

A STUDY OF THE
METHODOLOGY OF PRINTING
EDUCATION

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TABLE OF CONTENTS

CHAPTER	PAGE
<p>I. AN INTRODUCTORY CHAPTER ON THE HISTORY AND PHILOSOPHY OF PRINTING IN THE SECONDARY SCHOOL</p>	1
History	1
Philosophy	14
<p>II. A DISCUSSION OF THE PROFESSIONAL METHODS OF CONDUCTING A SCHOOL PRINTSHOP</p>	21
The teacher's duties before school opens . . .	21
How to meet classes the first day	31
The teacher's relationship with his superiors .	39
General methods of teaching the industrial arts subjects and their application to the subject of printing	43
The demonstration method	44
The lecture method	48
The project method	52
The instruction sheet method	56
The use of textbooks	62
Other useful devices	70
Combinations of methods	82
Class organization	86
Specific problems of teaching in printing with brief discussions of those methods most likely to succeed in each case	97

CHAPTER	iv PAGE
Teaching the case	97
Teaching composition	101
Teaching lock-up and imposition	104
Teaching make-ready	105
Teaching platen press operations	106
Teaching cutter operations	106
Teaching printers' mathematics	107
Teaching related information	109
Testing and marking	117
Problems of discipline	130
III. A DISCUSSION OF THE ADMINISTRATIVE METHODS OF CONDUCTING A SCHOOL PRINTSHOP	138
The maintenance of equipment	138
Publicity and the school printshop	156
Records	167
Safety in the printshop	174
Estimation of the cost of job printing	181
IV. SUMMARY AND CONCLUSION	193
BIBLIOGRAPHY	195

LIST OF TABLES

TABLE	PAGE
I. Average Number of Ems per Word	184
II. Ordinary Commercial Makeready	189
III. Running Time and Rate per Hour	190
IV. Ink Schedule	191
V. Spoilage Allowance	192

LIST OF FIGURES

FIGURE	PAGE
1. A Suggestion, from Schweickhard, for a Blank Job Sheet to Be Used when Students Plan Their Own Work	63
2. A Suggestion, from Patlow, for a Distribution Sheet	83
3. A Suggestion for a Job Ticket	98
4. The List of Words Used in Fletcher's Association-with-words Plan for Teaching the Case	99
5. A Progress Chart that Might Be Adapted to Use in the School Printshop	129
6. Record Sheet Used by Norman C. Tock in his Point Grading System	131
7. The Equipment Inspection Card Suggested and Used by C. A. Crowley	142
8. The Clean-Up Card Suggested and Used by Harold R. Johnson	144

CHAPTER I.

AN INTRODUCTORY CHAPTER ON THE HISTORY AND PHILOSOPHY OF PRINTING IN THE SECONDARY SCHOOL

Forty years ago practically no schools or school departments existed for the purpose of instructing beginners in printing the elements of the trade they had chosen to make their life's work. True, apprenticeships existed at that time and had existed since the early invention of movable types by Gutenberg in the middle of the fifteenth century, but the apprenticeship system as a form of instruction was fast becoming outmoded in the twentieth century production era. It was slow. It was inefficient. It was incomplete. The printing trade was growing as everything grew and needed, not printers to replace printers, but printers to fill positions that had never before existed. By 1928 printing in the schools had grown tremendously. John Clyde Oswald reports in that year:

There are now in the United States more than two thousand schools in which students are taught how to set type and run printing presses. . . . One printing supply house maintains a special educational department devoted to the planning and equipping of printing outfits suited to instructional purposes.¹

After a survey of not too extensive proportions

¹John Clyde Oswald, A History of Printing (New York: D. Appleton and Company, 1928), p. 333.

Chester A. Lyle said in 1936:

There are twenty-four colleges offering courses, a number of them awarding a bachelor of science degree in printing. Besides this, instruction in printing is given in vocational, technical, high, plant, special, and normal training schools. A conservative estimate places the number of such schools between two thousand five hundred and three thousand.²

It would be all but impossible to attempt a comparison of these existing conditions with those from which our printing education sprang in the fifteenth century. From the time of the invention of movable types apprenticeships have existed, but, even though the apprentices were privileged to learn the "mystery" of the printing art from their masters, the prime interest has always been that of the master in his immediate production rather than a more far-sighted objective of training another printer. It fell to the lot of the apprentice to acquire what knowledge he might while performing the less interesting, less instructive, and petty jobs that are to be found in every print shop.

The invention of movable types, and hence the beginning of the real growth of printing, found the apprenticeship system of instruction rather completely established in the other existing crafts and trades. Oswald gives a clear

² Chester A. Lyle, "Printing Education in America," Industrial Arts and Vocational Education, 25:231-2, August, 1936.

picture of those conditions:

Workshops were small, and association between master and man was intimate. Often the journeymen lived with their employers; apprentices always did. Apprentices received board, lodging, clothing, and pocket-money, but no wages save in the concluding year or two of the lengthy term of indenture. The period was from four to seven years. The hours of labor were long. It was part of the apprentice's duty to keep the shop and equipment clean and in order, to mix ink, dampen paper, and, when physically able, work the hand press.³

After three centuries of printing, the early printers of colonial America were subjected to much the same routine in apprenticeships, Benjamin Franklin having served nine years and, later, Isaiah Thomas thirteen. Quoting Oswald again:

A summary of prevailing apprenticeship conditions in America in the eighteenth century is given in the following quotation from the terms of an old-time indenture:

"During which term the said Apprentice his Master faithfully shall or will serve, his secrets keep, his lawful commands everywhere gladly do. He shall do no damage to his said Master nor see it to be done of others; but to his power shall let, or forthwith give notice to his said Master of same. The goods of his said Master he shall not waste, nor the same without license of him to any give or lend. Hurt to his said Master he shall not do, cause, nor procure to be done. He shall neither buy nor sell without his Master's license. Taverns, inns or ale-houses he shall not haunt. At cards, dice, tables, or any other unlawful game he shall not play. Matrimony he shall not contract; nor from the service of his said Master day or night absent himself; but in all things as an honest and faithful apprentice shall and will demean and behave himself towards his said Master and all his during said term."⁴

³ Oswald, op. cit., p. 353.

⁴ Ibid., p. 355.

The apprentices seemed always to be at the bottom. The masters used them to turn out production jobs in the cheapest possible way. Moreover, from the first the journeymen looked down on them, always fearful that the apprentices made their own positions more insecure. A tide of grumbling was heard and grew. In London, late in the eighteenth century, a group of pressmen demanded that their masters hire no more than three apprentices for every seven presses. The masters refused the demands, a dispute ensued, and a strike was called. Warrants were issued against several journeymen for conspiracy, and following their trial and their refusal to apologize they were sentenced to two years' imprisonment. This incident might well be looked upon as the first attempt of trade interference with education and, subsequently, the first triumph for education.

Dissatisfaction and antagonism continued to appear in the general attitudes of the disgruntled journeymen. In 1833 the New York Typographical Society in its constitution's preface held that one definite cause of depressions was the hiring of "two-thirds" men, discharged or runaway apprentices. In 1835 this general antagonistic attitude prevented a possible earlier beginning of systematized printing instruction in the now famous "General Duff Green Case." On March 14, 1835, a strike was called against the Washington, D. C., plant of General Duff Green, newspaper publisher and printer

to the United States Senate. Since 1833 Green had been employing "two-thirds" men in his plant, which practice had been tolerated by the local union, even though it was against union policies. However, Green also proposed the founding of the Washington Institute, a school in which two hundred boys each year would be taught the printing art. Each boy would have two dollars per week set aside for him in a trust fund which would be paid him at the end of the period of his agreement if he lived up to its terms. As stated before, the local union tolerated the irregularities in union practices but became incensed immediately on Green's proposal to inaugurate a school. The local union met and called a strike which lasted almost a year. Through Green's newspaper and other publicity the event was a nationally discussed case. Such a great number of sympathizing letters was received by the union that the whole occurrence ultimately had as a result, instead of the beginning of an institution for the education of printers, the formation, November 7, 1836, of the first national association of journeymen printers, The National Typographical Association.

This and other, local, associations or unions continued to restrict the hiring of non-apprentice workmen, although the National Typographical Association did condescend to lower the indenture term from seven to six years (ages fifteen to twenty-one). Oswald quotes six

articles taken from the National Typographical Association constitution which relate to apprentices:

"Article 1. Every apprentice shall serve until he be twenty-one years of age; and at the time of entering as an apprentice shall not be more than fifteen years of age; and every boy taken as an apprentice shall be bound to his employer in due form of law.

"Article 2. No runaway apprentice shall be received into any office in the United States attached to the National Society, either as an apprentice or journeyman.

"Article 3. Any boy who may be legally released from his master may be received into another establishment to serve out the remainder of his apprenticeship, provided he has not been legally released for his own bad conduct.

"Article 4. That on the death of his master, or if, from any cause, the office wherein he was indented shall cease to be, he may be taken into another office, and be regularly indented to finish the term of his apprenticeship.

"Article 5. After the _____ day of _____, 18____, it shall not be lawful for any local society to consider any application for membership unaccompanied by the credentials of the applicant that he had served the period of six years as a regularly indented apprentice at the printing business.

"Article 6. That after the _____ day of _____, it shall not be lawful for any local society to permit members of said society to work in any office where boys may be taken as apprentices to the printing business, to serve for a less period than six years."⁵

In 1850 when the National Typographical Association met again and became the National Typographical Union (International Typographical Union after 1869) it recommended indenturing apprentices for five years and limiting their

⁵ Ibid., pp. 358-59.

number. In 1917, according to Charles H. Winslow,⁶ this five-year apprenticeship period was still in effect, and definite ratios between the number of apprentices and the number of journeymen had been established for every minute department of the trade. These ratios varied from one apprentice to three journeymen in the hand composition department to one apprentice to four journeymen in the press-room and one apprentice to five journeymen in the mailing department.

It has never been the custom of the International Typographical Union to maintain a school to teach beginners the practical elements of printing. In 1907 it did institute a system of correspondence school instruction,⁷ the course comprising thirty-seven lessons covering the subjects of freehand lettering, principles of design, color, composition, and imposition. Six months after the inception of this system almost a thousand students had enrolled for the course.⁸ In 1936 19,297 had enrolled and 9,027 had been

⁶ Charles H. Winslow, "Report of the Indianapolis, Indiana, Survey for Vocational Education." Educational Bulletin Number 21, Indiana Survey Series Number 6, Vol. II (Indianapolis: The Indiana State Board of Education, January 1, 1917), p. 192.

⁷ W. B. Prescott, "Trade Teaching under the Auspices of the Typographical Union," Annals of the American Academy of Political and Social Sciences, 33:179, 1909.

⁸ Ibid., p. 185.

graduated.⁹ The international union now maintains a department of education for the purpose of giving greater attention to educational matters.

The United Typothetae of America is an organization to which much credit must go for finally giving the impetus to the drive to put printing in the schools. At the annual convention in 1906 an educator appeared who presented a plan for a trade school in which printing would be taught. A Committee on Education was appointed and following its report the next year a modest sum was appropriated for its use. Out of this small beginning there grew a technical school in Indianapolis, Indiana, which turned out hundreds of skilled compositors and pressmen. This was seventy-four years after the proposal of General Duff Green. The committee also planned to publish text material, which was then practically non-existent. This material was planned as a library of sixty-five volumes, forty-four of which are now completed.

Lyle¹⁰ shows that the earliest printing in a school was done in New Harmony, Indiana, where, in 1828, a group of boys issued and printed a school newspaper, The Disseminator. Lyle credits Indianapolis, Indiana, with being

⁹ Chester A. Lyle, "Printing Education in America," Industrial Arts and Vocational Education, 25:303, October, 1936.

¹⁰ Ibid., p. 232.

the "first city to put printing in the public schools"¹¹ and gives the date as 1887. Oswald, although intimating that Indianapolis was the first city, recognizes the earliest date as 1907 when the Committee on Education of the United Typothetae made its report and received its appropriation.¹²

In any event very little was actually done in the way of advancing printing in the schools before 1910 at the earliest. Such a new and drastic proposal as it seemed at that time demanded careful consideration and much planning. Inauguration of a new vocational subject of this scope involved the appropriation of much money for equipment, and most cities were content to await the success or failure of the experiments in other cities.

Wentworth Institute in Massachusetts was incorporated in 1904 but did not begin operations until 1911. All mechanical arts are taught, but printing is a leading subject.

A School for Printers' Apprentices was formally established in New York City in 1912 by the Hudson Guild, the Printers' League, and the local Typographical Union number six.¹³ However, as late as 1918 Waldo Adler in the

¹¹ Loc. cit.

¹² Oswald, op. cit., p. 360.

¹³ Editorial, The Independent, 75:752, September 25, 1913.

Review of Reviews¹⁴ wrote on the success of this school and reported it as "scarcely known" in the city.

In 1914 W. F. Book in his first annual report¹⁵ stated that four cities in Indiana were teaching printing in their schools. They were Anderson, Fort Wayne, Indianapolis, and South Bend.

By this time Indiana, as a state, was ready to do something definite regarding vocational education as a whole. The result was published by the State Board of Education in 1917¹⁶ and many interesting conclusions were presented.

The report showed first that the apprenticeship system was an inadequate method of developing skills or presenting information that were necessary in the trade:

In the printing trades, the apprenticeship system as it is practiced in Indianapolis shops is primarily a means of regulating entrance to the trades, and in the opinion of many men in the trades, it has comparatively little value as a means of developing trade skill. The apprentice serves his time, occupied for five years, if he is keen and persistent, in picking up and digging out scraps of trade knowledge. He may be kept indefinitely on any one line of unskilled work at which he can make his wage. He may drift about from shop to shop, sometimes acquiring in this way a semblance of trade training, and sometimes drifting entirely out of the industry.¹⁷

¹⁴ Waldo Adler, Review of Reviews, 57:414, April, 1918.

¹⁵ W. F. Book, "First Annual Report on Vocational Education in Indiana." Vocational Series Number 9-a (Indianapolis: State of Indiana, Department of Public Instruction, 1914), p. 173.

¹⁶ Winslow, op. cit.

¹⁷ Ibid., p. 193.

. . . the Survey finds that men in the trades generally feel that the apprentice does not get the training to which he is fairly entitled. . . . The apprenticeship is regarded as being of little value to either the boys or the master printers . . .¹⁸

The survey also found that pre-vocational printing had gained a definite foothold in Indianapolis. In 1915-16 classes were taught to 873 pupils of the seventh and eighth grades in eleven printing centers with seventeen pupils the average number per class.¹⁹ A comparative table showed no printing centers and no equipment valuation in 1908-09 but showed eleven printing centers and an equipment valuation of five thousand dollars in 1915-16.²⁰

This survey had two direct results. First, tentative contracts were drawn up between the schools and the employers to attempt to improve the instruction methods for those apprentices already indentured.²¹ The school was to furnish two terms of instruction of ten months each following a three months' probation period. The employers were to dismiss their apprentices from employment duties during instructional periods at no loss to the apprentices. When the apprentice completed his school work he was to be awarded a

¹⁸ Ibid., p. 194.

¹⁹ Ibid., p. 415.

²⁰ Ibid., p. 424.

²¹ Ibid., pp. 333-34.

diploma and was to be placed in the agreeing shops as an employee insofar as that was possible. In employing help all employers were to give preference to those who had completed the school work. A sort of board of control was set up to administer the plan more efficiently and consisted of three employers, three employees, and one representative of the superintendent of schools.

Second, a vocational school of printing was organized as a part of the city system of schools. A description of this plan is quoted directly from the report:

For a number of years the United Typothetae and Franklin Clubs of America have maintained a school of printing on the arsenal grounds. The school has been equipped by these organizations at an approximate cost of \$75,000. The equipment comprises seven linotype machines, three monotype machines, two Miehle presses, three job presses, two power cutters, besides a completely equipped composing room, a press room, and a bindery. With this complete and thoroughly modern equipment it is possible to do all kinds of printing which other shops can do. . . . The work of the school has the approval of the International Typographical Union and the local organizations have a friendly attitude toward it

A vocational school of printing has been organized which bears a cooperative relation to this school of printing whereby the classes receive daily four hours of shop practice. Any pupil of high school age in the city or anyone in the state by means of the transfer privilege can obtain here a two-year course in printing absolutely free. This cooperation is very unique in the field of education, for it opens to students, without any tuition charges, a great modern printing plant equipped and operated by the trade itself, not primarily for a high school vocational course, but for the most practical sort of training for the efficiency of the trade. . . .

This plan has been in operation for two years and it

is needless to say that it has proved to be highly satisfactory to all interests concerned.²²

In 1936 Lyle reported the result of a survey of schools offering printing. He sent questionnaires to 1,444 schools and from 388 replies from schools in thirty-eight different states, the District of Columbia, and Canada, compiled the following statistics:

Schools of all types reporting	388
Number of teachers	670
Total enrollment for 1933	50,306
1933 graduates (from all types of courses)	23,179
Value of printing equipment	\$3,999,619
Number of different textbooks in use (not including United Typothetae of America and International Typographical Union Apprenticeship Lessons)	39
Schools with reference libraries	253
Schools observing printing education week, 1933	170
Schools with local advisory committees	71 ²³

Lyle contends then that the findings of his questionnaire give sufficient statistical information to show:

1. That printing instruction is offered in all types of schools starting with the elementary grades and going through the University and that 60 per cent of the schools are on a four-year high-school level or above.

2. That another thirty per cent of the schools are of the junior-high-school level, giving pre-vocational instruction to 24,461 pupils, almost one half of the total enrollment of 50,306 of the three hundred eighty-eight schools.

²² Ibid., p. 464.

²³ Chester A. Lyle, "Printing Education in America," Industrial Arts and Vocational Education, 25:232, August, 1936.

3. That printing is gradually disappearing from elementary schools, except in the newer progressive schools, usually conducted under private enterprise, where printing is taught for its fundamental educational values.

4. That there is little possibility of overcrowding an industry which normally employs a large number of skilled craftsmen, office, and field men, when in a fruitful year for vocational education only 8,080 were enrolled in the leading schools that prepare directly for the industry, and when the actual number of graduates from such schools for the year 1933, as revealed by the survey, was 1,724.

5. That executive training for the industry and teacher training for the schools of printing are making adequate headway is evident from the report that twenty-four accredited colleges gave instruction to 1,856 students and graduated 360 in the year 1933.

6. That the printing industry has an abundantly fertile field to teach the appreciation of printing to future buyers and users of the printed product when almost forty thousand of the total enrollment of 50,306 were enrolled in printing schools of non-vocational and pre-vocational levels.²⁴

It is only natural to expect that in this long period of the development of printing there should be one or several changes in the philosophic attitude toward it and/or printing education. Nor should it be assumed that because the development has been long, and in some degrees slow, the final philosophy should by now have been reached. Philosophy in relation to any one thing is changing, not static; it tends more toward abstraction than concreteness. Fundamental truths exist in all subjects but even after

²⁴ Loc. cit.

having been accepted for centuries--proved scientifically--new data occasionally warrant their change. It is not then unnatural to expect changes in philosophies of education or its parts. It no doubt appears that the general educational philosophy has been changing constantly in the twentieth century.

There are any number of philosophic doctrines which can be and have been adopted by education or departments of education. Naturalism when properly used and applied might be a worthwhile philosophy for the sciences to adopt since it treats Nature as the whole of reality. This philosophic view would be permissible in education only in its materialistic or metaphysical sense, in which the search for the universal substance or first cause is philosophically continued. Positivism is impossible as an educational philosophy since it denies the existence of any reality except scientific knowledge.

Idealism contends that a spiritual universe, a higher type of reality, is necessary in the philosophic attitude. Robert R. Rusk says that this is the only satisfactory basis of education:

It [idealism] attributes to him [man] the possession of powers which issue in the form of intellectual culture, art, morality, and religion. These powers and their products are peculiar to man and differentiate him from other animals; they lie beyond the range of the positive sciences--biological and even psychological;

they raise problems which only philosophy can hope to solve . . .²⁵

However true Rusk's contention may be as regards education generally, it is doubtful that printing, except as an integral part of general education, could be justified as a part of the curriculum or could be successfully taught on the principles of idealism. A better view is the pragmatic one. Humanistic pragmatism is probably the best known type of this philosophy. Schiller was probably the founder of humanism, and much of James' pragmatism was humanistic. The contention of this view is that truth is that which fulfills one's purposes, satisfies one's desires, and develops one's life. General as these phrases may first seem, the developing of the lives and the fulfilling of the purposes of its followers are worthwhile attributes of any philosophy or subject. If printing as a subject or as an integral part of an educational system could make some contribution of life development and purpose fulfillment to everyone who came into contact with the subject, it would certainly be a goal well attained. Even a concentrated striving toward that end would put the subject on a new plane.

Printing has the fortunate advantage of being able to attack the development of life from several angles. Let us consider the social, educational, psychological, and voca-

²⁵ Robert R. Rusk, Philosophical Bases of Education (Boston: Houghton Mifflin Company, 1929), pp. 94-95.

tional angles.

Printing is excellent preparation for the socialized life one must lead as an adult, even though the student follows some other pursuit. In one of his papers J. C. Tranbarger says:

Educationally no subject lends itself more perfectly to a social Utopia than printing. The boy who sets the type and the boy who runs the press realize that the product of their hands is to be employed for some useful purpose. They realize that in order for their product to serve best the purpose for which it was intended it must be correct in every detail--the slightest error will detract from its usefulness in proportion to its importance. A sense of responsibility to himself and to others is thus impressed on a young mind and a better citizen is created. The highest type of citizenship is wholly dependent on the recognition and realization of responsibilities of its membership.²⁶

Life development educationally is a subject about which much can be, and has been, said. Few persons would question the fact that a worthwhile life cannot be developed without some formal education. Using education as a term meaning the consummate whole of one's past experiences, it is evident that life with no education is impossible. One is confronted with the task of enriching his life with as many worthwhile experiences as it is possible for him to cultivate, as well as the task of attempting to master the various fields of subject matter to which he is exposed in his formal education. Either of these goals is beyond one's achievement. However, one is judged in this life very largely

²⁶ J. C. Tranbarger, Personal papers.

by the degree of his attainment of them in relation to the goal itself. So it becomes the duty of educational institutions, and thereby printing as a subject, to encourage the students, to spur them on toward optimum attainment. Printing is a subject that is easily adaptable to these aims. Some of its richness of worthwhile experiences has been shown in the correct socializing effect it has on the students. The socialized production of jobs for socialized consumption of the rest of the school is a worthwhile experience that even more students should have. Other experiences in the print shop develop a proper buyer-consumer attitude and instill a greater sense of appreciation both for things artistic and things industrial.

The formally educative possibilities of printing are equally limitless. No other one subject in the curriculum can boast such a well-rounded, complete formal education in itself as can printing. Abundant material in English, mathematics, and art exist directly in the course of study, and related information covers many phases of history and the physical and chemical sciences.

Psychologically, too, printing can do much to develop the lives of its followers. Here the students can begin the development of a life pattern--a purpose toward which their energies can be directed. If the purposes are not set too high, beyond the ultimate realization of the student, a sane

mental attitude can be developed that will go far in properly adjusting the personality. The extreme demands of accuracy in printing and the nerve and muscle coordination necessary in handling type develop a patience that pre-determines one of the most sensible outlooks on life--a calm, composed, not too easily excitable one. Here, however, the subject needs some help. Here the philosophy and personality of the teacher can make or break the subject in the mind of the student, and perhaps even make or break the student himself. The psychological development of students needs careful study and supervision at any stage and in any subject, but beginners in printing, meeting for their first time the apparent tediousness and, if their jobs are often "pied" or taken by other students, the sometimes apparent uselessness of the subject, are under a nervous strain that requires a few weeks' time and the immediate skill of the instructor to cure. Although the methods of instruction will be covered later, it is impossible at any point to stress too forcibly the importance of the instructor in the psychological development of his students. Friendliness without intimacy, advice and supervision without dictation, discipline without forcefulness--for all these is the teacher the dispenser.

It would appear on the face that the vocational development of a boy's life through printing education would

be simple; that the aim would be to train a printer for the trade and if possible help him find a job. This is, of course, one aim, but by no means is it the sole one. If a boy does not possess the inherent capabilities that will lead him to greater success in printing than in other fields, it is important that he be directed toward the field in which his success does lie. Printing in its pragmatic philosophy should not be content merely to add something to every life, although that is admittedly a worthwhile goal. Rather, let us hope, printing will enrich every life as much as possible. If it takes but a day to decide definitely that a boy belongs in another vocation, let him leave printing with his personality and social outlook somewhat improved for his short stay.

CHAPTER II

A DISCUSSION OF THE PROFESSIONAL METHODS OF CONDUCTING A SCHOOL PRINTSHOP

The Teacher's Duties before School Opens

Little argument should be necessary to convince one that preparation, organization, and planning are prerequisites for the success of any job. This should be especially true for printers, since few other groups find more occasion for planning and organization than they. It must be realized that preparedness will add to the success of any job or position. It is unfortunate that more teachers of printing do not make application of this realization, for, even though the teacher's position is not placed in jeopardy as a result of his laxity (and often it is), the students suffer by not gaining the most that they possibly could from their contact with the printing field. And when an attempt to develop a child's life is made, to the degree that the attempt falls short of its possibilities printing education has failed that child. To be sure, preparation is a year-round duty, and it will be mentioned several times later. However, there is probably no other time that the printing teacher is in greater need of a well-organized, carefully prepared program of activities than on the first day of school when his stu-

dents are full of energy and anxious to begin work.

Preparation for this first day varies, of course, with the different teachers and with different systems. There will be new teachers who will have a great deal more work in store for them than those who are returning to their old positions. Ericson¹ divides these new teachers into three classes: (1) graduates of teacher-training institutions who are entering their first teaching positions, (2) those teachers who are changing positions and entering a new system, and (3) those teachers who are changing positions and entering a different school in the same system. All of these teachers must necessarily spend considerable time before the opening day of school acquainting themselves with their new jobs and the many bits of information that are essential to their success.

By combining several sources of material in the methods of teaching general industrial arts and adding a few points that relate directly to printing, a fairly complete list of pre-school activities can be made that will serve as a guide to those teachers of printing who are entering a new teaching situation.

1. Have a tentative plan of procedure in mind or, preferably, on paper before arriving in the city or vicinity

¹ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: Manual Arts Press, 1930), p. 16.

of your new position. This does not mean that a specific schedule must be prepared and maintained, for events are sure to arise that will prevent the absolute following of a procedure that is planned without a knowledge of the new situation. It does mean, however, the listing in some temporary order of the major points that follow. This initial plan should be flexible so that an unexpected change, such as may come in the first meeting with a superior, for example, will not disrupt the system. Some time and reflection should be given to the organizing of such a plan since one of the chief reasons for making it is to prevent the omission of some important step. A hurried plan of procedure is most apt to contain such omissions.

2. Time your arrival to include an interval for preparation before the opening day of school. Many schools and many school systems specify in their contracts or notify their teachers in some other manner of a definite time when the teachers are expected to appear. At times this date will make mandatory the attendance of early teachers' meetings or teachers' institutes. Even though the specific subjects covered in these meetings are not directly related to his subject, the printing teacher should never fail to attend them. He is a printer, but he is always a teacher, too, and teachers' meetings always relate in some way to general education. Whatever the time set for the teachers' arrival,

however, the new printing instructor is almost sure to find that it leaves him an insufficient interval to prepare himself and his shop for the first day. For this reason it is apparent that the teacher should arrive before he is compelled to. "Certainly no resourceful and conscientious teacher," advises Ericson, "will find a week or ten days of time too much for laying a foundation for the year's work and acquainting himself with conditions in a new system."²

3. Meet with your superior. If the new school system is one of any size, there is likely to be some doubt in the mind of the teacher as to whom he should confer with after arriving in the city. A good rule to follow in this respect is to see first that person with whom you have corresponded or had interviews regarding the position. This method gives the new teacher a logical introduction to the system and its members, and at the same time it is professionally the most ethical procedure. In general it will be found that supervisors can furnish more genuinely helpful material than the superintendents or principals. They are better qualified technically to give the teacher facts about his shop equipment, course of study, and local policies as regards the printing field. Moreover, in a system large enough to have a supervisor the new appointments to the staff are usually made upon his recommendation, so that in most cases he is

² Emanuel E. Ericson, "Pre-School Activities," Industrial Education Magazine, 28:54, August, 1926.

the logical man to see first.

This first meeting with his superiors is very important to the teacher. The ease with which he may be granted future interviews and his general relationships with his supervisor and administrators will depend on his initial impression. Ericson gives some very good advice in this respect:

1. Do not prolong the interview beyond the time indicated by the administrator.
2. Do not try to be too familiar.
3. Avoid calling for definite statements as to budgets or exact amounts of money available for the work.
4. Make no definite promises that may lead to later embarrassment.
5. Listen much and talk little.³

No matter how long or how short the first interview is, there are certain facts that the teacher is entitled to know at this time and which he should attempt to find out. The teacher should have definite information concerning the following:

- a. The school in which he will teach.
- b. The specific subject he is to teach. Most often the printing teacher will be in a one-man shop and will himself have charge of the composing room, press room, and

³ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: Manual Arts Press, 1930), pp. 21-23.

bindery. Cases will exist, however, in which the teacher has only one or two of these departments, or the teaching of related information under his supervision, and he should know his exact duties.

c. A course of study. The teacher should have a printed or mimeographed copy of the course of study in printing for his particular system. If, because of the size of the system or for any other reason, this material is not available the teacher is entitled to an outline or, at least, some suggestions from his supervisor which will aid him in making out a course of study of his own. The teacher must have a definite idea of what ground he is to cover during the year, whether this plan comes from the local system or is a product of his own endeavor.

d. The equipment of his shop. As early as possible the teacher should have in his hands a complete inventory of the print shop as of the date of the preceding teacher's departure. If this material is not immediately available, then some other statement concerning the shop equipment should be put in the teacher's possession. It is unreasonable to expect a teacher to prepare for a year's instruction in a shop with whose equipment he is unfamiliar.

All of the above information is of a type that can be procured even before a teacher's first interview with his superior. If by means of correspondence the teacher can

obtain this information in advance, he can be well started on his year's planning when he arrives at his new school. It is well to keep in mind the fact that the more time one spends planning his work, the more likely he is to attain the success he seeks. The following additional points of information are those that will be more difficult and perhaps impossible to obtain before the first interview:

e. Some method by which the teacher can gain admission to his shop to check equipment.

f. Any further information in the way of printed materials which may be helpful in starting the teacher properly in his work. By this is meant invoices, samples of forms and reports, samples of jobs printed in his shop the previous year, a copy of the school paper if his shop is expected to print one, any instruction sheets that are standardized in the system, and a list of supplementary teaching aids that are available from a central location and in addition to those he will find in his own shop.

g. The status quo. It is important that the teacher know the circumstances both past and present regarding his position. Matters of tradition and policy should be discussed until the supervisor or administrator and the teacher are mutually understood. It may be the teacher's desire or there may be a trend in the system to change certain matters of policy. It will ultimately pay the teacher, however, to

be very cautious at first about changing conditions that exist when he arrives. Unless the teacher is hired for the express purpose of making a change (and under such circumstances he would undoubtedly be told) he would be wise to hold his criticisms or even bona fide suggestions until his worth to the system has been definitely established.

4. "Visit the shop. Examine condition of equipment, mechanical skill expressed in left-over projects . . . and get acquainted with physical lay-outs, storing places, tool rooms, etc."⁴ The equipment and supplies should be thoroughly checked at this time, item by item, from the inventory left by the teacher's predecessor. Any damaged or missing equipment should be reported to the proper administrator at once, for when the inventory is accepted by the teacher as correct, he becomes responsible for the care of the equipment.

5. "Order equipment, materials, and supplies."⁵ In many places materials and supplies are ordered on semi-annual or annual requisitions and are ordered to last a semester or a whole year. In some systems the order is only a requisition to the central supply department of the local system,

⁴ Emanuel E. Ericson, "Pre-School Activities," Industrial Education Magazine, 28:54, August, 1926.

⁵ F. Theodore Struck, Methods and Teaching Problems in Industrial Education (New York: John Wiley and Sons, Inc., 1929), p. 124.

while in others the teacher deals directly with the commercial retailers, jobbers, or wholesalers. In any event, the teacher should be careful in making his requisition to order enough for his allotted time but not too much. Specifications should be very complete and clearly stated to avoid both waste of time and the substitution of inferior products. When a requisition is large enough to require bids, one familiar and satisfactory product should be specified and it or its equal demanded of all bidders.

6. "Put equipment in order. . . . Check each part of each machine and tool."⁶ "Care for the shop. Clean up."⁷ Every composing stick should be cleaned. Oil and grease that was applied to prevent rusting and deterioration should be completely wiped off. Cases should be checked and cleaned if necessary. Nothing is more discouraging to a beginning class in printing than dirty cases. Presses and other machinery should be checked to be sure they are in working order. The shop in general should make a clean and orderly appearance.

7. "Prepare job sheets and instruction sheets if they are to be used. Order text and reference books. Modern shop teaching involves the use of written material."⁸ Many print

⁶ Ericson, loc. cit.

⁷ Struck, loc. cit.

⁸ Ericson, loc. cit.

shops make use of locally prepared and standardized instruction sheets. These may not have to be prepared, but the teacher should make sure of their availability.

8. Make a brief survey of local industrial and occupational conditions and learn something of the public sentiment about the industrial education program. Get acquainted with representative men in business and industry.⁹

9. Prepare for the first class. Ericson's list of preparations for the first class is complete and well worth repeating. It follows:

1. Visualize the class as fully as possible as to age, training, temperament, aptitudes, and the like. Previous records will assist here.

2. Be certain that equipment and tools are in perfect condition.

3. Have a definite plan for the work of the semester.

4. Have materials on hand and ready for the first piece or pieces of work to be done.

5. Have a lesson plan, preferably written, for procedure at the first class meeting.

6. Have needed tools and other devices on hand for the first lesson.

7. Be ready to assign boys working places and lockers.

8. Plan a definite method for getting acquainted with the class.

9. Prepare to be glad to see the boys arrive and let them know it. If a teacher is not glad to see the work start he should quit and let someone else try in his place.

10. Have a definite plan for standards of order and

⁹ Loc. cit.

discipline, and prepare to put this plan in operation from the start.¹⁰

How to Meet Classes the First Day

It goes almost without saying that the first day of classes, specifically, and the first few days, generally, are most important phases of the teacher's success. Nor need this be viewed as the antithesis of the foregoing discussion of the importance of organization and planning. A well prepared first meeting and a well executed first meeting are component parts, and either can destroy the advantages of the other. Without skill in execution, plans remain undeveloped, and without preparation there is nothing specific to execute. It would be advantageous therefore to understand a few fundamental facts regarding the accepted method of meeting a class for the first time.

1. Greeting the class. The first day is the day that an almost permanent impression is left with the boys. It is imperative that the teacher recognize this and present always the impression he wants received. A friendly, personal attitude will go far in gaining the confidence, trust, and cooperation of the boys. The teacher might stand just inside his open shop door and pleasantly greet the boys as they enter

¹⁰ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), p. 36.

alone or in small groups. Personal greetings might be exchanged with boys whom the teacher already knows, but care should be taken not to ignore the students he does not know. The greeting as here outlined is on the whole a delicate process. A too stern or formal attitude is likely to impress the students as a cold reception, while a too jovial greeting may be the genesis of weeks of disciplinary trouble. Struck has discussed the matter as follows:

Many shop instructors let the boys go about the shop for awhile, letting them see what they will, but making certain they harm neither themselves nor the equipment. . . . Other instructors prefer to assign a bench or a machine or a place to each pupil as he enters, this having been previously planned.¹¹

It is doubtful that either of these methods, interpreted literally, would have direct application in the print shop. To let boys aimlessly wander about the shop "for awhile" uninstructed and unsupervised but watched, is to invite them to dirty the cases and perhaps pi some of them. In other shops the arrangement of equipment and tools is not so important as the condition of them, while in a print shop class morale is greatly dependent on the likelihood of the students' finding a 10 point "a" in the 10 point "a" box. Moreover, at least one of the greatest attractions to the beginner is the press. As exploratory courses in printing are taught in most places today, the seventh and eighth grade be-

¹¹ Struck, op. cit., p. 125.

ginners are offered no press work in their first trial course. Whether this practice is necessary or advisable is not our present concern--the fact remains. It follows that answering many questions on press work and waiting for an inspection of the presses is somewhat of a waste of time in a class of beginners whose course of study does not include that department.

On the other hand, meeting the pupils at the door and assigning them their number and cell is too much like the army and prison types of discipline and will probably attain worse results than the first method. Better attitudes are likely to be created by pursuing a middle policy, the teacher pleasantly greeting the pupils and then permitting them to walk about the shop while he greets others. But as soon as most of the class has arrived he asks the students to find a place (definite assignments can follow on a later day) and the first day's work is begun at once. The teacher's attitude throughout must remain one of friendliness. His first duty is to get acquainted and to encourage the boys to do so. During the first day and, indeed, all the year the following habit is one worth developing:

Since the teacher must be vitally interested in developing correct attitudes in his students, he cannot afford to let any opportunity pass to get in friendly personal contact with them. The beginning of the class period furnishes a very opportune moment for doing this,

and the results obtained will more than offset the loss of time that may accrue because of the attention entailed.¹²

2. Get the students' names. There are many different methods used in an attempt to supply the shop teachers with class lists. Ideally the teacher will always know how many, what age and grade, and whom to expect. Unfortunately, though, many of these methods are bogged down in the rush of first day duties, and it falls to the teacher to obtain the names of his boys during the first class period. Admittedly this is not the best pedagogy but is a condition to be faced until all schools are ideal. A serious attempt should be made to learn the students' names as quickly as possible, a task which will be made easier after cabinet assignments are made and a name-face-place association can be set up.

3. Get acquainted. Getting acquainted with one's students is a procedure that should have much greater significance than learning the proper pronunciation of their names and teaching them yours, although these do have their places. It has been suggested by Ericson¹³ that the teacher tell something of his past experiences--to show the students he has something to teach them--and to allow the boys the same privilege, thus creating a friendly atmosphere. It cannot be

¹² Editorial, "The Personal Touch," Industrial Arts Magazine, 20:323, September, 1931.

¹³ Ericson, op. cit., p. 40.

denied that both of these suggestions have some value, especially the latter. Boys are likely to be put together for the first time in the print shop, and to cooperate properly they must know something of each others' lives and experiences. The teacher, however, should think long of its value before he starts any recital of his own experiences. In most cases the boys come into the print shop with a desire to learn printing and a realization that the teacher can teach them or he would not be there. Excepting a few individual problems the motivating has already been done. If the teacher is skilled enough to whet the boys' appetites without boring them and hence losing their interest, then he is wise to talk. If he is not skilled, then he is unwise to talk. The following quotation does not apply directly to the first day of classes, but it gives a general idea of talking that should be more adhered to.

Manual training cannot be taught without any talking at all, but class lectures can easily be reduced to five minutes out of sixty.

The answer is contained in one word: action! Boy or man, the live exhibit beats the dead one, and there can be nothing deader than a talking teacher with an audience of small boys, fidgeting to get back to work.¹⁴

4. Explain what is to be done in the course. A technical discussion of printing education aims and purposes is

¹⁴ Frank W. Cheney, "The Talk Method," Industrial Education Magazine, 26:41, August, 1924.

obviously absurd, but a few of these expressed in a language that the boys can understand will help them to understand why they are taking printing. They should be shown some samples of other students' work. If they can see immediately a result of endeavor they are more likely to work hard to attain that result. The consumer angle of printing should be explained lest the students get the idea that the teacher is there only to make printers of them all. In general, the boys should be given something to look forward to. It has been said by Friese:

Advice found valuable is to have the aims of the junior high school, the general aims of manual arts, and the specific aims of the various subject courses type-written and neatly mounted and pinned on the bulletin boards. In addition to the students of the class seeing these aims, visiting students and others also see them. Their posting adds concreteness and definiteness to the course.¹⁵

This suggestion is basically a good one, especially so in a day when too few children know why they are going to school or what they should do after they get there. As before mentioned, however, the teacher should take care to see that all aims are worded in such a manner that a full understanding can be had by the students.

5. Discuss and explain the shop rules. Every shop must have definite rules for its effective operation. The

¹⁵ John F. Friese, Exploring the Manual Arts (New York: The Century Company, 1926), p. 296.

sooner the students understand what these rules are and why they are used, the less general disturbance the teacher will have to contend with. Rules, however, should not be forced on the students or they will be broken in defiance. The students can be made to feel the necessity of general rules by simple explanations of the shop activity. Many times if the explanations are made first the students can be coaxed into adopting very quickly the same rules the instructor has in mind. This would be the ideal way. Safety must be stressed as must the importance of equipment maintenance. Let the boys know that the equipment is there for their own use and, belonging to them, deserves their care. A few suggestions worth remembering when making shop rules follow:

- a. "The instruction must be specific."¹⁶
- b. Assume [*italics in the original*] the good intention and proper attitude of all pupils.
- c. Make few rules.
- d. Be considerate of every right and every reasonable wish of the boys.¹⁷
- e. Do not nag, dictate, or boss in presenting the rules, but be firm.

¹⁶ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), p. 43.

¹⁷ Samuel J. Vaughn and Arthur B. Mays, Content and Method of the Industrial Arts (New York: The Century Company, 1924), p. 273.

f. Whenever possible let the students themselves arrive at the rules from a feeling of necessity.

g. Do not neglect the safety angle.

6. Begin the actual instruction. Several authors have advised that shop work, that is, actual shop activity by the boys, should be started the first day. It is their contention that the boys are ready to go to work when they first enter the shop and that postponing the start any longer than is necessary destroys the natural motivation. No doubt this assumption is true, and better results may be obtained if the assumption is practiced. However, teachers of printing will find it difficult to cover well all the instructional material and have enough time left for student activity during the first class sessions. In fact, Friese,¹⁸ in a sample plan for the first days of a printing class, does not start the student activity until the third day, but it can be assumed on the basis of other authors' advice that Friese's plan waits too long. If students are allowed to do something a part of their desire is fulfilled and they are happier. If their activity in printing is only a practice one, such as setting a line of "a's" or "m's", the time is well spent for its psychological effect on the boys and is not altogether wasted as a part of an instructional

¹⁸ Friese, op. cit., pp. 314-18.

unit. Instruction should naturally precede this activity and should include a brief but adequate discussion of the case, the main parts only of type, the care that should be used in handling type, and the main parts of the composing stick. A short demonstration should be given showing the proper form and techniques to be used in setting type. Questions should be answered and, if none are voluntarily forthcoming, asked. Other initial instruction necessary for composition can be given the second, third, or even as late as the fourth and fifth days of class meetings. This instruction would include further discussion of the case, all type parts, all composing stick parts, distribution, spacing materials, justification, dumping type into the galley, tying up, and proofing.

The Teacher's Relationship with His Superiors

Since, in most cases, the teacher's superior is in direct or indirect control of personnel replacements, and since it is to be assumed that everyone wants a feeling of security in his position, it would behoove the teacher to develop the most pleasant and helpful relationship with his superior that he can. This is not to be confused, however, with the collegiate term "apple-polishing," although that method is not infrequently employed in the teaching profession. It is safe to say that those people who are en-

trusted to responsible positions have enough intelligence to detect an individual who is openly seeking special favors or general favoritism. It is the duty of a supervisor to give his teachers professional help. His respect and consideration, however, must be earned by the teacher. A few suggestions follow which should help the teacher gain this respect.

1. Be respectful and considerate toward your superiors if you expect them to treat you with respect and consideration. Most of the time supervisors and administrators are elevated to their positions only after demonstrating their proficiency in teaching. It is reasonable to assume that the sub-heads of any system are chosen to fill their positions because they are the best available. They generally have more experience, more training, or both than the teachers of whom they are placed in charge. It is ethical and also wise to respect this added training or experience in as friendly a way as is possible without becoming too personal. Professional advancement and superiority are worthy of this respect.

2. Learn to recognize and follow suggestions. It is a common practice of supervisors and supervising administrators to make numerous suggestions during supervisory visits or interviews, some of which suggestions when scrutinized are revealed as tantamount to orders. Determining whether or not this method of supervision or administration

is the best or most wholesome one is not within the scope of this work. It nevertheless remains the teacher's task to attempt to distinguish between suggestions that are orders and suggestions that are suggestions. For the new teacher, one who is not thoroughly acquainted with his system or superiors, this represents a delicate situation. Several suggested ways of meeting this difficulty follow:

a. Follow all suggestions to the letter until you believe you know the superior well enough to discriminate. This is of course the simplest thing to do but has the weakness of indicating that the teacher has no mind of his own. It will probably also involve the teacher's adjusting himself to situations and methods to which he is unaccustomed.

b. Seek the advice of fellow teachers to determine the relative value of the superior's suggestions. The opinion of only one teacher would obviously be invalid because of the possibility of prejudices. Even when all teachers are questioned it may be evident that personal feelings have influenced their opinions. Such answers must be weighted, of course, but in most cases older teachers are interested enough in helping the newcomer that they try to give objective opinions.

c. Those teachers who have two supervising superiors, a subject supervisor and the principal, for example, may

question one concerning the suggestions of the other. This method necessarily involves the use of great care and no little adroitness and should not be indulged in to excess. Creating animosities between one's superiors by quoting one against the other to protect one's self should be avoided. No situation is more difficult than attempting to satisfy both of two, differing superiors.

d. Try to decide which suggestions are orders, which are not, then wait. When the supervisor returns he will indicate in some manner that one of his suggestions has not been followed. It is best at this point to be perfectly frank in stating that the suggestion was made as such and considered as such. This will usually lead to a better understanding between the supervisor and the teacher and will probably result in a more definite type of supervision in the future.

3. Be willing to accept responsibility. Responsibility does not end with one's own subject. Many activities of an extra-curricular nature demand the successful cooperation of all teachers. Holley says:

Extra duties, such as work on social affairs, committees, and in similar projects, should be assumed willingly when asked and volunteered when feasible.¹⁹

¹⁹ Charles Elmer Holley, High School Teachers' Methods (Champaign, Illinois: The Garrard Press, 1937), p. 451.

4. Follow the general policies of the school and the system. No effort should be spared by the teacher in acquainting himself with general policies or in following those policies. Much embarrassment and criticism can be avoided in this way.

5. Do not express any opinions that might be interpreted as malignant or critical. In too many schools one can find constant criticism of the principal and other superiors by the teachers. A new teacher is expected to take part in this critical attitude or he is not a "good fellow." Such an attitude should be avoided, of course. One cannot hope to enjoy a healthful relationship with those whom he criticizes surreptitiously.

General Methods of Teaching the Industrial Arts
Subjects and Their Application to the
Subject of Printing

Many methods of teaching have been attempted and used since the industrial arts subjects became an important phase of general education. There is much unnecessary quibbling concerning the superiority of one or another of these methods. There is no logical reason for assuming that any one method is best for all purposes. On the other hand, it is apparent that each of the methods has some advantage at some time. The obvious task, then, is to discover those

methods of teaching which are most applicable to each phase of printing education. The discussion will be presented in the following order: (1) the demonstration method, (2) the lecture method, (3) the project method, (4) the instruction sheet method, (5) the use of textbooks, (6) other useful devices, and (7) combinations of methods.

1. The demonstration method. Since earliest time, when teaching was less self-conscious than it is today, the demonstration method has been one of the most frequently used and one of the most widely accepted ways of teaching. This is only what one might expect, however, since teaching by demonstrating implies the act of imitation which is one of the more primitive of man's traits. Imitation, requiring only an accurate sense of sight and an ability to direct one's muscular reactions as the sense of sight indicates, does away with any reasoning processes on the part of the learner. This absence of reasoning--one might say the absence of almost all thought other than a reflex-action type--makes a demonstration the simplest of the teaching methods. This is a method that is most desirable when exact and acceptable methods of performance are to be taught. A skilful performance attracts attention under any circumstances, and this instinct to watch a skilled person work is a type of motivation in the print shop. Besides the natural interest established the students at once want to copy the teacher--

do what he does and do it as well as he does.

There have been many lists of suggestions published to aid the teacher in his demonstration. The points remain about the same, however, despite authors' attempts to change the words or ideas of others. The following list is a composite one taken principally from Vaughn and Mays,²⁰ Selvidge and Fryklund,²¹ and Ericson:²²

a. Be fully prepared before attempting a demonstration. If the activity is one in which the teacher does not frequently engage, he should practice before demonstrating.

b. Have all materials and equipment in readiness before starting.

c. See that the class feels that the demonstration is important to them. Pick the most opportune moment--when class interest is at its peak--for demonstrating.

d. Do not attempt more than one unit of activity in a single demonstration.

e. Use the same equipment and materials that the stu-

²⁰ Samuel J. Vaughn and Arthur B. Mays, Content and Method of the Industrial Arts (New York: The Century Company, 1924), pp. 91-104.

²¹ R. W. Selvidge and Verne C. Fryklund, Principles of Trade and Industrial Teaching (Peoria, Illinois: The Manual Arts Press, 1930), pp. 168-75.

²² Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), pp. 56-64.

dents are expected to use.

f. Use trade methods and the same ones expected of students. Do not use short-cuts unless short-cuts are being taught.

g. Do not demonstrate with student work, thereby giving one boy an unfair advantage. Use a production job or an improvised one for demonstrations.

h. Correlated or unrelated material should not be made a part of a demonstration as it confuses the students.

i. The demonstration should be brief.

j. The whole performance should be punctuated by pertinent questions and clear statements or discussion of the primary points of the demonstration.

k. Be sure that the essentials of the demonstration are understood before sending the students to their individual work.

l. Follow up the demonstration with individual questioning, individual repeat demonstrations if necessary, close supervision, and group testing.

m. Be sure the demonstration is skilfully done both from the standpoint of trade technique and teaching technique.

Ability to perform in industry, or expert craftsmanship, is not a sufficient guarantee of ability to demonstrate to others, necessary and desirable as such craft skill is as a prerequisite.²³

²³ Ibid., p. 57.

The steps in a demonstration will of course vary somewhat with the type of activity being demonstrated. For the most part, however, the following steps will be found a good general outline to follow:

- a. Complete preparation on the part of the teacher. This should include personal practice, readying equipment and materials, and instilling a receptive attitude in the minds of the students.
- b. Statement to the class of the specific objective in view. The students should know the purpose of the demonstration.
- c. The manipulative performance. The demonstration itself should be done correctly and skilfully.
- d. Testing of the students by questioning to insure complete understanding.
- e. Assignment. This will include specific directions to the students concerning their next job.

The demonstration method is almost without parallel in its use in printing education. Although more knowledge of an academic nature probably is required in printing than in the other industrial arts subjects, there yet remain many manipulative operations that can be taught by use of the demonstration. Some of these operations are: using the composing stick correctly, using the proof press, cutting stock, punching, perforating, stitching, making up a form, locking

up, making ready, and operating a press. All these things can be taught better by use of the demonstration than by any other single method.

Many teachers will probably take exception to the preceding statement and show the value of such devices as the instruction sheet, visual aids of different types, lectures, etc. It will be noted that the demonstration was said to be better than any other single method and that, further, no denial of the definite value of other methods or devices was made. Later in the discussion such combinations as are supposed to be most effective will be discussed.

2. The lecture method. Outside of manipulative work and the demonstration method, the lecture method of teaching is the most natural and probably the most frequently used. Essentially, it consists of talking. It is an imparting of knowledge that makes use of the auditory sense rather than the visual sense. Other than this there is no great difference between a lecture and a demonstration. It should be understood, however, that the two methods cannot be successfully used interchangeably. Their individual values are definite but seldom overlap. As stated in the preceding section, the demonstration method is used to greatest advantage in teaching manipulative operations, a type of knowledge in the teaching of which the lecture method would be all but worthless. Facts and related materials exist, however,

which are impossible to demonstrate, and it follows that the lecture is especially adapted to this type of instructional material. In the printing field the following subjects lend themselves to teaching by the lecture method: digested or shortened histories of the development of printing equipment such as the press, the type case, the type, and the casting machines; typography and design; processes of manufacture of ink, paper, and type; history of printing; mathematics of printing, embodying the point system and stock cutting; and brief biographical sketches of great printers of the past.

Lectures dealing with the above subjects, just as lectures dealing with any subject, can be made more interesting by the use of illustrative materials. Besides making the lecture more interesting, visual aids increase the clarity of the subject being discussed, since stimuli thus affect the sense of sight as well as that of hearing. It must be remembered, though, that the visual aids alone are relatively ineffective.

In recent years the lecture as a method of instruction in the industrial arts subjects has been the subject of attacks from the pen and of verbal barrages. It has been called the weak and lazy teacher's method. It has been termed the "poll-parrot" or "question and answer" method. It has even been said that lecturing is not teaching at all.

Notwithstanding all this criticism, if students of secondary school age are to get all the essentials in a course in printing, part of the instruction will have to be verbal. At that age students cannot be depended on to hunt their own information, especially those of the backward type.

For greatest success in the use of the lecture method certain points, such as those following, should be remembered.

a. Thorough preparation is essential. Even if similar lectures have been given before, the old notes should be reviewed and new notes added. Any difficulties experienced in former lectures should be provided for and recent developments of the subject should be included. Student questions should be anticipated and answers carefully prepared.

b. The students should be prepared for the lecture and should feel that it is necessary.

c. The actual time spent in lecturing should be reduced to the minimum that will still include all the essentials of the subject being discussed.

d. Frequent questions should be asked to determine whether or not the lecture is being understood.

e. Care should be taken to speak the language of the students. Large and technical words should be omitted or, if they are necessary, explained. On the other hand, the discourse should not be so simple that it is evident that the

instructor is "talking down" to his students.

f. All the most important points should be brought out in the lecture, but sufficient material should be left that further reading on the subject can be done by the more capable students of the class. It is good practice to make assignments for further reading at the close of the lecture, which assignments are followed in later classes by reports of those who have done the reading.

g. Students should be held responsible for materials discussed in lectures and should be aware of this responsibility. The keeping of notebooks augmented by frequent testing will insure retention.

Frank W. Cheney²⁴ has advised that class lectures can be reduced to five minutes out of sixty. It is doubtful that this rule would be applicable in printing education. Particularly would this be true in the many modern courses of an exploratory nature, in which students are expected to learn a great deal in the six, eight, or ten weeks they are in the print shop. Especial care should be exercised by the natural talkers, those who, once started, like to talk on and on. If unrelated talking, rambling and extemporaneous time-killing, is outlawed, the lecture method will become a valuable tool to the printing instructor.

²⁴ Frank W. Cheney, "The Talk Method," Industrial Education Magazine, 26:42, August, 1924.

3. The project method. Since its inception in education the project method has come to have many different meanings, and no little quibbling has resulted from minor technicalities in definitions. William H. Kilpatrick,²⁵ one of the first to write of the project method, has indicated that the essential elements of a project are its representing hearty, purposeful activity on the part of the student and its being carried out in a social environment. Laubach says, "We might define 'project' as an intellectualized, whole-hearted, purposeful unit of activity proceeding to completion in a social environment or natural setting."²⁶ Snedden defines the term, "A project in vocational education is a definite unit of instruction which combines practical or manipulative achievement with definite enhancement of power to apply related technical knowledge."²⁷

Kilpatrick says, further:

It is the thesis of this paper that these evil results must inevitably follow the effort to found our educational procedure on an unending round of set tasks

²⁵ William H. Kilpatrick, The Project Method (New York: Bureau of Publications, Teachers College, Columbia University, Bulletin, 1918), pp. 4-5.

²⁶ M. L. Laubach, "The Project Method of Teaching Industrial Arts Work," Industrial Arts Magazine, 14:326, September, 1925.

²⁷ David Snedden, Vocational Education (New York: The Macmillan Company, 1920), p. 561.

in conscious disregard of the element of dominant purpose in those who perform the task.²⁸

But Struck parries:

This situation cannot always be avoided in trade or industrial education. Certain trade skill and knowledge must be acquired by the learner, and he may have no option as to whether or not he shall perform certain work. But the spirit of Kilpatrick's thesis will be adhered to if the instructor will present the trade job to be performed in such a way that the learner will accept the job as one desirable for him and will enter upon it whole-heartedly.²⁹

Whichever technical conception one chooses to adopt, it is still evident that the project method represents the first definite interest of education, in the child, for whom education exists. Ericson³⁰ supports the four steps of procedure in the development of a project advanced by Kilpatrick, "(1) purposing, (2) planning, (3) execution, and (4) judging."³¹ It should be remembered that these steps are steps taken by the student rather than by the teacher, the teacher's part now being that of a guide and supervisor, rather than a dictator or director. Snedden shows the difference nicely in saying:

²⁸ Kilpatrick, op. cit., p. 12.

²⁹ F. Theodore Struck, Methods and Teaching Problems in Industrial Education (New York: John Wiley and Sons, Inc., 1929), p. 49.

³⁰ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), p. 76.

³¹ William H. Kilpatrick, Foundation of Method (New York: The Macmillan Company, 1925), pp. 344-55.

Differentiating between project and exercise, the latter is largely purposed, planned, and judged by the teacher, the former is purposed, planned, executed, and judged by the student. It is then more than a doing job--it is an educational job.³²

Perfection in the use of the project method is a utopian ideal toward which many instructors are progressing. It is unfortunate that under existing conditions in printing education a majority of the teachers can never hope to realize such an ideal in any complete form. Production work in most shops is of such a demanding nature that pupil participation is curtailed to great extents. In far too many instances the project method becomes: purposing by the administration, planning by the instructor (to get the job out on time), execution by the students, and judging by the administration and the various consumers. When production work in the school shop becomes so extensive that it deprives the students of part of the education to which they are entitled, the school shop ceases to be a school shop and becomes a commercial establishment, whether fault for its becoming so lies with the administration or with the teacher.

If the production work of a school shop is limited to a reasonable amount, little difficulty should be realized in operating the project method with some success. Jobs will be of two types:(1) those suggested by the students for their

³² David Snedden, op. cit., p. 491.

individual use when completed, and, obviously, these will be purposed by the students, and (2) those production jobs that are furnished by the school, and these, since they are for use in the school, should not be troublesome from the standpoint of purpose. Convincing the students of the necessity of planning will probably consume more of the teacher's time and effort than any other step. The pupils are so anxious to finish a job they want to get to the finished product as quickly as possible. True, they are often dissatisfied with the workmanship in a rushed job and plan more thoroughly for the second step toward success, but it is the instructor's duty to train them to plan all jobs and avoid wasted time and materials. Execution and judgement of the jobs by the students should offer no serious problem to the instructor since these are more or less natural actions. To facilitate student judgement many printing instructors have developed rating sheets or forms which make judging both easier and more objective. It is a worthwhile thing for every teacher to develop some such a scheme and fit it in with his individual work.

R. Randolph Karch very strongly advises the use of the individual project in teaching printing. One of several aims of printing education he lists is as follows:

To provide experiences for junior- and senior-high school pupils in one of the major industries of the

United States. These experiences include the planning and laying out of a printed job, setting it in type, and printing copies of it on a printing press by every boy [italics in the original] in the class.³³

This type of program would, of course, demand more equipment than the average school shop of today has. Mr. Karch solved this problem by installing several small-size hand presses which his students use for their individual projects when production work is being run on the power presses. He reports success in the plan, but advises further that beginners should not be taught by the project method, presumably because of their inexperience and unfamiliarity with technicalities and shop routine.

4. The instruction sheet method. R. W. Selvidge, generally accepted as one of the authorities on instruction sheets, explains them as follows:

The operation sheet deals with instruction units involving the manipulative operations we wish to teach. Such units of instruction involve the development of skill, and all instructions designed to develop skill must follow closely the laws of habit formation. Instructions developed with a viewpoint of developing skill should be in the form of specific directions, and not in the nature of general advice.

The information sheet deals with those units of instruction represented by simple statements of fact which one is expected to know who occupies a position in industry that corresponds to the one that the learner intends to attain.

³³ R. Randolph Karch, "The Project Method in Printing," Industrial Arts and Vocational Education, 23:344, November, 1934.

The assignment sheet is used in the presentation of general principles, and is so arranged as to provide an opportunity for practice in their application.

The job sheet is applied correctly only to those forms of instruction sheets that tell how to do a complete work job. Only very small standard jobs may be handled successfully on this basis.³⁴

There are many advantages to be realized in using instruction sheets, but at the same time their use can bring many undesirable factors into the school shop if the instructor is not exceedingly careful. The two extremes of benefits and evils are shown below, the benefits or advantages taken from Van Westrienen and the evils or disadvantages taken from Ericson.

The new type lesson should:

1. Stimulate students to worthy individual and social purposes.
2. Reveal to the student the many opportunities of the course.
3. Serve the needs of students of varying abilities.
4. Serve as a means of enriching the experiences of the student.
5. Make all of the teacher's time available for the giving of individual assistance.
6. Serve as a solution to the large class problem.
7. Relieve the teacher of many of the formal demonstrations and lectures.

³⁴ R. W. Selvidge, "Types of Written Instruction Sheets," Industrial Education Magazine, 30:235, January, 1929.

8. Make it possible to eliminate the formal text-book.³⁵

Nevertheless the best that can be said for the job sheet or lesson sheet is that it tends to reduce the work to the level of a correspondence course; and unless the teacher realizes that such sheets are a teaching aid rather than a device for eliminating personal effort, the shop will soon show absence his personality.

A number of evils may creep into the shop through the use of job sheets unless the teacher is aware of the dangers:

1. Methods of handling tools are carried out haphazardly.
2. The teacher relies on the job sheet to give the instruction and becomes less diligent.
3. The standards of workmanship tend to be low.
4. The danger of accidents is increased.
5. The discipline of the shop tends toward laxity.
6. Tools and equipment suffer.³⁶

Great care must be exercised in preparing instruction sheets, for, unlike oral instruction, once a statement is made no second chance at clarity is allowed. Every statement must be concise and fully clear. Ernest C. Phillips shows that job sheets should be written only "after a process of breaking up a trade, or shop branch, into a series of jobs taken as typical of situations met in the practice of trade

³⁵ Harold J. Van Westrienen, "Preparation and Use of Lesson Sheets," Industrial Arts Magazine, 20:237, July, 1931.

³⁶ Emanuel E. Ericson, "Job Sheets and Personal Instruction," Industrial Education Magazine, 27:291, March, 1926.

or branch."³⁷ Some worthwhile points to remember when writing instruction sheets are:

a. The first paragraph of each sheet should be one of motivation, purposing, and stimulation. The students should understand the reason for the sheet.

b. The sheet should be divided into specific elements, and descriptive headings and positive statements should introduce each division. Phillips suggests breaking the sheet into the following parts:

. . . title [all italics in the original] setting forth the thing to be done; references to standard works; directions on how to do steps involved in the operation, written simply, phrased concisely; questions also stated briefly and directly, intended to compel the learner to think constructively through the steps of the operation, to enable him to see why the operation is performed in a certain way, to guide him in his reading of references, and to fix in his mind ideals of trade and skill practices.³⁸

c. The sheet should be written in a manner and a language that the students can understand. Some provision should be made for the learners to find definitions of new terms that are introduced in the sheets. Whenever it is possible pictures or diagrams should be included or made available to add to the clarity of the sheet.

d. The reference list included should be specific and

³⁷ Ernest C. Phillips, "Job Sheets and Operation Sheets as Teaching Devices," Industrial Arts Magazine, 14:321, September, 1925.

³⁸ Loc. cit.

should include all references to the subject contained in the shop or school library and some that are not so immediately available.

e. The questions included in the sheet should be such as to require that the students do some reference reading.

f. The general effect of the sheet as a whole should be one that will inspire and urge the learner to seek more and more information concerning the subject. It is wise in this respect to give recognition in some manner for the finding of references not included in the instruction sheet.

Printing education has a definite need for instruction sheets. Aptitudes and abilities vary greatly in this field, and one of the strongest arguments for the use of instruction sheets is their recognition of individual differences. It is not uncommon to find in exploratory printing classes of today small groups of boys who represent varying degrees of chronological age, educational age, mental age, and advancement in printing. Notwithstanding the inadequacies of such a system, it is a situation which the use of instruction sheets will do much toward correcting. The very nature of the printing trade, one job following another, demands that some descriptive, orderly method of handling these jobs be used. The instruction sheet method, properly used, meets this need and offers a distinct educational value in addition.

The assignment sheet is of relatively little value in

printing education, but good use can be made of the operation, job, and information sheets. Beginning classes will naturally find greater need for these than advanced classes, since the operations, jobs, and information are all new to them. It has been found very good practice to use these sheets quite frequently in beginning classes, with special emphasis being placed on the planning and order of operations of the job sheet. This prepares the students for the later planning of their own jobs. Cross references are particularly good in helping the students learn to use the sheets. References should be made from job sheets to operation and information sheets; from operation sheets to information sheets; and, less frequently, from information sheets to job and operation sheets. Students should be trained to consult their instruction sheets before questioning the instructor, and they will soon find that their questions are answered there.

As students become more experienced in shop routine and more familiar with technical terms they should be given greater and greater freedom in the planning of their own work. Advanced students should have reached the stage where they can plan a whole job of their own initiative and should be required to do so. Dean M. Schweickhard has advised the use of a special form for this purpose, which is reproduced in Figure 1, page 63. It is not advised that the teacher use this exact form, since it is obviously constructed for use in

any industrial arts shop. The teacher, however, in developing a form for his own use including other items of specific value to him, might well use Schweickhard's plan as a basis for the development. It can be seen that even when using a blank form of this type, the student is still guided in his planning. It might be a wise procedure to encourage a natural evolution on the part of the students from a form of this type to an almost completely blank one in which there is absolutely no indication of what step is to come next. Students are thus put entirely on their own and, besides learning the planning process, complete a job experiencing a greater feeling of success.

5. The use of textbooks. For general purposes, as well as for the purposes of the following discussion, textbooks can be divided into several classes or types: (a) professional books, or books pertaining to teaching problems and methods; (b) reference or related information books or those books which contain information of an additional or non-essential character and which is apart from the actual operations involved in a subject; and (c) the shop or student's textbook, which can be divided into two further types: (1) those composed of instruction sheets of various kinds--the problem, project, or exercise books, and (2) those containing essential information and instruction in a given field but excluding the practical exercises.

JOB PLAN	
To be used by students in planning individual jobs or projects	
(a). Name _____	
(b). Job _____	
(c). Specifications or description _____	

(d). Bill of material _____	
_____	_____
_____	_____
_____	_____
(e). Special tools or machines to be used _____	
_____	_____
_____	_____
(f). Procedure:	
(1) _____	(13) _____
(2) _____	(14) _____
(3) _____	(15) _____
(4) _____	(16) _____
(5) _____	(17) _____
(6) _____	(18) _____
(7) _____	(19) _____
(8) _____	(20) _____
(9) _____	(21) _____
(10) _____	(22) _____
(11) _____	(23) _____
(12) _____	(24) _____
(g). Read carefully the operation sheets for performing all the operations with which you are not thoroughly familiar.	
(h). Instructor's signature indicating acceptance _____	

FIGURE 1

A SUGGESTION, FROM SCHWEICKHARD,³⁹ FOR A BLANK JOB SHEET
TO BE USED WHEN STUDENTS PLAN THEIR OWN WORK

³⁹ Dean M. Schweickhard, Industrial Arts in Education (Peoria, Illinois: The Manual Arts Press, 1929), Appendix C.

Several good books of the professional type have been published, but these relate to the problems and methods of industrial arts generally. No books of the professional type as relate to printing exclusively have been placed on the market. This, however, does not excuse the printing teacher from having in his possession some professional books. The afore-mentioned general methods publications have many points of value to printing teachers and no teacher's library is complete without at least one of these. Some such books are mere re-applications of educational methods to industrial arts teaching and are filled with prosaic educational terminology that offers no practical help to the teacher. Others have delved directly into the core of teaching and have picked out definite and genuine teaching problems and offered advice as to how these problems should be met. It is obvious that the latter type is likely to offer more help of a practical nature than the former. For this reason if a teacher plans to have only one methods book in his library he would be wise to choose the practical type. It is a fact worth repeating that the printing teacher should not be without at least one professional book.

The second general type of books, dealing with related information, will be discussed at a later time in the section headed "Teaching Related Information."

Student's textbooks of the informational type are not

meant to furnish course outlines or projects available for student work. Rather this type is designed to furnish complete instruction in the fundamental tool processes of a given activity exclusive of exercises involving the use of the processes. Ralph W. Polk's Practice of Printing,⁴⁰ R. A. Loomis' Printshop Practice,⁴¹ and Selvidge's and Witt's Instructional Manual for Young Printers,⁴² are good examples of textbooks of this type. The second type of students' textbooks deals directly with the projects or exercises used in the shop and need not necessarily include the fundamental operations found in the informational books. However, it will be found that most books of this type do include discussions of such processes, sometimes in the form of operation sheets. J. C. Tranbarger's Practice in the Fundamentals of Printing⁴³ is an example of the exercise type of textbook.

Opinions regarding the use of textbooks in the industrial arts subjects are widely varied and strictly opposite, one from the other. That group opposed to the use of textbooks

⁴⁰ Ralph W. Polk, Practice of Printing (Peoria, Illinois: The Manual Arts Press, 1926).

⁴¹ R. A. Loomis, Printshop Practice (Milwaukee: Bruce Publishing Company, 1928).

⁴² R. W. Selvidge and Harvey A. Witt, Instructional Manual for Young Printers (Peoria, Illinois: The Manual Arts Press, 1926).

⁴³ J. C. Tranbarger, Practice in the Fundamentals of Printing (Terre Haute: By the author, 1932).

have varying reasons for their opposition. Ericson gives five reasons that he says have been given as explanations of the attitude of opposition.

- a. Textbooks limit the program.
- b. Teachers prefer to use their own methods.
- c. The expense is considered.
- d. The habit must be formed.
- e. Some teachers are afraid that what they are doing will not measure up to accepted standards, and that they will be forced to exert themselves more vigorously if textbooks are brought in.⁴⁴

Vaughn and Mays, in presenting the views of those favoring the use of textbooks, show the following advantages:

- a. Textbooks put a body of definitely related information in the hands of the boys.
- b. A clear statement of the fundamental principles of the work is always available to the boys.
- c. Textbooks satisfy the need of a kind of guide.
- d. Textbooks give continuity and coherence to the work which the teachers are attempting to do from week to week.⁴⁵

To these advantages Ericson adds the following as representing further arguments in favor of the use of textbooks:

⁴⁴ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), pp. 146-47.

⁴⁵ Samuel J. Vaughn and Arthur B. Mays, Content and Method of the Industrial Arts (New York: The Century Company, 1924), pp. 132-33.

a. Textbooks encourage the covering of a definite scope of work.

b. They check the instructor.

c. They fix the responsibility on students.

d. Practice in reading is necessary.

e. Books specify standards.

f. They are an economical investment.⁴⁶

It is perfectly obvious that from the standpoint of printing education the views set forth by these authors (which views may not necessarily represent their personal opinions) are so prejudiced as to obviate any validity. The usefulness of textbooks varies with different situations, and it will often be the teacher's problem to weigh the advantages and disadvantages as they apply to his individual position and make his own decision. On the other hand, certain circumstances would in themselves answer the problem of textbook use. Before adopting a textbook one should consider carefully such items as the age of the students, the grade level of the students, the length of term the students will take printing, and the kind of printing being taught, i. e., industrial arts, exploratory, pre-vocational, vocational, or trade school printing. For example, in a school where exploratory printing is being taught for a term of eight weeks to seventh or eighth grade students, it would

⁴⁶ Ericson, op. cit., pp. 148-49.

hardly be considered practicable to require the purchase of textbooks. In a trade school, however, where students are of high school age or over, textbooks for several phases of printing would probably be considered essential to the two or three years' curriculum offered.

In choosing a textbook several points need to be remembered by the teacher or whomever is making the choice.

a. The book should cover as fully as possible the subject matter contained in the course of study to be taught.

b. The vocabulary of the book should be on a level with that of the students to be taught.

c. If of an informational type, the book should be interestingly written. School children should not be required to pore over their assignments, forcing themselves to read the required information.

d. A well illustrated book increases student interest and at the same time adds clarity to the subject matter.

e. The book should be well organized so that the students will understand at once the scope of the work as well as its purpose. Students who are required to read chapter ten first, then chapter three and chapter fourteen, etc., have a tendency to doubt either their instructor or their textbook. For this reason a teacher is wise to find a textbook that meets the demands of his course organization or, failing in this, to adapt the organization of his course to that of the

textbook he chooses.

f. Not the least important item in most schools is the expense of the textbook, whether the school furnishes the books or the students buy their own.

g. The book should have some value to the student after he has finished the course.

For use in all training levels up to the advanced vocational courses, a situation such as the following might be regarded as one of an ideal type. The core of the whole course should be either a textbook of the exercise type or a set of teacher-made instruction sheets, the instruction sheets being used for the younger students or those in the course for a short period of time, and the textbook of exercises being used for the older and advanced boys. Augmenting these instructions should be the informational type books in the shop library--immediately available to all students. References should appear in the exercise-type text or in the instruction sheets to the information covered in the shop library books, and occasional class assignments or individual reports should be prepared from them. In the school library, somewhere outside of the shop, further reference material of a more technical or less essential nature should be available. This information is for the use of those superior students of the class who can prepare class assignments with ease as well as for those who find the subject of printing especially

interesting to them. The combination of exercise textbook or instruction sheets, shop library, and school library should provide the students with all the subject matter required of them. The demonstrations, teacher lectures, group and individual supervision, and other teaching devices should then be used to augment and clarify the available information.

In any case it should not be forgotten that any textbook, or any set of instruction sheets no matter how good, is not meant to be a substitute for the instructor. In the last analysis the teaching personality is one of the most important factors in successful education. Were the imparting of varied facts the only requirement of it, the teaching profession would long ago have ceased to exist. True teaching implies further guiding and inspiring qualities, so that learners suffer to the extent that the personal element, the inspiration, is removed.

6. Other useful devices. There are several teaching devices that have not been discussed as yet and which have at least occasional value in printing education. These devices include the oral recitation, the written recitation, questioning, visual aids, examinations, the bulletin board, and student notebooks. M. W. Haynes⁴⁷ in a similar list in-

⁴⁷ M. W. Haynes, Teaching Shop Work (New York: Ginn and Company, 1924), pp. 57-64.

cludes the terms "experiment" and "practice in the job." The experiment is not included here since, in teaching the industrial arts subjects, it is so closely related to the demonstration, a device or method to which considerable discussion has already been devoted. Haynes' "practice in the job" is such an established custom in present-day shop teaching that it is omitted due to fear of superfluity. Other lists include many other devices which are also omitted here because of their lack of value to printing education or because of their inclusion in one of the devices already listed.

a. The oral recitation is essentially only a form of the later device, questioning. It is a method, in its most common use a question and answer method, of checking on assignments. Students are made definite assignments of specified reading, for example, and the following day their ability to recall the facts required is tested in an oral discussion or recitation.

b. The written recitation, as might be expected, is the counterpart of the oral recitation except that it is written. The commonly accepted difference in meaning between the written recitation and the examination is that the examination demands retention over a longer period of time. Written recitations are, for the most part, day to day examinations.

c. Questioning is one of the most used devices in all

branches of education, and its proper use in printing education is important. Besides its first mentioned use of testing in the daily recitation, questioning can be used to emphasize certain desired bits of information and to guide the students in their acquisition of further information. Edward S. Maclin, in an excellent article on questioning, presents the following advice for the use of questioning:

(1). Questions should always be stated in clear, understandable English.

(2). Questions must be adapted to the age and understanding of the pupil.

(3). Short, pointed questions are most desirable.

(4). Pumping questions are in poor form.

(5). Yes or No questions should be avoided at all times.

(6). It is bad form to repeat answers of pupils.

(7). It is bad form to in any way indicate the answer to the question.

(8). Always state the question first--then call on the student.⁴⁸

Questioning can be adapted to use in almost any set of circumstances. It will be found that a much better student attitude can be built up by using questions in the place of the stereotyped "do as you're told" form of shop management. A few well-planned questions will direct students'

⁴⁸ Edward S. Maclin, "The Art of Questioning as Applied in Manual Arts Teaching," Industrial Education Magazine, 30:84, September, 1928.

reasoning so that the desired conclusions will be reached by their own power of thought rather than the instructor's. Listed below are several occasions when questioning will prove of value to the teacher.

(1). Questions at the beginning of a demonstration will help the students feel a need for it.

(2). Questions at the close of a demonstration will help the teacher determine the extent to which his efforts have succeeded or failed. By the careful use of questioning the instructor can always be sure of a thorough understanding of a subject.

(3). Questions used in assigning lessons, reference work, or jobs will motivate the students.

(4). Questions, well planned, will direct a student from an incorrect method of procedure or performance to the correct one without his feeling that he is being dictated to.

d. Visual aids, as used in this listing, refer to drawings, charts, diagrams, etc., or, as the term implies, to anything that aids the learner through visual perception. Material of this type in the field of printing is plentiful due to the fact that printing equipment and supplies manufacturers have taken a serious interest in printing education and furnish much material free.

Wall charts and diagrams are very useful and helpful to beginners in printing. Charts are available that cover

almost every printing operation from learning the case and how to use the composing stick, through the press and cutter operations, to the mechanics of machine composition. It is a wise instructor who keeps something of this nature before his students at all times, but, in some respects, it is an unwise teacher who keeps the same thing before them at all times. To be fully effective, visual aids must be changed to coincide with the subjects being studied. If this is not done, the diagrams or other materials become a part of the shop just as much as the blackboards or window shades and are seldom noticed. The bulletin board is such an effective method of handling visual aid material that a special section has been devoted to it later.

Another and an almost inexhaustible source of visual aid material is printed matter such as newspapers, magazines, books, pamphlets, programs, and jobs that come out of other shops. Material of this type can be used to exemplify rules of composition that have been discussed in class, to illustrate good as well as bad forms of typography, and to explain why certain rules exist. Harry J. Muntz⁴⁹ suggests that the instructor collect pictures that appear in trade journals and other places, adding that over a period of time the accumu-

⁴⁹ Harry J. Muntz, "Make Your Own Visual Printing Aids," Industrial Arts and Vocational Education, 26:183, June, 1937.

lation grows to a complete coverage of several units. He suggests further that for filing, the material can be mounted on tagboard, size eight and one half inches by eleven inches, or for hanging it can be mounted on plywood, size sixteen inches by twenty-four inches.

Students can do much toward helping the instructor assemble such material if they are urged in the proper manner. Added credit should be given to those students who respond in the desired way.

e. The examination of an oral or written type is about the only method the teacher has of testing retention over a comparatively long period of time. Lesser examinations, such as the quiz or daily or weekly oral and written recitations, can be used for shorter periods. The value of the examination as a teaching aid comes in making the students feel responsible for the information they are supposed to be learning. The advanced students or those studying vocational printing can see immediately why the material should be remembered, since they have its use in the trade to look forward to. Unfortunately, in the exploratory courses the examination must be relied upon for this purpose.

f. The bulletin board is a type of visual aid and can be made one of the strongest influences in the shop. If the proper material is used in the proper way, the pupils soon develop the habit of looking at the bulletin board daily, and

much instruction can be given in this manner. The following instructional suggestions may assist the teacher in making his bulletin board a more helpful teaching aid, as well as making it more valuable to his students.

(1). The board should be conveniently located in the shop. Since there may be three or four boys reading the material on the board at the same time, it would be unwise from the standpoint of safety to have the board located near any dangerous machine, such as a press or paper cutter. It probably would be unwise also to locate the board too near the hand composition cabinets since boys at the board might interfere with the work of the compositors. Good places for the board might be any of the following: near the entrance door, so that boys might stop on their way into the shop and read posted material while waiting for the rest of the class to assemble; near the shop lavatory, if no separate washroom is available, so that boys waiting their turn to wash at the close of the period can occupy their time in a worthwhile manner; or near the teacher's desk, so that students waiting their turn there can read while waiting.

(2). The size of the board should be given careful consideration. On too small a board adequate material appears to be crowded, while on too large a board adequate material does not seem to relieve the look of emptiness. A board three feet square or three feet by four feet, should satisfy

the demands of most printshops.

(3). The board should be kept interesting at all times. Since this will take some time on the part of the instructor it will be found that in some shops the bulletin board becomes a depository for any and all information that the instructor happens to run across. Some material may prove interesting to the instructor and his advanced technical ideas but at the same time seem entirely unrelated in the minds of the students.

(4). An attractive arrangement of the material on the board will help to increase pupil interest.

(5). It is not necessary to confine all the information or material on the bulletin board to the field of printing. Boys will become more interested in the board as a whole if occasional variations occur. It has been found a good policy to post daily a cartoon of a humorous nature, such as may be found in Collier's or Saturday Evening Post. At first thought this may sound a little unprofessional, but the scheme will attract some boys who otherwise would never go near the bulletin board. Other interesting topics that have proved helpful in attracting lagging students are: how to build log cabins, lean-to's, camp fires, tepees, snowshoes, and almost anything that relates to out-of-doors or camping; sports results--baseball, football, and basketball write-ups that some of the students may not have access to; pictures of projects

that the students might want to make in other classes or shops; pictures of boats or airplanes or diagrams of model boats or airplanes. The instructor must be sure to remember, however, to use discretion in posting material of this type, lest the printshop bulletin board become one of hobbies alone.

(6). Pupils should be given freedom to look at bulletin board material at any time during the class period, or at least until the instructor can discern the few pupils who will take this privilege as a chance to loaf. Such a plan furnishes a break in the routine work of the printshop which is not entirely without tediousness for small and young boys.

(7). The boys should be held responsible for the material that appears on the bulletin board and frequent tests should be made to include questions on that material.

(8). Topics that are posted on the board should be changed intermittently. The use of daily cartoons has already been mentioned, to which might be added other material of short enough length to be changed daily. Longer or more complicated articles might be left posted for several days. It would be inadvisable to leave any one topic posted for over a week (five school days).

George F. Billey says:

A bulletin board is a great asset. A good board should

be interesting enough to attract the attention of the students from an educational viewpoint. . . . Perhaps one of the greatest benefits of the bulletin board is the vocational help that can be given to the students who are trying to decide what is to be their life's work.⁵⁰

g. Student notebooks vary in content with the instructor who requires them and with the course, but in general it can be said that the notebook helps the instructor considerably and the student even more. In the shops that keep much information readily available for student use, i. e., permanent wall charts, a complete reference library, and all types of instruction sheets, a very complete notebook will be found unnecessary. In those shops, however, where circumstances prevent such availability of information the notebook will serve very well as a storage place for the information that the students will need throughout the course. Leroy Brewington gives the following points as those that he requires in the notebooks of his Pittsburg, Kansas, high school students:

I. Lecture notes and printed information given by the instructor.

II. Correct procedure in proofreading and standard proofmarks.

III. Printshop kinks and shortcuts.

IV. Questions and answers in condensed written reviews.

⁵⁰ George F. Billey, "The Bulletin Board in the Shop," Industrial Arts Magazine, 17:313, September, 1938.

V. Student's shopwork exercises--copy, first proof, second proof, and final product.

VI. Stylebook of printers' English, trade terms, standard forms, etc.

VII. Various types of good printed specimens.⁵¹

If notebooks are required they should, of course, be checked by the instructor. Nor should he wait until the term is practically over to do this. Frequent checking by the teacher will show the students that he is genuinely interested in what they are putting in their notebooks, and as a result more care and energy will be spent. Needless to say, if notebooks are required and marks are given, the marks should be somewhat dependent on the quality of the notebooks the students submit. Furthermore, the students should know what part of their mark will depend on their notebooks.

Although neatness in keeping the notebook should undoubtedly play some part in the teacher's estimation of its value, it would generally be considered unwise, because of financial circumstances of some of the students, to require any certain type of notebook.

Many other suggestions of teaching devices have been made from time to time by teachers of printing. Some of these have found their ways into industrial arts magazines or printing trade magazines. For the most part, however, these

⁵¹ Leroy Brewington, "The Value of a Notebook in Printing," Industrial Arts Magazine, 18:463, December, 1929.

suggestions for teaching aids or devices are specifically applicable to the individual shops for which they were devised and are not to be interpreted as having universal application in printing education. The wise instructor can nevertheless gain some good points in the way of general suggestions by keeping up with the modern developments of his field as presented in the trade journals. His immediately applied use of the device may vary widely from the presented one, but in most cases his own plan will be better for having been developed from another origin. It is folly to assume that a given plan is superior only because it is entirely original.

Two devices of checking distribution are given below. These are presented as types of the suggestions referred to above more than as the most worthy suggestions that can be found.

W. Harry Phipps⁵² has developed a California job case that has both a sliding bottom and an actual bottom, so that only the type distributed immediately before is visible. After the instructor has checked on the distribution and found it correct, he can insert a key in the device and slide the bottom to a point at which holes in the actual bottom and holes

⁵² W. Harry Phipps, "Helpful Suggestions for School Printshops," Industrial Arts and Vocational Education, 19:298-301, August, 1930.

in the sliding bottom coincide. The newly distributed type then falls through the device into whatever case is desired. In the same article Phipps also illustrates samples of job sheets, name cards, record sheets, and tool racks that he uses in his own shop.

William J. Patlow has had published a reproduction of the distribution sheet that he uses in the Milwaukee Vocational School. It is shown in Figure 2.

7. Combinations of methods. In the preceding discussion several methods of teaching printing have been discussed singly. Each method was shown to have advantages under certain circumstances and disadvantages under others. It is only logical to assume, then, that the most successful job of teaching would include several of these methods, each being used at the time when it is most advantageous to use that particular method.

Probably the most obvious combination, as well as the one used most frequently, is that of the demonstration and lecture methods. No demonstration could ever be given satisfactorily without some degree of talking accompanying the actual manipulations. To the extent that talking is a part of the instruction, the lecture method is being used. Instructions in printing operations will be more successful if this combination is used. The talking or lecturing must be kept to a minimum, however, and at no time should the in-

Milwaukee Vocational School

STUDENTS' TYPE DISTRIBUTION SHEET

[Rules for distribution appear in this space]

Student's name of	No. of job	Type used in job		Date dist'd			No. of case	Foreman's OK
		Size	Name of type	A.M.	P.M.	Eve.		

FIGURE 2

A SUGGESTION, FROM PATLOW,⁵³ FOR A DISTRIBUTION SHEET

⁵³ William J. Patlow, "A Check-Up on Type Distribution," Industrial Arts and Vocational Education, 20:360-61, October, 1931.

structor feel safe in trying to tell the students by lecture alone how to proceed in a manipulative operation. As pointed out before, imitation is a very important part of the educational process, and the teacher should give the students a chance to use this simple process of learning by performing before them all the necessary operations.

Another important combination of methods is the instruction sheet-project method. These methods go hand in hand by definition. Job sheets, operation sheets, and, if properly constructed, information sheets and assignment sheets are projects in themselves. Whether or not the instruction sheet method of teaching becomes also the project method of teaching depends on the instructor and the fidelity with which he follows the purposing, planning, execution, and judging steps of Kilpatrick.⁵⁴ If these steps are followed in the manner Kilpatrick advises, the instruction sheet-project combination will prove very worthwhile to the teacher.

Undoubtedly the most successful combination would be that of all four methods, the demonstration, lecture, instruction sheet, and project methods. To assume that an operation sheet would take the place of a demonstration would be just as erroneous as assuming that an operation could be taught successfully by the lecture method. Although operation

⁵⁴ William H. Kilpatrick, Foundation of Method (New York: The Macmillan Company, 1925), pp. 344-55.

sheets can, and should, be illustrated with helpful pictures and diagrams, the personalized instruction of a demonstration cannot be put on paper. It is therefore evident that the demonstration must be used in conjunction with instruction sheets if fullest attainment is desired. Moreover, since lectures or oral explanations are essential in clear demonstrations the lecture method must also be included.

If a complete shop library of good reference books is kept available and used in conjunction with these four methods of presentation, the teacher will have a well balanced system of printing education.

One important element, the most necessary for success, remains: the teacher. It is quite possible, in some cases even likely, that the teacher might adopt all these methods for use in his shop--give demonstrations, lecture, make projects of his job sheets, make or buy instruction sheets of all types, maintain a shop library--and still fail in his teaching. This is possible because the mere adoption of a system by no means precludes its failure. The continual work and attention of the teacher is imperative for his success, no matter what methods he uses. Those who adopt methods for the sole purpose of lessening their own work are doomed to fail. Demonstrations and lectures must be painstakingly prepared and carefully presented. Constant supervision must accompany any effort to make use of the project method. Much

time must be spent constructing instruction sheets, and their administration must not be left entirely to the students. A reference library of limitless bounds is worthless if unused, and one of the teacher's duties is to encourage its use. The best and most efficient methods will fail in the hands of a poor teacher while, occasionally, a capable teacher can succeed with an inferior system. It is up to the teacher.

Class Organization

Class organization is one of the principal ways that printing differs from other subjects in the industrial arts field. As Ericson⁵⁵ points out, there were many years after the introduction of manual training in this country when class organization was almost wholly on an individual basis. Boys were required to do certain operations or groups of operations irrespective of their ability or aptitude in the subject. This situation evolved into one where boys were allowed to choose from groups of projects that contained the required operations, and interest was thus increased. Ericson⁵⁶ refers to the former organization as individual and the latter as group.

Printing education has not undergone any such evolu-

⁵⁵ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), p. 154.

⁵⁶ Loc. cit.

tion on a very wide scale. One reason for this fact, no doubt, is the ease with which the subject can be adapted to individual organization. Beginners in printing have much technique and many operations to master before they have gained enough knowledge to have a very wide choice of projects. It might be said that this condition is true of beginners in woodwork, metal, or other industrial arts subjects as well as in printing. However, a boy in woodwork who, in making his first project, ruins a piece of lumber does not paralyze the work of the whole class by his carelessness. On the other hand, a boy in printing who is allowed the freedom of using all the type sizes before he has had time to learn to differentiate between them, can upset the routine of his own class and all the other classes by his careless distribution. For this reason, most instructors have confined their beginning students to one face and type size. Using one type face and one type size, the choice of projects by the students becomes too limited and most instructors have assigned the lessons or projects to be composed--the individual type of class organization.

The demands of production work in the school printshop is another reason why the group method of organization is seldom found there. By the time that printing students have learned enough of the subject to choose projects they might want to print, the instructor has to draft their services for

the production work that is required of the shop. Hence, instead of the group organization, we find that in school printshops many advanced classes are organized on an out-and-out production basis, while many others are spending their time on production work but are not organized with that end in view.

Production work in the schools has been an argued point for many years, and, because there seems to be more of it to do in the printshops than in the other shops, printing instructors can be found airing their respective views almost constantly. It has never been made perfectly clear just how the problem of school-shop production arose, but undoubtedly a large part was played by the presentation of some of the arguments for putting printing into the public schools. Backers of other industrial arts subjects were content to rest on the advantages of their curricula alone, but printing enthusiasts added to their curriculum advantages (as if the educational and cultural values of printing were insufficient justification) the financial gain the schools could make by producing their own printed matter. School heads were told that the initial investment would pay for itself in savings in the course of two to five years, depending on the size of the plant installed and the amount of printing previously bought. Larger systems were told that the economies gained by adding a printshop would even pay for the new

instructor that would have to be hired. And many school printshops were made to do just these things. As a result there is today a constant undertone of disagreement. Administrators hold to the course of production and savings, trying to squeeze more and more work out of the shops. Instructors, probably not as overworked as they think they are, cry for mercy in the name of the students they do not have time to teach.

In reality production in the school shops is not wrong in itself; it is the immense disproportion between instructors' and administrators' views that needs adjusting. It cannot be denied that production methods have definite educative values, especially in the courses that have exploratory, pre-vocational, or vocational training as one of their aims. In a world filled to the brim with industrialization and mass production an educational system would be sadly negligent if it did not prepare youth for the processes of large manufacturers. On the other hand, if printing instructors and printing students are continually exploited to the financial advantage of the school systems, the instructors will soon lose sight of the higher ideals of education and will devote their time to developing short-cuts in production methods rather than to developing worthwhile personalities and character habits in their pupils; the students will lose what little interest they might have in the values of formal education and will

fall back into the child-slave attitudes of the oldtime era of crafts and lengthy apprenticeships.

It is time that administrators and instructors each understood the problems of the other. The administrator should realize that a limit of production exists in the shops of his system, if it is to continue as a system of education; that constant nagging for rush jobs is very trying on the patience of an overworked instructor; and that students soon lose interest in the grinding out of school jobs if they have no chance of satisfying their own desires. But adjusting the viewpoint of the administrator is not within the scope of this work, and the teachers' adjustment is, if anything, even more important.

The teacher must first realize that since the production work is there to be done, it will be advantageous to himself and his pupils if he accepts it and makes the most of it. Biased criticism of the administration of his system is personally and professionally an unwise procedure for a teacher to undertake. Harry K. Gardner says:

Many of them [teachers] use as a war cry, "When production starts, education stops." The thinking, progressive printing teacher knows that when "interest ceases, education also stops." It is his job not only to educate, but to stimulate interest, because without the latter the former is impossible.⁵⁷

⁵⁷ Harry K. Gardner, "Production Work in the Junior High School Printing Shop," Industrial Arts Magazine, 18:372, October, 1929.

Production is not a method of vocationalizing industrial arts. The junior high school theory pertaining to industrial arts is, in substance, that industrial arts develops industrial appreciation by participation.⁵⁸

The teacher should first justify every production job that is brought into his shop. Some of these will justify themselves. Students should be motivated. They should not be allowed to assume the idea that the job is unnecessary--even if, in some cases, it is. Much instructive and educative value has been found in requiring the students to make out job sheets for all production work, these job sheets to be checked first by the student foreman, later by the instructor. The teacher should not make the mistake of promising every job as soon as it is asked for. Situations will arise when a production job would seriously handicap the work going on in the shop, and the instructor should not feel obligated to disrupt his organization to incur the favor of an administrator. It will be found that an action of this type only invites more rush jobs. However, if the circumstances are such that the rush is unavoidable the instructor should cooperate. An easy way to avoid untoward feelings in this respect is to announce a deadline for copy of all kinds. Establish a shop rule that no job should be expected until a week, or two weeks, after the time the job was taken. W. W. White suggests, "Enclose a blotter with all jobs explaining

⁵⁸ Ibid., p. 373.

that rush jobs are inferior in quality. Early orders receive more attention."⁵⁹ It is also advisable to allow extra time when promising jobs. A much better impression is made if the order is delivered a little early than if the orderer has to wait longer than he anticipates.

Karch gives the following list as possible helps in controlling production work:

1. Staggered schedules.
2. Copy cutting.
3. Instructor starts difficult jobs.
4. Doubling the stock size.
5. Incompleted-work board.
6. After-school club period.
7. Small hand presses.
8. Instructional job order envelope.
9. The foreman idea.⁶⁰

If production work is to be successful much planning and work is required of the teacher. Ericson says:

Whether it "goes over" or not probably depends more on the instructor than the students. Lack of knowledge of methods involved in manufacture, or lack of faith in

⁵⁹ W. W. White, "Educational Production in the School Printshop," Industrial Arts and Vocational Education, 26:367, November, 1937.

⁶⁰ R. Randolph Karch, "Organizing Printshop Production," Industrial Arts and Vocational Education, 25:210-11, July, 1936.

the purposes and principles under which the scheme is undertaken, will go far to prevent its success.⁶¹

Ericson gives the following advantages and disadvantages of production work in the shop:

Advantages:

1. It is the method of industry.
2. It puts "drive" into the work.
3. It raises standards of workmanship.
4. Cooperation is developed.
5. It discovers and develops managerial ability.
6. It gives an opportunity to inferior workmen.

Disadvantages:

1. Group work takes away the feeling of individual responsibility.
2. It produces loafers.
3. It kills interest.
4. Students are exploited.
5. It makes teaching difficult.⁶²

The following plan has been devised as a suitable one for organizing printing classes in the junior high school. It has been assumed that the beginners in printing are to be taught exploratory work.

1. Beginning classes should be organized on the indi-

⁶¹ Ericson, op. cit., p. 158.

⁶² Ibid., pp. 159-61.

vidual basis. This organization will lend itself very conveniently to the teaching of fundamental operations, but the instructor should choose exercises that will be of as interesting a nature as is possible. For example, rather than requiring the students to set up rows and rows of p's, q's, b's, d's, n's, and u's to teach them the characteristics of these demons, a few carefully constructed sentences or paragraphs containing these letters, and written about the school or its athletic program, will capture the boys' interest quickly. After the students have become acclimated to the work, exercises can be composed of related information such as brief excerpts from printing history or from biographies of great printers.

2. Near the close of the beginning course the learners should be allowed to select a project from a group chosen by the instructor, or one of their own choosing if the instructor approves it. This would be an adaptation of Ericson's⁶³ two plans of organization, the group method and the free choice method. If the students are told of this plan at the beginning of the term, it gives them an added interest in the work, having something of a personal nature to look forward to. The students of beginning classes would probably be capable of making such projects as the following: name

⁶³ Ibid., pp. 154-58.

cards (for themselves or members of their families), small grocery list pads, simple outlines or written assignments for academic classes, or small memorandum pads or notebooks.

3. Advanced classes are generally depended on to do the shop production work and should be organized on a production basis. This not only makes production easier but gives the students an idea of how work is done in industry. It has been found practicable to divide the class into four groups, composition, imposition and make-up, press work, and binding and cutting departments. The size of these groups will necessarily vary with the facilities and arrangement of the shop, but in most cases it will be necessary as well as advisable for the composition department to be somewhat larger than the others. There has been some discussion as to whether students should be rotated in these different departments, experiencing every activity, or left in one department for the full semester, mastering the operations of the smaller field. In general such a question should be decided by two things: the students' wishes and the amount of production required of the shop. Naturally, a boy who wants very badly to work in the bindery should not be forced to spend all of his time in the composing room, especially if production requirements will permit occasionally a transfer from one department to another. However, in a busy shop where much work is demanded, the instructor is almost forced

to get by with as few transfers as possible. It is surprising how readily boys' choices fall into required groupings if they are allowed to choose their own departments and if the method of organization is explained before choices are made. For this reason it is deemed advisable to allow students the privilege of choosing their own departments. If, after explanations have been made, some group is still overcrowded, the instructor can ask for volunteer changes or even draft certain changes himself. It would be wise to have foremen in the larger groups such as the bindery or composing room. Foremen can be elected by the group members, elected from selections made by the instructor, or appointed by the instructor. Duties of a foreman should be answering questions within his group insofar as he is capable, checking jobs before presenting them for the teacher's final approval, and acting as general overseer of his department. If the system does not provide them, it would be to the instructor's advantage to develop a job envelope, or ticket, to follow the job through the shop. Harry P. Buboltz supports this suggestion, saying:

Use order blanks for all jobs entering the printshop. Have all orders OK'd by the supervisor of printing or industrial arts. Obtain all necessary information on the blank so no oral instructions are needed.⁶⁴

⁶⁴ Harry P. Buboltz, "Controlling Production Work," Industrial Arts and Vocational Education, 26:216, July, 1937.

This device insures against lost copy and furnishes an easy method of filing copy, proofs, and specimens. A form printed on the outside of the envelope will do much to facilitate the handling and filing of the job. Such a form is suggested in Figure 3.

Specific Problems of Teaching in Printing with
Brief Discussions of Those Methods Most
Likely to Succeed in Each Case

1. Teaching the case. Teaching the case is undoubtedly one of the major concerns of printing teachers everywhere, since the whole of printing depends on the individual's mastery of this fundamental. Instructors have spent many and long hours trying to develop or discover a plan that will teach the case thoroughly, quickly, and simply. As a result there are today almost as many methods as there are teachers. Many of these methods have good points, while others are decidedly weak.

From the standpoint of the methods discussed previously the best one to use would probably be the illustrated lecture method or information sheets augmented by illustrated lectures. No operations are involved in the learning of the case, which obviates the use of job sheets or demonstrations. Lectures might be illustrated by the following: a California job case, wall charts, drawings on the blackboard,

J O B T I C K E T

For _____
 Address _____
 Date received _____ Quantity _____
 Job description _____

COMPOSING ROOM

Student compositors _____

Style _____ Size _____
 Proof wanted _____ 1st proof sent out _____
 1st proof returned _____ Sent to make-up dept. _____

MAKE-UP DEPARTMENT

Student stonemen _____

Type of lock-up _____ for _____ press
 Received from comp. room _____ Press proof sent out _____
 Press proof returned _____ Sent to press room _____

PRESS ROOM

Student pressmen _____

Received from make-up dept. _____
 Color ink _____ Cover _____
 No. forms _____ Impressions _____
 Off press _____ Sent to bindery _____

BINDERY

Student binderymen _____

Stock _____	Cover _____
Cut stock size _____	No. full sheets _____
Cut cover size _____	No. full sheets _____
Pad _____	Number _____
Staple _____	Perforate _____
Punch _____	Wrap _____

Delivered _____
 Charge _____

JOB NO.

FIGURE 3

A SUGGESTION FOR A JOB TICKET

individual case diagrams, and blank individual case diagrams.

Kenyon S. Fletcher has reported success in the use of his association-with-words plan. This plan calls for the use of a list of words that Fletcher has devised, each new word involving the use of one or more new letters. He reports that when frequent testing accompanies the use of his plan better retention is gained. Figure 4, below, shows Fletcher's list of words in the order of their use.

word	new letter used	word	new letter used
1. the	t-h-e	12. this	i-s
2. that	a	13. foolish	f
3. than	n	14. young	y
4. and	d	15. rush	r
5. done	o	16. wish	w
6. taught	u-g	17. part	p
7. caught	c	18. quick	q-k
8. bought	b	19. jack	j
9. could	l	20. exercise	x
10. love	v	21. size	z
11. move	m		

FIGURE 4

THE LIST OF WORDS USED IN FLETCHER'S⁶⁵ ASSOCIATION-
WITH-WORDS PLAN FOR TEACHING THE CASE

⁶⁵ Kenyon S. Fletcher, "Learning the Type Case," Industrial Arts and Vocational Education, 20:362-63, October, 1931.

Frank Di Giacomo⁶⁶ criticizes three methods of teaching the case that are in common use, then gives his own method. The first method consists of drawing a case diagram and copying letters in from a key chart. Di Giacomo points out that there is no educational value in this method. The second method requires that all letters in the case be set out and then stood up in the boxes. In the third method the students are given printed charts of the case and are started off setting full lines of type. The criticism of the second and third methods is that there are so many learning elements in them that they should be taught separately in the junior high school. In Di Giacomo's own method the students are given a blank chart on news print which they fill in according to an instruction sheet. They are also given a blank chart on white bristol which they are to fill in in ink for their notebooks. They then practice setting imaginary lines from the case charts and inform the instructor when they think they have the case well enough learned to be tested.

C. K. Lush⁶⁷ tells a story when teaching the case to his students. The type cabinets become apartment houses, the

⁶⁶ Frank Di Giacomo, "Teaching the Lay of the Case in Junior High School," Industrial Arts and Vocational Education, 26:21-22, January, 1937.

⁶⁷ C. K. Lush, "Teaching the Job Case to Young Students," Industrial Arts and Vocational Education, 26:281-82, September, 1937.

cases become apartments, the boxes become rooms, and the type is represented as people or families who live in the rooms. Ligatures are spoken of as twins, triplets, etc. Although this method of teaching the case would be very valuable in the teaching of printing to the lower grades, it is probable that students in the junior high school would rather resent being talked down to. It is usually the best policy to keep the level of instruction equal to or just a little above the students' level of learning.

George J. Bilsey⁶⁸ advises the use of objective tests in teaching the case and uses them frequently himself. He considers the learning of the case one of the most important elements of printing education and insists on perfection from his students. He requires the students to draw and fill in case diagrams and tests them until they make no mistakes.

2. Teaching composition. Composition and the use of the composing stick is a printing operation and hence can be most successfully taught by the use of the demonstration method. Again, certain aids to teaching are worthwhile, but cannot substitute entirely for the personalized instruction of a demonstration. Wall charts or other illustrative material showing the correct way to hold a stick, the method of handling the type, and good posture at the case are very help-

⁶⁸ George J. Bilsey, "Teaching the Type Case with Objective Testing," Industrial Education Magazine, 33:212-14, February, 1932.

ful. Instruction sheets can be put to good use in emphasizing the most important points of the demonstration. Information sheets and operation sheets could both be used, and when students have practiced but little they are ready for a simple first job sheet. The instructor should not forget to make use of the lecture method in orally explaining points in the demonstration, nor should he fail to question his students thoroughly to test their understanding of the demonstration. The first demonstration should not be made too technical by the introduction of the names of all the parts of type and the composing stick. A few of these names will be necessary for clear understanding, but most of the names can be left until later.

R. Randolph Karch⁶⁹ has made the job of teaching composition in his shop easier by the use of giant materials. He has constructed a composing stick, line gauge, type, leads, and slugs immensely oversized, using wood as the principal construction material. The stick is five feet long, eighteen inches wide, and five inches deep. The other materials are made in exact proportion to the stick. Besides making the operation of typesetting clearer to the learners, this method is a great help in starting them on a definite understanding

⁶⁹ R. Randolph Karch, "The Use of Giant Materials in Teaching Printing to Beginners," Industrial Education Magazine, 37:42-44, January, 1935.

of the point system.

Not the least troublesome of the problems in teaching composition is getting the students to recognize the four demons, p, b, q, and d. J. E. Fintz⁷⁰ advises a method of imagination, i. e., holding the type in its proper position with the nick up and imagining that the ascender or descender is pushed in the opposite direction from that in which it appears. The correct letter is then seen in one's imagination. To make his method more easily understood, Fintz uses large wooden models of type. These models are constructed with sliding ascenders and descenders to better illustrate the principles of his method.

John Allen Smith⁷¹ uses and advises the same imagination method in principle, but instead of using wooden models he uses a cardboard wall chart.

Several methods of keeping the cases clean have been used. Karch⁷² suggests three ways. First, label the boxes of every case. This method, however, eliminates only the errors that are made because of a lack of knowledge. The

⁷⁰ J. E. Fintz, "Teaching Them Their P's and Q's," Industrial Arts and Vocational Education, 22:69-70, February, 1933.

⁷¹ John Allen Smith, "The Four Demons," Industrial Education Magazine, 30:475-76, May, 1929.

⁷² R. Randolph Karch, "Three Remedies for the Dirty Type Case," Industrial Education Magazine, 33:23, July, 1931.

problem of boys deliberately throwing in handfuls of type to get rid of it is not successfully met by this method. It is also a poor method from the standpoint of industrial education, since case boxes are not found labeled in industrial shops. Second, determine the spaces, buying spaces already marked or marking them in the shop after purchase so that the five-to-em spaces have five nicks, four-to-em spaces have four nicks, three-to-em spaces have three nicks, and en quads have two nicks. This is a good method of solving the space problem. Third, use individual cases, each boy being made responsible for his own case and no other boy being allowed to use it. This is definitely one of the best methods of keeping cases clean, or, at least, finding the right boy to blame for their becoming dirty. It has the disadvantage of requiring more cases and more type than most school shops are fortunate enough to own.

3. Teaching lock-up and imposition. Lock-up being another operation, the demonstration method will be the principal one to use, but it should be augmented by lectures, illustrations, and, if possible, instruction sheets. Reference work should play an important part in the teaching of imposition, and student notebooks should be a definite part of the instruction plan. Stress should be layed on work and turn, work and flop, sheetwise, and two-color forms after the students have learned the principles of simple lock-ups.

Dummies and drawings of form lay-outs for pamphlets and folders should also be a part of the instruction, but probably should not extend higher than a sixteen-page booklet, sheetwise, or an eight-page booklet, work and turn, since equipment is seldom found in school printshops that will print larger forms than these.

4. Teaching make-ready. So much depends on the students' understanding of make-ready that especial care should be used in demonstrating this operation. Questioning should be thorough and extensive, and provision should be made for much practice. The results of careless make-ready should be explained from the standpoints of wrecked materials and equipment, lost time, and inferior completed jobs. Some practice, and if possible a live job, should be given in two-color make-ready.

Hugh Flaherty⁷³ has suggested that the instructor use a dummy platen for teaching how to change a tympan and for general make-ready practice. Such a device could be constructed easily in the wood shop, and the bales could be added in the metal shop. Flaherty suggests that an angle of about forty-five degrees be used.

To avoid make-ready accidents and damage to materials

⁷³ Hugh Flaherty, "A Teaching Aid for the Printshop Teacher," Industrial Arts and Vocational Education, 23:326, October, 1934.

the teacher should inspect all jobs made ready by students before the press run is started.

5. Teaching platen press operations. Demonstrations and opportunities for constant practice by the students are the essential elements of good presswork instruction. Some reference work should be done and student notebooks should be kept, but practice is the main element as far as the actual operation of the press is concerned. Bert Popowski suggests the following four steps for teaching the platen press operations:

1. Feed easy, card stock; press not running.
2. Feed easy, card stock; press running slowly with throw-off lever off.
3. Feed different stocks; press running slowly with throw-off lever off.
4. Feed different stocks; press running slowly with throw-off lever on.⁷⁴

A further knowledge of inks and paper surfaces should be other requirements of student pressmen.

6. Teaching cutter operations. The care required in demonstrating cutter operations is not required because of the difficulty of the operations so much as the danger to the operator. Students should be ever aware of this danger and should be taught constant carefulness. The danger of ruining

⁷⁴ Bert Popowski, "Safety in the Printshop," Industrial Arts and Vocational Education, 24:269, September, 1935.

expensive stocks in attempts to hurry should also be explained. Reference work needed in conjunction with bindery instructions should include kinds of paper and the uses each kind is best suited for, sizes in which various kinds of paper are most frequently sold, and the method of figuring stock.

7. Teaching printers' mathematics. Mathematics is a definite part of printing education and has a direct application in the point system and in stock cutting. Lectures and instruction sheets furnish the best media for presenting printers' mathematics, although sample exercises worked out by the instructor, which might be called a type of demonstration, prove very effective.

In teaching the point system Karch's⁷⁵ giant materials would be most helpful. Students can see the relationships between the various measures much more readily in something of this size. Another teaching aid would be the adoption of a simple table of relative measures as one of the beginners' lessons. Such a lesson might take the form shown below.

72 points equal one inch

12 points equal one pica

6 points equal one nonpareil

⁷⁵ R. Randolph Karch, "The Use of Giant Materials in Teaching Printing to Beginners," Industrial Education Magazine, 37:42-44, January, 1935.

2 nonpareils equal one pica

12 nonpareils equal one inch

6 picas equal one inch

Another help in teaching the point system as well as teaching relationships between spacing materials, is the comparing of spacing materials from different type sizes. It could be shown, for example, that a ten point three em quad is the same size as a thirty point three-to-em space. Then the mathematics of the relationship should be explained and the students asked to show other examples of duplication. Questions such as the following will test the learners' understanding of the system:

1. What is the relationship between a twelve point em quad and a twenty-four point en (nut) quad?
2. What other spacing material could be used in place of a thirty-six point three-to-em space?
3. What twenty-four point spacing material might be used to replace a forty-eight point two em quad?

The mathematics of stock cutting generally proves more interesting to the students. There are two possible reasons for this: first, its study accompanies the privilege of using the cutter, which privilege most boys enjoy, and second, its beginning stages are simple to understand and promise continued simplicity. Students should not be allowed to become careless in their stock figuring but should be reminded con-

stantly of the waste that results from an error in figuring the first cuts. They should be aware also of the even more waste resulting from errors in trimming pamphlets, booklets, and other jobs that are already printed. Several good reference books dealing with printers' mathematics are available, and the instructor should see that one or more of these can be referred to by his students. Most books of this type contain exercises that provide worthwhile practice in stock figuring.

8. Teaching related information. Related information can be taught by the lecture method, the instruction sheet method, or by the use of textbooks. The teaching of related material by any one of these methods exclusive of the others should be definitely discouraged, however, and the lecture method should be used on rare occasions only. The most effective method is to cover all related subjects in information sheets which refer the students to a completely outfitted library of shop reference books.

Nor should all information of remote interest be forced on the students in the name of related work. H. John Paustian says:

Care should be taken in the selection of informational material. It should be selected in the light of four aims--(a) will be used most often in connection with the shop work, (b) serves important ends, (c) is useful in

more ways than one, and (d) appeals to the boy.⁷⁶

Related information, like production jobs and all shop work, should create or embellish a desire in the students to learn. Unrelated material will destroy this desire instead, since it is not easily justified and students will not feel a need for it.

Clifford Louis Yard shows five ways that related work can be taught:

1. Bulletin board.
2. Special study and investigation.
3. Lectures.
4. Movies.
5. Encouragement of individual or special talent.⁷⁷

It would not be congruent with the general theme of this work to accept this list as representative of all the ways of teaching related work, or, for that matter, as representing the best ways. Selvidge⁷⁸ points out that oral instruction (lectures) in related work is "expensive, impractical, and inefficient." Movies furnish an effective method

⁷⁶ H. John Paustian, "Related Informational Material," Industrial Arts and Vocational Education, 22:10, January, 1933.

⁷⁷ Clifford Louis Yard, "Methods of Presenting Informational Content in Teaching Printing," Industrial Education Magazine, 38:215-18, September, 1936.

⁷⁸ R. W. Selvidge, "Teaching of Related Subjects," Industrial Education Magazine, 28:275, March, 1927.

of presenting this information, but wherever it is possible the same result can be obtained more effectively by visiting the industry itself, rather than merely looking at pictures. In the last analysis, however, the use of instruction sheets backed up by a good reference library is about the most potent method of presenting related material. Selvidge says, "The written instruction sheet is the best solution."⁷⁹ Selvidge and Fryklund collaborate in their book with, "The written instruction sheet appears to offer the most satisfactory solution to the problem, and when carefully prepared serves the purpose admirably."⁸⁰

The making of instruction sheets has already been covered, and the discussion will not be repeated here. The shop library should be made one of the most important units of instruction. Charles A. Bennett points out, "More and more teachers of industrial arts work are guiding their students in use of technical literature."⁸¹ Paustian says:

Extensive informational material related to every subject taught in the shops should be available in the library. Librarians are glad to collect and compile material and file it for you. She will need the cooperation of the shop

⁷⁹ Loc. cit.

⁸⁰ R. W. Selvidge and Verne C. Fryklund, Principles of Trade and Industrial Teaching (Peoria, Illinois: The Manual Arts Press, 1930), p. 192.

⁸¹ Charles A. Bennett, "The School Shop Library," Industrial Education Magazine, 27:308, April, 1926.

teacher. In assigning reading material, it is wise to give each student a copy of questions to be answered, and go to the library with them and supervise their reading.⁸²

The ideal situation would consist of a separate room for the shop library where students could work without the interference of the noise of routine shopwork. If possible this room should be set aside by a glass partition so that one instructor could effectively control the activities in both the library and the shop proper. The library room should be made as attractive and interesting as possible with wall hangings and late trade magazines. If a separate room is not available, much can be done by renovating an odd corner of the shop for a library corner. It is even advisable to rearrange some shop equipment, if such a rearrangement will provide for the installation of a shop library.

Books for the library should not be selected haphazardly. The books should be chosen with the end in view that they are for students. The following points will help guide the teacher in his choice:

a. The book should not be so technical as to be beyond the understanding of the pupils, but some technical terms should appear along with their definitions or explanations to aid the students in acquiring the necessary industrial vocabulary.

⁸² Paustian, loc. cit.

b. The book should be written in an interesting way.

c. The more pictures or illustrations a book has, the more it will appeal to the boys.

d. The teacher should not rely on too few books. For example, if only one book is available for the study of information relating to several branches of the printing field, a boy studying one bit of this information would deter the work of several other boys. Under such circumstances several copies of the same book should be bought.

e. The teacher should be sure to furnish his library with ample material of a vocational guidance nature in the field of printing. Some studies of printing occupations alone are available, while other books studying occupations in general furnish good material in the printing field.

f. If possible, books should be chosen that contain questions or problems of a nature that will make the students want to secure added information.

g. The books chosen should be well organized and should contain complete tables of contents and indexes. This will facilitate the students' finding information, and they will not become discouraged so easily.

A type of study which might be referred to as a form of related information and which too many instructors are prone to neglect or pass over lightly, is the study of occupations and vocational guidance. Any course in printing,

whether exploratory, vocational, or even the industrial arts type, should include some definite study of the printing occupations. Instruction sheets and library work furnish a good method of presenting parts of this information, but lectures, and questions and answers will be almost a necessity in augmenting this work. Students have a genuine interest in their futures, and although their choices of vocations are apt to fluctuate widely during their adolescence, their eventual choice must be based on past experiences and knowledge of the available fields. The United States Bureau of Education has published an excellent outline for use in studying occupations which can be easily used in studying the printing trade. The outline follows:

OUTLINE FOR THE STUDY OF AN OCCUPATION

I. General statement concerning the vocation:

1. Value of the vocation as a social service.
2. Duties of one engaged in it.
3. Number engaged in it in local community.
4. Relative number engaged in it, in general;
with its probable future development.
5. Relative capital invested in it.

II. Personal qualities demanded:

1. Qualities of manner, temperament, character.
2. Mental ability.
3. Physical demands.

III. Preparation required:

1. General education.
2. Special or vocational education.
3. Apprenticeship conditions.
4. Experience required.

IV. Wages earned by workers:

1. Range of wages made (table showing distribution of all cases).
2. Average wage per week.
3. Relation of wage to length of experience and preparation.

V. Length of working season, working week, working day.

VI. Health of the workers:

1. Healthful or unhealthful conditions.
2. Dangers, accidents, or risks.

VII. Opportunities for employment:

1. In local community.
2. In general.

VIII. Organization of the industry, including the relations of the worker to his fellow-workers, his employers, and the community.

IX. Status of the workers:

1. Opportunities for advancement.
2. Time for recreation and enjoyment.
3. Adequate income for recreation and the comforts of life.

4. Any items of peculiar interest in this connection.

X. Biographies of leaders in the vocation.⁸³

Guidance work requires more than the mere teaching of occupations, however, important as that phase is. Personal counseling is the teacher's real chance to be of service to the boy as an individual and to society generally. The best teachers have always been counselors as well, and student appreciation reaches its highest when a boy knows he can come to his teacher for advice. Ericson does not recognize a teacher as such if he cannot fill the requirements of a counselor, as is shown in the following quotation:

To be interested in the individual instead of the masses, to deal with classes and groups and yet know and appreciate the individual and be a friend and counselor to him, requires more than craftsmanship and mechanics. Without having developed the gift and interest to help each youth to form wholesome attitudes toward fellowmen, vocation, and employment, an instructor is not fully prepared as a member of the great profession to which he belongs.⁸⁴

It is not such a drag on the teacher's time to interview his students. Most teachers have at least one or two free periods a week that could be used to good advantage in this way. In fifteen minutes or half an hour, student and teacher can go far in learning to know each other, especially

⁸³ United States Bureau of Education, Bulletin No. 19 (Washington, D. C.: United States Government Printing Office, 1918), pp. 17-18.

⁸⁴ Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), p. 364.

if the teacher is wise in choosing his questions. The interview time should not be used for getting such irrelevant information as age, address, number in family, father's occupation, marks in school work, etc. This information is available in the office and should be studied before the interview. Moreover, the type of questioning required in gaining this information makes the student think he is being put through the third degree, and the chances of a personal relationship between teacher and pupil is destroyed. The teacher should have at least one interview per semester with each boy enrolled in the printing course. Those boys who seem to be having difficulties of adjustment should have more interviews.

The roles of adviser and counselor are important ones that the teacher should not neglect.

Testing and Marking

Testing in general education has undergone many changes in comparatively recent years. From the almost universal use of the essay type of examination of twenty or more years ago, the trend has been to the other extreme of objective or new-type tests. The latter exist in many forms and have many advantages, but already some doubt exists as to their application to every situation, an advantage that closely followed the adoption of the tests to wide use. Now leaders in the

field of tests and measurement are beginning to qualify their criticism of the essay test, and in some cases are even encouraging its use.

Industrial arts subjects were just beginning to get a firm foothold in the public schools when the test revolution was sprung. It would appear that under these circumstances immediate adoption of new-type tests by the industrial subjects would be in order. However, adoption of any type of testing procedure by this field was not made for some time. It appeared that instructors felt that daily testing was in progress in their shops--that a boy could not complete a project without learning the operations its completion necessitated--and that their personal and subjective evaluation of the boys' progress on the basis of such work was sufficient to insure fair systems of marking. Moreover, such a newcomer in education had not had the time to standardize its content and the expected attainment of its pupils.

In the last ten years, however, much has been done by the leaders of the industrial arts subjects in an attempt to bring their testing program up to date. Many nation-wide standardized tests are available, but unfortunately printing is the subject of too few of these. Several good mechanical aptitude tests have been constructed, but no really satisfactory one has yet appeared in the field of printing.

There are several purposes of testing: (1) To diagnose learning difficulties, (2) to motivate learning, (3) to classify and group students according to ability and to aid in guidance, (4) to determine the rate and direction of change of educational status of individuals, (5) to evaluate instructional procedures, (6) to evaluate teaching efficiency, and (7) to aid in general survey purposes.

Testing is one of the most valuable devices for determining what difficulties individual members of the class are experiencing. Individual differences make learning processes more difficult for some than for others, and the recognition of the difficulties of each student makes for a more fair system of marking and learning.

Tests are, in a way, twice useful in motivating learning. In the first place students attempt to learn more in order to do well on tests that they anticipate. In the second place, after the test has been given if the students are led to believe they have done well, they are motivated to try even harder on the next test. It is only natural for one to want to do a successful job, and realization of success is one of the strongest motives in the schools.

Many schools organize their classes homogeneously, a system that would be impossible without the use of tests. Testing is further useful in the organization of special classes for the subnormal or supernormal students.

Since marking is a traditional habit in the educational system and apparently will continue to be, it is the duty of teachers to mark as accurately as possible. The testing of pupil progress helps the teacher get a little farther away from the subjectivity of marking and at the same time furnishes him with something other than his personal opinion with which to combat the irate parents he is occasionally called upon to meet.

Testing similar classes after using different methods of teaching will help the teacher decide which of several instructional procedures is most advisable.

Any teacher who has a genuine interest in the profession and the good of his students at heart, can and should want to improve his teaching efficiency. Testing provides a method of doing this.

It almost goes without saying that test scores are valuable for survey purposes--establishing norms and standardization.

There are essentially only three kinds of tests commonly used today: (1) the essay type, (2) the instructor-made objective type, and (3) the standardized objective type.

The principal advantages of the essay type test are its ease of construction and its ease of administration. Also, the questions can be made to cover any part or parts of the course that the instructor wishes, which cannot be said of

the standardized tests. Certain disadvantages of this type of test exist, some of which the instructor can control and some of which he cannot. The latter, or uncontrollable disadvantages, would include the difficulty of grading, the length of time required to give the test, the restriction placed on the amount of the course that can be covered and hence the limitation on the test's comprehensiveness, and the growing habit of the students of writing anything that "will make the old duck think you know something." Other disadvantages of the essay test have been listed which are not really disadvantages if the instructor uses care with the test. (1) It is difficult to avoid biased grading; but the wise instructor can do much toward eliminating this if he uses class numbers instead of names on papers, grades question by question instead of paper by paper, and tries other methods of eliminating unconscious favoritism. (2) It is unfair to give equal values to unequal questions; but careful weighting of the values of each question will solve this difficulty--the most difficult questions being assigned the greatest value. (3) The meaning of some of the questions may be obscure due to the instructor's haste in preparing the test; but obviously this can be remedied by careful and prolonged preparation.

The essay type test should by no means be considered obsolete. It has its place in the most modern methods of education if it is properly constructed. There is no guessing

in answering an essay question--either the student knows the material asked for and indicates it in his answer, or he does not know it and shows this in an attempt to fake a response. Admittedly, the essay type test has a greater number of uses in the academic field of subjects, especially in the social studies, where student thought processes on causes and effects are probably more important than the acquiring of definite facts and information. This does not mean, however, that thought processes are not found in printing and that the acquisition of facts and skills is the subject's only aim. As a matter of fact it is a wise instructor who makes occasional use of thought provoking questions to determine the extent to which his teaching is impressing his students. Possibilities for essay type questions are found most frequently in the related work of the printshop and at the close of a term or semester when a general cross-section of the students' knowledge is desired.

There are several types of essay questions that might be used. First, there are questions of comparison, in which conditions at different times or different places are compared. Examples are:

How do printing operations of today differ from the printing operations of Benjamin Franklin's day?

Show several differences that might exist between printing in the United States and printing in China.

There are questions of cause and effect, in which students are asked to give effects of certain causes or causes of certain effects. Examples are:

How did the invention of the linotype machine affect the following: time consumed in type composition, number of printers employed, general cost of printing from the standpoint of the employer and the consumer, the time consumed in producing a job, and the investment necessary to start a printshop?

What do you suppose were some of the chief causes of the great growth of printing in the last century; how can you justify your choice of these particular causes?

There are questions of organization and discussion, in which students are given a very broad subject to discuss, and their ability to organize material and pick out important points is shown in their answer. Examples are:

Discuss the rise of printing that followed Gutenberg's invention of movable types.

Discuss the importance of the composing room in printshop organization.

There are questions of a debate nature, in which a problem is given the students and they are asked to write arguments for the affirmative or negative side, as they choose. Examples are:

Why should I (should I not) choose printing as my life

vocation?

Printing has grown by such leaps and bounds that it has (but it has not) reached its limits of growth.

It will be said that questions using "discuss" or its equivalent are in bad form; that students are not told in a definite enough manner what they are expected to write on. In one sense this is an advantage of questions of that type. The ability of the student to organize is thus measured and the instructor gets a much better perspective of the boy as an individual than he does in the new-type tests, which measure progress and advancement only. It is advised that for purposes of measuring achievement the new-type or objective tests be used, and for purposes of learning something of the individual students the essay type test be used. Essay test responses form excellent bases for guidance by the printing teacher, and if he discusses the questions and their answers with the English teacher much help can be given the boy by the latter, also.

Objective type tests are shown to have the following advantages and limitations by Ruch:

Advantages of objective examinations:

1. Objectivity (freedom from personal opinion) in scoring.
2. Extensive sampling.
3. High reliability per unit of working time.

4. Economy of scoring.

5. Freedom from bluffing.

Limitations of objective examinations:

1. No provision for language training.

2. Open to guessing and chance.

3. Reputed to measure only factual memory.

4. Said to be an unnatural method of using school-acquired information.

5. Test recognition rather than spontaneous recall.⁸⁵

It would seem that these advantages and limitations would apply to both the instructor-made tests and the standardized tests, granting that the instructor is careful to obtain a complete sampling and high reliability. Instructor-made tests are used to best advantage in testing student achievement in relation to the course of study of the local system, since the questions can be controlled by the instructor and since the test is essentially a factual measurement. There are several types of objective tests or questions, and these are illustrated below.

True-False: A soft tympan is best for the long life of type faces T F

Multiple choice: A (soft, white, velvet, hard) tympan is best for the long life of type faces.

Completion: The best tympan for the long life of type

⁸⁵ G. W. Ruch, The Objective or New-Type Examination (Chicago: Scott, Foresman and Company, 1929), p. 112.

is a _____ one.

Matching: 1. Two three-to-em spaces	Three ems	_____
2. Pica	$\frac{1}{2}$ em	_____
3. Inch	12 points	_____
4. Em quad	6 points	_____
5. En quad	One em	_____
6. Four-to-em space	72 points	_____
7. Three em quad	$\frac{1}{4}$ em	_____
8. Nonpareil		
9. Two five-to-em spaces		

Other types of objective tests exist, but they are relatively impractical for use in printing classes. A few points need to be remembered in the construction of objective tests if the best results are to be obtained. They are:

1. Only one answer should be possible for any question.
2. Long, involved sentences should be avoided.
3. No statements giving clues to the answers should be used.
4. Statements should not be constructed so as to be partly true and partly false.
5. In the matching type question, the two columns should be made of unequal length.
6. In constructing a completion test, lines of different lengths, indicating the length of the answer, should be avoided.
7. Simple and familiar language should be used and bad

English form guarded against.

Standardized objective tests are for the use of the instructor who wishes to compare the grades of his own students with the norms established by the standardized test. Besides comparing the individual scores with the standardized norms, the instructor can determine to some extent the efficiency of his own teaching by comparing his group as a whole with the norm of the test. If the group is below a nationally established norm, and the instructor has reason to believe that his is an average group, then the instructor's system is probably somewhere at fault. It probably would not be advisable to use this type of test more frequently than once each term or semester.

Marking has come to be somewhat of a major problem in education. Due to the subjectivity of any system of marking, many educationists have advised that no attempt be made to represent the relative achievements of students. Others have backed a move to reduce the number of marks given to a "passing and not passing" or "satisfactory and unsatisfactory" basis. Still others are content with the most common method in use today, the five-letter method (generally A, B, C, D, and E or F), and argue for its retention. Some few very liberal schools have done away with marks and give monthly reports discussing the improvement or non-improvement of the student's character habits.

The tradition of awarding marks is too firmly entrenched to warrant a teacher's attempting to revolutionize the marking plan of his own school system. A teacher should, however, do all that is possible to use the system's marking plan in as fair a manner as possible. The principal thing that will help in this respect is constant marking throughout the term. Then when the end of the term comes, the teacher has but to arrive at an average of all grades to determine an individual's term grade. This will do away with partiality and a teacher's saying, "Well, I guess John's worth a C, Dave ought to have a B, but I doubt if Henry's grade should be over a D."

Some definite system of grading should be adopted and strictly adhered to. The students should be made fully aware of the system so they will know on what basis their marks are being awarded. A progress chart, a chart that shows the relative advancement of all pupils in the class, helps the students to realize what type of work they have been doing. An example of such a progress chart is shown in Figure 5. These charts should be available to students at all times, it having been found a good policy to leave them posted on the bulletin board.

Edwin M. Love suggests the following as a basis for grading in the shop:

1. Conduct--25 (negative).

PROGRESS CHART

Student Names	Job Sheet Numbers														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.															
2.															
3.															
4.															
5.															
6.															
7.															
8.															
9.															
10.															
11.															
12.															
13.															
14.															
15.															
16.															
17.															
18.															
19.															
20.															
21.															
22.															
23.															
24.															
25.															

FIGURE 5

A PROGRESS CHART THAT MIGHT BE ADAPTED
TO USE IN THE SCHOOL PRINTSHOP

2. Woodwork--25 (positive).
3. Drawing--25 (positive).
4. Related work--25 (positive).⁸⁶

Norman C. Tock says:

Much of the variation and irregularity which must be taken into consideration in giving a manual training grade, can be taken care of by putting the grading system on a point basis. A certain number of points is credited to the pupil for every piece of work done. For defective quality a certain number of points is subtracted from the pupil's total as fines. For the display of proper shop habits, care of tools and equipment, meeting extra assignments, etc., a bonus of additional points is given. A method of grading like this is fair, convenient, objective, and has an excellent effect on the pupil.⁸⁷

To aid in the use of his point system of grading Tock advises the use of a form which is shown in Figure 6. Obviously the one important thing lacking in the form is the student's name. The system does have its points from the standpoint of fairness and objectivity.

Problems of Discipline

Practically all problems of discipline can be solved easily if the instructor will remember but one fact: a democratic form of government has been found to be the best. Individual desires and feelings must be recognized in the school room and in the shop or those desires and feelings

⁸⁶ Edwin M. Love, "A Method of Grading Manual Training Students," Industrial Education Magazine, 25:278, April, 1924.

⁸⁷ Norman C. Tock, "A Grading Method for Printing Classes," Industrial Arts Magazine, 16:508, January, 1927.

Job	Composi- tion	Imposi- tion	Make- ready	Press	Miscel- laneous	Total

FIGURE 6
 RECORD SHEET USED BY NORMAN C. TOCK⁸⁸
 IN HIS POINT GRADING SYSTEM

⁸⁸ Loc. cit.

will be expressed to the disadvantage of the teacher. Dictatorial attitudes will seldom solve the immediate problem and are never good in the long run. Vaughn and Mays, in adopting the same view, have said:

In the management of a group or class, there are two conflicting principles in operation. One is the compulsion of unwilling obedience by external authority. The other is the accomplishment of willing obedience by inducing a wholesome and compelling desire. The one uses as its instruments force and mandate. The other depends upon intimate understanding and co-operation and the sense of justice. The one is the government of the monarch. The other is the government of the group through guidance. Under the one, goaded by the lash of the driver, the group suffers repression, dependence, and mental and moral atrophy. Under the other, the group achieves mental and moral happiness, strength, initiative, and independence through leadership.⁸⁹

This method of discipline, using justice, cooperation, and understanding, has a further advantage in that it solves disciplinary problems before they are disciplinary problems. Nothing beats preparedness in the teaching profession, and it is especially true as it applies to cases of student management. Boys who understand that their teacher is one of them, a helper and a fellow-worker, will spend much less time thinking up ways to get the better of him. Properly guided and supervised boys will work and not play, will learn printing and not the insolence of the smart-alec.

One of the best ways to be fair and just with the stu-

⁸⁹ Samuel J. Vaughn and Arthur B. Mays, Content and Method of the Industrial Arts (New York: The Century Company, 1924), p.254

dents is, as Vaughn and Mays point out,⁹⁰ to meet them with a proposition. Certain rules must be in constant effect in the printshop for reasons of safety, and the class should be informed of these on their first entrance to the shop. Nor should this advice be interpreted as strictly opposite that of the preceding paragraphs. When the occasion demands that rules must be formulated by the instructor to ensure that the proper rules are enacted, it is the instructor's attitude in presenting them that makes the rules dictatorial or just as the case may be. Reference is made here to the list of suggestions for making shop rules that appears on pages thirty-seven and thirty-eight. Several questions of importance will arise in connection with the formulation of shop rules.

Shall boys be permitted the freedom of the shop, roaming about for the purposes of collecting materials, referring to the dictionary or other reference books, or seeking help? In general it is wise to give the boys such freedom but with the mutual understanding that the abuse of such a privilege will mean its withdrawal. Again it should be mentioned that the wisest procedure is to let the boys arrive at the rule as a result of their own initiative, and in many cases it will be found that the withdrawal of such a privilege can also result directly from student suggestions

⁹⁰ Vaughn and Mays, op. cit., p. 255.

in class discussions of the method's efficiency. The instructor can do much in helping a plan of this sort to success by making easily available those necessities which boys must have to do their work in a proper manner. Leads, slugs, galleys, string, etc., should be easily accessible from either the composing room or the make-up department. Ink, oil, paper stock, clean-up rags, etc., should be within easy reach of the press room. No boy should have to leave the approximate bounds of his own department to obtain supplies or materials. In advanced classes where organization is made on the production-basis it might be found advisable to limit the amount of any kind of inter-departmental communication.

Should boys be allowed to talk in the shop without the permission of the instructor? Industrial arts subjects as a whole differ widely from the academic subjects in the formality of discipline in the room. Although absolute quiet is required, and in some cases demanded, in the academic school room, most shops have found it advisable to permit talking in a mild sort of way. By the very nature of the work printshops will usually be more quiet than other shops, but quiet talking between immediate neighbors should not be outlawed. It is advised, however, that the instructor withhold this information from his classes, for boys who are told on the first day, "You will be allowed to talk in this shop," are more likely to abuse the privilege than those who are kept

somewhat in doubt about the matter. Retraction of the privilege from those who abuse it has been found to be a successful method of control.

Should students come to the instructor's desk for help or should the instructor go to the student's cabinet when difficulties arise? In view of the fact that disorder or commotion should be kept at a minimum at all times, it would appear to be a wiser procedure for the instructor to go to the student's cabinet. Such an action gives the student a more favorable idea concerning the instructor's interest in the pupil's work. Many students would prefer to labor under difficulties, perhaps undergoing wrong learning processes, in order to escape walking to the teacher's desk for help. They often think this is admitting inferiority and that their mark will be affected by their admission. The teacher should walk about, closely supervising the work of all members of the class and helping those who need his help, whether he is asked or not.

Should the boys be permitted to leave the room or their work for rest periods during the class hour? Individual rest periods should be permitted whenever necessary, and in the case of long class periods it would be wise to set aside a few minutes when the whole class is excused from its work. Under no circumstances, however, should students be permitted to leave the room without the permission of the in-

structor, who should be able to account for all boys at any time.

Ericson lists fourteen points for effective discipline, the major suggestions of which were listed by Haynes⁹¹ in his Teaching Shop Work.

1. Do not bluff. [Italics throughout the list are Ericson's.] It may work until someone calls the bluff. But even before that, students can usually tell insincerity when they see it.

2. Do not threaten. It furnishes too much of a challenge. . . .

3. Do not use sarcasm. Sarcasm cuts deeply and leaves scars. It is a good method for making enemies uselessly. . . .

4. Do not nag.

5. Make few rules and regulations. Let the cooperative spirit reign, and not many rules will be required.

6. Do not exaggerate.

7. Do not humiliate the student. To accuse individual students before the entire class is bad practice and can lead to no good. It is better to pass the grievance by in the least noticeable way, and later deal with it on the individual basis.

8. Do not be anxious for the last word.

9. Do not review misdemeanors. The better way is to work upon the assumption that everyone is honest, that everyone cooperates; . . .

10. Accept the word of the student. The most effective way to train liars is probably to tell persons that they belong in that class. . . . If we want veracity we must expect it, and let it be known that there is not so little of it among boys of today.

11. Do not emphasize dignity and self-importance. If

⁹¹ M. W. Haynes, Teaching Shop Work (New York: Ginn and Company, 1924), Unit Seven.

the teacher has dignity it will be known.

12. Take full responsibility, but no more.

13. Use extreme measures seldom. The less disturbance and commotion, the more effective is the class management.

14. The bad boy often becomes a good man.⁹²

In the last analysis, discipline problems will be few if the teacher remembers that the core of education around which all other things revolve, is the student. Trite as it may seem to constantly remind teachers that they are teaching boys more than printing, the essentials of this advice remain good. The farther away from army and prison methods of discipline the instructor can get, the greater will be his success in management.

⁹² Emanuel E. Ericson, Teaching Problems in Industrial Arts (Peoria, Illinois: The Manual Arts Press, 1930), pp. 110-14.

CHAPTER III

A DISCUSSION OF THE ADMINISTRATIVE METHODS OF CONDUCTING A SCHOOL PRINTSHOP

The maintenance of equipment

Practically all school printshops operate as a definite part of the school system as far as financial support is concerned. School budgets are drawn from public funds obtained by taxation and, as a result, are never as high as they might be. It thus falls to the duty of the individual teacher to keep his shop or department operating to its best advantage for as long a time as is possible without the addition of expensive new equipment. Even in those shops that operate as a separate unit financially, maintaining themselves from charges made for work done in the shop, the maintenance of equipment is an important item, since any new purchases must necessarily come out of the profit.

Nor is careful maintenance of equipment necessary solely from the standpoint of dollars and cents. Boys in the junior high schools are, for the most part, taking printing as a part of an extensive course in vocational exploration. Many boys in high schools are taking printing as a preparation for a life vocation, while others are continuing the junior high school exploratory work. In any case the most

successful results, from the standpoint of attaining objectives, are obtained only when the general atmosphere, appearance, and working conditions of the industry are maintained in the school shop insofar as that is possible. Industrial printing plants must keep their equipment functioning in perfect order or they lose time and orders. In either industrial shops or school shops carelessness and inattention to routine details result in lost time, shop accidents, and general inefficiency. The school shop is the place to create and practice habits of care and attention.

If the printing teacher is to keep the equipment of his shop up to high standards, there are four things to which he must give attention. These are: (1) the constant day to day and week to week of the existing equipment in the shop, (2) a complete and accurately specified annual or semi-annual replacement order, (3) a complete running inventory, thoroughly checked at least once every year, and (4) a thorough knowledge of the progress of the printing industry and of printing education so that he could, on short notice, prepare plans for equipping a brand new print-shop unit.

The routine care of equipment is no doubt familiar to all. Those who are now teaching have been, or should have been, experiencing these menial tasks for some time. Those who have just received training, whether in teacher training

institutions or in industry itself, no doubt feel that they have had more than their share of routine checking, clean-up, and press washing. Nevertheless, these duties are necessary and, because of their lack of attractiveness and their dullness due to constant repetition, it is sometimes a problem to show the students the full importance of the work. Several suggestions have been made as to how this can be done. L. F. Ashley suggests a system comprised of much more red tape than the average suggestion, and although his article does not refer to printshops in particular, his idea is presented here to show the extent to which some go to systematize routine duties. The following quotation is from Ashley:

A slovenly, messy shop invariably reflects discredit upon the person who is in charge. To participate in the activities of a splendidly ordered shop is one of the finest possible experiences in any boy's life. It develops habits of thrift and order. The author has developed a plan which makes this possible and still does not put a load on the instructor.

The first day the instructor takes the students' names he explains that on the following day their names will appear on the bulletin board, in alphabetical order, and that opposite each name will be a piece of shop equipment which will be charged to his care for the rest of the term. In addition to keeping his locker in order, he will be expected to keep this machine in good shape. For this work he will receive ten per cent of his term grade. The checking of the boys' assignments at the end of the period becomes a special assignment for one or more boys who appear trustworthy. All the teacher does is check the checkers. The checkers report to the teacher on slips or cards. In the shops at Eastern Illinois State Teachers College a red tag such as policemen attach to a car is placed on the piece of machinery charged to the student who has left without putting it in order. Each machine is labeled plainly with a serial number. If

the student finds the band saw out of order, he writes the number, say six, in the right space on the card or ticket and notes the condition that should have been corrected. Tearing the ticket apart, he attaches the upper part to the machine and turns the lower part in to the instructor. Next morning the student in charge of the bandsaw finds a "demerit" mark against him on the bulleting board and a red ticket on the saw. Turning in the ticket, he finds out what is wrong and corrects it.¹

It is perfectly obvious that most teachers would prefer to spend thirty to sixty seconds of their own time and correct the error themselves. Moreover, it must be remembered that this plan is used in a college where, apparently, plenty of equipment is available. In secondary schools, where individual equipment is seldom found, a machine that is not cleaned at the close of one period cannot be put off until the next day but must be cleaned at once for the use of the next class. For this reason some system must be found that will prevent an incoming class from being forced to finish the incomplete work of the preceding one.

C. A. Crowley suggests the use of the Equipment Inspection card shown in Figure 7. These cards are to be filled in by previously appointed student inspectors at the first of every period. In this way the condition of the shop can be determined from period to period and the responsibility for any discrepancy in order can be placed at once. One advantage

¹ L. F. Ashley, "Plan for Care and Maintenance of Shop Equipment," Industrial Education Magazine, 34:167, April, 1933.

Equipment Item _____ Date _____

EQUIPMENT INSPECTION RECORD

Print Shop

Day	Period						Day	Period						
	1	2	3	4	5	6		1	2	3	4	5	6	

FIGURE 7

THE EQUIPMENT INSPECTION CARD SUGGESTED AND USED

BY C. A. CROWLEY²

² C. A. Crowley, "A System of Printshop Instruction and Management," Industrial Arts Magazine, 18:132-36, April, 1929.

of this system is the fairness of it, since the inspectors do not know whom they are checking, the checking being done at the beginning of each period and the disorders, when found, being caused by the outgoing class.

Harold R. Johnson presents another plan for daily cleanup work. He uses the cleanup card shown in Figure 8. The shop foremen perform this checking service at the close of each class period, and it will be noted that it is the foreman's duty to report extraordinarily good work the same as that that is inadequate. Johnson has suggested that because of certain inequalities which might exist between the various assignments it is a good idea to rotate the students' assignments. The students in his shop keep the same job for two weeks then change to another. Johnson shows that this gives the student sufficient time to become thoroughly familiar with the requirements of his task and that the change helps the pupil to learn how and where all materials must be kept.

Of course, there are any number of plans or devices that the teacher may use to improve the care and attention given to his equipment and supplies. The plan that he ultimately adopts will naturally be the plan that best fits the requirements of his individual system, regardless of that plan's success or failure in other plants. However, instructors must be warned against expecting too much from the

CLEAN-UP CARD		Week of _____				
Jobs	Students' Names	M	T	W	T	F
Metal Furniture		/	/	/	/	/
Wood Furniture		/	/	/	/	/
Reglets		/	/	/	/	/
Rule and Leader Cabinet		/	/	/	/	/
Sticks and Pica Rules		/	/	/	/	/
Type on Floor		/	/	/	/	/
Stones		/	/	/	/	/
Cases in Order		/	/	/	/	/
Case Rests		/	/	/	/	/
Bindery Table, Drawers, and Books		/	/	/	/	/
Galleys		/	/	/	/	/
Floor		/	/	/	/	/
Drawer under Stones		/	/	/	/	/
Aprons, Chases, Notebook File, and Tools		/	/	/	/	/
Drying Rack		/	/	/	/	/
Presses		/	/	/	/	/
Ink Cabinet		/	/	/	/	/
Leads and Slugs No. 1		/	/	/	/	/
Leads and Slugs No. 2		/	/	/	/	/
Leads and Slugs No. 3		/	/	/	/	/
Leads and Slugs No. 4		/	/	/	/	/
Leads and Slugs No. 5		/	/	/	/	/
Leads and Slugs above the Stone		/	/	/	/	/
Washbowls		/	/	/	/	/
Proof Press and Benzine		/	/	/	/	/
Distribute Wrong Fonts		/	/	/	/	/
Floor around Saw		/	/	/	/	/

Check for Neglect I-A-E-	I-Inadequate
Check Absences	A-Adequate
	E-Excellent

Signed _____

FIGURE 8

THE CLEAN-UP CARD SUGGESTED AND USED BY HAROLD R. JOHNSON³

³ Harold R. Johnson, "A Printshop Clean-Up System," Industrial Arts and Vocational Education, 25:330, October, 1936.

plan alone--depending on it to take care of the equipment and keep it in perfect order. Boys of school age are not quick to realize the value of printshop equipment; their only acquaintance with money and its worth has been on a much smaller scale; their sense of value is correct only when they deal with values that are proportionate to the common things of boys' lives. The instructor, then, finds constant supervision necessary to prevent the students' becoming careless.

Carelessness and damage to equipment result from inattention to work. Boys who are playing, running, pushing, or scuffling do not have their minds on printing or on printing instructions that have been given. Hence a fairly strict code of conduct that forbids actions of this sort at all times will tend to produce less carelessness. A student hard at work is much more likely to remember cautions and warnings.

Another approach to gaining the proper attitudes of the boys in regard to equipment is that of partnership. The boys should understand that the equipment was placed there for their use and belongs to them while they are in the class. They should know that the equipment is purchased, indirectly, by taxation, and that careless action on their parts helps, in a small way, to raise the tax rates for their parents. In the care and use of power tools the safety angle is a strong

argument.

The annual or semi-annual ordering of equipment and supplies has come to be a more or less general thing in education circles. Almost all schools now place their orders at these intervals, if not for the financial advantage of buying in large quantities, then for convenience alone. Every printing instructor should be able to make an annual or semi-annual order with little difficulty. In making such an order the chief problem in most cases will be what quantity of the items to order, rather than the items themselves. The natural place for the instructor to go for help in this matter is the record of orders of previous years. The instructor should not be content, however, to look at only one yearly order, since that particular one might have been too large or too small. The order of the following year would, of course, show whether or not this was true. After determining the average annual order for past years, the instructor should compare the student enrollment in printing in those years with the prospective enrollment for the coming year; he should compare also past demands on the printshop in the way of production work with the likely demands of the coming year.

The order should be well organized so that those firms bidding only a part of the order will not have to read the whole list to find the particular things in which they are interested. A good general division to make is that between

equipment and supplies, equipment referring to tools and machines used in the various shop operations and supplies referring to such materials as are consumed in their use.

Above all things, the annual or semi-annual order should be specific. For example, an order for "3 reams paper, white bond" would be grossly insufficient, while an order stated "4 reams canary bond, 17 x 22-16" would be little more complete. All possible information concerning the item should be given, even though the information may seem inconsequential at the time that the order is made out. If this is not done there is no certainty that the instructor will receive what he really wants. To be sure that the desired quality is obtained, a certain brand that is satisfactory should be selected, the trade name given, and the demand made that the brand be matched. A paper such as the above, then, should be ordered, "Three (3) reams white bond, Hammermill or equal, laid finish, 17"x 22"-16 lb lb. substance." This order gives, as all paper orders should, the quantity, quality, color, size, weight, and finish that is desired, and in the event that an inferior product is obtained the bidder can be held to the original terminology of the order.

Earl L. Bedell⁴ shows that there are three accepted

⁴ Earl L. Bedell, "Specifying Equipment and Supplies for School Shops," Industrial Arts Magazine, 19:163-67, May, 1930.

methods of purchasing supplies, (1) the board of education furnishes everything without charge to the pupil, (2) the board purchases supplies and arranges for sale to the pupils, and (3) the pupils make purchases from retail dealers. Either of the first two methods would, of course, be preferred to the third. Since most printshops do less individual project work than other school shops because of the quantity of live production work always available, the pupils in printing classes are seldom charged anything for materials. It is the general practice, however, to charge for such personal projects as cards, letterheads, memorandum pads, etc., that the students take out of the shop for their own use.

The inventory is just as important in the printshop as any other place and hardly needs to be justified. It has been found convenient to divide the inventory into three parts, (1) the equipment inventory, which lists the machines and tools used by the students but which are not consumed in their use, the same tools being carried over from year to year except in cases of condemnation or breakage or theft; (2) the supplies inventory, which lists those items that are consumed in their use and must be replaced, viz., paper, ink, press wipers, staples, tabbing cement, cutting blocks, etc.; and (3) the furniture inventory, which lists all articles of furniture in the shop, some, such as the teacher's desk, recitation chairs, etc., being common in all the classrooms,

others, such as the demonstration desk, stock bin, drying rack, and bindery tables being peculiar to the printshop.

W. E. Roberts names the following four points as being essential to the equipment inventory:

1. Show the items and numbers of the last inventory.
2. Show losses and additions.
3. Show numbers at date.
4. Show reasons for change from last inventory, and unusual conditions that should be noted.⁵

The reasons for change from the last inventory would include theft, breakage, depreciation, and new purchases.

It can be said that the supplies inventory has a less permanent value than the equipment inventory, since, after the requisitions have been completed and the budget fixed its purpose has been served. However, a running inventory of supplies will save much time and be a great deal of help when the time for making the annual requisition does come. There is no reason for supposing that Roberts' four points for keeping the equipment inventory would not serve just as usefully in the keeping of the supplies inventory, or, for that matter, the furniture inventory. In order to keep the supplies inventory up to date at all times, it is advisable to have several copies. One or two of these should be kept

⁵ W. E. Roberts, "The Manual Arts Inventory," Industrial Education Magazine, 28:358, May, 1926.

in the permanent file of the shop. Others should be divided into sections and posted at the various supplies storage places for the purpose of changing them when supplies are removed from storage. For example, there should be a copy of the paper stock inventory within easy access of the stock bins. When stock is cut, an entry, with the date, is made on the stock inventory stating the amount taken and the amount remaining. The same system should be used with ink and other supplies.

The furniture inventory is probably less important than the others to the printing instructor, but, nevertheless, it should not be neglected. The items will naturally remain practically the same from year to year, but their condition should be carefully inspected and entered annually. By using some such simple terms as "excellent, good, fair, poor" to describe the condition each year a more careful check on depreciation can be made and allowances for replacements can be made several years ahead. A piece of furniture whose condition has been reported "fair" for several years and finally drops to "poor" is probably still in a usable condition, but appropriations should be made for its eventual replacement.

A printing instructor may spend his entire life in the profession and never be called upon to organize and plan a new shop or re-organize an old one. On the other hand, in changing from place to place, circumstances may require that

he develop several new shops. It is necessary that the instructor be able to do this whenever he is required to do so. It is naturally expected that a new shop will be constructed in accordance with the most recent ideas of the industry and the profession, so that it becomes necessary for the instructor to keep up with the research and development in both the field of printing and the field of education. There are several ways that this may be done. A list of suggestions follow, but the reader should be advised against supposing that one method alone is sufficient. He should be encouraged to adopt just as many of the following ways of keeping up with modern developments as is possible.

1. Subscribe to at least one good trade magazine and read it thoroughly.

2. Subscribe to at least one good professional magazine of a general nature. To obtain a full and general idea of educational trends all the articles should be read, not just those relating to printing.

3. Subscribe to at least one good industrial arts magazine and read it thoroughly to keep up with the trends in industrial arts and vocational education.

4. Make every attempt to keep abreast with the changing policies of the local system of education.

5. Maintain relations, directly or indirectly, with the university or college where teacher training was received,

or establish new relations with a closer or more convenient institution.

6. Visit local shops of the printing industry, and establish friendships there with members of the industry. Inspect their latest mechanical developments and inquire about the advantages and improvements of the newer machines over the old ones. Most printing teachers fail to establish this contact with the trade itself and in so doing lose one of the richest fields for advice, helpful criticism, and news of the commercial developments of printing.

7. Whenever possible to do either, spend the summer vacations attending school for professional advancement or gaining employment in a commercial shop. Such vacations should be alternated as much as possible to avoid the contraction of a closed mind from the standpoint of either education or the printing trade.

8. Read reviews of the late book publications and purchase or read from a library those books that promise to be helpful.

9. Do not be hasty in discarding advertising material received through the mails. Many mechanical developments are introduced in this manner.

If the printing instructor has thus kept himself prepared, when the time to plan a new shop arrives he will be ready. There remain other things, however, than being pre-

pared. It may seem an easy task to plan the new shop or re-organize the old one, and the instructor may thus undertake to do the job alone. This would, of course, be a mistake. First, other printing teachers should be consulted, their opinions and suggestions obtained and weighed carefully. Many suggestions will be worthless, but if even a few good points are brought out the work has not been in vain. Educational supervisors and administrators should also be consulted so that the new shop can be organized in accordance with the latest trends in educational circles and with the existing policies of the local system. Leaders in the local printing industry should be asked for suggestions so that the school shop will approximate the conditions and general atmosphere of the trade. Lastly, all the suggestions that are considered most worthwhile should be incorporated into a single definite plan for presentation to the architect. He will then pass judgement on the plan and state which parts, if any, will have to be changed in view of the structural requirements of the building. In other words, the instructor gains all the help he can and plans the Utopian school printshop. The architect supposedly designs the Utopian school building. Then the two meet and approach, as nearly as is possible, the perfection of both plans, changing parts of each to meet the requirements of the other.

Elmer W. Christy, too, has suggested that help be obtained in planning.

In facing the situation of planning a new school a director of Industrial Arts might arbitrarily make the plans and select the equipment, and thus meet his responsibility. Or he might share his problem with his superintendent, assistant principals, and others who are concerned with the school plant in its entirety, or with the architect, who probably knows little about school practice, but who can determine the feasibility of suggestions in accordance with his structural plans, and with the teachers of his own department, who from practical experience have developed preferences for one thing or another. With a new high school to equip we should choose to share our problems with others.⁶

In the matter of equipping a printshop Herbert Warfel's article, "School Printshop Equipment,"⁷ is very helpful in pointing out trends. Warfel notes that the tendency is toward lesser variation in type faces and advises instructors to purchase larger fonts of body type and more spacing material, but less ornaments, borders, and accessories. He advises further that each beginner be supplied with a case and a small font of type for his exclusive use. He also shows that the commercial quota of three chases per platen press is insufficient in school printshops, since students leave their jobs in the chase rack till a press is free.

As somewhat of a summary of points to be observed in

⁶ Elmer W. Christy, "Planning School Shop Equipment," Industrial Education Magazine, 30:261-70, April, 1929.

⁷ Herbert Warfel, "School Printshop Equipment," Industrial Education Magazine, 30:273, January, 1929.

properly maintaining equipment the following list from Siepert is given.

1. Know how to care for and keep up equipment.
2. Know correct names as they are listed in catalogues.
3. Be able to organize and administer a tool room and an effective checking system.
4. Know and practice "safety first."
5. Be able to make out lists of tools and supplies for the ensuing year.
6. Know how to write correct specifications for purchasing equipment.
7. Know how to make recommendations for tools and supplies.
8. Know standard lines and brands of equipment without prejudice.
9. Be able to get in touch with dealers who handle equipment.
10. Know adaptability and appropriateness of certain tools and machines for special services.
11. Know how much floor space is necessary.
12. Know how to estimate the correct number of each item of equipment necessary for a class of a given size.
13. Know how to plan a new shop or re-organize an old one.
14. Know how to determine the needs of a community.
15. Have an open mind concerning newer trends.
16. Have a cooperative attitude toward superiors.⁸

⁸ Albert F. Siepert, "The Teacher and His Equipment," Industrial Education Magazine, 29:351, April, 1928.

Publicity and the school printshop

Few school systems advertise the results of their work as much as they should. Two reasons for this failure to advertise are apparent: (1) Teachers, supervisors, superintendents, and all others connected with the profession have adopted the idea that the school's work should speak for itself and should not need advertising, and (2) this same group has for some reason or other looked upon advertising as being unprofessional.

However, these two stands of opposition are not sufficient to convince one that schools should continue to be backward about publicity. Such organizations as railroads, telephone and telegraph companies, electric and gas corporations, traction and transit companies, and other forms of public utility organizations use publicity very profusely, and do so because their success depends on public opinion. Likewise, the success of schools is dependent on the public's acceptance of them. Since the school system cannot depend on the students to take home an absolutely true account of the school's workings, publicity of some form or other is needed to keep the public informed. Other reasons for the use of publicity by the schools are the prevention of misjudgement of the schools and the protection of the personnel.

The printshop instructor should make all the use that

he can of any publicity practices of his own school or system. If his system uses no publicity he should make suggestions of advertising methods to his superior and if nothing results should start publicity of his own.

Publicity for the printshop might easily be classed in four different media: (1) written media, (2) visual media, (3) oral media, and (4) social media, each of these having several methods of presentation. The common practice is to think of all types of publicity in terms of the written media, since this type is the one most easily noticed. It need not follow, however, that the written media is the best or most effective. In fact, the consciousness of the readers that they are reading publicity often reduces its effectiveness, since they are very apt to take it with the proverbial grain of salt. Publicity to be effective must present nothing but the straight truth, and that in a manner that is interesting to those for whom it was intended.

The methods of using written media can be divided into the following classifications: (a) the press, (b) school papers, (c) superintendent's reports, and (d) house organs. Printing teachers, because of the nature of their work and training, should already have better than average knowledge concerning the organization and operation of newspaper work, and should know the personnel of the local newspaper well enough to understand the methods by which the most can be

obtained in the way of publicity. Most news of the print-shop will fall into the feature story classification as opposed to the straight news story, and the instructor should keep in mind the type his material is best suited to when writing the story or presenting the facts to the newspaper for publication. In using the scattering method of newspaper publicity, stories are used as they break and are likely to appear on any page of the paper. This method is opposed by the concentration method, in which all school news appears on one page and is a weekly feature of the newspaper. The advantage of concentration over scattering, as shown by some, is that it trains people to look for school news at one particular time. On the other hand, the school news page almost always appears on the weakest of newspaper days, Friday or Saturday, and it is further said against the concentration policy that people are inclined to turn away from a page of "dead" reading. If an instructor's school system is in the habit of using school publicity, his method of using the press will probably be dictated by the administrator in charge of publicity, while, if his system does not make use of publicity, the instructor will almost be forced to use the scattering method since he is not likely to have enough material to warrant the newspaper's setting aside any specified amount of space every week.

The printing teacher is at the same time fortunate and

unfortunate in being so close to the school paper, another agent of school publicity. He is fortunate in that it is not very difficult to obtain space for publicity purposes, since, if necessary, he can even use fillers to publicize his work. On the other hand, he is unfortunate in that there are those who will think, no matter how little use the printing teacher makes of the school paper, that he is selfishly appropriating space that they are denied. Since the latter situation exists, many printshops have refused to make full use of the school paper as a means of publicity on the grounds that any use of it would indicate a selfish motive and the publicity thus backfire, having an adverse or undesirable effect. It is not usually necessary for the printing teacher to go quite this far in his attempts to prevent criticism, although he should naturally beware of the temptation to use all the space that is available to him. The type of material used in the school paper will necessarily differ from that sent to the press, since the school paper readers are essentially students. The stories should appeal to the students and promote the best interests of the shop as well as the school, but at the same time some of the material should be such as adults will read, since it must not be forgotten that the school paper is taken into the children's homes.

Superintendent's reports offer another opportunity for the instructor to advertise his work, and although they are

not usually very widely circulated within the community, the instructor should not fail to make the fullest use of them. A chance is presented in this type of publicity to review the work of a whole year and to include some matters of a statistical nature. Care should be taken, however, that too much of this material is not presented and the reading interest of the report lost. Published and bound reports of the larger systems frequently contain pictures of various activities. It would be wise for the printing teacher to attempt to have pictures of his own shop activities included in such reports.

A house organ is any circular, bulletin, or magazine issued primarily for the stimulation and information of the staff members. The bulk of the circulation of such publications is within the ranks of the teachers, although some systems deliver copies to interested outsiders. For the reason of its limited circulation, the house organ offers limited opportunities for purposes of publicity. Articles of general professional interest, such as new methods of teaching or the relation of printing to general education, might be published since the subject matter relates in a general way to the majority of the readers. Articles of this type written by teachers are almost always recognized with by-lines and become a method of the teacher's advertising himself without particular reference to his work. This practice is

one which may definitely aid the teacher in his professional advancement, and when he has an article of genuine value he should not be backward about submitting it for publication. However, a growing satisfaction with seeing one's name in print frequently combines with an editor's inability to obtain copy, and the result is a false and undesirable vanity that reduces the author in the estimation of his fellow-teachers. Discretion should be the guiding principle in the use of the house organ.

Various types of visual media have been listed and include the use of (a) motion pictures, (b) stereopticons, (c) school work, (d) drawings, (e) posters, and (f) exhibitions. It is readily seen that printshop publicity as a unit in itself could not be practically presented by any of these methods other than school work, exhibitions, and the occasional use of posters. In a general way, these methods are not so extensively used as the written media, and unless great care is taken they will not be so effective.

The previously expressed view of many professional people that the school work should speak for itself, is sufficient justification for using this medium as a method of publicity. In printing the work is especially adapted for use in publicity. A single job such as a school paper or magazine can effectively show the work of fifty to one hundred students who have cooperated in a social environment

to produce the finished product. Moreover, exhibits of this type take less space than corresponding ones of other shops. The forms used within the school, such as absence slips, tardy blanks, report cards, library slips, book marks, etc., hold printshop work constantly before the eyes of the students. Printshop publicity reaches adults through their reading and handling of the school paper or magazine, school entertainment placards and posters, report cards, entertainment tickets and programs, and form letters to parents. With the routine work of the shop playing such an important part in molding the public's opinion, the best results from a publicity standpoint can be attained only when every job produced in the shop nears perfection. In this way everyone who sees a product of the printshop receives a favorable impression.

Exhibitions are annual or semi-annual events in schools of any size. The printing department will naturally take part in any such all-school exhibit, and in order to receive the publicity desired the department must prepare one of the most attractive and interesting of all exhibits. It has been found advisable to exhibit work in progress insofar as that is possible. A series of separate exhibits showing type in the stick, type tied in the galley, a marked galley proof, a corrected proof, a stone proof, a press proof, type locked in the form, and the finished product, has proved

an interesting type of exhibit. Another method is to move type cabinets and proof press into the exhibition room and have students set and print name cards for visitors during the exhibit. Attractive specimens should be added to either of these, however, to show the variety of work done in the shop.

The third medium for presenting printing education publicity is the oral medium. This can be divided into three methods of presentation: (a) use of the students, (b) use of extension courses, and (c) use of lectures and lecture courses. Probably the most important of all influences in formulating the adult opinion of a school system is the oral expression of the student body. Parents are naturally biased in listening to their children's stories of what transpired in the school room on any particular day, and, since these parents are inclined to accept these stories as true, it is the duty of the school to keep the students well and correctly informed. If the printing teacher would have favorable reports carried to the homes by the students, he should see that his students understand the procedure of the school and the shop and instill in them a pride in the progress and achievement of the school. Frequent use of assemblies, home-room programs, exhibits, bulletin boards, contests, school newspaper, and school news in the local papers is a sure way to create this favorable student interest.

In short, this is a method of capitalizing on the parents' emotional interest in their children--it influences a favorable opinion through a "middle-man", the student.

Lectures and lecture courses given by the printing teacher or, in the exceptionally large systems some member of the printing department, will greatly add to the public's understanding of the work being done in the printshop, and as understanding becomes more complete acceptance of the work should become more general. Good places for such lectures are Parent-Teacher Association meetings and meetings of Kiwanis, Rotary, and other similar service organizations. Specimens might well be shown during these lectures to increase the audience interest, but the prime objective of the talks should be to acquaint the listeners with the aims of printing education. Stress should be given to the values of vocational exploration and guidance, consumer education, and general cultural enrichment as well as the ease with which the subject can be inter-related with other subjects of the school's curriculum.

The fourth medium is the social one. Methods of presentation would here include (a) the teachers, (b) the Parent-Teacher Association, and (c) student clubs. Teachers should, naturally, understand and believe in the undertakings of the school as a whole in order to be better prepared to defend the school's policies. The same principle can be

applied just as well to individual subjects as to the school as a whole. It is important that a teacher of music, for example, understand the aims of printing education just as it is important that a teacher of printing understand the aims of music education. These teachers then become, instead of champions of an individual cause and leaders in petty intra-faculty disputes, real defenders of the local systems policies as well as of education generally.

The Parent-Teacher Association is a strong social medium of publicity. This association represents a chance to interest directly those who are vitally concerned with the schools.

Student clubs can also be made important media. Any properly organized club should be an important socializing agent as far as the students are concerned. The real opportunity in publicizing printing education by means of student clubs comes in the extra meetings. These should be held after school hours with parents in attendance. It will sometimes even be possible to organize adult clubs in which the adults are instructed as the students.

Adolph L. Juten⁹ offers several worthwhile and concrete suggestions for advertising the school printshop. Probably his most effective method is his suggestion of a

⁹ Adolph L. Juten, "Advertising the School Printshop," Industrial Arts Magazine, 18:387, October, 1929.

program of student education. This education of the full student body can be cared for in several ways. First, calendars, published either annually or monthly and distributed to the students free of charge, might be printed in the printshop. These calendars should be artistically designed and practical as well, and to further the education of the student body in the field of printing they should contain some point of history in the printing trade or the description of an operation that is necessary to complete a job. Small booklets or pamphlets could be published discussing such topics as "The Invention of Printing," "Benjamin Franklin," "Typesetting," etc. The use of printing subjects as subjects for English compositions or compositions for the school newspaper should be encouraged by both the printing and English instructors. Teachers of English might be shown the value of requiring compositions at some time during the term dealing with the subject of printing, or even trades in general.

Juten also suggests the use of a six-point lightface tailpiece on all jobs printed in the school shop. This lends somewhat of a commercial tone to the printed piece, however, and the practice would be condemned in many school systems for that reason. The use of a tailpiece on all jobs is somewhat out of the question, anyway, due to the exceedingly small jobs required of some school shops.

Popowski¹⁰ is rather indefinite in suggesting the use of school forms, jobs, school paper, and school annual for advertising the printshop.

Records

Records that must be kept by the printing instructor might easily be placed under two general headings, (1) those that he must keep as a teacher in that particular school, and (2) those that he should keep as a teacher of printing.

Little need be said here about the former classification. Records that all teachers must keep are, by and large, standardized, and the individual teacher has nothing to say about the form used. Home room attendance reports, daily, weekly, monthly, and annually, are necessary and have to be done. Those printing instructors who find themselves with home rooms will therefore do well to keep the records as required, submitting all reports on or ahead of time, and should take special care to see that the reports are accurate and neat. All other reports and records that are required by his local school or local system should likewise be done neatly, promptly, and accurately. Any dissension expressed by the teacher along these lines is professionally unethical,

¹⁰ Bert Popowski, "Securing Public Approval for the School Printshop," Industrial Arts and Vocational Education, 25:150-53, May, 1936.

in poor taste, and detrimental to his standing within the school.

Other records that must be kept and which are peculiar to the printshop will be of a more voluminous nature and will be of more personal importance to the teacher, since they will lighten his work considerably. Since the discussion is of teachers the first thought of records will have to do with the students. The teacher should have on file a personal record of all students in his present classes with information concerning them that is of immediate use. The amount of information kept in a file of this type will depend on the desires or duties of the individual teacher. Some prefer to keep the name, address, phone number, parent's name, parent's occupation, child's intelligence quotient, results of mechanical aptitude tests, etc., while other teachers take only the names. Since all the information in the former instance is available in the principal's office and can be obtained on comparatively short notice whenever needed, it would seem unnecessary to take time in the students' classes to gather the information a second time. Information that might be of immediate use to the printing instructor and which would probably be helpful to have immediately available is the child's name, grade, home room number, and his present choice of adult vocation. It is also found helpful to keep on file a record of disciplinary cases. The

student should write an account of the infraction, admit his error, give a record of the type of admonishment administered, promise better behavior, and sign his name, with the date. In this manner the instructor can handle most cases himself, and when particular trouble arises he has his past records, signed by the student, to back up his story. It is a matter of personal opinion and storage space whether these records be kept after the student has left the class. The chances are against their ever being needed or wanted, but, of course, if they are, it is advantageous to have them available.

Students' grades should be kept on file permanently, preferably in another form than the daily grade book. It is not an altogether uncommon thing to have some discussion arise over grades, and proof is sometimes demanded. Embarrassment is avoided if this proof can be procured.

A very complete record should be kept of all the jobs printed in the shop. This completeness will enable the instructor to give better account of the disposal of his materials and supplies and at the same time will make an easier job of the production of re-orders. The job ticket suggested in Figure 3, page ninety-eight, should be the basis for this file of jobs. Job tickets, when the job has been completed, should be filed in numerical order, with the original copy, first and second proofs, and a finished specimen enclosed. A second specimen should be filed under

a different heading suggested by the type of job it is. Such headings could be as follow: envelopes, letterheads, tickets, personal and other cards, pamphlets, programs, placards and posters, dodgers and handbills, forms for the local school, rule forms for the local school, etc. This second specimen should be marked with the original job ticket number to refer the instructor back to the more complete information found there. A third file is often used and is sometimes quite helpful. This third specimen is filed by the date of the job's completion or by the date that the order was received. In any case, the auxiliary specimens should always refer back to the original job ticket.

Many systems require that the printing instructor make monthly reports to a superior, giving all the jobs printed for the given month. The last filing of job specimens mentioned above will prove a definite aid to reports of this kind. Care should be taken to see that these reports are complete in every detail, and, as always, neatness should be characteristic of the printing instructor's report.

Although the storage of line engravings, halftones, linoleum blocks, etc., is not strictly a matter of records, they should be filed away in a suitable place and in a suitable manner. A satisfactory system of doing this will be presented here. Most printshops have at least a few of these cuts that have been used and can possibly be used at some future

time in the school paper or magazine. Because of the dirt that will collect on them or because of the damage that might possibly come to them, it is very unwise to leave such useful material lying about in a helter-skelter manner. Moreover, much time is lost in finding the desired cut when one is needed. These cuts should be assembled and numbered (on the bottom or reverse side). This number, as did the job ticket number in the previous filing description, should be the basic number for all methods of filing. Then a proof should be made of each cut, care being taken to mark each proof with a number corresponding to the one on the back of the plate. Then the cuts should be wrapped, with a piece of straw board or chip board placed over the top to protect the engraving, identified on the outside with the basic number, and stored in a safe place in numerical order. The proofs then become the working file, or file from which all operations are begun. These proofs can be filed under any group of headings that the individual instructor deems most helpful under his particular circumstances. Such headings might be as follow: small zinc etchings, large zinc etchings, halftones of individuals, halftones of buildings or rooms, linoleum blocks, two-color cuts, etc. If the cuts available are more numerous perhaps a topical file would be more useful. Christmas, Valentine's Day, Thanksgiving, spring, fall, winter, commencement, etc. are headings that might be used

under such a plan. It will probably be found more convenient in filing the proofs if they are all made on the same size paper and numbered in the same place. Any such consistency of details is sure to save the instructor time and is a mark of efficiency in his administration of the shop.

The discussion of inventories has already been given and need not be repeated here. The reader should probably be reminded, however, of the necessity of keeping the inventories of past and present years permanently on file. Material of this type is often found useful and should be available at all times.

All requisitions for supplies, materials, and equipment should be made in duplicate and a copy kept on file by the instructor as a protection against incomplete deliveries. When invoices are received with the delivery they can be filed separately or with the original requisition. Since the invoices should be checked against the requisition the latter method will probably be found less bothersome.

All letters received from superiors should be kept on file together with notes of all supervisory interviews. Letters and reports addressed to superiors should be made in duplicate and the copies filed.

Many systems do not require job tickets on jobs of such regular publication as the school paper or magazine. Since no record would thus be made of jobs of this kind in the job

ticket file some other method should be devised for recording the work. Copy, first proofs, second proofs, final printing, and a bound copy should all be included in the record kept of these publications. It should go without saying that two or more complete files, from volume one, number one to date, should be kept of the school paper or magazine.

Those printing instructors who have the full financial control of their own shops, ordering their own stock and estimating all the jobs that are to be printed, will have more work in the way of records than other instructors. Handling the finances of the printshop is a task that requires great care and constant application and watchfulness. Even one slip in accuracy can easily double the amount of work required and can often cause embarrassment or even loss of one's reputation. Nevertheless, keeping the financial records need not be a continuous dread of the instructor. The teacher may be tempted to impress others with his ability to keep books and in his attempt bury himself beneath numbers, ledgers, petty cash accounts, and other such terms. It will probably be found that the most accurate way to keep such records is also the simplest. Perhaps the simplest and surest way to keep accounts is by the use of the tried and true "expenditures and receipts" method. Some prefer to use two books for this, while others like the use of one book only,

with expenditures entered on one page and receipts entered on the opposite page. Some such simple system given careful attention will prove to be all that the instructor need trouble himself with. All financial transactions entered in the books should be backed up with written receipts in the case of expenditures, and carbon copies of the written receipts given, in the case of money received by the instructor.

Safety in the printshop

Safety consciousness, always an important factor in education and especially so in the shops, where students are more often exposed to dangers, has grown by leaps and bounds in importance to instructors, administrators, and the public at large. Many more books and magazine articles dealing with this subject are available now than were available a decade ago, indicating that more demand has been made for suggestions as to how the safety problem should be attacked. Perhaps a part of the stress placed on safety education in the schools has been occasioned by the national, state, and local drives on safety education that was precipitated by the appalling growth in traffic accidents. Perhaps further stress is placed due to the recent recognition of the importance of vocational and industrial arts education and the consequent increased number of school shops. In any

event, the limit of education for safety has not yet been reached and is not likely to be reached. It can almost be said that it is impossible to spend too much time on this subject.

G. H. Wichman brings out some important points in his article in the Industrial Arts Magazine, a part of which article is quoted below.

The problem of safety education and training falls to the lot of the school. Many schools are now carrying on safety work by use of safety textbooks, organizing safety councils, safety patrols, safety posters, etc. In teaching safety work the industrial arts department takes the lead because it has real problems dealing with the machinery of industry. Hence, safety practices in the industrial arts department are highly important and should be strictly enforced.

School executives are seldom interested in shop safety unless a serious accident occurs. The average teacher is none too well informed concerning safety practices, and with the maze of other varied duties required of him, frequently becomes a flagrant violator of the most common of safety practices.

It is therefore our duty as shop teachers, not only to protect and guard against accidents in the shop, but to develop safety habits and a respect for safety that will function outside the school shop.¹¹

W. T. Bawden, in an article in the Industrial Education Magazine, has said substantially the same thing in regard to safety control.

In a school shop practically all the conditions are under the control of the teacher. It is a part of his specific job to see that a thoughtful student faces every

¹¹ G. H. Wichman, "Safety Education in the Shop," Industrial Arts Magazine, 18:58-60, February, 1929.

possible source of danger. The instructed, forewarned student usually succeeds in avoiding trouble.¹²

However, Bawden goes a step farther in placing almost all the responsibility directly on the shoulders of the instructor when he says, "So far as the mechanical features of the shop equipment are concerned, few actual hazards are beyond the power of the instructor to remedy or remove."¹³ At first thought it may seem that Bawden has thrust a heavy burden on the teachers, but, at the same time, it must be admitted that the realization of such a responsibility by many more teachers would substantially reduce the number of shop accidents. All teachers should naturally begin the safety drive in their own shops, but they should not feel content to end it there. There should be a cooperative spirit among all shop teachers of the department to effectively solve the problem.

A novel method of handling the safety problem has been introduced by Noel B. Grinstead, of the Central Missouri State Teachers College. He says:

Safety is to a considerable extent a manner of thinking. A habit of safety may be developed by experience, by instruction, by the use of cautions, guards, slogans, posters, penalties, or a number of other schemes or devices, all undoubtedly having some value in encouraging safe practice. But the efficiency of any device or

¹² W. T. Bawden, "Accident Prevention in the School Shop," Industrial Education Magazine, 27:354, May, 1926.

¹³ Loc. cit.

method of instruction in teaching people to be careful depends largely upon the extent to which the device helps to build up a point of view on how to go about any hazardous task in the best and least dangerous manner. The safety concept may be developed in the school through regular instruction only when it is a part of the teacher's plan in giving instructions, which properly emphasize a safe procedure to be followed, and to analyze the reasons for this procedure. Supplementary rules, devices, posters, placards may be found effective, in varying proportion, as aids in some teaching situations, with different teachers or working conditions.¹⁴

Grinstead then goes on to suggest that the hazards in the school shop should be thought of as threefold.

There are hazards to the worker, hazards to the tool or the machine being used, and hazards to the material being fabricated. Perhaps too many teachers emphasize the former hazard almost to the exclusion of the other two.¹⁵

It is readily seen that these considerations for the material and the tools and machines as well as the considerations for the operator should lead to the natural founding of a more substantial concept of safety. For example, a thorough understanding of the mechanism of a platen press and the care that such a complicated mechanism requires will formulate a clearer idea in the mind of the student of the possible dangers that exist in the machine. A thorough knowledge of the many possible ways of wasting stock in cutting should lead to greater care and planning in that opera-

¹⁴ Noel B. Grinstead, "Building a Safety Concept," Industrial Arts and Vocational Education, 26:12, January, 1937.

¹⁵ Loc. cit.

tion and should consequently result in fewer accidents involving the cutting machine.

There is the possibility, however, of making the students too conscious of such considerations for material. A pressman, for example, must not be allowed to reach into a moving machine in an attempt to avoid the spoilage of a single sheet of stock. It is a sane median between these two concepts for which the instructor must strive.

Max S. Henig conducted a study in the Wewt Orange and Irvington units of the Essex County vocational schools in an attempt to discover something authentic concerning the mental causes of accidents. As a result of the study he published the following:

No safety program may be considered complete unless it includes the testing for general intelligence of those exposed to accidents. The results of these tests and an explanation of their significance in the light of the above findings should then be placed in the hands of the person responsible for the institution's safety activities. This procedure, coupled with careful instruction and supervision of those workers in the more susceptible intelligence levels, would undoubtedly result in a substantial reduction in the occurrence of accidents.¹⁶

Such a study and such a conclusion would certainly be another persuasive argument to present to those who would make the industrial arts shops into dumping grounds for the unfortunate, mentally hampered students. Unless such stu-

¹⁶ Max S. Henig, "Intelligence and Shop Accidents," Industrial Arts Magazine, 27:265, August, 1928.

dents are given shop work in small groups and under the strictest supervision, they only increase the hazards normally found in the shops.

E. Pieri has had published such an excellent list of general rules and health hazards as regards the printshop particularly that they are used here as a conclusion to the section discussing safety. A clear understanding of these rules and hazards by the students and close supervision by the instructor will keep the printshop free of accidents of practically all kinds.

General rules:

1. Machine must not be operated while instructor is out of room.
2. No adjustments should be made while machine is running.
3. Aprons should be securely fastened, and extreme care should be taken so that they do not come in contact with moving parts of machines.
4. Power should always be shut off after machine is used.
5. Care should be taken to see that paper is placed right side up on machine. If in doubt, consult instructor.
6. Never operate any machine until you have been assigned to do so by instructor.
7. Talking to a student while he is operating a machine is forbidden.
8. Do not put type or other materials into your mouth.
9. Never make repairs or attempt to clean motors unless so ordered by the instructor.

10. Instructor's O.K. is absolutely necessary before any student operates a machine.¹⁷

Health Hazards:

Lead Poisoning. Keep type from mouth. Avoid dry sweeping. Do not eat in the washroom. Wash hands before eating. Clean nails often.

Cleaning Liquid. Provide proper ventilation. Do not splash liquid on hands or clothing.

Platen Press. Do not try to feed very small or odd-shaped sheets. Do not reach for falling sheets.

Paper Cutter. Work alone when cutting paper. Do not catch scraps when they come from the knife.

Tripping and Falling. Keep floors free of waste paper, etc.

Sleeves, Ties, Trousers, Smocks. Do not wear a long tie, loose smock, flapping sleeves or trousers. Roll sleeves and trousers.

Oiling Machine when in Operation. Do not oil or wipe machine when it is in operation.

Handling of Paper. Take care of paper cuts to avoid infection. Do not lift heavy paper loads.

Horseplay. Refrain from wrestling or other play around machinery.

Talking with Workmen Operating Machines. Do not talk to operators working at machines.¹⁸

¹⁷ E. Pieri, "Safety Rules for the Printshop," Industrial Arts and Vocational Education, 26:288-89, September, 1937.

¹⁸ Ibid., p. 289.

Estimation of the cost of job printing

"Estimating is the process of computing the cost or value of anything--a means whereby a master printer can determine the cost and selling price of printed matter."¹⁹

In many printshops the instructor will not be called upon to estimate the cost of the jobs he prints. The financial setup in most institutions is such that the operating costs of the printshop are charged to education, since the students are allegedly learning while they produce, and hence the cost is not the primary objective. However, there remain those other shops in which the instructor is responsible for the money spent in his department and must show a profit at the end of the year or be able to explain the losses. It is suggested that the following matter, together with the quoted tables, may be some help to instructors working under these conditions.

In order that the reader, as a future estimator, can better prepare himself to fill his position, the following further quotation from J. C. Tranbarger's lecture is given. Tranbarger has called this list "The Ten Conditions under Which Estimation Should Be Done," and the list itself sums up the vast amount of knowledge which a successful estimator

¹⁹ J. C. Tranbarger, "Printshop Estimation," Unpublished lecture read before class meeting of Indiana State Teachers College, Terre Haute, Indiana, January 4, 1934.

must have.

1. Thoroughly understand all phases of the work that is to be estimated.
2. Determine the most economical method of manufacture.
3. Know what materials to choose, and specify them.
4. Possess a knowledge of artwork, methods of illustrating, engraving, and electrotyping.
5. Have a working knowledge of the manufacturing processes of printing.
6. Know the approximate time required for all operations.
7. Know the average productive capacity of men and machines. (Compositors, as a rule, estimate themselves too highly. The estimator should study the individual compositors of the shop).
8. Understand the use and application of cost figures.
9. Understand that honesty, integrity, and accuracy prevail at all times.
10. Always include a profit.²⁰

The composing room estimate is the logical place for the estimator to begin, and coincidentally, it is probably the most difficult section of the shop to estimate with any definite degree of accuracy. The three most used methods of copyfitting: the word method, the letter method, and the character count method, will be discussed; but first a few hints to the estimator will be given concerning the most

²⁰ibid.

common oversights in figuring composing room costs.

The commercial printer now receives most of his copy in typewritten form. The school shop, especially junior high school shops, is not as likely to do so. Since it is practically impossible to estimate copy from a longhand manuscript, it would be a wise move on the part of the instructor to have the copy typewritten before he does any copyfitting. This might be done as a part of the classwork in typing classes in those schools where commercial work is one of the exploratory courses. Copy containing long words will naturally set more lines than that containing shorter words, and many short paragraphs will increase the number of pages. The type face to be used must also be kept in mind, since the condensed faces will take fewer lines and the extended faces more.

The word method of copyfitting is the fastest, but is also the least accurate. It is believed, however, that its accuracy will suffice in most cases which printing instructors are called upon to estimate. By following the steps outlined below in the proper order this method of copyfitting should be easily understood.

1. Determine the number of words in the complete manuscript. If the manuscript is a long one, double spaced typewritten sheets, $8\frac{1}{2}$ by 11 inches, can be judged to contain about 300 words, and if single spaced, about 500 words.

One sheet, at least, should always be counted.

2. Determine the number of ems in each word. This can easily be done, after the type face is selected, by consulting Table I, below, which was taken from Tranbarger.²¹

TABLE I
AVERAGE NUMBER OF EMS PER WORD

Linotype		Monotype
4.0	5 point	3.7
3.8	5½ point	3.4
3.7	6 point	3.3
3.3	7 point	3.0
3.2	8 point	3.0
3.2	9 point	3.0
3.2	10 point	3.0
2.9	11 point	2.8
2.8	12 point	2.7

3. Determine the total number of ems in the manuscript by multiplying the number of words (1) by the number of ems in each word (2).

4. Determine the length, in ems, of the desired page.

5. Determine the width, in ems, of the desired page.

6. Determine the total number of ems that will be contained in one page by multiplying the length in ems (4) by the width in ems (5).

7. Determine the total number of pages by dividing

²¹ J. C. Tranbarger, "Estimating Printing," Unpublished syllabus used in Indiana State Teachers College, Terre Haute, Indiana, 1938.

the total number of ems (3) by the number of ems contained in one page (6).

The letter method of copyfitting is much more accurate than the word method, although not quite so accurate as the character count method. The letter method can be used for estimating book composition but is more valuable and more often used in the estimation of commercial advertisements or other open form work. The following steps are necessary in using this method:

1. Make a layout of the complete job showing the amount of white space and the amount of space to be used for ornaments, border, type (display), and type (body).

2. Separate the display lines and other ornamentation from the body type and figure the total amount of space required by the display.

3. Subtract this amount from the total amount of space available to determine the available space for the body type. (This computation can be done in either square points or square picas, whichever is apparently the more convenient).

4. Determine as follows what is the best type size to fit the available space. There are approximately 65 to 66 characters in a typewritten line. Suppose the copy to be fitted into the form contains ten such lines. First, set a line of 65 characters in ten point type. It will approximate 25 picas in length, or would require a total of 250 picas

to set the complete copy. If set solid the copy could be put in space 25 picas by $8 \frac{1}{3}$ picas. If the type is leaded it is figured as 12 point type and will take 25 picas by 10 picas; while if double leaded (equivalent to 14 point type) it will take 25 picas by $11 \frac{2}{3}$ picas.

The most accurate method of copyfitting and probably the best to use for long or book manuscripts is the character count method:

1. Determine the average number of typewritten characters per line in the given manuscript. (This will usually run 65 or 66).

2. Determine also the total number of lines to the page, then by multiplication find the total number of characters in the manuscript.

3. Determine the type size, the type face, and the length of line that will be required in the printed product.

4. Set a few sample lines in that particular type on the measure required. Then by counting the number of characters or consulting charts the average number of characters per line can be found.

5. Divide the total number of characters in the manuscript (2) by the average number of characters per line in the desired type (4), which will give the total number of lines needed.

6. Determine the depth of page needed and from this

the number of lines per page.

7. Divide the total number of lines (5) by the number of lines per page (6) to find the number of pages the manuscript will fill.

In using this method, short lines at the ends of paragraphs should be counted as full lines, since there will be corresponding short lines at the end of every paragraph in the printed matter, also.

The tables that appear on the following pages are all taken from J. C. Tranbarger²² and are given here in an attempt to make an easier job of the estimation required of printing instructors. The tables by no means represent all the information that is necessary in estimating a job of printing, but it is thought that the ones given will cover most of the situations found in school shops.

Table II, page 189, does not include such extra work as holding press to lock on bed of press, laying patent base plates, registering color work, etc. Succeeding forms of very short runs, when packing is not changed, should be figured as shown, less 50 per cent. Additions should be made as required when expert makeready for bringing out halftone details is needed.

²² Ibid.

Table III, page 190, showing press running time, gives the normal running of average stocks, and special allowances should be made for light and thin papers that are hard to feed and for heavy stock that must be put on the feed board in small lifts.

Table IV, page 191, shows the number of square inches per 1000 impressions a pound of ink will cover solid. Light face type should be figured 1/10 solid; black face type, 2/10 solid; halftones, 2/10 to 4/10 solid, depending on their tone; and linoleum blocks, whatever percentage solid that is not cut away.

Table V, page 192, is self-explanatory in showing the spoilage allowance that should be made.

TABLE II
ORDINARY COMMERCIAL MAKEREADY

	Size of press required						
	5 x 8	8x12	10x15	12x18	17x22	22x34	25x38
Minimum form . . . .	.2	.2	.3	.4	.5	.8	.9
Ordinary commercial work, full forms	.3	.4	.6	.8	1.0	1.3	1.5
Add .05 hours ($\frac{1}{2}$ tenth) per page							
Add .05 hours ($\frac{1}{2}$ tenth) per cut							
Add for automatic feed first form only . . . . .	..	.1	.1	.2	.3	.4	.4
Add for color wash- up as required .	.2	.2	.2	.3	.3	.4	.4
Allowance for each succeeding form .	..	.1	.1	.2	.2	.3	.3

Note: Time is given in hours.

TABLE III
 RUNNING TIME AND RATE PER HOUR

	Impressions per Hour	Time per 1,000	Makeready Rate per Hr.	Price per 1,000	Time per 1,000 if Slipsheeted
Hand feed 8x12	1,250	.8	\$2.50	\$2.00	1.0
Hand feed 10x15	1,111	.9	2.75	2.50	1.0
Hand feed 12x18	1,000	1.0	3.00	3.00	1.1
Hand feed 14x22	833	1.2	3.00	3.60	1.25
Miller 10x15 .	1,540	.65	3.00	2.00	.85
Miller 12x18 .	1,250	.8	3.00	2.40	1.0
Miehle vertical 13x19	2,500	.4	4.00	2.00	.8
Kelly press 17x 22	2,500	.4	4.00	2.00	.8
Cylinder 22x34	1,250	.8	4.50	4.00	1.0
Cylinder 25x38	1,111	.9	5.00	4.50	1.1

TABLE IV
INK SCHEDULE

	Coated	S. & S.C.	M. F.	Print	Antique
Black	200	180	130	110	100
Process red	180	165	120	100	90
Process blue	180	165	120	100	90
Transparent yellow	160	145	105	85	80
Opaque yellow	135	120	85	75	65
Blue lake	180	165	120	100	90
Bronze blue	180	165	120	100	90
Deep red	170	155	110	95	85
Orange red	165	150	105	90	80
Opaque red	145	130	95	80	73
Opaque orange	140	125	90	75	70
Ultra blue	150	135	100	83	75
Chrome green	120	110	80	65	60
Mixing white	120	110	80	65	60
Tint base	200	180	130	110	100
Double tones	180	165	120	100	90
Cover white . . . . .	...	...	...	...	25
Cover yellow . . . . .	...	...	...	...	50
Cover blue . . . . .	...	...	...	...	50
Cover red . . . . .	...	...	...	...	40
Gold size	130	115	85	70	65
Gold bronze	60	60	55	55	50
Gold ink	160	145	105	85	80
Alum. bronze ink	180	165	120	100	90

TABLE V

SPOILAGE ALLOWANCE

- 1,000 copies, 10% for each color.
- 2,000 copies, 8% for first color and 4% for each additional color.
- 5,000 copies, 6% for first color and 2% for each additional color.
- 10,000 copies, 5% for first color and 1% for each additional color.

CHAPTER IV

SUMMARY AND CONCLUSION

In view of the fact that this study is composed very largely of digests of available literature dealing with methodology in printing education and frequent interpolations consisting of the author's individual opinion, a summary of the study's contents would by necessity be repetitive. The summary is included nevertheless, with the end in view that any study of method in education can well stand repetition.

In establishing a background for the discussion of methodology, an attempt was made to emphasize two major points. The first was that although printing is by comparison a very new subject in the secondary school curriculum, it has rapidly and steadily grown in scope since its introduction, showing great promise of a future of vocational and educational value for its students. The second point was that although educational philosophy is constantly changing, at the present time a pragmatic view probably represents the best basis for a philosophic doctrine in printing education.

In the discussion of professional methods an attempt was made to apply to printing education the accepted methods of teaching as used in the general industrial arts. The methods included were the demonstration, the lecture, the project, the instruction sheet, the use of textbooks, and

other devices. Throughout the study it has been emphasized that no one method is satisfactory under any and all circumstances. The variations in these methods make each of them the most effective at one time or another. It followed, then, that a teacher of printing should be well acquainted with all the known methods and devices, and also be able to apply the most efficient method or device to each situation.

These methods were then applied to specific printing operations and learning situations to aid the beginning teacher, who is likely to experience difficulty in the application of teaching techniques.

It was shown that disciplinary problems are best dealt with before they arise. The natural motivation and interest that exist in the printshop care for practically all cases of this nature, since the boys are too busy to make trouble if they are fairly treated. It is the duty of the teacher to be just and fair in outlining and enforcing his code of conduct for the shop. If he does this, few problems will arise.

The chapter discussing administrative methods was devoted to suggestions that will enable the beginning teacher to simplify his work sooner than he would be able to if he learned from experience only. The tables appearing at the end of the chapter should be of great help in any estimating he may need to do.

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