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A Comparison of the Use and Acceptance of Phototypesetting with Other Typesetting Processes Among Commercial Publishers and University Presses

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A COMPARISON OF THE USE AND ACCEPTANCE OF PHOTOTYPESETTING WITH OTHER TYPESETTING PROCESSES AMONG COMMERCIAL PUBLISHERS AND UNIVERSITY PRESSES

BY

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This thesis is approved as a creditable, independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree; but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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INTRODUCTION

Reasons for Undertaking the Study

Varying degrees of praise and criticism of the phototypesetting process have been made since the first commercial installation of a phototypesetting machine in 1949. The process produces type images on film or paper in negative or positive form by exposing light through transparent film negatives of "master" images. Since its introduction, there has been considerable discussion among graphic arts personnel of the advantages and disadvantages of the process. Their discussions are fortified by experience as well as by numerous speeches, advertising pieces, and periodical articles concerning the pros and cons of the process.

In The Inland Printer of March 1957, Frank DeWitt of the Graphic Arts Research Department at the Rochester Institute of Technology (now of Friden, Incorporated) asserted:

> The photographic machines are producing a wonderfully sharp and opaque image on film or paper, but speed is not emphasized in any of the existing machines to the extent that might be expected, considering the relative advantage of photography over casting with respect to time. (5-54)

Carl P. Palmer, in the Graphic Arts Monthly of September 1960, chided the "metal boys" when he reported:

> In phototypesetting, we are not only faced with the errors and vagaries of human beings, but we have, in some instances, introduced yet another source of error. In this case, we refer to the machine itself. Electronic circuitry too can produce errors, being a new field and full of minor problems....

> "Aha!" the metal boys all cry--well fellows, you have them too and you are content to live with them. A chewed mat, a worn mat, etc., will give the same troubles, so will a wrong font mat in a magazine. The basic thing to remember is: "If you can't understand it, oppose it." (6-106)

Discussions of the virtues and problems of phototypesetting are not the only current areas of disagreement in the graphic arts. There are discussions of the appropriateness or inappropriateness of the letterpress and offset processes, the Dycril, nylon and other fast-etch plates, and the web-fed and sheet-fed offset. These and other discussions seem to be part of a more vigorous industry which began to revitalize itself about the time of the Chicago newspaper strike in 1947-1949. It was then that the Chicago newspaper publishers made the first extensive use of the Vari-Type and other cold-type machines. They looked for new methods of production when their line-casting machine operators went on strike. Surprising to everyone, the dailies were printing newspapers of about their usual size by the end of the first week of the strike (2-62) by using Vari-Typers and photoengraving. (4-62)

C. Lester Walker, in the July 1948 issue of Harper's Magazine, was enthusiastic about the typewritten or Vari-Typer-set newspapers:

> For make no mistake, a real revolution is going on.... And just over the horizon are magazines which will be, if I may use the word, "ghost" printed. No printing surface of any kind will ever touch their paper, yet a faithful "impression" will be made. (8-56)

According to Time editors, the Vari-Typer process, at first, was more expensive than was typesetting: "...(one estimate was about 30% more) but the cost was dropping fast. Though it might take five years

to make it as cheap and efficient as linotype, some editors thought it had already caused 'a revolution.' Said one: 'One sure change will be the use of larger type. Let this machine be developed a little more, and the cost of starting a newspaper will be very little. Instead of $50,000 or $100,000 for linotype machines to start a small-town paper, I'll bet you could start one for $10,000 with the Vari-Type. And you could put out a damned good-looking paper.'" (4-62)

That some people saw the strike as part of a revolution is not surprising. The Chicago papers began to use the new "Dow-etched" magnesium plate which speeded up the photoengraving part of the process. Intertype had just come out with the new Fotosetter, and there were the new Fairchild Scan-A-Graver, rubber plates, plastic plates and the new Huebner "ghost" or electronographic printing process. (8-58)

Revolution or not, one thing the strike did was force the printers and publishers to notice the new processes. The Chicago publishers were made to change their methods of reproduction and to continue their search for methods improvement.

Phototypesetting has been part of this search and awakening for new and improved methods. The compatibility of the process with offset lithography is exemplified by the possible direct exposure of the film images to photosensitive lithographic plates. Additionally, the development of new fast-etch zinc and plastic plates seemingly allows phototypesetting to lend itself more readily to letterpress. Among the apparent advantages of the phototypesetting process compared to the hot-metal process, the most significant is the elimination of the need

for reproduction proofs of the metal type for subsequent photographing. More simplified storage is also a tangible benefit.

At present there are five commercially available phototypesetting machines appropriate for setting text matter: The American Typefounders' "ATF Typesetter," the Intertype Company's "Fotosetter," the Lanston Monotype Company's "Monophoto," the Mergenthaler Linotype Company's "Linofilm" and the Photon Corporation's "Photon." Although these machines arrive at the same end product, type images on film or paper, they vary greatly in the means used to achieve this end. These means cause them to vary also in price and flexibility. The ATF Typesetter, the Monophoto, and the Linofilm each consist of two units--a keyboarding unit that punches a tape, and a photographic, film-producing unit that is actuated by the tape. The Fotosetter is a single-unit machine combining keyboard, matrix assembly, photographic, and matrix distribution operations. The Photon utilizes both principles and can be operated either directly by a keyboard or by a pre-punched tape. The operation of the ATF Typesetter, the Fotosetter and the Monophoto is largely mechanical while the Photon is chiefly electronic. The Linofilm utilizes both mechanical and electronic operations.

Much was expected of the new phototypesetting process, as was expressed by C. Lester Walker:

> And some of the inventions and discoveries which were lying around were eye-openers. For instance, ways to bypass typesetting had been discovered which were, perhaps, more remarkable than the justifying typewriter. There had been invented a machine known as a Fotosetter, which eliminated not only hot metal typesetting but even the sheet of paper which the justifying typewriters set down their copy on. The machine

> composed by photography. The typist tapped its keys, and a camera then picked up each letter on a sensitized film. Proportional spacing (more space to fat "w" than to thin "i") was taken care of as the line grew, and the whole was automatically justified at the end.
>
> A film fed out of this machine into a light-tight box, where it was developed like any negative. Place your film against a sensitized metal printing plate, expose it to light, process the plate--that is, develop it--and it was ready to print with.
>
> Errors? A mistake could be taken out of the negative and a correct line easily substituted. The film could be used to make any kind of printing plate, and the machine's speed of composition far exceeded the original typesetter's. (8-59)

Since phototypesetting was developed during, and was part of, a general awakening of the graphic arts industry, it should have been fully adopted if it were a panacea of speed and simplicity. If phototypesetting was evolutionary, perhaps it should have been tried and adopted by a greater percentage of printers and publishers than it seems to have been at the present time. Or perhaps phototypesetting was a specialty process from the beginning--destined to be more efficient only for certain kinds of typesetting. If this were so, should phototypesetting not be more generally available today? In May 1960, Book Production editors listed as a disadvantage of phototypesetting: "...a source of supply. While there are countless shops engaged in hot-metal work, there are but a limited number of trade composition shops [which] offer Fotosetter, Photon, Monophoto and Linofilm." (3-59) In the October 1961 issue of Book Production, the lack of available phototypesetting machines was cited as a possible cause of the high costs of setting straight text matter by this process:

> It is generally believed that straight text matter set by filmsetting is more expensive than that set by other

> composition processes, even though some machines have been designed for cheap mass-produced work. As more machines become available for book work, however, prices should come into line. (8-69)

This apparent lack of availability would indicate that phototypesetting has not yet been accepted to any great extent. Perhaps equipment manufacturers have not been able to solve some problems which make the process's advantages weigh less heavily than its disadvantages. Perhaps, in spite of a feeling of awakening, there is an underlaying resistance to change on the part of graphic arts personnel; or perhaps the high capital investment necessary for hot-metal equipment acts as a deterrent against the purchase of new and unfamiliar equipment.

In 1960, a study by Richard G. Underwood, Production and Manufacturing Problems of American University Presses, was published by the Association of American University Presses. A section of this study dealt with phototypesetting as a recent development in the book manufacturing industry. This was a study in depth to "collect from the forty member presses of the AAUP as complete cost information as possible on each title published during the calendar year between July 1, 1957 and June 30, 1958." (7-17) Of thirty-one respondents, usable information was furnished by twenty-nine presses. Information from four general areas was elicited by the questionnaire used for this study: "(1) methods and procedures in design and production, (2) purchasing policies, (3) author's alterations, and (4) new production and manufacturing processes and techniques recently employed by each press. The fifth section of the questionnaire asked that a copy of each book published in the survey period . . . be sent to the Manufacturing Study

office for examination, and that a cost summary sheet for each title be furnished." (7-17)

In the AAUP study the twenty-nine presses reported 674 titles published for the period. The tabulation of the methods of composition showed the following distribution:

Linotype	569 titles	84.5% of the total
Monotype	61	9.0%
Cold Type	33	4.9%
Photocomposition	3	.4%
Miscellaneous	8	1.2% (7-39)

This research project was undertaken to analyze commercial book publishers and university presses for their acceptance of and attitudes toward phototypesetting. This was to be done by comparing phototypesetting to other typesetting processes. Although the AAUP study was both broader and deeper and dealt with a more limited group, its tabulations and observations have made it invaluable for background material.

This study was limited to book publishers and university presses for four reasons: (1) because it was felt that these groups, who set a wide variety of text matter, would have sufficient contact with phototypesetting to offer some concrete information about the process, (2) because it was felt that a majority of publishers and presses had no capital investments in composing rooms and therefore would seemingly be more objective in their evaluation than would printers, (3) because the number of publishers and presses would keep the study within reasonable bounds, and (4) because the author has a personal interest in the book publishing industry.

This project was undertaken because of the small amount of research completed in this area and because of the other reasons stated on previous pages.

Objectives of the Study

The first objective of this study was to determine the degree of acceptance of the phototypesetting process among commercial publishers by comparing this process to the hot-metal and cold-type processes. Two immediate factors that would seemingly affect this acceptance would be the size of the publisher and whether or not the publisher operated his own composing room. The second objective was to determine to what degree acceptance of phototypesetting was influenced by the size of the publisher. The third objective was to determine to what extent acceptance was influenced by a composing room operation. The fourth objective was to discover what attitudes publishers had toward the phototypesetting process, and to compare the attitudes of those who have used the process with those who have not. Along with this, publisher's attitudes of specific phototypesetting machines were probed.

As a last objective, it was decided to compare the entire study of commercial publishers with that of the university presses. Some significant differences might be expected to be found here because the differences in purpose of the two groups affect their entire publishing procedures. (7-xiv) The AAUP study listed four purposes peculiar to university presses: "(1) to provide an outlet for the publication of research for the faculty members of its own and other universities; (2)

to extend the instructional function of the parent institution by publishing and disseminating knowledge and scholarship as widely and as economically as possible to both scholars and educated laymen; (3) to publish learned books of small sales potential and limited possibility of financial returns which commercial publishers cannot profitably undertake; and (4) to gain favorable publicity and prestige for the university of which it is a part." (7-xiv)

Methodology of the Study

The study was carried out by mailing a questionnaire, covering letter and self-addressed, stamped envelope to each commercial publisher and university press in the sample. The complete questionnaire may be found in Appendix A and the covering letter in Appendix B.

Question 1 of the questionnaire was used to discover what part of the sample operated their own composing rooms. The purpose of question 2 was to learn if any of the respondents who operated composing rooms thought that phototypesetting equipment was sufficiently worth capital investment. The latter part of this question was to establish the number of particular makes of machines owned by those who had invested in phototypesetting equipment. Question 3 was to indicate how many of these respondents owned hot-metal equipment. The number of particular makes of hot-metal machines owned by each respondent was not especially relevant to this study; however, this part of question 3 was asked to balance out the questionnaire among the various typesetting processes. Questions 2 and 3 also categorized a composing room

as having either phototypesetting or hot-metal equipment, or both. The purpose of question 4 was to indicate how many of the respondents used phototypesetting. From the response to this question along with that of question 1, the extent of influence a composing room had toward acceptance of phototypesetting could possibly be resolved. Question 5 was designed to show how many of the respondents used cold-type composition. It defined cold-type composition as a process similar to that work performed by the Vari-Typer, Justowriter, and IBM Executive machines. The purpose of question 6 was to discover if any of the respondents owned or rented cold-type machines and how many. Question 7 was included to find out from those respondents who used phototypesetting what particular machine processes they used.

Questions 8 and 9 were aimed at discovering attitudes. Question 8 was asked of both those who used phototypesetting and those who did not. From this question it was possible to compare what each group thought were the limitations of phototypesetting. Question 9 was asked only of those who used phototypesetting and was intended to bring out opinions regarding individual machine advantages. This question also defined Fotosetter, Monophoto, etc. as being in the class of phototypesetting.

Questions 10, 11, and 12 were used for two reasons. The first was to determine the number and percentage of titles set by each typesetting process, and the second was to determine the total number of titles as a basis for categorizing each respondent. It was felt that the size of a commercial publisher or university press could have great

bearing upon trial and acceptance of phototypesetting. It was also felt that using the number of titles produced over a two-year period would establish a reliable measure of size without asking confidential cost information. All references in this study to the size of a publisher or press were therefore based on the total number of titles set in 1960 and 1961. Because the questionnaires were mailed to the sample on November 10, 1961, an estimate of the number of titles set in 1961 was requested.

Question 13 was used to discover if there was a trend for more newcomers to phototypesetting compared with earlier years, whereas question 14 was asked to find out use trends in phototypesetting after the process was first tried.

Questions 15, 16, and 17 were used to obtain some idea of availability of each typesetting process; however, these questions did no more than give an indication of this. They gave an idea of how sources of purchase were affected by the size of the publisher or press and by those publishers and presses with their own composing rooms.

Question 18 was used to discover what kinds of typesetting the respondents thought were less expensive by phototypesetting than by hot metal.

Question 19 was used to determine what part of the respondent's total costs of typesetting went into each printing process, while question 20 was asked to determine the estimated total costs of typesetting by each typesetting process. An implication might be drawn by asking the question: If phototypesetting lends itself to offset, what

percentage of total costs of typesetting to be used in offset are accounted for by phototypesetting.

Question 21 was used to find if there was a tendency for any of the publishers and presses to use phototypesetting for any printing processes other than offset lithography. The object of question 22 was to discover in a general way how the publishers and presses felt about the amount of time necessary to set comparable jobs by phototypesetting and hot-metal typesetting. This question listed five categories of varying degrees of time from "much more time" to "much less time." Question 23 was the inverse of question 8 and was used to find the attitudes of the sample concerning the advantages of phototypesetting over hot-metal typesetting. As in question 8, it would again be possible to compare the attitudes of those who had used phototypesetting with those who had not.

The covering letter mentioned that this survey was for a thesis and that the thesis topic was, "The Acceptance of Photocomposition in the Book Publishing Industry." Considerable thought was given in deciding whether the name of the topic should be mentioned. An alternative would have been to mention that this was a survey of typesetting methods. There was a possibility that this would have reduced any bias held by a publisher or press either for or against phototypesetting. There were two reasons why the objective of the survey was made clear: (1) unless publishers or presses had invested in typesetting equipment they would seemingly be objective in their evaluations; their concern in the use of any typesetting method is whether or not it does the job

as they want it done; and (2) because this study was concerned chiefly with photocomposition, the questionnaire was weighted heavily in this direction and might have aroused suspicions of authenticity among the recipients. In the end, a compromise was made by mentioning "photocomposition" in the letter and labeling the questionnaire, "Typesetting Questionnaire."

The letter also stressed the anonymity of the survey by specifying that no company's name would be used explicitly or implicitly in the thesis. This statement could be made in honesty because the questionnaires were not keyed except to separate publishers from university presses by the kind of stamp used on the return envelopes. A second mailing therefore was sacrificed because it was felt that a higher return would be possible through anonymity.

The letter briefly thanked each recipient for helping to make the study possible. Finally, it asked that if the recipient would rather have another person handle the questionnaire, would he kindly forward it to this person or inform the sender of this person's name and address. This statement implied that an answer was important and that the sender would contact another person if the recipient so desired. A copy of the covering letter may be found reproduced as Appendix B.

The questionnaires were addressed to the "Managing Editor" of each commercial publisher and to the "Director" of each university press. It was felt that each of these individuals would be in a position to gather the information to complete the questionnaire or to direct the questionnaire to a qualified person for completion.

The covering letter was printed on a South Dakota State College letterhead and the forwarding envelope had a South Dakota State College return address. This was an attempt to convey a final note of authenticity to the study.

The sample for this survey was drawn from all three volumes of the Publishers' Trade List Annual of 1961, published by R. R. Bowker Company. Of the two alphabetical supplements in the first volume, only the first was used. This was done to keep the sample number within reasonable limits. The sample included both commercial publishers (including religious) and university presses. Distributors and foreign publishers were excluded.

Questionnaires were mailed to 304 commercial publishers and to 52 university presses. Responses came from 133 commercial publishers and 30 university presses. This represented a 43.75 per cent return from commercial publishers, and a 57.69 per cent return from the university presses, for an overall 45.79 per cent return.

CHAPTER II

RESULTS AND FINDINGS

The Classifications

Various classifications were established before tabulating this study to aid in presenting the results and findings. The commercial publishers were placed in size groups according to the number of titles set in 1960 and 1961. They were first placed in 25 title groups from "0-25" to "1626-1650." Because near-equal numbers of publishers fell into groups "0-25 titles," "26-100 titles," and "more than 100 titles," it was decided to designate these as classes 1, 2, and 3. For convenience, publishers will be referred to also as small (class 1), medium (class 2), and large (class 3) throughout this study. The number of respondents in each class was 31, 40, and 38 respectively. Class 4 was established for 24 of the 133 commercial publishers who did not provide information on the number of titles set in 1960 and 1961. This group was treated separately and briefly because of the lack of information they provided. The university presses were divided also, but because they were a smaller unit, they were divided into only two groups--"0-50 titles" with 12 respondents and "more than 50 titles" with 16 respondents. Classes 5 and 6 were established for these two groups and will be referred to in this study as small (class 5) and large (class 6) presses. Only two presses failed to provide information on the number of titles set, and because the information provided was rather meager, only brief mention will be made of them. These two

presses were assigned a class number of 7.

For additional ease of presentation, classes 1, 2, 3, 5, and 6 were divided into four subclasses. Subclasses were determined by whether or not a publisher or press used phototypesetting and by whether or not the publisher or press operated a composing room. The subclasses, designated A, B, C, and D were established as follows:

A: Have used phototypesetting, operate own composing room.

B: Have used phototypesetting, have no composing room.

C: Have not used phototypesetting, operate own composing room.

D: Have not used phototypesetting, have no composing room.

The data in Table 1 explain these classifications, show the number of respondents in each class, and present the percentage of all respondents that used phototypesetting. Note that 1A and 5A are null classes because none of the small publishers or presses that used phototypesetting operated composing rooms. Note also that 41.10 per cent of all respondents used phototypesetting. Of the two groups, commercial publishers and university presses, 40.60 per cent of the former respondents and 43.33 per cent of the latter respondents used phototypesetting.

The remainder of Chapter 2 will be devoted mainly to the discussion of results and findings of groups 1, 2, 3, 5, and 6: commercial publishers and university presses that have indicated the number of titles set in 1960 and 1961. Classes 1, 2, and 3 will be discussed first, followed by a brief discussion of class 4. Classes 5 and 6 will then be examined and finally, class 7 will be briefly mentioned. Publishers and presses will be compared when classes 5 and 6 are cited.

Table 1. Total Number of Respondents and the Percentage That Used Phototypesetting

Class	Number of respondents	Per cent that have used phototypesetting	Classifications
Commercial Publishers			
1A	--	--	1: Publishers, 0-25 titles.
1B	7	100.00	
1C	6	--	2: Publishers, 26-100 titles.
1D	18	--	
2A	3	100.00	3: Publishers, more than 100 titles.
2B	12	100.00	
2C	4	--	4: Publishers, no size indicated.
2D	21	--	
3A	4	100.00	5: Presses, 0-50 titles.
3B	23	100.00	
3C	4	--	6: Presses, more than 50 titles.
3D	7	--	
4	24	20.83	7: Presses, no size indicated.
Totals	133	40.60	
University Presses			A: Have used phototypesetting, operate own composing room.
5A	--	--	
5B	4	100.00	B: Have used phototypesetting, have no composing room.
5C	3	--	
5D	5	--	C: Have not used phototypesetting, operate own composing room.
6A	1	100.00	
6B	8	100.00	
6C	4	--	D: Have not used phototypesetting, have no composing room.
6D	3	--	
7	2	--	
Totals	30	43.33	
Grand Totals	163	41.10	

Commercial Publishers

Table 2 was designed to show three aspects of phototypesetting for classes 1, 2, and 3: (1) the percentage of commercial publishers who used phototypesetting, (2) the number of titles that these publishers set by phototypesetting during 1960 and 1961, and (3) phototypesetting as a per cent of the publishers' total typesetting costs in 1961. Following the discussion of these three aspects of phototypesetting there will be similar examinations of hot-metal and cold-type composition of the same classes. There will also be a discussion of what part of the publishers' total costs of typesetting went into each printing process, followed by comparisons of all three typesetting processes.

The data in Table 2 show that the larger the publisher, the greater the tendency to use phototypesetting. The number that used phototypesetting increased from 22.58 to 37.50 to 71.05 per cent in classes 1, 2, and 3 respectively. The rate of increase from class 1 to class 2 was 1.67 times and from class 2 to class 3 was 1.89 times. An average of 44.95 per cent of classes 1, 2, and 3 used phototypesetting.

The number of titles set by phototypesetting increased with the size of the publisher. The average number increased from 30 to 105 to 1,004 from classes 1 to 2 to 3. This was an increase in titles set per respondent from 0.97 to 2.63 to 26.42; however, it must be noted that the class spreads varied greatly. There was a 25-title spread in class 1, (0-25 titles), a 75-title spread in class 2 (26-100 titles), and an even greater spread in class 3 (more than 100 titles) because

Table 2. Percentage Use of Phototypesetting Among Commercial Publishers

Class	Number of respondents	Per cent that have used phototypesetting	Number of titles set by phototypesetting (1960-61)	Per cent (1961) phototypesetting was of total typesetting costs	Number answering	Per cent answering
Publishers, 0-25 titles						
1A*	--	--	--	--	--	--
1B*	7	100.00	30	20.71	7	100.00
1C*	6	--	--	--	4	66.67
1D*	18	--	--	--	15	83.33
Totals	31	22.58	30	5.58	26	83.87
Publishers, 26-100 titles						
2A	3	100.00	35	31.67	3	100.00
2B	12	100.00	70	6.70	10	83.33
2C	4	--	--	--	4	100.00
2D	21	--	--	--	17	80.95
Totals	40	37.50	105	4.76	34	85.00
Publishers, more than 100 titles						
3A	4	100.00	681	12.50	4	100.00
3B	23	100.00	232	11.14	21	91.30
3C	4	--	--	--	4	100.00
3D	7	--	--	--	5	71.43
Totals	38	71.05	1,004	8.35	34	89.47
Grand Totals	109	44.95	1,139	6.29	94	86.24

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

the largest publisher reported setting 1650 titles in 1960 and 1961. The rate of increase in the number of titles set per respondent from class 1 to class 2 was 2.71 times and from class 2 to class 3 was 10.05 times. The 109 respondents set 1,139 titles by phototypesetting in 1960 and 1961. This was an average of 10.45 titles per respondent for the period.

The publishers of class 1 reported that phototypesetting accounted for 5.58 per cent of their total typesetting costs in 1961; those in class 2 reported a slight decrease to 4.76 per cent, and those in class 3 reported an increase to 8.35 per cent. The average for the 94 of 109 respondents reporting was 6.29 per cent. In general, there was a slight decrease in phototypesetting costs as a percentage of total typesetting costs between the small and medium publishers, but the large publishers showed a significant 75 per cent increase over the medium-sized group.

It could be assumed that all respondents in subclasses C and D had no phototypesetting costs; however, only those respondents who answered question 20 were included in the tabulation.

The data in Table 3 show the percentage of commercial publishers that used hot-metal typesetting in 1960 and 1961. Three publishers reported not using hot-metal typesetting during the period. Two of these used cold-type composition entirely and one used phototypesetting. The number that used hot-metal typesetting in classes 1, 2, and 3 averaged 93.55, 97.50, and 100 per cent of the total. The average for all classes was 97.25 per cent. The rate of increase from class 1 to class

Table 3. Percentage Use of Hot-metal Typesetting Among Commercial Publishers

Class	Number of respondents	Per cent (1960-61) that have used hot metal	Number of titles set by hot metal (1960-61)	Per cent (1961) hot metal was of total type-setting costs	Number answering	Per cent answering
Publishers, 0-25 titles						
1A*	--	--	--	--	--	--
1B*	7	85.71	48	62.86	7	100.00
1C*	6	100.00	99	82.25	4	66.67
1D*	18	94.44	190	93.47	15	83.33
Totals	31	93.55	337	83.50	26	83.87
Publishers, 26-100 titles						
2A	3	100.00	74	68.33	3	100.00
2B	12	100.00	594	85.80	10	83.33
2C	4	100.00	285	98.75	4	100.00
2D	21	95.24	1,094	92.12	17	80.95
Totals	40	97.50	2,047	88.94	34	85.00
Publishers, more than 100 titles						
3A	4	100.00	1,940	87.50	4	100.00
3B	23	100.00	6,473	85.43	21	91.30
3C	4	100.00	835	99.25	4	100.00
3D	7	100.00	1,731	85.88	5	71.43
Totals	38	100.00	10,979	87.36	34	89.47
Grand Totals	109	97.25	13,363	86.87	94	86.24

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

2 was 1.04 times and from class 2 to class 3 was 1.03 times.

The number of titles set by hot-metal typesetting increased from 337 to 2,047 to 10,979 from classes 1 to 2 to 3. This was an increase in titles set per respondent from 10.87 to 51.18 to 288.92. The 109 respondents set 13,363 titles by hot-metal typesetting, an average of 122.59 titles per respondent for the period. The rate of increase per respondent between classes 1 and 2 and classes 2 and 3 was 4.71 and 5.65 times respectively.

The publishers of class 1 reported that 83.50 per cent of their total typesetting costs were accounted for by hot-metal composition. Class 2 reported an increase to 88.94 per cent and class 3 reported a decrease from class 2 to 87.36 per cent. The average for the three classes was 86.87 per cent. For this entire group, hot-metal costs as a percentage of the total typesetting costs generally started high and increased as the size of the publishers increased, then dropped off slightly with the large publishers.

The data in Table 4 show that the percentage of commercial publishers that used cold-type composition tended to increase with the size of the publishers. The number that used cold type increased from 38.71 to 47.50 to 63.16 per cent in classes 1, 2, and 3 respectively. The rate of increase from class 1 to class 2 was 1.23 times and from class 2 to class 3 was 1.33 times. An average of 50.46 per cent of classes 1, 2, and 3 used cold-type composition.

The number of titles set by cold-type composition increased from 65 to 187 to 754 from classes 1 to 2 to 3. This was an increase in

Table 4. Percentage Use of Cold-type Composition Among Commercial Publishers

Class	Number of respondents	Per cent that have used cold type	Number of titles set by cold type (1960-61)	Per cent (1961) cold type was of total type-setting costs	Number answering	Per cent answering
Publishers, 0-25 titles						
1A*	--	--	--	--	--	--
1B*	7	57.14	27	16.43	7	100.00
1C*	6	50.00	29	17.75	4	66.67
1D*	18	27.78	9	1.20	15	83.33
Totals	31	38.71	65	7.85	26	83.87
Publishers, 26-100 titles						
2A	3	--	--	--	3	100.00
2B	12	66.67	48	7.50	10	83.33
2C	4	50.00	2	1.25	4	100.00
2D	21	42.86	137	7.88	17	80.95
Totals	40	47.50	187	6.29	34	85.00
Publishers, more than 100 titles						
3A	4	50.00	12	--	4	100.00
3B	23	78.26	633	3.43	21	91.30
3C	4	25.00	1	.75	4	100.00
3D	7	42.86	108	14.12	5	71.43
Totals	38	63.16	754	4.28	34	89.47
Grand Totals	109	50.46	1,006	6.00	94	86.24

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

titles set per respondent from 2.10 to 4.68 to 19.84. The 109 respondents set 1,006 titles by cold-type composition in 1960 and 1961. This averaged 9.23 titles per respondent. The rate of increase per respondent between classes 1 and 2 and classes 2 and 3 was 2.23 and 4.24 times.

Class 1 publishers reported that cold-type composition was 7.85 per cent of their total typesetting costs. Class 2 reported a decrease to 6.29 and class 3 reported another decrease to 4.28. The average for the three classes was six per cent. Generally, cold-type costs as a per cent of total typesetting costs declined as the publishers increased in size.

Note that the 12 titles set by cold type in subclass 3A during the 1960-1961 period were not included as a per cent of total typesetting costs in 1961 apparently because they were set in 1960.

One publisher in subclass 1D reported that 80 per cent of his estimated total cost of typesetting was photographing published titles for reprinting by offset lithography.

The data in Table 5 show the estimated percentage of total costs of typesetting to be used for the various printing processes, as asked in question 19. The number of respondents that answered this question in classes 1, 2, and 3 averaged 90.83 per cent. Of the total typesetting costs of class 1 publishers, 42.32 per cent was for titles to be printed by letterpress and 57.50 per cent was for titles to be printed by offset. One publisher in this group reported that five per cent was for titles to be printed by another process which was not specifically mentioned. Of the total typesetting costs of class 2

Table 5. Percentage, among Commercial Publishers, of Total Costs of Typesetting to be Used in the Various Printing Processes

Class	Letterpress	Offset	Gravure	Other	Number of respondents	Number answering	Per cent answering
Publishers, 0-25 titles							
1A*	--	--	--	--	--	--	--
1B*	27.86	72.14	--	--	7	7	100.00
1C*	41.75	58.75	--	--	6	4	66.67
1D*	48.53	51.18	--	.29	18	17	94.94
Totals	42.32	57.50	--	.18	31	28	90.32
Publishers, 26-100 titles							
2A	40.33	59.67	--	--	3	3	100.00
2B	56.80	43.20	--	--	12	10	83.33
2C	63.75	36.25	--	--	4	4	100.00
2D	71.50	28.25	--	.25	21	20	95.25
Totals	64.16	35.70	--	.14	40	37	92.50
Publishers, more than 100 titles							
3A	43.75	56.25	--	--	4	4	100.00
3B	60.60	39.40	--	--	23	20	86.96
3C	83.25	16.75	--	--	4	4	100.00
3D	75.00	25.00	--	--	7	6	85.71
Totals	63.82	36.18	--	--	38	34	89.47
Grand Totals	57.87	42.03	--	.10	109	99	90.83

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

publishers, 64.16 per cent was for titles to be printed by letterpress and 35.70 per cent was for titles to be printed by offset. One publisher in this group reported that five per cent was for titles to be printed by mimeograph. Of the total typesetting costs of class 3 publishers, 63.82 per cent was for titles to be printed by offset. For the 99 of 109 respondents reporting, the average was 57.87 per cent for letterpress and 42.03 per cent for offset. None of the publishers reported using gravure.

Generally, the estimated percentage of total costs of typesetting for the smaller publishers favored offset over letterpress by about 15 per cent. This immediately turned in favor of letterpress by about 28 per cent with the medium publishers and remained substantially the same with the large publishers.

In answer to question 21, only one publisher in class 2 and three in class 3 reported ever using phototypesetting for a printing process other than offset. All four reported this process to be letterpress.

Comparing the data on Tables 2 through 4, the percentage of publishers that used hot metal in 1960 and 1961 far exceeded those that used phototypesetting and cold type. The average number of class 1, 2, and 3 respondents using hot metal was 97.25 per cent of the total (see Table 3, page 21); the average for phototypesetting was 44.95 per cent (see Table 2, page 19); and the average for cold type was 50.46 per cent (see Table 4, page 23). Because the percentage that used hot metal was high among the small publishers, the rate of increase was quite

small from classes 1 to 2 to 3.

More small and medium publishers used cold type than used phototypesetting; however, more large publishers used phototypesetting than used cold type. This made the rate of increase from small to medium publishers and from medium to large publishers greater for phototypesetting than for cold type. The percentage of small publishers that used phototypesetting and cold type was 22.58 and 38.71 per cent respectively; of the medium publishers, 37.50 and 47.50; and of the large publishers, 71.05 and 63.16. The rates of increase from small to medium and from medium to large publishers were 1.67 times and 1.89 times for phototypesetting and 1.23 times and 1.33 times for cold type.

During 1960 and 1961, class 1, 2, and 3 respondents reported setting 30, 105, and 1,004 titles by phototypesetting; 337, 2,047, and 10,979 titles by hot metal; and 65, 187, and 754 titles by cold type. In terms of the number of titles per respondent in each of the classes 1, 2, and 3, this amounted to 0.97, 2.63, and 26.42 for phototypesetting; 10.87, 51.18, and 288.92 for hot metal; and 2.10, 4.68 and 19.84 for cold type.

The small publishers, therefore set about 11 times more titles by hot metal than by phototypesetting and about 5 times more than by cold type; the medium publishers set about 19.5 times more by hot metal than by phototypesetting and about 11 times more than by cold type; and the large publishers set about 11 times more titles by hot metal than by phototypesetting and about 14.5 times more than by cold type. This showed a tendency for a large decrease in the use of cold-type

composition in relation to hot metal as the publishers increased in size. Phototypesetting made a significant decrease in its relationship among the medium publishers, but climbed to the same relationship with hot metal among the large publishers that it held with the small group.

By comparing the rates of increases in the number of titles per respondent, this trend can be seen in more detail. Hot metal use increased the most, by 4.71 times between classes 1 and 2; phototypesetting was next by an increase of 2.71 times, and cold type next with an increase of 2.23 times. Between classes 2 and 3, however, phototypesetting use increased 10.05 times, hot metal 5.65 times and cold type only 4.24 times. Phototypesetting made a significant increase between the medium and large groups whereas cold type and hot metal made lower rates of increase.

The average number of titles per respondent for all publishers in classes 1, 2, and 3 was 10.45 for phototypesetting, 122.59 for hot metal, and 9.23 for cold type. Remembering that these figures were for a two-year period, it nonetheless shows the dominence of hot metal in the field.

The tabulation of the methods of composition by number of titles showed the following distribution:

Phototypesetting	1,139 titles	7.34% of the total
Hot Metal	13,363 titles	86.17%
Cold Type	1,006	6.49%

Phototypesetting as a per cent of total composition costs in each of classes 1, 2, and 3 was 5.58, 4.76, and 8.35 per cent; hot metal was 83.50, 88.94, and 87.36 per cent; and cold type was 7.85, 6.29, and

4.28 per cent. Phototypesetting and cold type dropped slightly from class 1 to class 2 as hot metal made a gain; however, from class 2 to class 3, phototypesetting increased by about three-quarters, hot metal dropped slightly as did cold type. It was not only significant that cold type was used by more larger publishers, but it was also significant that cold type decreased as a percentage of total typesetting costs as these publishers increased in size.

As a percentage of total composition costs of small publishers, hot metal was about 15 times greater than phototypesetting and about 10.5 times greater than cold type; of the medium publishers, hot metal was about 18.5 times greater than phototypesetting and about 14 times greater than cold type; and of the large publishers, hot metal was about 10.5 times greater than phototypesetting and about 20.5 times greater than cold type.

Looking at the situation from rates of increase and decrease, hot metal increased 1.07 times between classes 1 and 2 while phototypesetting decreased 1.17 times and cold type decreased 1.25 times. Between classes 2 and 3, however, phototypesetting increased 1.75 times while hot metal decreased 1.02 times and cold type decreased 1.47 times.

Phototypesetting gained significantly with the large publishers as a per cent of total typesetting costs; hot metal, which started as a high percentage with the small publishers, increased in percentage with the medium publishers and decreased slightly with the large; cold type started as a higher percentage than phototypesetting with the small publishers, decreased with both medium and large publishers. Cold

type, as a percentage of total composition costs, was about one-half that of phototypesetting with the large publishers.

By comparing phototypesetting as a per cent of total typesetting costs (see Table 2, page 19) with the percentage of total costs of typesetting for offset (see Table 5, page 25), it was possible to draw some conclusions concerning the extent to which phototypesetting is compatible with offset. Of 109 respondents, 94 reported that phototypesetting accounted for an average of 6.29 per cent of their total costs of composition, whereas 99 reported an average of 42.03 per cent of their total costs of typesetting was for titles to be printed by the offset process. Even though four publishers reported having used part of their phototypesetting for letterpress, the fact that phototypesetting, at the most, accounts for only about 15 per cent of the typesetting costs going into offset makes it appear, perhaps, that phototypesetting and offset in their present states are incompatible.

To find the possible reasons why phototypesetting has not been used more with the offset process as well as in general will be the purpose of the remainder of the section on commercial publishers in Chapter II. There will first be a discussion of the effect that captive composing rooms have on the use of phototypesetting, followed by a study of the attitudes of class 1, 2, and 3 publishers toward phototypesetting.

Of 109 respondents, 21 reported operating composing rooms. The data in Table 6 show an average of 19.27 per cent of classes 1, 2, and 3 operated composing rooms. Of the small publishers, none that operated

Table 6. Percentage of Operators and Non-operators of Commercial Publisher Composing Rooms That Used Phototypesetting, Hot-metal, and Cold-type Composition

Class	Number of respondents	Number that operated composing rooms	Number that did not operate composing rooms	Per cent that operated composing rooms	Per cent that did not operate composing rooms	Per cent that operated composing rooms that have used phototypesetting	Per cent that did not operate composing rooms that have used phototypesetting	Per cent that operated composing rooms that have used hot metal (1961)	Per cent that did not operate composing rooms that have used hot metal (1961)	Per cent that operated composing rooms that have used cold type	Per cent that did not operate composing rooms that have used cold type
Publishers, 0-25 titles											
1A*	--	--	--	--	--	--	--	--	--	--	--
1B*	7	--	7	--	100.00	--	100.00	--	85.71	--	57.14
1C*	6	6	--	100.00	--	--	--	100.00	--	50.00	--
1D*	18	--	18	--	100.00	--	--	--	94.44	--	27.78
Totals	31	6	25	19.35	80.65	--	28.00	100.00	92.00	50.00	36.00
Publishers, 26-100 titles											
2A	3	3	--	100.00	--	100.00	--	100.00	--	--	--
2B	12	--	12	--	100.00	--	100.00	--	100.00	--	66.67
2C	4	4	--	100.00	--	--	--	100.00	--	50.00	--
2D	21	--	21	--	100.00	--	--	--	94.12	--	42.86
Totals	40	7	33	17.50	82.50	42.86	36.36	100.00	96.97	28.57	51.52
Publishers, more than 100 titles											
3A	4	4	--	100.00	--	100.00	--	100.00	--	50.00	--
3B	23	--	23	--	100.00	--	100.00	--	100.00	--	78.26
3C	4	4	--	100.00	--	--	--	100.00	--	25.00	--
3D	7	--	7	--	100.00	--	--	--	100.00	--	42.86
Totals	38	8	30	21.05	78.95	50.00	76.67	100.00	100.00	37.50	70.00
Grand Totals	109	21	88	19.27	80.73	33.34	47.73	100.00	96.59	38.10	53.40

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

composing rooms reported using phototypesetting, although 28 per cent of those that did not operate composing rooms reported using it. Of the medium publishers, 42.86 per cent of the operators used phototypesetting whereas 36.36 per cent of the non-operators used it. Of the large publishers, 50 per cent of the operators used phototypesetting and 76.67 per cent of the non-operators used it. Of those who operated composing rooms in classes 1, 2, and 3, an average of 33.34 per cent used phototypesetting; of those who did not operate composing rooms, an average of 47.73 per cent used it. This showed that both groups tended to use phototypesetting as they increased in size; however, with the large publishers who operated composing rooms, the use of phototypesetting tended to taper off. Between the medium and large groups who did not operate composing rooms, the use of phototypesetting more than doubled.

Of the operators of composing rooms, all class 1, 2, and 3 respondents reported using hot metal composition in 1961. Of the non-operators, the users of hot metal averaged 96.59 per cent. Cold type was used by 38.10 per cent of the operators whereas 53.40 per cent of the non-operators used it.

These figures show that about 14 per cent more respondents that had not operated composing rooms used phototypesetting than those that had operated composing rooms. About 15 per cent more also used cold type.

The data in Table 7 show phototypesetting, hot metal and cold type as percentages of total typesetting costs of commercial publishers

Table 7. Phototypesetting, Hot Metal, and Cold Type as Percentages of Total Costs of Typesetting of Operators and Non-operators of Commercial Publisher Composing Rooms in 1961

Class	Number of respondents	Number answering	Per cent answering	Phototypesetting as a per cent of total costs of typesetting of operators	Phototypesetting as a per cent of total costs of typesetting of non-operators	Hot metal as a per cent of total costs of typesetting of operators	Hot metal as a per cent of total costs of typesetting of non-operators	Cold type as a per cent of total costs of typesetting of operators	Cold type as a per cent of total costs of typesetting of non-operators
Publishers, 0-25 titles									
1A*	--	--	--	--	--	--	--	--	--
1B*	7	7	100.00	--	20.71	--	62.86	--	16.43
1C*	6	4	66.67	--	--	82.25	--	17.75	--
1D*	18	15	83.33	--	--	--	93.47	--	1.20
Totals	31	26	83.87	--	6.59	82.25	83.73	17.75	6.05
Publishers, 26-100 titles									
2A	3	3	100.00	31.67	--	68.33	--	--	--
2B	12	10	83.33	--	6.70	--	85.80	--	7.50
2C	4	4	100.00	--	--	98.75	--	1.25	--
2D	21	17	80.95	--	--	--	92.12	--	7.88
Totals	40	34	85.00	13.57	2.48	85.71	89.78	.71	7.74
Publishers, more than 100 titles									
3A	4	4	100.00	12.50	--	87.50	--	--	--
3B	23	21	91.30	--	11.14	--	85.43	--	3.43
3C	4	4	100.00	--	--	99.25	--	.75	--
3D	7	5	71.43	--	--	--	85.88	--	14.12
Totals	38	34	89.47	6.25	9.00	93.37	85.52	.38	5.48
Grand Totals	109	94	86.24	7.63	5.94	88.21	86.53	4.16	6.46

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

for both operators and non-operators of composing rooms. Phototypesetting was a greater percentage of total costs of composition for the operators of composing rooms than it was for non-operators--7.63 per cent compared to 5.94 per cent. Of the smaller publishers, there were no operators of composing rooms using phototypesetting, but the non-operators reported that phototypesetting accounted for 6.59 per cent of their total typesetting costs. Of the medium publishers, the operators reported phototypesetting as 13.57 per cent of their total typesetting costs and the non-operators reported 2.48 per cent. Of the large publishers, the operators reported 6.25 per cent and the non-operators 9.00 per cent of costs in typesetting resulted from phototypesetting. Of these publishers, the small and large non-operators therefore used phototypesetting as a greater percentage of their total typesetting costs than did the small and large operators. The medium operators used phototypesetting as a greater percentage of their total typesetting costs than did the medium non-operators.

Of the small and medium publishers, hot metal was a greater percentage of total typesetting costs among non-operators than among operators. Non-operators in the small and medium groups reported hot metal as 83.73 and 89.78 per cent of their total typesetting costs whereas the operators reported 82.25 and 85.71 per cent. The operators in the large group reported hot metal as 93.37 per cent and the non-operators reported 85.52 per cent. For class 1, 2, and 3 operators, hot metal averaged 88.21 per cent of the total typesetting costs and for the non-operators, 86.53 per cent.

Of the small publishers, cold type was a greater percentage of total typesetting costs among the operators of composing rooms, whereas of the medium and large publishers it was a greater percentage among the non-operators of composing rooms. Operators in the small group reported cold type to be 17.75 per cent of their total typesetting costs whereas the non-operators reported 6.05 per cent. Of the medium and large publishers, however, non-operators reported cold type was 7.74 and 5.48 per cent respectively of their total costs of composition whereas the operators reported 0.71 and 0.38 per cent.

In general, among the medium and large operators, although the use of cold type was negligible, phototypesetting was used to a greater extent. Among the small operators of composing rooms, however, cold type was used considerably more than was phototypesetting which, in this group, was not used at all. Among small non-operators, phototypesetting was used slightly more than was cold type, whereas among medium non-operators, cold type was used considerably more than was phototypesetting. Large non-operators used phototypesetting more than did the operators.

Of 109 respondents in classes 1, 2, and 3, only one publisher reported owning phototypesetting equipment. This publisher owned Intertype Fotosetter equipment, but failed to indicate the number of machines owned. Thus, it appeared that there was negligible capital investment in phototypesetting equipment within the publishers' composing rooms.

Of the 25 publishers who operated composing rooms, 19 reported having a total of 43 Intertypes, 58 Linotypes and 33 Monotype casters.

Of 109 publishers, 16 reported owning or renting a total of 50 cold-type machines.

Of the 49 class 1, 2, and 3 respondents who set titles by phototypesetting, 47 answered question 13 (in what year was phototypesetting first used). The results are summarized in Figure I which shows a general increase which began in 1950 and continued through 1956. After a slight decrease in 1957 and 1958 from the 1956 level, there was a return to the 1956 level in 1959. Finally, there was a slight decrease in 1960 and another decrease in 1961 to less than half the 1959 level. There was a distinct trend away from trying phototypesetting therefore, even though 59.40 per cent of the total number of respondents in this study never used the process.

By asking from how many sources each publisher purchased composition set by any of the three processes, questions 15, 16, and 17 gave some indication of the availability of each process. These questions showed whether or not the size of the publisher and the fact that a publisher operated a composing room affected the number of sources from which typesetting was purchased.

Of 49 class 1, 2, and 3 respondents who said they used phototypesetting, 43 reported the number of sources from which they purchased phototypesetting. The data in Table 8 show that of these 43 respondents, 21 purchased from one source, 14 from two sources, and 8 from three sources. The smaller publishers purchased from one source only, the medium publishers from one and two sources, and the large publishers from one, two, and three sources. None of the respondents purchased

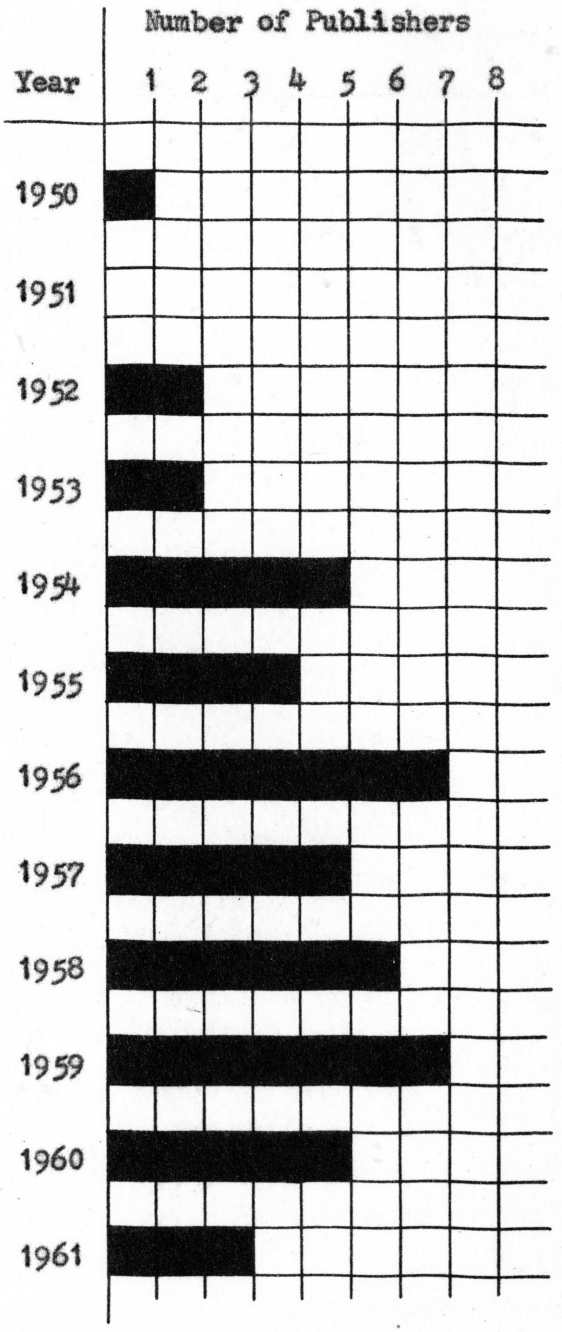


Figure I. The year in which commercial publishers first used phototypesetting

Table 8. Number of Sources of Purchase for Phototypesetting and Cold-type Composition by Commercial Publishers

Sources of phototypesetting:	1	2	3		Sources of cold type:	1	2	3	4	5	6	7	
Publishers, 0-25 titles													
1A*	-	-	-		1A	-	-	-	-	-	-	-	
1B	7	-	-		1B	2	2	-	-	-	-	-	
1C	-	-	-		1C	1	-	1	-	-	-	-	
1D	-	-	-		1D	6	-	-	-	-	-	-	
Totals	7	-	-	= 7	Totals	9	2	1	-	-	-	-	= 12
Publishers, 26-100 titles													
2A	1	1	-		2A	-	-	-	-	-	-	-	
2B	6	3	-		2B	1	4	1	-	-	-	-	
2C	-	-	-		2C	1	-	-	-	-	-	-	
2D	-	-	-		2D	3	3	-	-	-	-	-	
Totals	7	4	-	= 11	Totals	5	7	1	-	-	-	-	= 13
Publishers, more than 100 titles													
3A	-	-	2		3A	-	-	-	-	-	-	-	
3B	7	10	6		3B	4	4	3	2	2	1	1	
3C	-	-	-		3C	-	-	-	-	-	-	-	
3D	-	-	-		3D	1	-	1	-	-	-	-	
Totals	7	10	8	= 25	Totals	5	4	4	2	2	1	1	= 19
Grand Totals	21	14	8	= 43		19	13	6	2	2	1	1	= 44

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

phototypesetting from more than three sources.

The data in Table 8 also show that 44 respondents reported the number of sources from which they purchased cold-type composition. The small and medium publishers purchased from one to three sources whereas the large publishers purchased from one to seven sources.

The data in Table 9 show that 89 respondents reported the number of sources from which they purchased hot-metal typesetting. The small publishers purchased from one to 6 sources, the medium publishers from one to 12, and the large publishers from two to more-than-15 sources. One publisher reported purchasing hot metal from 25 sources.

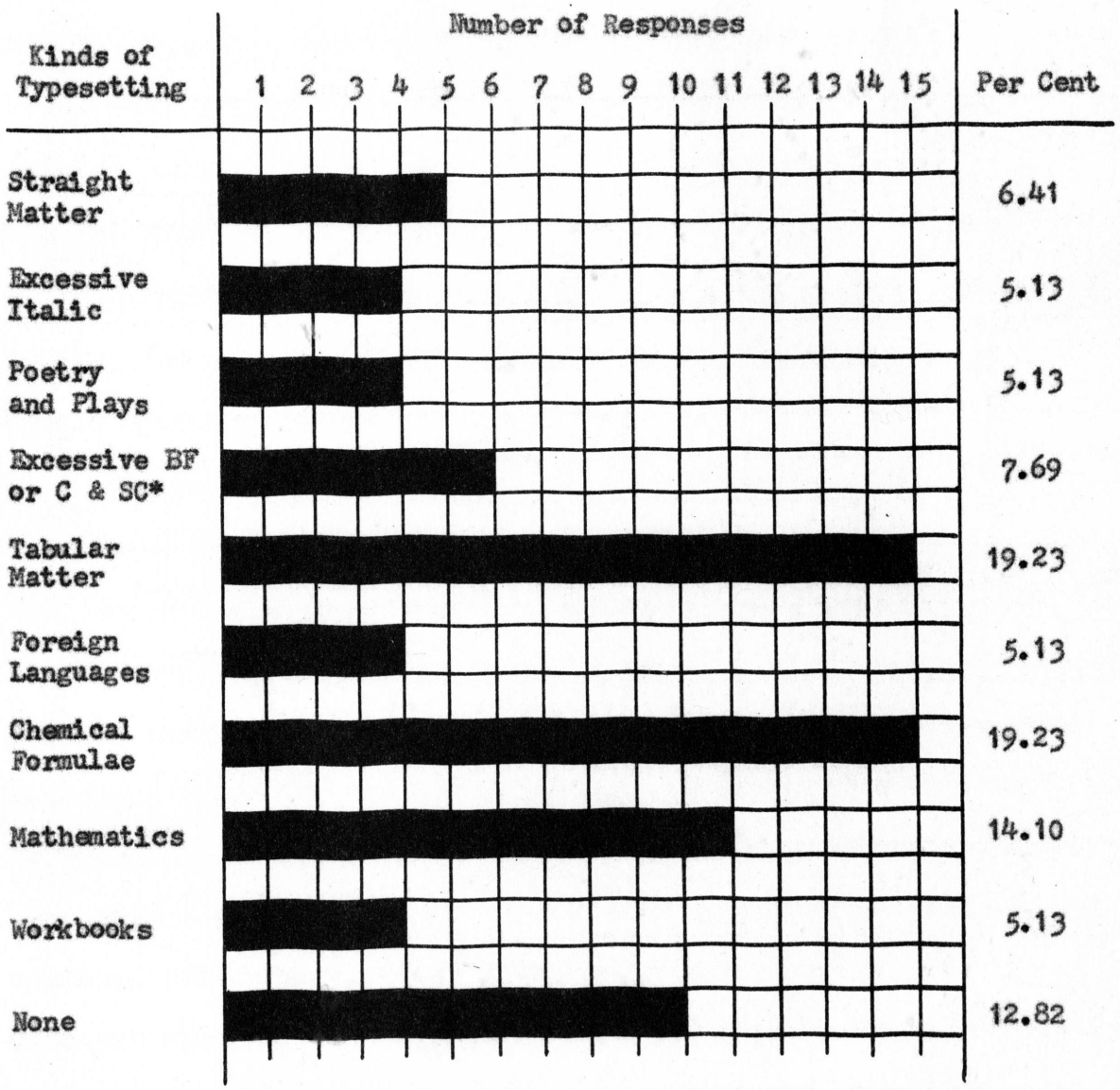
In all cases, subclasses A and C, which included only those publishers that operated composing rooms, purchased from fewer sources of hot-metal, phototypesetting, and cold-type composition than did subclasses B and D, publishers without composing rooms. Phototypesetting was purchased from fewer sources than were cold type and hot metal. This gave an indication of the relative lack of availability of phototypesetting, especially when compared to cold type by which process the publishers set a comparable number of titles in 1960 and 1961.

The responses to question 18 of 42 respondents in classes 1, 2, and 3 are summarized in Figure II. This question listed eight categories or kinds of composition of varying degrees of complexity. The question asked if any of these kinds of composition were found to be less expensive by phototypesetting than by hot-metal typesetting. Of the 78 responses from the 42 respondents, 19.23 per cent indicated that both tabular matter and chemical formulae were less expensive and 14.10

Table 9. Number of Sources of Purchase for Hot-metal Typesetting by Commercial Publishers

Sources:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	More than 15	
1A*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1B	1	2	2	-	1	-	-	-	-	-	-	-	-	-	-	-	
1C	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
1D	7	2	4	2	-	1	-	-	-	-	-	-	-	-	-	-	
Totals	9	4	7	2	1	1	-	-	-	-	-	-	-	-	-	-	= 25
Publishers, 26-100 titles																	
2A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2B	-	1	2	1	4	1	1	-	-	1	-	1	-	-	-	-	
2C	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
2D	4	1	5	1	2	3	1	1	-	1	-	-	-	-	-	-	
Totals	5	2	8	2	6	4	2	1	-	2	-	1	-	-	-	-	= 33
Publishers, more than 100 titles																	
3A	-	1	1	-	1	1	-	-	-	-	-	-	-	-	-	-	
3B	-	-	1	-	4	5	2	1	-	3	1	1	-	-	2	3	
3C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3D	-	1	-	2	-	-	1	-	1	-	-	-	-	-	-	-	
Totals	-	2	2	2	5	6	3	1	1	3	1	1	-	-	2	3	= 31
Grand Totals	14	8	17	6	12	11	5	2	1	5	1	2	-	-	2	3	= 89

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.



*Excessive bold face or caps and small caps

Figure II. Kinds of typesetting commercial publishers thought were less expensive by phototypesetting than by hot metal

per cent indicated that mathematics was less expensive. All other categories each comprised less than eight per cent of the responses; however, 10 respondents, or 12.82 per cent of the responses, added that they did not think the typesetting represented by any of the categories was less expensive. Another category, in addition to those listed, was cited by four respondents who thought that "workbooks" were less expensive by phototypesetting.

The responses of 42 respondents in classes 1, 2, and 3 to question 14 are summarized in Figure III. This question asked those that used phototypesetting if their typesetting by this method had "increased in number of titles," "increased and then decreased," "increased and then remained constant," or had been "tried and then abandoned." Of these 42 respondents, 42.86 per cent stated that their use of phototypesetting had continually increased, 9.52 per cent stated that it increased and then decreased, 26.19 per cent said that it increased and then remained constant, and 21.43 per cent reported that they tried it and then abandoned its use. The number who reported phototypesetting continually increased in use was just double the number who said it had been abandoned.

To find out, in a general way, how publishers felt about the amount of time that it took to set comparable jobs by both phototypesetting and hot metal, question 22 listed five categories from "much more time" to "much less time." The results are summarized in Figure IV. Of the 35 class 1, 2, and 3 respondents, 17, or almost half, thought phototypesetting took the same amount of time as hot metal;

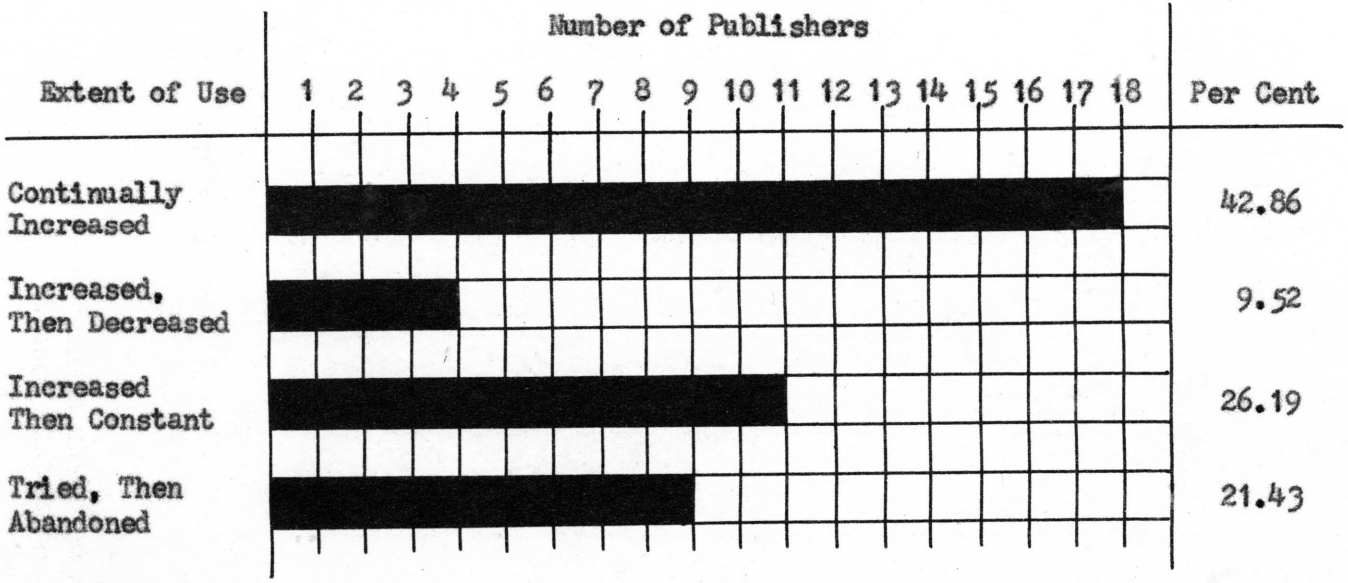


Figure III. How commercial publishers who used phototypesetting evaluated the extent of their use of the process

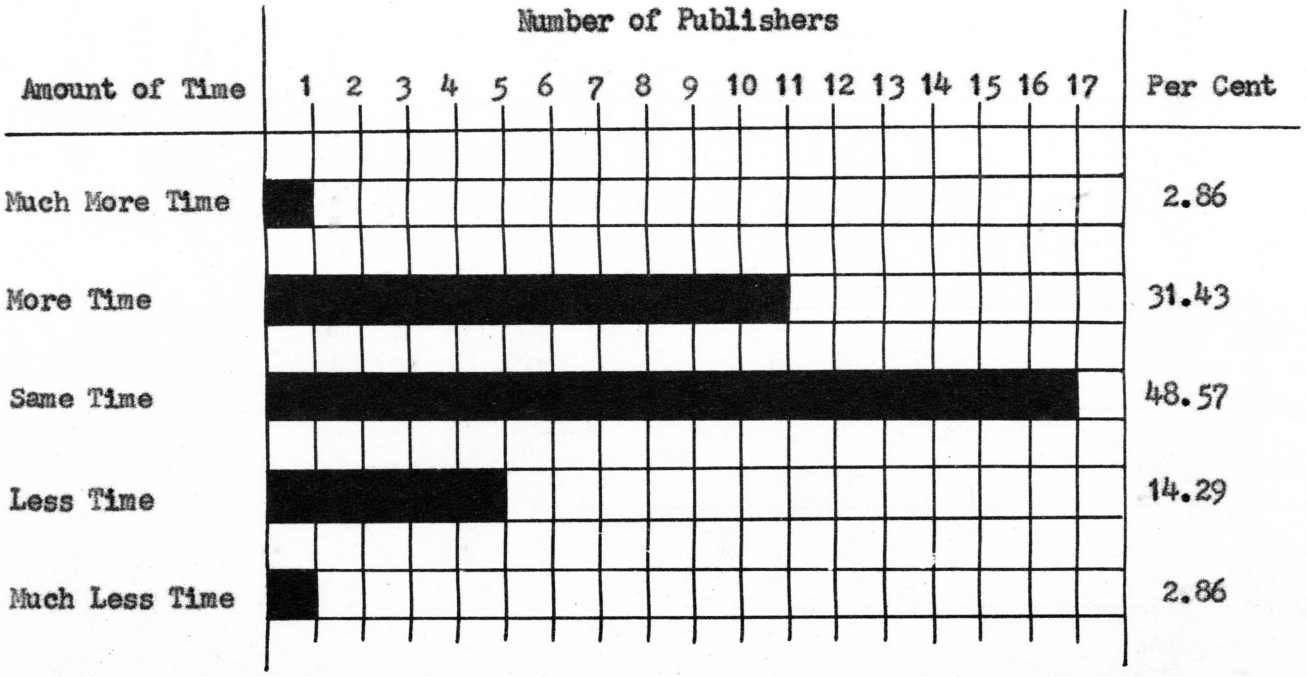


Figure IV. How commercial publishers evaluated the time it took to set comparable jobs by phototypesetting compared to hot metal

however, 11, or about one-third, thought that phototypesetting took more time and only five, or one-seventh, thought that it took less time.

The purpose of question 8 was to determine what the publishers thought were the chief limiting factors of phototypesetting. This question was asked of both those who had titles set by this method and those who had not. The data in Tables 10, 11, and 12 show how the publishers in classes 1, 2, and 3, answered this question.

The data in Table 10 show that four subclass 1D publishers said "availability" was a chief limiting factor. This group is one that had not used phototypesetting--possibly lack of availability was the reason. Three publishers in class 1 cited a "limited number of type faces" as a limiting factor and two respondents in subclass 1C, who operated their own composing rooms, cited "original expense." "Economy" in various forms was cited by six publishers in class 1.

The data in Table 11 show that eight class 2 publishers felt that "difficulty and high costs of correcting" was a chief limiting factor. Four of these had used phototypesetting and four had not. Two publishers that used phototypesetting and two that did not thought that "difficulty and high costs of proofing" was a chief limiting factor. "Higher costs" was mentioned by four who used phototypesetting and two each reported "not economical for short runs," "revisions difficult," and "availability." Two publishers who operated their own composing room mentioned "money already in hot-metal equipment."

The data in Table 12 show that in class 3, 17 publishers cited "difficulty and high costs of correcting" as a chief limiting factor.

Table 10. What 18 Commercial Publishers (0-25 Titles) Thought Were the Chief Limiting Factors of Phototypesetting

Limiting factors	1A*	1B*	1C*	1D*	Total
Original expense	-	-	2	-	2
Not economical for technical and complicated matter	-	2	-	-	2
Not economical for straight matter	-	-	1	-	1
Not economical for short runs	-	-	1	-	1
Cost of setting not economical	-	-	-	2	2
Difficulty and high costs of correcting	-	-	-	1	1
Bad appearance	-	-	-	1	1
Limited number of type faces	-	2	-	1	3
Lack of repair facilities	-	-	1	-	1
Scarcity of operators and trained personnel	-	-	1	-	1
Availability	-	-	-	4	4
Quality (of offset process)	-	1	-	-	1
None	-	1	-	1	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 11. What 27 Commercial Publishers (26-100 Titles) Thought Were the Chief Limiting Factors of Phototypesetting

Limiting factors	2A*	2B*	2C*	2D*	Total
Original expense	-	-	1	-	1
Not economical for short runs	1	-	1	-	2
Cost of setting not economical	1	-	-	1	1
Difficulty and high costs of correcting	-	4	2	2	8
Difficulty and high costs of proofing	-	2	1	1	4
Higher costs in general	-	4	-	-	4
Limited number of type faces	-	1	-	-	1
Limited in mixing type faces	-	1	-	-	1
Letterspacing inflexible	-	1	-	-	1
Poor fitting of type faces	-	1	-	-	1
Revisions difficult	-	2	-	-	2
Justification inferior to hot metal	-	-	-	1	1
Too clean--loses marriage of type and paper	-	1	-	-	1
Availability	-	1	-	1	2
Money already in hot-metal equipment	-	-	2	-	2
No comment--job of printer to determine	-	-	-	1	1
Unfamiliarity of publisher	-	-	-	1	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 12. What 34 Commercial Publishers (More than 100 Titles) Thought Were the Chief Limiting Factors of Phototypesetting

Limiting Factors	3A*	3B*	3C*	3D*	Total
Not economical for short runs	-	1	-	-	1
Not economical for technical and complicated matter	-	1	-	-	1
Economy limited to technical matter	-	2	-	-	2
Difficulty and high costs of correcting	3	14	-	-	17
Difficulty and high costs of proofing	2	4	-	1	7
Lack of control due to proofing	-	1	-	-	1
Higher costs in general	-	-	1	4	5
Bad appearance	1	-	-	1	2
Bad spacing between letters and words	-	4	-	-	4
Inability to change leading	-	1	-	-	1
Handwork of stripping pieces takes too long	-	1	-	-	1
Limited number of type faces	-	1	-	-	1
Aesthetic deficiencies of type faces	-	1	-	-	1
Scarcity of operators and trained personnel	-	-	1	1	2
Inferior quality of phototypesetting and offset process to good letterpress	-	1	-	-	1
Lack of versatility	-	-	2	-	2
Availability	-	5	1	1	7
Inconsistent pricing	-	1	-	-	1
Unfamiliarity of publisher	-	1	-	-	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

All 17 were in subclasses A and B, publishers who used phototypesetting. In class 3, seven mentioned "difficulty and high costs of proofing." Six of these comments were from publishers who used phototypesetting. "Availability" also was cited by seven publishers, two of whom had not used phototypesetting. "Higher costs" was mentioned by five who had not used phototypesetting and "bad spacing between letters and words" was cited by four that used the process. "Economy limited to technical matter," "bad appearance," "scarcity of operators and trained personnel," and "lack of versatility" were each cited by two publishers.

Those factors mentioned most often by all classes were the various categories including lack of economies and higher costs, the difficulties and higher costs of correcting and proofing, and the lack of availability of the process. A few mentioned limitations with the number, quality, and versatility of the type faces and a few were dissatisfied because of spacing problems created by the process.

Question 23 was the counterpart of question 8 and was to determine what the publishers thought were the chief advantages of phototypesetting over hot-metal composition. The data in Tables 13, 14, and 15 show how class 1, 2, and 3 publishers reacted to this question.

Note that in class 1, four respondents reported "ease and economy of complicated matter" as a chief advantage. Two of these respondents were publishers who had not used the process. "Quality--sharper and cleaner letters" and "more flexibility" were each cited by three respondents who had not used the process. Two publishers each cited "more economical," "economy for large books," and "ease and

Table 13. What 13 Commercial Publishers (0-25 Titles) Thought Were the Chief Advantages of Phototypesetting

Chief advantages	1A*	1B*	1C*	1D*	Total
Ease and economy of complicated matter	-	2	1	1	4
Ease and economy of straight matter	-	1	-	1	2
Quality--sharper and cleaner letters	-	-	-	3	3
More flexibility	-	-	-	3	3
More economical	-	-	-	2	2
Economy for large books	-	2	-	-	2
Advantages after setting (repro, camera or stripping advantages)	-	-	-	1	1
Economy for headings	-	1	-	-	1
Wider selection of type faces	-	-	1	-	1
Easier to work with film	-	1	-	-	1
Ease of storing	-	-	1	-	1
Lower cost of corrections	-	-	1	-	1
Ease of manipulating characters	-	-	-	1	1
Lends itself to offset which is less costly and more available	-	1	-	-	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 14. What 24 Commercial Publishers (26-100 Titles) Thought Were the Chief Advantages of Phototypesetting

Chief advantages	2A*	2B*	2C*	2D*	Total
Ease and economy of technical matter	-	2	-	4	6
Ease of assembling pages	-	2	1	2	5
Flexibility in mixing all sizes and kinds of type faces	-	4	-	6	10
Wider selection of type faces	-	-	1	-	1
Economical for "run-arounds"	-	-	-	1	1
Ease of storage	-	1	-	1	2
Economical for wide measures	1	1	-	1	3
More economical	-	1	-	2	3
Quality--more even color	-	1	-	-	1
Quality--sharper and cleaner letters	-	4	1	4	9
Can combine with illustrations before proofing	-	1	-	-	1
Easier to combine with illustrations	-	-	-	1	1
Advantages after setting (repro, camera or stripping advantages)	1	1	1	2	5
More uniform spacing	1	-	-	-	1
More versatile	-	-	1	-	1
Headings can be set without waiting for "break up" of sorts	-	1	-	-	1
No advantages	-	-	-	1	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 15. What 31 Commercial Publishers (More than 100 Titles) Thought Were the Chief Advantages of Phototypesetting

Chief advantages	3A*	3B*	3C*	3D*	Total
Ease and economy of formulae, rules and tables	-	3	-	1	4
Advantages except in scientific and technical matter	-	3	-	-	3
Ease in handling illustrations	-	5	-	1	6
Ease of assembling pages	-	1	-	1	2
Ease of duplicating negatives and positives	-	1	-	-	1
Ease of setting random measures and margins	-	1	-	-	1
Ease of storage	-	1	-	-	1
Ease of mixing all sizes of type	2	1	1	-	4
Quality--sharper and cleaner letters	4	17	-	1	22
Better for workbooks--more control of tints, "break for color" and other "gimmicks"	1	1	-	-	2
Advantages after setting (repro, camera or stripping advantages)	2	10	-	1	13
Can combine with illustrations before proofing--author sees complete proof	-	1	-	-	1
Economical for "built-out" material	-	1	-	-	1
Freedom in placement of heads, illustrations, screens, and display	-	1	-	-	1
Savings in total costs	-	1	-	-	1
Eliminates cost of engravings	-	1	-	-	1
Labor less expensive	-	-	1	-	1
Letters more even after correction	1	-	-	-	1
Easier for large sizes of type	-	1	-	-	1

Table 15. (continued)

Chief advantages	3A*	3B*	3C*	3D*	Total
Ultra quality, if cost not a factor	-	1	-	-	1
Economical for wide measures	1	1	-	-	2
Makes total process faster	-	1	-	-	1
No advantages	-	2	-	-	2

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

economy of straight matter" as advantages.

In class 2, 10 respondents reported that "flexibility in mixing all sizes and kinds of type faces" was a chief advantage. Four of these had used phototypesetting and six had not. Nine respondents mentioned "quality--sharper and cleaner letters" as a chief advantage. Four of these had used phototypesetting and five had not. Six said "ease and economy of technical matter" was an advantage, although four of the six had not used phototypesetting. Five respondents each reported "ease of assembling pages" and "advantages after setting (repro, camera, or stripping) advantages." The latter was the only advantage reported by all four subclasses in class 2. Three respondents each reported that phototypesetting was more "economical for wide measures" and "more economical." Two respondents cited "ease of storage" as an advantage.

In class 3, 22 respondents cited "quality--sharper and cleaner letters" as a chief advantage; 21 of these had used phototypesetting.

In this same class, 13 mentioned "advantages after setting (repro, camera, or stripping)advantages." Of these, 12 had used the process. Six publishers cited "ease in handling illustrations," four each mentioned "ease of mixing all sizes of type," and "ease and economy of formulae, rules, and tables." Three said "advantages except in scientific and technical matter." Two each cited "ease of assembling pages," "better for workbooks," and "economical for wide measures" as chief advantages.

Those factors mentioned more often by all classes were the sharper, cleaner and higher quality letters, the advantages after setting, the ease and economy of complicated matter, and flexibility in mixing many sizes and kinds of type faces. A few publishers mentioned the economy of wide measures, the ease of assembling pages, the ease in handling illustrations, and other economies.

The results of question 7 are summarized in Figure V. This question asked those who used phototypesetting what specific processes were used. The 42 respondents to this question reported a total of 64 processes. Of these, 35 mentioned using the Fotosetter, 15 the Photon, eight the Monophoto, four the Linofilm, and two the ATF Typesetter. The Fotosetter was used by more than twice the number of publishers who used the next most-used machine, the Photon. The Photon, in turn, was used almost by twice as many publishers as used the Monophoto and the Monophoto by twice as many as the Linofilm. This perhaps reflected the relative newness of the Linofilm and Monophoto and, consequently, their relative lack of availability on the market.

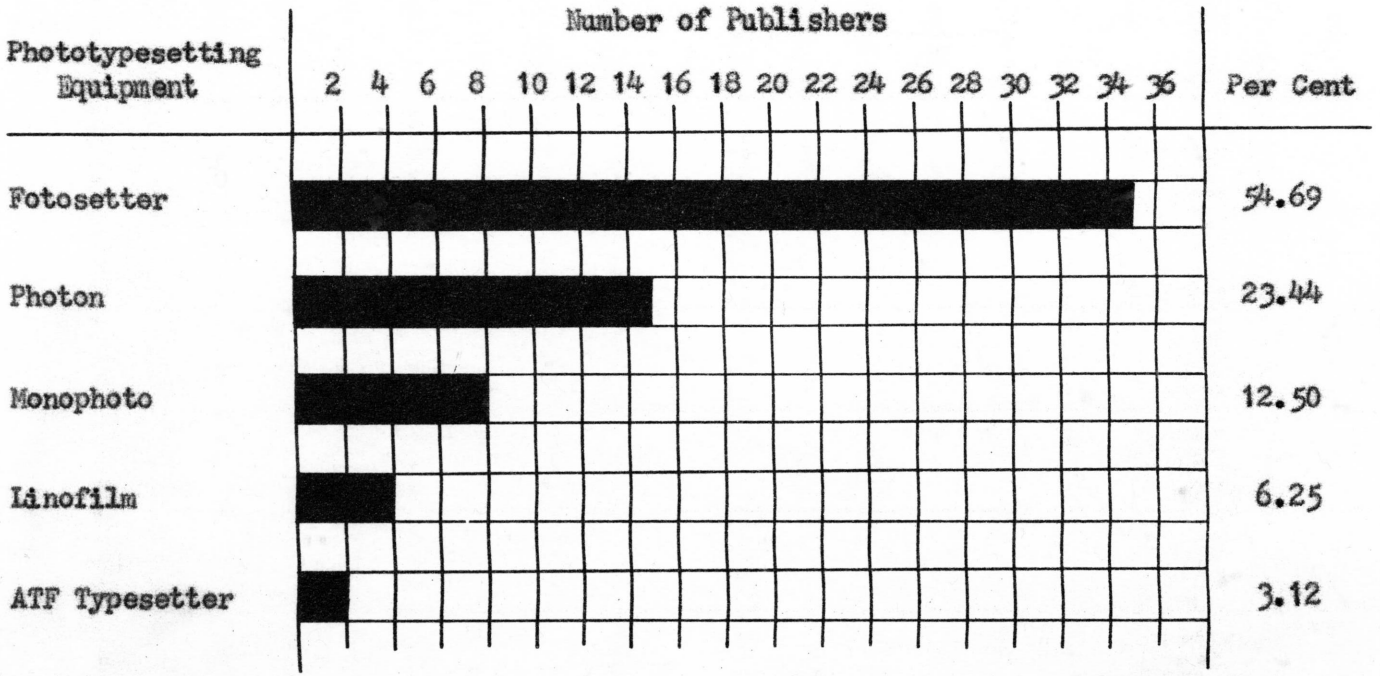


Figure V. The use of specific phototypesetting equipment by commercial publishers

The data in Table 16 show how class 1, 2, and 3 publishers reacted to question 9 which asked what phototypesetting method was best adapted to their needs. The Intertype Fotosetter was mentioned most frequently, but almost one-third favored the Fotosetter because it was available. Two respondents in particular said that the Linofilm was not available and nine said that they did not have enough experience with any of the machines to know. Two said that it depended on the kind of work and one said that none of the machines was adaptable. Two respondents said that all of the machines were necessary because all had advantages and limitations. One of these went on to explain that by using all of them one was able to get a better "spread" of type faces.

The information provided by the 24 commercial publishers in class 4 was generally inadequate. None provided the number of titles set in 1960 and 1961 by the various typesetting processes; therefore, it was impossible to categorize them along with the other publishers.

Of this group, five publishers reported that they used phototypesetting and three reported operating composing rooms; however, none of those operating composing rooms used phototypesetting. Those who reported operating composing rooms had a total of five Intertype and seven Linotype machines. Cold type was used by three respondents in this group, but none reported owning or renting cold-type equipment. Of the five respondents who used phototypesetting, the three that answered question 7 reported using the Fotosetter.

Four respondents of class 4 reported the percentages that each

Table 16. Distribution of Commercial Publishers Regarding Adaptability of Individual Phototypesetting Processes to Their Needs

Reasons why more adaptable	Fotosetter	Linofilm	Monophoto	Photon
Process most adaptable	24	3	3	4
Time proven and reliable	2	-	-	-
Better for formulae and mathematics	1	-	1	-
Faster	-	-	-	2
More versatile	3	1	2	1
Available	7	-	-	-
Good enough for simple composition	2	-	-	-
Marginal notes one step rather than two	1	-	-	-
Cheaper cost	1	-	-	-
Suits "juveniles" with large faces and double columns	1	-	-	-
Best for corrections	1	-	-	-
Alignment better	-	-	-	1
Better for storage in strips of film	-	1	-	-
Supplier who understands method	2	-	-	1
Cheaper for text and large sizes	2	-	-	-
Supplier has book experience	1	-	-	-
Fast service	1	-	-	-
Easier mixing of sizes and type styles	-	-	-	1
Better quality	2	-	-	-

typesetting process was of their total typesetting costs: hot metal averaged 93.75 per cent, phototypesetting 0.75 per cent, and cold type 5.50 per cent. Nine class 4 respondents reported the estimated percentage of total costs of typesetting to be used for the various printing processes. Of the total costs, an average of 60.19 per cent was to be used for letterpress and 39.81 was to be used for offset.

Two publishers in this class answered question 14. One reported that since they first started using phototypesetting, their typesetting by this method "has continually increased in number of titles" and the other reported that it "has increased and then decreased in number of titles." The one publisher who answered question 22 stated that, compared to hot metal, phototypesetting took "much less time."

Of three class 4 respondents, one reported purchasing phototypesetting, hot metal and cold type from each of four sources, another purchased hot metal from three sources, and the third purchased hot metal from two sources.

Two respondents listed, as a chief limitation of phototypesetting, "difficulty and high costs of correcting" and one each listed "availability," "bad spacing between letters and words," "scarcity of operators and trained personnel," "inferior quality," "difficulty and high costs of proofing," "impractical for letterpress," and "no limitations." Two respondents each listed as chief advantages of phototypesetting, "quality--sharper and cleaner letters," and "advantages after setting (repro, camera, or stripping advantages)." One each listed "more even color," "wider selection of faces," "cheaper," and "takes less time."

The one respondent who answered question 9 reported that the Fotosetter seemed best adapted to his needs "mainly because that's what the firm has that gives me fast service and good layout."

University Presses

The data in Table 17 show that the percentage of university presses that used phototypesetting increased with the size of the presses. The percentage increased from 33.33 per cent in class 5 (0-50 titles) to 56.25 per cent in class 6 (more than 50 titles). An average of 46.43 per cent of class 5 and 6 presses used phototypesetting.

The number of titles set by phototypesetting increased with the size of the press. The number increased from two titles in class 5 to 36 titles in class 6. This was an increase in titles set per respondent from 0.17 to 2.25. The 28 respondents set a total of 38 titles by phototypesetting in 1960 and 1961.

The presses of class 5 reported phototypesetting was 2.50 per cent of their total typesetting costs in 1961. Class 6 reported a slight decrease to 2.20 per cent. For the 25 of 28 respondents reporting in both classes, phototypesetting averaged 2.32 per cent of the total typesetting costs.

In summary, although a higher percentage of the large presses used phototypesetting and set more titles per respondent by this process, costs for phototypesetting among the large presses were lower than among the small presses, as a percentage of total typesetting costs.

The data in Table 18 show the percentage of university presses

Table 17. Percentage Use of Phototypesetting among University Presses

Class	Number of respondents	Per cent that have used phototypesetting	Number of titles set by phototypesetting (1960-61)	Per cent (1961) phototypesetting was of total typesetting costs	Number answering	Per cent answering
Presses, 0-50 titles						
5A*	--	--	--	--	--	--
5B*	4	100.00	2	6.25	4	100.00
5C*	3	--	--	--	3	100.00
5D*	5	--	--	--	3	60.00
Totals	12	33.33	2	2.50	10	83.33
Presses, more than 50 titles						
6A	1	100.00	5	5.00	1	100.00
6B	8	100.00	31	4.00	7	87.50
6C	4	--	--	--	4	100.00
6D	3	--	--	--	3	100.00
Totals	16	56.25	36	2.20	15	93.75
Grand Totals	28	46.43	38	2.32	25	89.29

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 18. Percentage Use of Hot-metal Typesetting among University Presses

Class	Number of respondents	Per cent (1961) that have used hot metal	Number of titles set by hot metal (1960-61)	Per cent (1961) hot metal was of total type-setting costs	Number answering	Per cent answering
Presses, 0-50 titles						
5A*	--	--	--	--	--	--
5B*	4	100.00	90	76.25	4	100.00
5C*	3	100.00	48	91.67	3	100.00
5D*	5	80.00	118	96.67	3	60.00
Totals	12	91.67	256	87.00	10	83.33
Presses, more than 50 titles						
6A	1	100.00	124	80.00	1	100.00
6B	8	100.00	792	84.57	7	87.50
6C	4	100.00	296	89.50	4	100.00
6D	3	100.00	166	97.67	3	100.00
Totals	16	100.00	1,378	88.20	15	93.75
Grand Totals	28	96.43	1,634	87.72	25	89.29

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

that used hot-metal typesetting in 1960 and 1961 was 91.67 per cent in class 5 and 100 per cent in class 6. One press reported not using hot metal during the period because all its titles were set by cold type. An average of 96.43 per cent of both classes used hot metal.

The average number of titles set per respondent by hot metal increased with the size of the press. The number set by class 5 respondents was 256 and the number set by class 6 respondents was 1,378. This was an increase in titles set per respondent from 21.33 to 86.13. The 28 respondents in both classes set 1,634 titles by hot metal in 1960 and 1961. This averaged 58.36 titles set per respondent by hot metal during the period.

The presses of class 5 reported hot metal was 87 per cent of their total typesetting costs in 1961. Class 6 reported an increase to 88.20 per cent. For the 25 of 28 respondents reporting in both classes, hot metal averaged 87.72 per cent of the total typesetting costs. Hot metal was used therefore by more large presses and was also a greater percentage of total typesetting costs of the large presses.

The data on Table 19 show that the percentage of university presses that used cold type increased with the size of the presses. The increase from class 5 to class 6 was from 58.33 to 81.25 per cent. An average of 71.43 per cent of the presses in classes 5 and 6 used cold-type composition during the period.

The average number of titles set per respondent by cold type in 1960 and 1961 increased with the size of the press. The 12 class 5 respondents reported setting 45 titles by cold type and the 16 class 6

Table 19. Percentage Use of Cold-type Composition among University Presses

Class	Number of respondents	Per cent that have used cold type	Number of titles set by cold type (1960-61)	Per cent (1961) cold type was of total type-setting costs	Number answering	Per cent answering
Presses, 0-50 titles						
5A*	--	--	--	--	--	--
5B*	4	50.00	18	17.50	4	100.00
5C*	3	100.00	5	8.33	3	100.00
5D*	5	40.00	22	3.33	3	60.00
Totals	12	58.33	45	10.50	10	83.33
Presses, more than 50 titles						
6A	1	100.00	23	15.00	1	100.00
6B	8	87.50	95	11.43	7	87.50
6C	4	75.00	66	10.50	4	100.00
6D	3	66.67	10	2.33	3	100.00
Totals	16	81.25	194	9.60	15	93.75
Grand Totals	28	71.43	239	9.96	25	89.29

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

respondents reported setting 194. This was an increase in titles set per respondent from 3.75 in class 5 to 12.13 in class 6. The 28 respondents in both classes set 239 titles by cold type or 8.54 titles per respondent for the period.

The presses of class 5 reported that cold type was 10.50 per cent of their total typesetting costs whereas class 6 reported a slight decrease to 9.60 per cent. For the 25 of 28 respondents reporting in both classes, cold type averaged 9.96 per cent of the total typesetting costs. Cold type as a percentage of total composition costs therefore decreased slightly with the large presses, even though the percentage of the presses that used cold type increased by almost 23 per cent from the small to the large presses.

Comparing the statistics from Tables 17 through 19, the number of university presses that used hot metal in 1960 and 1961 averaged 96.43 per cent. The number that used phototypesetting averaged 46.43 per cent and the number that used cold type averaged 71.43 per cent. The tendency for phototypesetting to be used by more of the large presses coincided with the findings for commercial publishers; however, the average of 46.43 per cent for all presses was slightly higher than the 44.95 per cent average for all publishers. Generally, almost the same ratio of publishers and presses used phototypesetting.

The ratio of university presses that used hot metal was similar to that found among the commercial publishers. Of both the small presses and small publishers, between 91 and 94 per cent used hot metal; this increased to 100 per cent with the large presses and large

publishers.

The tendency for cold type to be used by more large presses coincided with a similar tendency among commercial publishers; however, cold type was used by about 20 per cent more university presses than commercial publishers. For the 1960-1961 period, university presses averaged 1.36 titles per respondent set by phototypesetting, 86.13 titles per respondent by hot metal, and 8.54 titles per respondent by cold type. The number of titles set per university press by phototypesetting was much lower than among publishers. The 1.36 titles for the presses compared to 10.45 titles for the publishers. This means that the average publisher set about 7.5 times more titles by phototypesetting than did the average university press.

The average publisher in this survey set over twice the number of titles that the average university press set by hot metal. The average number of titles set by hot metal by the university presses was 58.84, whereas the average set by commercial publishers was 122.59.

The average number of titles set by cold type was about the same for university presses and publishers. The publishers reported an average of 9.23 titles set per respondent by cold type. This was similar to the 8.54 average reported by the presses.

The tabulation of the methods of composition by number of titles of university presses showed the following distribution:

Phototypesetting	38 titles	1.99% of the total
Hot Metal	1,634	85.50%
Cold Type	239	12.51%

The tabulation of the methods of composition by number of titles

showed the following distribution in the AAUP study and is again offered here for closer comparison:

Linotype	569 titles	84.5% of the total
Monotype	61	9.0%
Cold Type	33	4.9%
Photocomposition	3	.4%
Miscellaneous	8	1.2%

In comparing the above two tabulations, the AAUP study included only books; this study included books, manuals, and workbooks and did not consider titles set by methods other than phototypesetting, hot metal, and cold type. In addition, the AAUP tabulation covered a one-year period whereas this tabulation covered a two-year period.

The tabulation of the methods of composition by number of titles of commercial publishers is repeated here for comparison:

Phototypesetting	1,139 titles	7.34% of the total
Hot Metal	13,363	86.17%
Cold Type	1,006	6.49%

As a percentage of total typesetting costs, phototypesetting amounted to 2.32 per cent for the presses, hot metal amounted to 87.72 per cent, and cold type amounted to 9.96 per cent.

Phototypesetting, as 2.32 per cent of total typesetting costs of university presses, was about 2.75 times smaller than that of the publishers who reported 6.29 per cent. This showed the increased acceptance of phototypesetting of the publishers over the presses.

Hot-metal typesetting as a percentage of total typesetting costs of commercial publishers was about one per cent smaller than that of the university presses. The publishers reported it to be 86.87 per cent. This showed a greater tendency for the university presses to stick with

the proved hot-metal method.

Cold type was six per cent of the total typesetting costs of the commercial publishers; however, the university presses reported cold type costs of 9.96 per cent--two-thirds more than the publishers.

In summary, it appears that the university presses have relied on cold type rather than on phototypesetting for a larger portion of their work than have commercial publishers. At the same time, the publishers seemed better able to use phototypesetting for their work than did the university presses.

The data in Table 20 show the estimated percentage of total costs of typesetting to be used for the various printing processes. Of the total typesetting costs of class 5 presses, 76.36 per cent was for titles to be printed by letterpress and 23.64 per cent was for titles to be printed by offset. Of the total typesetting costs of class 6 presses, 77.76 per cent was for titles to be printed by letterpress and 21.16 per cent was for titles to be printed by offset. One press in subclass 6A reported that 15 per cent of its estimated percentage of total costs of typesetting was for titles to be printed by sheet-fed gravure.

The 25 of 28 respondents estimated that 77.15 per cent of their total costs of typesetting was for titles to be printed by letterpress, 22.25 per cent by offset, and 0.60 per cent by gravure.

Comparing these data with those of Table 5 shows that a much higher percentage of the typesetting of university presses went into the letterpress process than did that of the publishers. The typesetting costs of publishers averaged 57.87 per cent for letterpress and

Table 20. Percentage, among University Presses, of Total Costs of Typesetting to be Used in the Various Printing Processes

Class	Letterpress	Offset	Gravure	Number of respondents	Number answering	Per cent answering
Presses, 0-50 titles						
5A*	--	--	--	--	--	--
5B*	71.25	28.75	--	4	4	100.00
5C*	83.33	16.67	--	3	3	100.00
5D*	76.25	23.75	--	5	4	80.00
Totals	76.36	23.64	--	12	11	91.67
Presses, more than 50 titles						
6A	60.00	25.00	15.00	1	1	100.00
6B	76.12	23.88	--	8	6	75.00
6C	75.00	25.00	--	4	4	100.00
6D	90.67	9.33	--	3	3	87.50
Totals	77.76	21.16	1.07	16	14	87.50
Grand Totals	77.15	22.25	.60	28	25	89.29

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

42.03 per cent for offset. Unlike the small publishers who prepared more typesetting for offset than for letterpress, the small presses had practically the same propensity as the large presses to prepare a greater part of their typesetting for letterpress. The medium and large publishers tended to prepare most of their typesetting for letterpress but not to the extent that the presses did. Letterpress as a process apparently lent itself more than did the offset process to the work of the university presses.

Because 22.25 per cent of the total typesetting costs of university presses was for material prepared for offset, and because phototypesetting was 2.32 per cent of the presses' total typesetting costs, phototypesetting accounted for only about 10.5 per cent of the costs of material prepared for offset. This figure, compared to the about 15 per cent reported by publishers, again, does not substantiate the compatibility of phototypesetting and offset in their present state.

Eight respondents of 28 reported operating composing rooms. The data in Table 21 show 28.57 per cent of class 5 and 6 respondents operated composing rooms. Of the small presses, none that operated composing rooms reported using phototypesetting while 33.33 per cent of those that did not operate composing rooms used phototypesetting. Of the large presses, one, or 20 per cent of those that operated composing rooms used phototypesetting whereas eight, or 50 per cent of those not operating composing rooms used it. For both classes, one press, or 12.50 per cent of those operating composing rooms used phototypesetting while 12 presses, or 60 per cent of those that did not

Table 21. Percentage of Operators and Non-operators of University Press Composing Rooms That Used Phototypesetting, Hot-metal, and Cold-type Composition

Class	Number of respondents	Number that operated composing rooms	Number that did not operate composing rooms	Per cent that operated composing rooms	Per cent that did not operate composing rooms	Per cent that operated composing rooms that have used phototypesetting	Per cent that did not operate composing rooms that have used phototypesetting	Per cent that operated composing rooms that have used hot metal (1961)	Per cent that did not operate composing rooms that have used hot metal (1961)	Per cent that operated composing rooms that have used cold type	Per cent that did not operate composing rooms that have used cold type
Presses, 0-50 titles											
5A*	--	--	--	--	--	--	--	--	--	--	--
5B*	4	--	4	--	100.00	--	100.00	--	100.00	--	25.00
5C*	3	3	--	100.00	--	--	--	100.00	--	66.67	--
5D*	5	--	5	--	100.00	--	--	--	100.00	--	40.00
Totals	12	3	9	25.00	75.00	--	33.33	100.00	100.00	66.67	33.33
Presses, more than 50 titles											
6A	1	1	--	100.00	--	100.00	--	100.00	--	100.00	--
6B	8	--	8	--	100.00	--	100.00	--	100.00	--	100.00
6C	4	4	--	100.00	--	--	--	100.00	--	100.00	--
6D	3	--	3	--	100.00	--	--	--	100.00	--	66.67
Totals	16	5	11	31.25	68.75	20.00	50.00	100.00	100.00	100.00	90.91
Grand Totals	28	8	20	28.57	71.43	12.50	60.00	100.00	100.00	87.50	65.00

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

operate composing rooms used it. These figures showed more operators and non-operators of composing rooms using phototypesetting as they increased in size; however, about five times more non-operators than operators used it. This tendency also occurred with the commercial publishers, but not with as wide a differential. The publishers had a 14.39 per cent difference in contrast to a 47.50 per cent difference among the presses.

All university presses reported using hot metal typesetting in 1961. In contrast to the presses, three publishers not operating composing rooms used no hot metal in 1961; therefore only 96.59 per cent of the publishers in this group used hot metal. Of those publishers who operated composing rooms, 100 per cent used hot metal.

An average of 87.50 per cent of class 5 and 6 university presses that operated composing rooms also used cold type. Among those that did not operate composing rooms, the use of cold type averaged 65 per cent, or 21.50 per cent less than its use among operators of composing rooms. This was in contrast to the commercial publishers whose non-operators used about 15 per cent more cold type than did the operators. This indicated that cold type possibly had some advantages over hot metal for certain kinds of university press publishing or the operators would have used their hot-metal equipment.

The data in Table 22 show phototypesetting, hot metal, and cold type as percentages of total typesetting costs of university presses for both operators and non-operators of composing rooms. For the non-operators of composing rooms, phototypesetting was a greater percentage

Table 22. Phototypesetting, Hot Metal and Cold Type as Percentages of Total Costs of Typesetting of Operators and Non-operators of University Press Composing Rooms in 1961

Class	Number of respondents	Number answering	Per cent answering	Phototypesetting as a per cent of total costs of typesetting of operators	Phototypesetting as a per cent of total costs of typesetting of non-operators	Hot metal as a per cent of total costs of typesetting of operators	Hot metal as a per cent of total costs of typesetting of non-operators	Cold type as a per cent of total costs of typesetting of operators	Cold type as a per cent of total costs of typesetting of non-operators
Presses, 0-50 titles									
5A*	--	--	--	--	--	--	--	--	--
5B*	4	4	100.00	--	6.25	--	76.25	--	17.50
5C*	3	3	100.00	--	--	91.67	--	8.33**	--
5D*	5	3	60.00	--	--	--	96.67	--	3.33
Totals	12	10	83.33	--	3.57	91.67	85.00	8.33**	11.43
Presses, more than 50 titles									
6A	1	1	100.00	5.00	--	80.00	--	15.00	--
6B	8	7	87.50	--	4.00	--	84.57	--	11.43
6C	4	4	100.00	--	--	89.50	--	10.50	--
6D	3	3	100.00	--	--	--	97.67	--	2.33
Totals	16	15	93.75	1.00	2.80	87.60	88.50	11.40	8.70
Grand Totals	28	25	89.25	0.63	3.12	89.13	87.06	10.25	9.82

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

**Includes 1.67% hand lettering.

of total costs of typesetting than it was for operators--3.12 per cent compared to 0.63 per cent. Of the smaller presses, there were no operators of composing rooms that used phototypesetting, but the non-operators reported phototypesetting was 3.57 per cent of their total typesetting costs. Of the large presses, the non-operators of composing rooms reported a greater percentage of phototypesetting than did the operators--2.80 per cent and 1 per cent. Both the small and large non-operators of composing rooms, therefore, reported phototypesetting to be a greater portion of their total costs of typesetting than did the operators.

Among commercial publishers, phototypesetting costs were highest for the operators of composing rooms, whereas among university presses the situation was reversed with the higher costs for the non-operators.

Of the small presses, hot-metal typesetting costs were higher among the operators of composing rooms--the operators reporting 91.67 per cent and the non-operators reporting 85 per cent of typesetting costs in hot metal. Of the large presses, hot metal costs were higher among the non-operators than among the operators--88.50 per cent compared to 87.60 per cent. For both classes 5 and 6, however, hot metal costs averaged 89.13 per cent for operators and 87.06 per cent for non-operators. The same trend was found among the commercial publishers.

Cold type was a larger percentage of total typesetting costs among class 5 and 6 operators of composing rooms than among non-operators. The operators reported costs averaging 10.25 per cent whereas the non-operators reported costs averaging 9.82 per cent.

Of the small presses, cold type was a greater percentage of total typesetting costs among non-operators than among operators. The operators reported that cold type was 8.33 per cent of their total costs whereas the non-operators reported cold type costs of 11.43 per cent. Of the large presses, operators of composing rooms reported cold type to be 11.40 per cent of total typesetting costs while the non-operators reported such costs to be 8.70 per cent.

In general, among commercial publishers, the non-operators reported cold type to be a greater percentage of total composition costs than did the operators. The reverse was true for university presses.

Of the 28 respondents, none reported having phototypesetting equipment. The eight presses that operated composing rooms reported having a total of 29 Linotype machines and 8 Monotype casters. Of the 28 respondents, 10 reported owning or renting a total of 19 cold-type machines.

All of the 13 university press respondents that used phototypesetting answered question 13 that asked in what year they first used phototypesetting. One each reported the years 1954, 1955, and 1957; four reported 1958; and two each reported 1959, 1960, and 1961. There were too few respondents to establish any trends, except that the year of heaviest adoption coincided with the period from 1956 to 1959 when most commercial publishers first used the process.

The data in Table 23 show that of 26 respondents to questions 15, 16, and 17 in classes 5 and 6, eight of the 13 that used phototypesetting reported that they purchased it from one source, two each

Table 23. Number of Sources of Purchase for Phototypesetting and Cold-type Composition of University Presses

Sources of phototypesetting:	1	2	3		Sources of cold type:	1	2	3	4	5	6	
Presses, 0-50 titles												
5A*	-	-	-		5A	-	-	-	-	-	-	
5B	4	-	-		5B	-	-	-	-	1	-	
5C	-	-	-		5C	1	1	-	-	-	-	
5D	-	-	-		5D	2	-	-	-	-	-	
Totals	4	-	-	= 4	Totals	3	1	-	-	1	-	= 5
Presses, more than 50 titles												
6A	1	-	-		6A	-	-	3	-	-	-	
6B	3	2	2		6B	2	3	2	-	-	1	
6C	-	-	-		6C	1	-	1	-	-	-	
6D	-	-	-		6D	1	1	-	-	-	-	
Totals	4	2	2	= 8	Totals	4	4	6	-	-	1	= 15
Grand Totals	8	2	2	= 12		7	5	6	-	1	1	= 20

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

reported that they purchased it from two and three sources, and one did not answer. The small presses purchased phototypesetting from only one source, while the larger presses purchased from one to three sources.

The data in Table 23 also show that 20 respondents reported the number of sources from which they purchased cold-type typesetting. Four of the five small presses purchased from one or two sources, but one purchased from five sources. Fourteen of the large presses purchased from one to three sources, but one purchased from six sources.

The data in Table 24 show that 22 respondents reported the number of sources from which they purchased hot-metal typesetting. The 11 small presses purchased from two to ten sources, with nine of the eleven purchasing from two to five sources, and the 11 large presses purchased from two to fifteen sources, with three purchasing from 15 sources.

Generally, subclasses A and C, which included presses that operated composing rooms, purchased all forms of composition from fewer sources than did subclasses B and D. Phototypesetting was purchased from fewer sources than were cold type and hot metal, which, again gave an indication of the relative lack of availability of phototypesetting as compared to the other methods of typesetting.

The responses to question 18 of 10 respondents in classes 5 and 6 are summarized in Figure VI. Of the 28 responses from these respondents, 25.93 per cent indicated that tabular matter and mathematics were less expensive by phototypesetting than by hot metal and 18.52 per cent indicated that chemical formulae were less expensive. Two respondents added that they did not find any of the kinds of typesetting represented

Table 24. Number of Sources of Purchase for Hot-metal Typesetting by University Presses

Sources:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Presses, 0-25 titles																
5A*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5B	-	-	1	1	1	-	-	1	-	-	-	-	-	-	-	
5C	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	
5D	-	1	-	3	-	-	-	-	-	1	-	-	-	-	-	
Totals	-	3	1	4	1	-	-	1	-	1	-	-	-	-	-	=11
Presses, more than 50 titles																
6A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6B	-	-	-	-	-	1	-	1	-	1	-	1	-	-	3	
6C	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
6D	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-	
Totals	-	-	1	2	1	1	-	1	-	1	-	1	-	-	3	=11
Grand Totals	-	3	2	6	2	1	-	2	-	2	-	1	-	-	3	=22

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

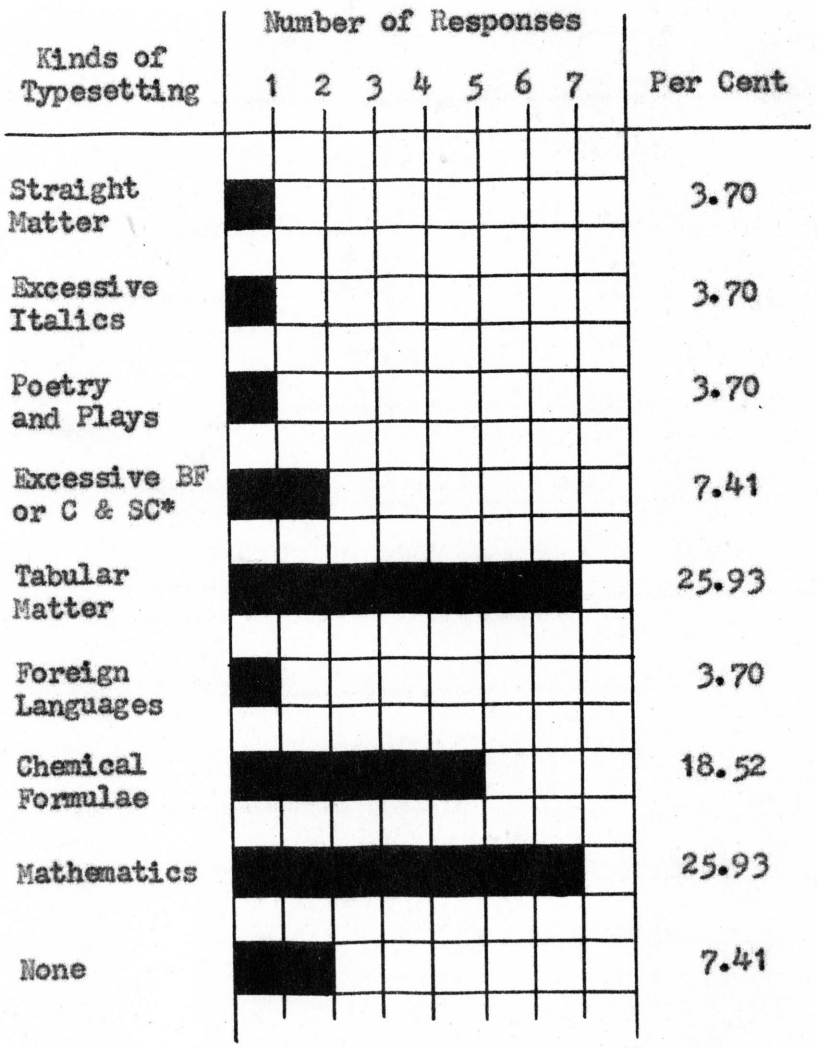


Figure VI. Kinds of typesetting university presses thought were less expensive by phototypesetting than by hot metal

by the categories less expensive. This trend reinforces that of the commercial publishers who also listed tabular matter, chemical formulae, and mathematics as being less expensive by phototypesetting than by hot metal. Ten of the commercial publishers thought that none of the kinds of typesetting represented by the categories were less expensive by phototypesetting than by hot metal.

The results of 10 of 13 class 5 and 6 respondents who used phototypesetting and answered question 14 indicated that phototypesetting had not been accepted for university press work. Half of these respondents said that they "tried and then abandoned" phototypesetting, three each said that their use of phototypesetting "continually increased" or "increased and then remained constant." One said that their use of the process "increased and then decreased."

This is in contrast to the group of commercial publishers who used phototypesetting. Almost 43 per cent of the publishers said that their use of the process had "continually increased" and 26 per cent said that it "increased and then remained constant," whereas only 21 per cent said the process had been "tried and then abandoned."

Of the ten respondents in classes 5 and 6 that tried phototypesetting and answered question 22, four thought that phototypesetting took the "same amount of time" as hot metal. Three thought that it took "less time," two thought that it took "much more time," and one thought that it took "more time."

In agreement with the findings among the commercial publishers, almost half of the university press respondents thought that

phototypesetting took the same amount of time as hot metal. There was also an apparent feeling among some of the presses that phototypesetting took less time as well as some feeling that it took much more time. This ambivalence would indicate that phototypesetting is evidently more time saving for some kinds of typesetting and more time consuming for other kinds of work when compared to hot-metal typesetting.

In answer to question 8, the data in Table 25 show that in class 5, four respondents thought that "difficulty and high costs of correcting" was the chief limiting factor of phototypesetting. Factors of expense were also cited, especially among respondents in subclass 5C, operators of composing rooms. Two respondents mentioned "vertical spacing cannot be adjusted" as a chief limiting factor.

The data in Table 26 show that in class 6, "difficulty and high costs of correcting" was again the chief limiting factor. Items of expense and lack of economy were also mentioned. Two respondents cited "difficulty in page makeup" as a limiting factor.

As did commercial publishers, the university presses considered "difficulty and high costs of correcting" the chief limiting factor of phototypesetting. Expense and lack of economy items were also mentioned by both groups. The presses, however, were not as concerned with "availability" as a chief limiting factor as were the commercial publishers. Also, the presses did not cite "difficulty and high costs of proofing" as did the commercial publishers.

In answer to question 23, the data in Table 27 show that in class 5, three respondents thought that "flexibility in mixing type sizes and

Table 25. What 12 University Presses (0-50 Titles) Thought Were the Chief Limiting Factors of Phototypesetting

Limiting factors	5A*	5B*	5C*	5D*	Total
Original expense	-	-	2	-	2
Too expensive	-	1	3	1	5
Difficulty and high costs of correcting	-	2	2	-	4
Difficulty in handling the makeup of tabular matter	-	1	-	-	1
Bad appearance	-	-	-	1	1
Variations in focus--letter weights inconsistent	-	1	-	-	1
Vertical spacing cannot be adjusted	-	1	1	-	2
Line justification difficulty	-	-	1	-	1
Lack of flexibility in mixing types	-	-	-	1	1
Availability	-	1	-	-	1
Poor proofs	-	1	-	-	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 26. What 14 University Presses (More than 50 Titles) Thought Were the Chief Limiting Factors of Phototypesetting

Limiting factors	6A*	6B*	6C*	6D*	Total
Too expensive	-	2	1	1	4
Not economical for short runs	1	-	-	1	2
Difficulty and high costs of correcting	-	2	2	1	5
Difficulty in handling the makeup	-	-	-	1	1
High cost per page when not highly illustrated	-	1	-	-	1
Not economical for straight matter	-	1	-	1	2
Line justification difficulty	-	1	-	-	1
Difficulty in page makeup	-	1	-	1	2
Unreliable quality	-	1	-	-	1
Lack of quality faces	-	-	1	-	1
Not ready for highly complex books	-	1	-	-	1
Scarcity of operators and trained personnel	-	1	-	-	1
One company can't match the results of another	-	1	-	-	1
Chaotic pricing	-	1	-	-	1
Availability	-	1	-	-	1
No limiting factors	-	1	-	-	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

Table 27. What 8 University Presses (0-50 Titles) Thought Were the Chief Advantages of Phototypesetting

Chief advantages	5A*	5B*	5C*	5D*	Total
Ease and economy of tabular matter and mathematics	-	1	-	-	1
Ease and economy for books with many illustrations	-	1	1	-	2
Ease and economy of reprints	-	1	-	1	2
Economical for short runs	-	-	-	1	1
Easier to use special fonts and characters	-	-	1	-	1
Advantages after setting (repro, camera or stripping advantages)	-	-	2	-	2
Quality--sharper and cleaner letters	-	-	1	-	1
Flexibility in mixing type sizes and styles	-	2	1	-	3
Ease of storage	-	-	-	1	1
Obviates precise proofing	-	-	1	-	1
Facilitates light-table makeup	-	-	1	-	1

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

styles" was a chief advantage of phototypesetting. Two each thought that "ease and economy for books with many illustrations" and "advantages after setting" were important factors favoring the process.

The data in Table 28 show that in class 6, eight respondents thought that "ease and economy of setting tabular matter and mathematics" was a chief advantage and five thought that "ease and economy for books with many illustrations" was a chief advantage. Two each thought that "ease and economy of reprints" and "quality--sharper and cleaner letters" were advantages. Four respondents thought that there were no advantages.

In summary, fewer university presses than commercial publishers cited the advantage of quality and the advantages after setting. Both agreed that the ease of handling books with illustrations and the flexibility in mixing all sizes and kinds of type faces were advantages. They both felt that the ease of setting complicated matter was an advantage of phototypesetting.

Of 14 university presses that answered question 7, ten, or five-sevenths of the respondents, reported using the Fotosetter; four, or two-sevenths reported using the Photon; and one reported using the Linofilm. More than one-half of the commercial publishers reported using the Fotosetter, and about one-quarter used the Photon; therefore, for university presses and commercial publishers, Photon and the Fotosetter seem to be the most widely used.

Ten presses responded to question 9, asked to determine which phototypesetting process was best adapted to the respondents and to

Table 28. What 12 University Presses (More than 50 Titles) Thought Were the Chief Advantages of Phototypesetting

Chief advantages	6A*	6B*	6C*	6D*	Total
Ease and economy of tabular matter and mathematics	1	5	-	2	8
Ease and economy for books with many illustrations	-	5	-	-	5
Ease and economy of reprints	-	2	-	-	2
Economical for "built-out" material	-	-	-	1	1
Flexibility	-	1	1	-	2
More versatile	-	1	-	-	1
Precise enlargement or reduction	-	1	-	-	1
Advantages after setting (repro, camera or stripping advantages)	-	-	1	-	1
Quality--sharper and cleaner letters	-	-	1	1	2
Corrections can be made in smaller units than one line	1	-	-	-	1
Ease of storage	-	-	-	1	1
Ease of correction on film	-	-	-	1	1
Saves time	-	1	-	-	1
Reprints are of better quality than by letterpress	-	1	-	-	1
Along with offset, gives better appearance	-	1	-	-	1
Smaller, neater working area	1	-	-	-	1
No smelting or transporting of lead	1	-	-	-	1
None	-	2	1	1	4

*A: Have used phototypesetting, operate own composing room.
B: Have used phototypesetting, have no composing room.
C: Have not used phototypesetting, operate own composing room.
D: Have not used phototypesetting, have no composing room.

learn the reasons why. Seven cited the Fotosetter, with six mentioning that it was best adapted to their needs because it was "available." One each mentioned "versatile," "works best for mathematics and formulae," and "most reliable." One press cited the Photon as best adapted because of "easier mixing of sizes and type styles." Two other presses, one using the Fotosetter and one using the Photon, reported that they did not have enough experience to know which was best adapted to their needs.

Similarly to the commercial publishers, the university presses reported that the Fotosetter was best adapted to their needs because it was available. Each of the other advantages of the Fotosetter cited by the presses was also cited by the commercial publishers. The one advantage of the Photon, mentioned by a university press, was also cited by a commercial publisher.

Two university presses failed to note the number of titles set by the various typesetting processes in 1960 and 1961. Because of the omission, it was impossible to categorize these presses by size along with the other presses. These two presses were assigned a class number of 7. One of the presses did not use phototypesetting and did not operate a composing room; this was the extent of the information offered. The other press also reported not having used phototypesetting. This press operated a composing room with two Linotype machines, used hot metal for all its typesetting, and prepared all typesetting for letterpress printing. The chief limitation of phototypesetting as cited by this press was that ". . . it would be the investment we have in

Linotype equipment and letterpress equipment." The chief advantage cited was that it was "evidently cheaper if work is to be done offset."

CHAPTER III

SUMMARY AND CONCLUSIONS

If phototypesetting were a revolutionary process, then the fact that 41.10 per cent of the respondent publishers and presses in this study have tried it indicates they possessed a venturesome spirit. This group probably would have been adequate to break any undercurrent of resistance to change if such resistance existed in the industry. Also, this group would have been a fair market for phototypesetting to have won if the process met their needs. The class 1, 2, and 3 publishers, however, reported that phototypesetting accounted for only 6.29 per cent of their total typesetting costs and class 5 and 6 presses reported that it accounted for only 2.32 per cent of their total typesetting costs. This indicated that perhaps phototypesetting was not revolutionary but was efficient for only a limited kind of work among commercial publishers and of even more restricted value to the university presses.

Almost 21 per cent more university presses than commercial publishers used cold type; it accounted for almost four per cent more of the total typesetting costs among presses than it did among commercial publishers. Apparently, more university press work was adaptable to cold type than was adaptable to phototypesetting.

Phototypesetting as a percentage of total typesetting costs increased almost 3.5 per cent between the medium and large publishers, chiefly at the expense of cold type. It seemed that as the publishers produced more titles, an increased percentage of these titles lent

themselves to phototypesetting, or that in these high ranges, sources of supply began to diminish for other kinds of typesetting and phototypesetting received some of the overflow.

The commercial publishers reported that of their total typesetting costs, 42.03 per cent was for titles to be printed by offset; the university presses reported this figure to be 22.25 per cent. But, if phototypesetting is compatible with offset lithography, why has not phototypesetting been more widely used? Perhaps the advantages are small or the manufacturers of phototypesetting equipment have some unsolved problems.

The captive composing room influenced the number of publishers that used phototypesetting because those who operated composing rooms tended to stick with their hot-metal investments and did not as readily venture into the newer processes. Those that operated composing rooms and used phototypesetting, however, used it as a greater percentage of typesetting costs than did those who did not operate composing rooms. This seems to reinforce the thinking that certain kinds of work are more adaptable to phototypesetting, or these publishers would have used the equipment in which they had investments. Among the university presses, however, not only did more non-operators than operators use phototypesetting, but it accounted for a greater percentage of their total typesetting costs. This seems to indicate that the operators found it more advantageous to use the equipment in which they had investments. In addition to phototypesetting accounting for 2.32 per cent of their total typesetting costs, it seems that phototypesetting

was of more marginal value to university presses than to commercial publishers. Because only one publisher who operated a composing room invested in phototypesetting equipment, it did not seem that publishers generally produced enough of the kind of work that made investments in phototypesetting profitable.

The trend was for those who had tried phototypesetting to increase their use of the process. Many also found that it accounted for a fixed portion of their work after they had tried it. Almost one-quarter of the commercial publisher respondents that used phototypesetting and one-half of the university press respondents that used it, however, were dissatisfied with the process and abandoned its use. Those that reported using it increasingly, probably found phototypesetting applicable to more kinds of work, or the kinds of work to which it was applicable were on the increase; those who used it as a constant part of their typesetting probably found a place where it was applicable and profitable to their operation. Perhaps those that reported its use decreasing were not satisfied with its results in certain kinds of work, or the kinds of work with which they preferred to use phototypesetting were on the decrease. Obviously, those that tried and abandoned the process were dissatisfied with its results, availability, services, or costs.

The trend in thinking was that comparable jobs set by phototypesetting and hot metal took the same amount of time, but that in many instances phototypesetting may have taken more time, and in others, slightly less time. Another trend was that the new users of phototypesetting decreased in recent years. Unless the process is made more

attractive, new venturers into the field might continue to decline.

There was a definite feeling that chemical formulae, tabular matter, and mathematics were less expensive by phototypesetting than by hot metal. There was also, however, a substantial group that saw absolutely no advantages in the use of phototypesetting.

The limiting factors of phototypesetting that were mentioned most often by publishers and presses were the various categories including lack of economies and those of higher costs. The process evidently had difficulties and higher costs of correcting and proofing. In addition, availability was cited by publishers as a limiting factor. A remote indication of availability was that no publisher or press purchased phototypesetting from more than three sources. A west coast respondent mentioned that he used a specific phototypesetting machine because an eastern firm had this machine and had book experience. This respondent went on to say that the phototypesetting business went bankrupt in his area. Another respondent said, "Very little of this kind of composition is available in New York City." Perhaps, if this process were more generally available, it would have been used to a greater degree than it was. Availability was not as critical a factor among university presses. This supported the findings that perhaps they had not found phototypesetting as adaptable to their operations as had the publishers.

The Fotosetter was probably the best known and most generally available phototypesetting machine because it had a head start in the field; therefore, it was more generally accepted because it was adapted

to certain kinds of work for the majority who used it. If the other machines became more generally available and the publishers became more familiar with them, possibly these machines too would be adapted to the same or even a wider range of work.

The advantages of phototypesetting that were cited most often were those which had to do with quality, such as sharper and cleaner letters and more even color. Many mentioned advantages after setting that occur with the use of offset or other photosensitive plates: the elimination of reproduction proofs and of camera work and advantages of stripping. Others mentioned ease of storage, the flexibility in mixing many sizes and kinds of type, and the economy of wide measures and of handling illustrations. The university presses did not appear to be as concerned with quality advantages as did the publishers.

Because the difficulties and higher costs of correcting and proofing were cited most as disadvantages, and because these have a direct bearing upon the cost of all kinds of typesetting, it is difficult to compensate serious disadvantages such as these with esthetic advantages of higher quality or flexibility in the mixing of type faces. The advantages gained when using phototypesetting for offset appear to be less attractive than the disadvantages. Commercial publishers indicated a substantial movement to offset when they reported that 42.03 per cent of their total costs of typesetting was for titles to be printed by offset. Phototypesetting does not seem to be joining this movement because these same publishers reported that phototypesetting was only 6.29 per cent of their total typesetting costs. The

disadvantage in lack of availability was also substantial because the process obviously could not grow if not available. Why was phototypesetting not more generally available? Perhaps it has not been given enough time; perhaps the skills associated with hot-metal typesetting were not adaptable to phototypesetting, consequently not making it a profitable investment for the hot-metal typesetter. Must a firm begin anew to make phototypesetting profitable so that there are no "hang-over" hot-metal skills? Perhaps this can be the undertaking of a further study. A survey of typesetters might provide the key to the disadvantage of lack of availability.

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APPENDIX A

Example of An Individual Questionnaire Sent to Both Commercial Publishers and University Presses

TYPESETTING QUESTIONNAIRE

1. Do you operate your own composing room?

_____Yes

_____No

(If you do not operate your own composing room, omit questions 2 and 3)

2. If you operate your own composing room, do you have photocomposing equipment?

_____Yes

_____No

If yes, how many machines of each do you have?

_____Intertype Fotosetter

_____Lanston Monophoto

_____Mergenthaler Linofilm

_____Photon

_____Other--If other, what kind? _____

3. Do you own hot-metal equipment?

_____Yes

_____No

If yes, how many machines of each do you have?

_____Intertype

_____Linotype

_____Monotype

4. Are any of your titles (include books, manuals and workbooks) set by photocomposition?

_____Yes

_____No

5. Are any of your titles set by cold-type composition? (Vari-Typer, Justowriter, IBM Executive, etc.)

_____Yes

_____No

6. Do you own or rent cold-type equipment?

_____Yes

_____No

If yes, how many machines do you have? _____

7. If any of your titles are set by photocomposition, what phototype-setting processes are used?

_____Intertype Fotosetter

_____Lanston Monophoto

_____Mergenthaler Linofilm

_____Photon

_____Other--If other, what processes? _____

8. Whether or not some of your titles are set by photocomposition, what do you think are the chief limiting factors of this method of composition?

_____

_____

9. If some of your titles are set by photocomposition, what phototype-setting process (Fotosetter, Monophoto, etc.) seems best adapted to your needs?

_____

Why? _____

_____

10. How many titles have you had set by photocomposition

    in 1960? _____

    in 1961? _____ (please estimate)

11. How many titles have you had set by hot-metal composition

    in 1960? _____

    in 1961? _____ (please estimate)

12. How many titles have you had set by cold-type composition

    in 1960? _____

    in 1961? _____ (please estimate)

13. In what year did you first start using photocomposition? _____

14. Since you first started using photocomposition would you say that your typesetting by this method

    _____has continually increased in number of titles?

    _____has increased and then decreased in number of titles?

    _____has increased and then remained constant in number of titles?

    _____has been tried and then abandoned?

15. If you purchase photocomposition, from how many sources do you buy it? _____

16. If you purchase hot-metal composition, from how many sources do you buy it? _____

17. If you purchase cold-type composition, from how many sources do you buy it? _____

18. Do you find any of the following kinds of composition less expensive by photocomposition than by hot-metal composition?

    _____straight matter

    _____excessive italics

_____poetry and plays

_____excessive boldface or caps and small caps

_____tabular matter

_____foreign languages

_____chemical formulae

_____mathematics

19. About what percentage of your estimated total costs of typesetting for 1961 is for titles to be printed by

_____% letterpress?

_____% offset?

_____% gravure?

_____% other--If other, what process? _____

100%

20. About what percentage of your estimated total costs of typesetting for 1961 is for titles set by

_____% photocomposition?

_____% hot-metal composition?

_____% cold-type composition?

_____% other--If other, what method? _____

100%

21. Have any of your titles, set by photocomposition, been printed by processes other than offset lithography?

_____Yes

_____No

If yes, by what processes?

_____letterpress

_____gravure

_____other--If other, what process? _____

22. On the whole, what differences do you find in the amount of time it takes to set comparable jobs by photocomposition over that of hot-metal?

_____much more time

_____more time

_____same amount of time

_____less time

_____much less time

23. Whether or not you use photocomposition, what would you say are the chief advantages of photocomposition over hot-metal composition?

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

APPENDIX B

Example of Covering Letter That Accompanied Each Questionnaire

Dear Sir:

As a graduate student in Printing Management at South Dakota State College, I have chosen as a thesis topic, "The Acceptance of Photocomposition in the Book Publishing Industry." By canvassing the nation's publishers, it is my wish to determine the extent photocomposition is being used, along with some of its advantages and disadvantages. I believe this study can be made by comparing photocomposition to hot-metal and cold-type composition without asking participating companies for confidential information.

Enclosed is a questionnaire which will give the necessary information to make this study. I would appreciate your returning the completed questionnaire in the accompanying self-addressed, stamped envelope at your convenience. The questionnaire is anonymous and no company's name will be used explicitly or implicitly in this thesis.

It is my belief that much value for both publishers and printers can come from a survey of this kind. I will appreciate the time and consideration you will take in helping to make this study possible.

If you would rather have another person in your organization handle this matter, will you kindly forward this to him, or inform me of his name and address, so that I may contact him.

Very truly yours,

Mark F. Guldin