenure of teachers and administrators satisfactory?.....
b. Redecoration and repair of building (both exterior and interior)?.....
c. Repair and replacement of:
   1. Laboratory Equipment?.....
   2. Shop Equipment?.....
   3. Home Economics Equipment?.....
   4. Library?.....
   5. Permanent office and class furniture?.....
   6. Typewriters?.....

Is satisfactory janitor service provided?..... Are janitors under contract?..... Are janitors under the supervision of the principal or superintendent?.....
Is there adequate provision for janitorial supplies?.....
When selecting a janitor, is care given to the personal qualifications and habits as the basis for fitness for the particular position he is to fill?.....
Has he had special training?..... How recently?..... For how many months employed?.....
Name of chief janitor or custodian..... Salary.....

HANDLING OF ACTIVITY FUNDS

1. Is an accounting system used for your High School Activities?.....
2. Who is responsible for the accounting of the activities finances?.....
3. Do you have a surety bond?..... Yes No
4. Do you issue serially numbered duplicate receipts for all money received?..... Yes No
5. Do you pay out money only by serially numbered checks?..... Yes No
6. Do you make monthly and annual summary reports to your school board?..... Yes No
7. Do you maintain a columnar account book?..... Yes No
8. Do you use serially numbered tickets for admittance to school events..... Yes No
9. Do you have a regular audit?..... Yes No

THE GUIDANCE PROGRAM

1. Name your counselors who have regularly assigned individual counseling duties and indicate for each the number of periods devoted to counseling and the number of semester hours of professional training in the guidance field.

NAME	Periods Per Day	Semester Hours Training

2. Evaluate the following aspects of your guidance program by checking the appropriate column as follows: Column 1, Well-developed; column 2, Some attention given; column 3, Only incidental attention given.

	1	2	3
a. Assists the student to know himself on a comparative basis in terms of his abilities, capacities, and aptitudes.			
b. Assists the student to make personal adjustments and educational plans in light of his individual needs.			
c. Uses an individual cumulative record for keeping the data needed for guidance services.			
d. Files occupational and educational information in a systematic way for ready availability and use.			
e. Uses occupational and educational information in both group and individual situations.			
f. Assists students in knowing about occupational and employment opportunities on both a local and national level.			
g. Assists students in knowing about and selecting opportunities for further education or training.			
h. Follows up graduates and drop-outs in a systematic way for the purpose of gathering information for use by the school staff in planning the educational program.			

GROUNDS—BUILDING—EQUIPMENT

1. How large is the school ground?.....
2. When was the building erected?..... Cost?.....
3. Number of rooms used for high-school purposes?.....
4. Does each room have equipment suitable for the purpose for which it is used?.....
5. Do you have suitable furniture and equipment for Home Economics?..... Shop?.....
   Bookkeeping?..... Typewriting?.....
6. Is your laboratory equipped with suitable laboratory furniture? ..... Check the subjects for which the science equipment is adequate: General Science.....
   Agriculture..... Biology.....
   Physics..... Chemistry.....
7. Is provision made for necessary decoration and repair of building?

AUDIO-VISUAL INSTRUCTIONAL MATERIAL

1. Material used—check types used
   - Motion pictures
   - Film strips
   - Slides
   - Mounted pictures
   - Exhibits and demonstrations
   - Charts and posters
   - Globes and maps
   - Field trips
   - Radios
   - Recordings
2. Amount of time given to this type of instruction.....
3. Are materials used as part of regular instruction in the classroom? .....
4. Are materials kept up-to-date?.....
5. Name of person in charge.....
6. List (below) the material and equipment in good condition.....
   .....
   .....
   .....

ADMINISTRATION

1. Are meetings of board held regularly?.....
2. Are formal minutes of each meeting kept?..... By whom?.....
   If school is CSD, RHS or Community are copies of minutes sent to the County Superintendent?.....
3. Are the meetings attended by the Superintendent?....., the Principal? .....

ORGANIZATIONS OR ACTIVITIES

Names of literary, debating, athletic, music, or other pupils' organizations, clubs and activities worthy of favorable comment	Approximate membership	Number of meetings in year	Name of supervising teacher	Is school credit given for satisfactory work and, if so, how much?
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Group VIII Music–Art *Required.	*7th Grade Music		
	*8th Grade Music		
	Chorus		
	Glee Club		
	Orchestra		
	Band		
	Music Appreciation		
	Art		
Group IX Physical Education *Required	*One unit of Physical Education during high-school course.		

ADULT EDUCATION

Enrollment .....

Courses offered .....

.....

.....

Are regularly qualified high-school teachers employed? .....

When are classes held? .....

Is high-school credit given for this work? .....

How is adult education financed? .....

LIBRARIES

1. Number of volumes in library .....
2. Number of volumes withdrawn since last report .....
3. Appropriation for library this year: (High School only)
   Books ..... Periodicals .....
4. Is there a public library in your city? .....
5. Is your library under the supervision of: (Check)
   Professionally trained librarian .....
   Teacher-librarian .....
   Study hall keeper .....
   Teacher without training in Library Science .....
6. Name of librarian .....
7. Number of semester hours in library science .....
8. Number of years library experience .....
9. Is systematic instruction given in use of library? .....
10. Are your books catalogued with Dewey decimal system? .....
11. Name of most recently acquired set of encyclopedia .....
    .....
    Date of copyright .....
12. Latest unabridged dictionary .....
    Date of copyright .....
13. Is "Readers' Guide to Periodical Literature" in your library?
    ..... Abridged? .....

14. Distribution of volumes in library:

Classification	Total number on hand	Number added since last report
000 Reference		
100 Philosophy		
200 Religion		
300 Social Science		
400 Philology		
500 Natural Science		
600 Useful Arts		
700 Fine Arts		
800 Literature		
900 History		
Travel		
Biography		
Fiction		

15. List Magazines and Newspapers (If more convenient attach list)

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SUPPLEMENTARY REMARKS

Additional remarks:

Major problems confronting your school system:

It is exceedingly desirable and highly recommended that this report be discussed fully in school board meetings, so that the school boar members may become familiar with the school organization, procedure, and requirements.

Before signing this report please look it over and see that every item has received proper attention.

Signed: .....Prin. or Supt.

.....Clerk of Board

23-8397-s 6-51—5400

"HOW CAN THE SCHOOLS OF CHANUTE BE IMPROVED?"

Subject or Aspect of the School Program	Greater Attention	Satisfactory	Less Attention
English Language — Oral			
English Language — Written			
Arithmetic and Mathematics			
Spelling			
Handwriting			
Reading			
Health Education			
Physical Education			
Science			
Music			
Religious Education			
History			
Geography			
Sex Education			
Art			
Homemaking			
Industrial arts			
Foreign languages			
Consumers Education			
Discipline			
Guidance			
Moral Instruction			
Civic responsibility			
Parent Education			
Summer playground			
Homework			
Competitive athletics			
Recreational activities			
Scholastic standards			
Vocational Education			
Adult Education			
Junior College			
Salaries of personnel			
Teacher efficiency			
Report to parents			
Reduction of school taxes			

over the United States each day. It is consumed in great quantities each day and for this reason must be reasonably inexpensive and available in vast quantities.

Newsprint is purchased either in rolls or sheets. Rolls are purchased by the larger newspapers having high speed rotary presses. It is purchased in sheet form by smaller newspapers and publishing firms using hand fed cylinder presses.

Like most other papers, it is available in several sizes, weights, and finishes. Some newsprint is rather slick or has a coated effect while others have a rough, un-coated finish of "fuzzy" effect. This is found in the very cheapest grades of newsprint.

There is little else for the student to know about newsprint other than its primary use and to recognize it when he sees it.

A knowledge of papers is as essential to the student of printing as a knowledge of the various woods is to the woodworking student. It is the medium with which he expresses his thoughts and ideas and therefore is an essential and integral part of the graphic arts instruction.

No student of printing can be expected to do commendable work without this basic knowledge of papers and if the student has a background and technological knowledge of papers, it follows that his work will be easier for him and, in all probability, of a higher quality.

This is, in itself, sufficient justification for including such instruction in a general shop graphic arts course.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

An attempt has been made in the foregoing chapters to show that the graphic arts area has a rightful place in the general shop curriculum.

It was shown that the basic philosophies of the general shop are in accordance with the activities carried on in the graphic arts and that the graphic arts afford many opportunities for the fulfillment of various objectives of an industrial arts program.

The graphic arts fulfills the prime objective of the general shop, exploration, through the media of linoleum block printing, silk screen printing, and the dry point process. Also, the graphic arts are especially helpful in instilling within the students the desirable qualities of appreciation of good design, careful and methodical workmanship, an attitude of being helpful to others, and proper care and use of the things they buy or use.

A definite need for including the graphic arts area in the general shop curriculum was shown to be apparent by the fact that of the 157 general shops in Kansas, only ten have such a program in their general shops.

Results of the experiments by Hansburg indicate that printing does contribute to the general education of the student in the areas of spelling and reading comprehension.

The four experiments conducted by Hansburg are not conclusive proof that all students enrolled in printing will profit in this manner from their print shop activities, but rather indicative of the close correlation between the graphic arts and other general education subjects. It is indicative also of the fact that further study should be made in this direction and more definite, conclusive results obtained.

As pointed out, the equipment in the graphic arts area should be kept on a hand operated basis for two reasons.

The first reason is the matter of economy. Printing equipment is costly and most school systems cannot afford the automatic machinery found in the larger unit shops.

Second, by keeping the equipment at a minimum and on a rather small scale, the factor of exploitation by teachers and administrators is eliminated.

Perhaps this is one of the main reasons why such a small number of general shops in Kansas include the graphic arts in the program. Administrators and teachers are prone to look upon the print shop as a means of satisfying their needs for printed materials and overlooking the matter of instruction. For this reason, then, industrial arts teachers are perhaps reluctant to include printing in their general shops. However, by keeping the equipment of the nature described, this undesirable factor will be eliminated because no mass production is possible with such limited equipment.

By including the graphic arts area in the general shop, the instruction and exploratory opportunities afforded might, in some small way, help alleviate the situation described by John Ruskin.[1]

> We are always in these days endeavoring to separate the two; we want one man to be always thinking, and another to be always working, and we call one a gentleman, and the other an operative; whereas the workman ought often to be thinking, and the thinker often to be working, and both should be gentlemen, in the best sense. As it is, we make both ungentle, the one envying, the other despising, his brother; and the mass of society is made up of morbid thinkers and miserable workers.

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[1]John Ruskin, The Stones of Venice (Boston: Dana Estes and Company, n.d.), p. 169.

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APPENDIX A

APPENDIX B

LIST OF TOOLS AND EQUIPMENT TO BE INCLUDED

IN THE GRAPHIC ARTS AREA

Pressroom

1. One 6½x10 press, open platen, pilot, Chandler and Price
2. Two 6½x10 chases
3. Six Hempel quoins
4. One Hempel quoin key
5. One midget planer
6. One planer mallet
7. One can, benzine, Success Brass, ATF
8. One 3'x3' imposing stone, steel top
9. Set of 1½" to 3/8" end wrenches, Bonney
10. One one-pound can bond black ink
11. One one-pound can red ink
12. One one-pound can blue ink
13. One one-inch spatula
14. One stick sealing wax
15. One roll tympan paper, 15" width
16. One makeready knife
17. One furniture cabinet, reglet, Hamilton
18. One furniture cabinet, No. 3728, Hamilton

Composing Room

1. Six six-inch composing sticks, Rouse, pica scaled
2. Two wooden composing banks, double tier type
3. One case 12 point Caslon Oldstyle
4. One case 12 point Caslon Oldstyle
5. One case 14 point Caslon Oldstyle
6. One case 18 point Caslon Oldstyle
7. One case 10 point Bernhard Gothic
8. One case 12 point Bernhard Gothic
9. One case 14 point Bernhard Gothic
10. One case 24 point Bernhard Gothic
11. One case 12 point Kaufmann Script
12. One case 14 point Kaufmann Script
13. One case 24 point Kaufmann Script
14. One case 10 point Cloister Black
15. One case 14 point Cloister Black
16. One case 24 point Cloister Black
17. One case 12 point Liberty
18. One case 14 point Liberty
19. One case 18 point Liberty
20. One case 24 point Liberty
21. Assorted ornaments and borders
22. Three line gages, Rouse, black enameled, aluminum alloy
23. 12 steel galleys, size 8 3/4"x13"
24. One roll of string
25. One proof press, Vandercook

26. One slug cutter and miterer, Rouse American

Bindery and Stockroom

1. One Chandler and Price 26½" Craftsman Lever Paper Cutter
2. One utility table, 3'x6', wooden
3. One ream 16# Mead Bond white
4. One ream 16# Mead Bond canary
5. One ream 20# Mead Bond white
6. Two cartons vellum calling cards, paneled

Linoleum Block Printing

1. Battleship linoleum, either unmounted or mounted, type high. Not enameled or inlaid
2. Three sets of X-acto linoleum block cutting knives, interchangeable blades
3. Carbon paper
4. India ink
5. Thumb tacks

Silk Screen Printing

1. Wooden Printing Frame
2. Stencil paper
3. One printing squeegee
4. One roll masking tape, 1" width
5. Soft, lint free, rags
6. One can stencil adhering liquid
7. One can stencil removing liquid

8. Assorted colors of silk screen paint. Red, yellow, blue, black, or others as desired

9. One stencil knife, interchangeable blade type

The Dry Point Process

1. Several sheets .004 thickness celluloid

2. Sharp pointed stylus

3. One can etching ink

4. Etching press or other similar hand, screw-type, pressure press

Papermaking

1. Six wooden frames, 8"x10", brass screen covered

2. Galvanized tub

3. Quantity of clean, soft rags

4. Six sheets of felt, 8"x10"

5. Blotting paper

6. Sizing compound

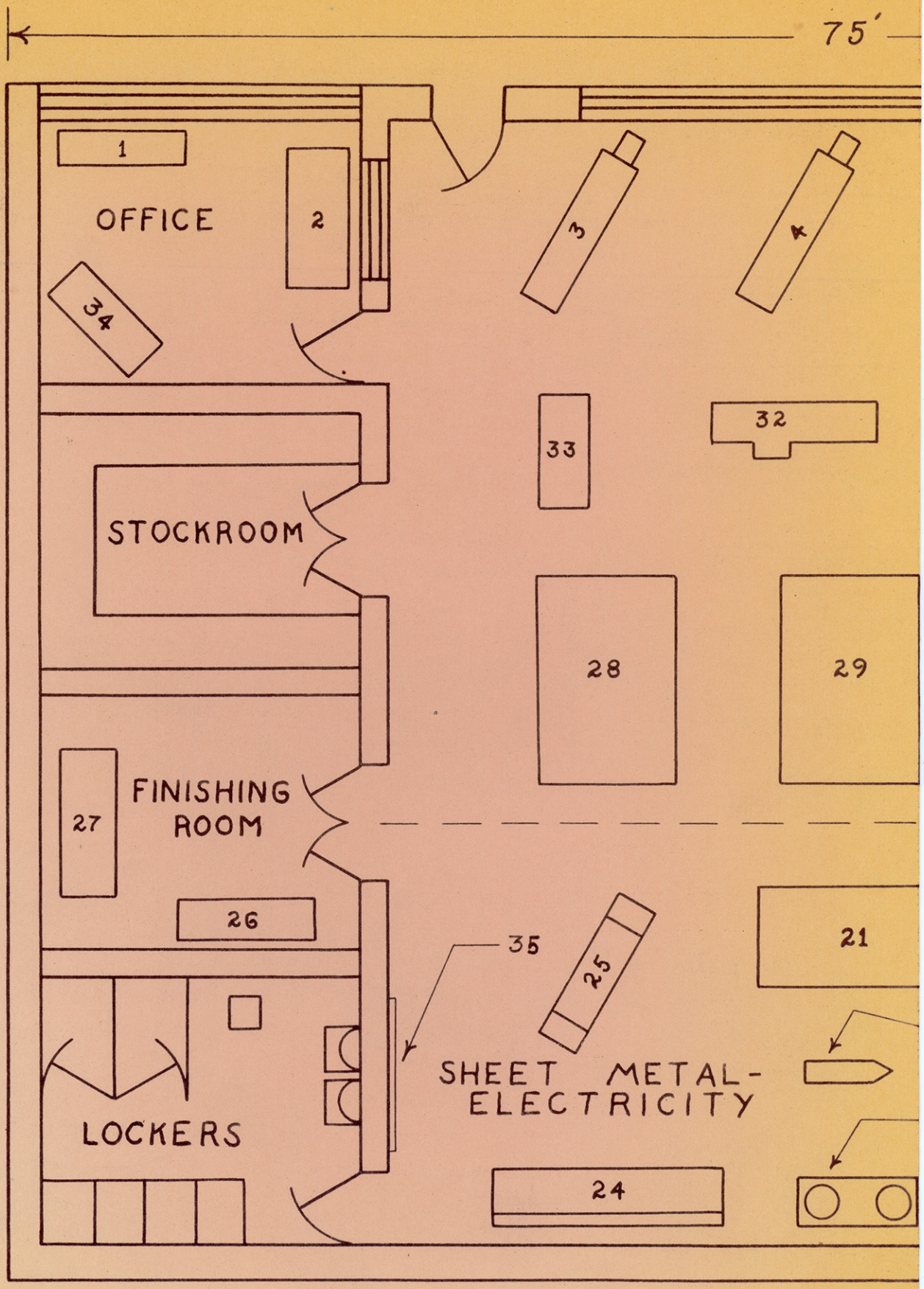
7. Electric iron

Textbooks

Cleeton, G. V. and Pitkin, C. W., General Printing. Bloomington: McKnight and McKnight, 1941.

Marinaccio, Anthony, and Osburn, B. N., Exploring the Graphic Arts. Scranton: International Textbook Co., 1944.

APPENDIX C


75'
1
OFFICE
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STOCKROOM
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FINISHING ROOM
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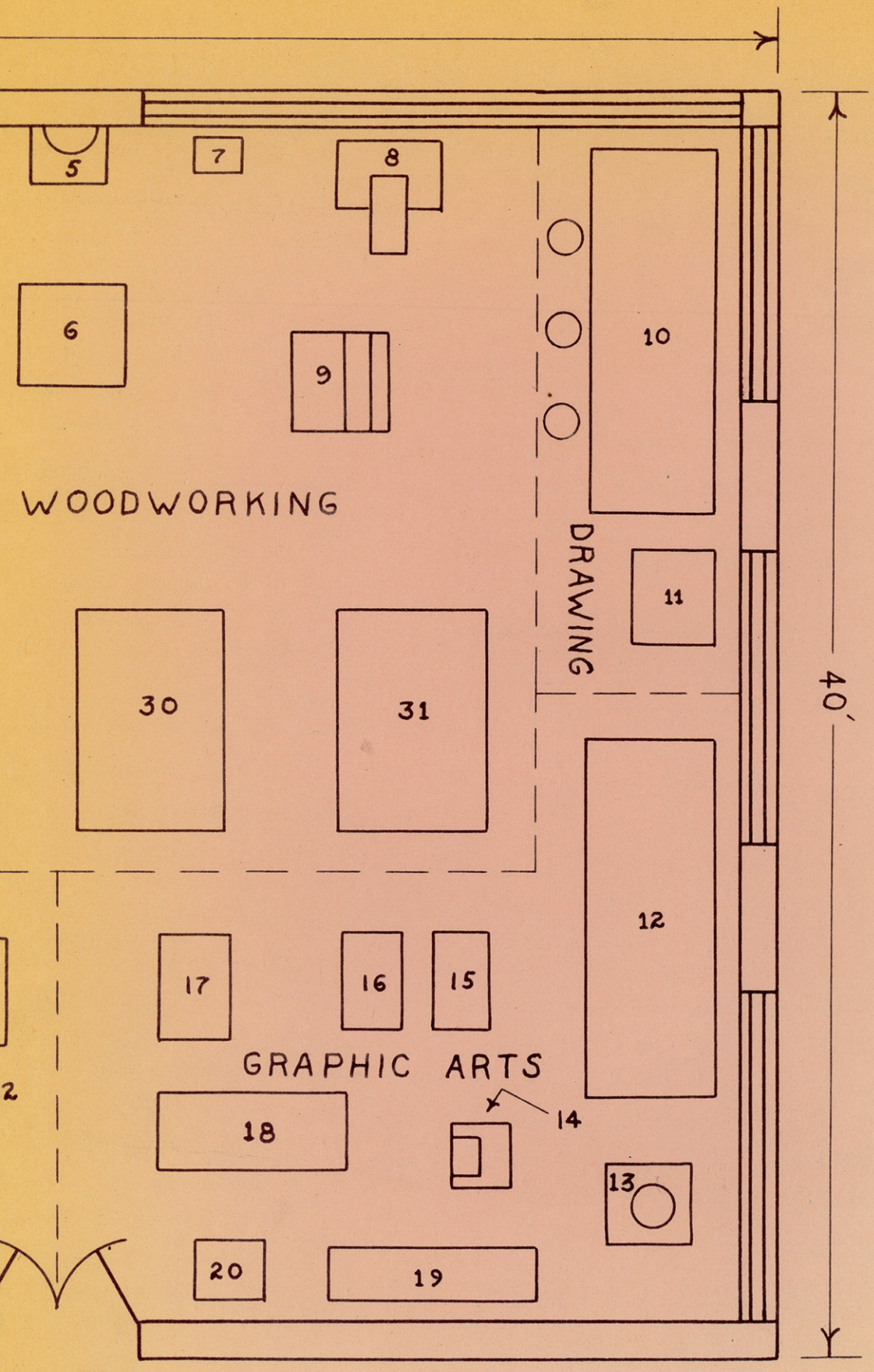
SHEET METAL-
ELECTRICITY
LOCKERS
24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WOODWORKING
DRAWING
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30
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40'
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17
16
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GRAPHIC ARTS
14
18
13
20
19

KEY TO FLOOR PLAN

1. Bookcase
2. Instructor's desk
3. Wood lathe
4. Wood lathe
5. Drill press
6. Circular saw
7. Grinder
8. Jig saw
9. Band saw
10. Drawing and planning table
11. Electric furnace
12. Table for linoleum block, silk screen, and dry point printing
13. Hand press
14. Composing stone
15. Composing bank (double tier)
16. Composing bank (double tier)
17. Hand lever paper cutter
18. Stock and bindery table
19. Cabinet for ink and paper storage
20. Etching press
21. Sheet metal bench
22. Anvil
23. Oxyacetylene welding unit
24. Electricity test panel

25. Spinning lathe
26. Cabinet for paint storage
27. Finishing table
28. Workbench
29. Workbench
30. Workbench
31. Workbench
32. Jointer
33. Shaper
34. Periodical table
35. Bulletin board

APPENDIX D

A FRIEND

By Harry Newman

A friend is one in whose company we find rest and stimulation.

He is the person who, whether we are right or wrong, will defend us against the world and make our cause his.

And privately will point out our faults and tell us how he thinks we can cure them.

He is the one to whom we can confess our failures and our hopes and our fears and have them listened to with calm understanding.

He is the sanctuary to which we hurry from disaster and blasted dreams and heartaches

and to whom we take, for his praise, our rewards and victories.

His is the hand we hold when we need strength and encouragement.

He shares our house, our hopes, our foolish moments and our sad ones.

His tears course with ours and his laughter is the echo of our own.

He stands beside us when we fight and doesn't run away when and if the battle turns against us.

He is the one to whom we're friend, and proud to be, and for whom each sacrifice is joy.

To him our purse lies open to his hand and for whom our heart beats with each beat of his own,

and when he goes away to far places to voyage or to death, and we know that we will never more enjoy the sweet communion of his friendship,

then the sun dims for a while and the nights grow dark with sorrow for the words we could have said to him and the little deeds we left undone.

A friend is man or woman, son or daughter, wife or husband, lover or sweetheart, father or mother, brother or sister, our kin or not,

and this land of ours,

our country.

Reprinted from the Kansas City Journal by Jerry Klinginsmith of the Chanute Trade School, Chanute, Kansas.

CREDO OF AN AMERICAN CHILD

By Toni Taylor

I BELIEVE in what I can see with my eyes; the hills that are green in spring and red and brown in fall, the brook I fish in and the ocean where the waves roll me over. I believe in the sun that gets up with me in the morning, and the night that I see from my bed.

I BELIEVE in what I can feel with my hands; the walls of the house that shelters me, the thick fur on my puppy's neck, the sharp blades of my new Christmas skates, the warm wool of my sweaters and mittens, the crunch of my sled as I go downhill, and the cold of the snow.

I BELIEVE in what I hear with my ears; the crack of the fire when I cook out of doors, the shouts when we play after school, the whirr of the plane that goes over my house every day at the same hour, the lambs that bleat in the spring, and the songs we sing.

I BELIEVE in the people I know; my mother and father because they are wonderful and because they love me, my teacher because she makes school fun, my friends because they are not sissies, my doctor because he laughs a lot and hurts only when he has to.

I BELIEVE in America because I was born here. I am happy here; when I get big, I can be a pilot, or a fireman; I can build the biggest bridge in the world if I want to; I can be the captain of a ship. I'll be as big as everybody else when I grow up in America—I like it here.

43 million children in the United States believe this.

Designed, set, and printed by Jerry Klinginsmith of the Chanute Trade School

Printing

The mission of the printer is to diffuse light and to help progress by the judicious intermingling of black with white—

Blest be the power that taught mankind to stamp a lasting image on the mind. Beasts may convey, and tuneful birds may sing their mutual feelings in the opening spring, but man alone has skill and power to send the hearts warm dictates to the distant friend. 'Tis his alone to please, instruct, advise ages remote, and nations yet to rise. Printing! Gutenberg's gift to the world.

Mrs. J. E. Klinginsmith

Mr. Jerry Klinginsmith