Physical Development of Bookmaking and Printing

MARSHALL LEE

This paper deals with all kinds of books manufactured for sale. While each category cannot be discussed in detail, the bookmaking problems of all groups have a common base; unless otherwise indicated, the statements that follow can be regarded as generally applicable.

Initially, certain basic terms should be defined: bookmaking encompasses design, composition, illustration, platemaking, printing, binding, and the materials used therein; design is the conception, planning, and specification of the physical form of the book; production is the execution of the design; cover refers to an attached outer covering of the book; and jacket refers to a separate wrapper.

Bookmaking is so much a product of its economic and cultural environment that any treatment of its development must relate to the factors which control and affect it: (1) The needs of other departments of publishing (editorial, sales, etc.); (2) Industry factors (technical improvements, labor supply, etc.); (3) Economic conditions in general as well as within the industry; and (4) cultural patterns (aesthetics, reading habits, education, leisure).

The history of bookmaking in America reveals its close association with the broad problems of publishing. Indeed, from 1639, when the first book was printed in the colonies until the nineteenth century, the printer was publisher and bookseller as well, and in some notable instances, still is. Working with presses little different from Gutenberg's, he became increasingly involved in the complexities of publishing until it was impractical to operate these functions and the craft of printing from one office. Separation began with the advent of the steam-powered press about 1815, when printing became a major business in itself. With power presses capable of devouring all the handmade paper produced, it was fortunate that papermaking ma-

Mr. Lee is Art Director, H. Wolff Book Manufacturing Company, Inc.
Physical Development of Bookmaking and Printing

Chines came along at the same time to satisfy the demand. The first mechanical typecasting equipment was introduced about 1838 and mass production of books became possible.

Rapid expansion had an unfortunate effect on typographic development. Where the hand printer was confined to a few basic typefaces, the machine-age printer had types of every description—and many that defied description. The result, beginning at mid-century, was typographic chaos. About 1890, a reaction set in against machine-made monstrosities. In England, William Morris revived the handicrafts of medieval bookmaking. In America, a few scholar-printers, such as DeVinne, Updike, and Rogers, restored the typography of the seventeenth and eighteenth centuries. Although no more creative than Morris', this movement introduced the mature traditions of printing to machine technology.

The last basic bottleneck in printing was resolved by the perfection of typesetting machinery—the Linotype in 1886, and the Monotype in 1887. About this time machinery was introduced into the bindery also, although some operations are only now being mechanized.

The separation of printer and publisher which had begun at the start of the nineteenth century was far advanced at its end. Where the association remained, it was generally the publisher who owned a printing plant rather than the printer who published books.

New distribution methods created the need for protective wrappers which developed rapidly from pieces of plain paper to the modern full-color jacket. While books changed little in four hundred years, jackets evolved entirely during the first quarter of the twentieth century.

At the beginning of the second quarter a distinction between printer and typographer/designer took form. By then technical developments permitted a wide enough range of expression in book design to attract some full-time designers. This trend was given further impetus in the thirties through the advent of offset lithography.

World War II interrupted the progress of bookmaking as it did every other activity. The principal effects were a shortage of personnel and materials, and the suspension of technical advances. At the end of the war the demand for books was high and the supply limited. This combination opened an era of activity and promise.

In the period from 1946 through 1957, the Korean War, at midpoint, marks a distinct break in the train of events. The first phase
can be considered postwar adjustment. During this time, wartime shortages disappeared; volume was heavy, due to a backlog of demand; inflation ruled; renewed attention was turned to technical improvements. Towards the end of this phase came a recession which shifted the advantage from seller to buyer and television began to loom as a threat to book-reading.

With the end of the Korean War and its period of readjustment, a phase of expansion commenced. Prices stabilized and business picked up as the effects of the World War II baby crop began to be felt. Full warehouses increased competition among suppliers while at one point demand threatened to outstrip manufacturing facilities. The renewal of bookmaking in Europe brought a trend to importation. Such was the background against which the development of bookmaking took place during the period 1946-57. The general effects were:

1. Intensification of the search for cost-saving materials and methods.
2. Development of some superior products and methods as a by-product of this search. (For example, the phototypesetter, sought as a cheaper way of typesetting, can produce a sharper image than metal type and is, in some ways, more versatile.)
3. Design assumed greater importance in the minds of publishers as a result of keener competition, particularly in textbooks and children’s books.
4. Competition between suppliers of materials resulted in new offerings of increased variety.
5. Shortages and the pressures of rising prices conditioned publishers to the acceptance of lower standards of craftsmanship. This attitude worked back to the craftsmen and reinforced the trend.
6. Mass market distribution in the field of paperbacks created a new area of production and design problems.

The high cost of typesetting is an obstacle to the publication of small editions and plays havoc with the break-even point of large ones; therefore strenuous research efforts have been made in this field. During the first postwar years considerable hope was held for composing typewriters which can deliver camera copy without setting type and require less skilled labor. However, these machines have not won wide reader acceptance and are employed mostly to produce short-run titles and school workbooks.
Physical Development of Bookmaking and Printing

The perfection of photographic typesetting machines has been more significant. They have the same advantage as the composing typewriters in bypassing metal type, but are much more complex. While they meet all the demands of composition, they are not big cost-savers—due largely to their need of skilled operators and a high initial cost. Their potential economy is in work requiring complicated make-up.

Wartime electronic development has led to several applications in bookmaking, notably the use of electronic compilers in the preparation of reference books.

New typefaces have been few. In text sizes, the only noteworthy innovations are Times Roman—used for its economy of space, Eldorado—which has not yet had much success, and Monticello—which has had limited use in scholarly publishing. In display faces (18 point and up) the trend has been towards a revival of nineteenth century designs rather than the invention of new ones. Indeed, most of the interesting new faces are European and not so readily available. Of the latter, only the more personal scripts seem to have been widely adopted. Among revivals, Cheltenham and the Gothics are popular; and recently there has been a resurgence of heavy serifed modified Egyptians, such as Clarendon, Fortune, and the almost unclassifiable Latin. In general, the tendency is toward wide faces. While fads in typography usually begin in advertising, they tend to find their way into books. For the most part, book typography has remained with the traditional faces—Baskerville, Garamond, Bulmer, Janson, etc. Use of advertising types has been more frequent in textbooks, than in tradebooks.

There has been progress in the evolution of a contemporary typographic style and little sentiment prevails for repetition of antique modes. Excellent books are still done in these styles, but they are of diminishing importance. On the other hand, the widespread acceptance of contemporary typographic forms has led to some “modern” clichés. The outward forms—sans serif types, off-centered arrangements, and striking contrasts, are being used without much underlying meaning and frequently without real competence. As a result only a small part of the work described as “modern” is creatively valid.

An outstanding development has been the greatly increased use of color in textbooks and children’s books, accompanied by a decreased use in tradebooks. Competition for an expanding school market has involved the publishers in a race to produce more attractive books.
This has meant adding color until, today, the schoolbook with four color illustration is not uncommon and one without color is rare. A parallel development is found in children’s books. While the primary reason for the increased use of color is competition, it is true that children of today are accustomed to far more color than were their parents. Publishers are responding to a demand created by advertising, the movies, and magazines. It is interesting to note that this has taken place during a time when sharply rising costs created pressures to economize. Two factors were helpful. The increase in juvenile population enabled larger runs to carry the cost of illustrations; the use of high-speed, multi-color presses reduced the expense of running extra colors. Nevertheless, the increase in cost has been astronomical. Also, the results have not always been successful esthetically. Where color is used to impress rather than express, vulgarization is hard to avoid. Some publishers put this strong graphic device in the hands of inexperienced people instead of hiring competent designers. In tradebooks, where large runs (which make multicolor printing economical) are relatively rare, there has been a decrease in the use of color.

The greatest impetus to the use of illustration has been offset lithography. Although a prewar development, it assumed major importance in the past decade. The quality of offset printing, first regarded as a “cheap” process, has improved until it can now sometimes rival sheet-fed gravure. By cutting engraving and make-up costs, and rendering unnecessary the use of expensive coated paper, offset has made illustration practicable where it would not otherwise be so. Furthermore, since cost is not increased by enlargement of the text area, the designer has more leeway in offset books. As a result of these advantages, there has been an increase in all categories of illustrated and photographic books. In textbooks and children’s books, competition has increased the use of illustration as well as color. In fact, the use of both in school books has grown to the extent that there is doubt that so much is desirable or that publishers and school administrations can stand the cost. A movement was begun recently to find an end to the folly of this costly competition. In illustration as in color, tradebooks have seen a decrease rather than an increase. Again, the tight economy of tradebook publishing has been the main factor.

The work of “fine” artists (i.e. those who depend on the sale of their pictures rather than making pictures for commercial purposes) in book illustration has seen a small increase. In tradebooks, where
the use of "fine" art appears most logical, economic limitations inhibited what might have been an important trend.

The question of "modern" illustration has had its airing during this period. The exponents of realistic, "humanistic" illustration have had strong things to say, but the modern school appears to have prevailed in the children's book and the adult tradebook. In teen age juveniles and most school books, illustrations have been mostly of the realistic kind. The choice seems to depend rather on the individual publisher's preference than on philosophical considerations.

One technique which has benefited publishers of multicolored illustration is the transparent color overlay. By this process, the artist renders each color on a separate sheet, thus eliminating the need for the costly photographic color separation. Another platemaking process of interest to artists and publishers was the direct positive method. Used before the war only to a small extent, it acquired importance during the past few years. In this process the artist has to work directly on a sheet of grained transparent plastic, which takes the place of the engraver's negative. Thus, the camera is eliminated entirely, reproduction is more faithful, and finer work can be reproduced. Since the advantages are considerable this process will undoubtedly be of increasing significance.

Electronic scanning, a method of making expensive color separations without dependence on the skilled human eye, is now in production. The speed and accuracy of this process promise both economy and high quality. At present, and unless new methods change the picture, process (multicolor, halftone) plates can often be made more cheaply in Europe where skilled craftsmen receive relatively low wages. Although complications are substantial, savings on large orders have encouraged many publishers to buy their color plates abroad. In addition, the quality of these plates is usually higher than here.

Considerable effort has been made to find substitutes for the expensive electrotype plate. At the end of the war a method of making molded plastic plates was invented which has been improved to the point where these substitutes can almost equal the quality of electros at two-thirds of their price. The recent use of rubber plates on rotary presses has been of interest. While quality of work is not high, books can be produced quickly and cheaply in this way.

Magnesium, which can be extracted from sea water, has excellent etching properties and is said to harden with use. Shortly after the
war, photoengraved magnesium plates were offered as letterpress printing's answer to offset's threat—since any copy made for the offset printer's camera could be used to make a magnesium plate, which could then be printed by letterpress. Some technical difficulties have not been entirely overcome and the cost of these plates has been higher than expected. An even more promising invention is the new nylon plate. Photosensitive throughout, this plate is made without etching or molding in much the same way as a photographic print. Used now on an experimental basis by Time-Life magazines, nylon plates have exciting possibilities for book printing.

Pioneered by the Armed Services Editions during World War II, the use of high-speed roll-fed, rotary presses for books has helped to make the low price of postwar paperbacks possible and to hold the cost of text and reference books down. Feasible only for large runs, rotary presses originally developed for newspaper and magazine printing can reduce unit costs considerably. Some of these presses can receive a roll of paper at one end and deliver folded signatures with multicolor printing at the other. The application of this machinery to book production is one of the most significant accomplishments of the postwar period.

Another trend has been toward larger presses. With handling costs rising, printers have sought to reduce the number of forms by increasing the number of pages per form. Today a press exists which will print sixty-four pages of a 6” x 9” book on each side of a sheet. Unfortunately, larger presses tend to lower quality of presswork as well as costs.

Whenever high costs of book production are discussed, inevitably the idea of standardizing sizes is raised. In the first postwar years renewed efforts were made in this direction. With the exception of series and sets, these attempts have generally failed. The vagaries of authors, the public’s fickleness, variations in manuscripts, and competition tend to frustrate standardization and probably always will.

One invention which reduces costs and improves quality is the machine-made makeready sheet. Replacing tedious preparation of the numerous underlays needed to equalize pressures in letterpress printing, this device can save hours of expensive press time and eliminate human errors in discovering and correcting inequalities.

Offset lithography, prominently mentioned for its effect on the use
Physical Development of Bookmaking and Printing

of illustration, has had increasing use in the printing of British books here. To avoid the expense of resetting, sets of proofs are imported and reproduced in this manner. Dry offset, which substitutes a relief plate for the lithographic plate, is an interesting innovation which has not yet found an important place in book printing. Its most significant characteristic is the elimination of water from the offset process.

In paper, the first postwar move was to restore high-bulking stock. Although these sheets virtually assure poor printing, tradebook publishers could not resist the lure of thick books.

Expanded use of offset lithography has resulted in the creation of antique stock which can be printed by this process. It is now possible to do halftone printing on this new material which looks like ordinary book paper and costs about the same.

An important recent development for textbooks was the introduction of pigmented sheets which have the opacity and printing qualities of coated paper, but are lighter in weight and avoid surface glare.

One company has offered a line of colored stock at something near the price of average text paper. Whether tinted text paper gains general acceptance remains to be seen, but it is pointed out that lower contrast between ink and paper improves readability.

Supplies of paper became normal shortly after the war and have remained adequate except for brief periods in 1951 and 1956, when slow deliveries in some lines were experienced.

Wartime shortages of cotton necessitated a search for book cloth substitutes which increased postwar costs perpetuated. Several substitutes of similar construction were introduced; a base stock of kraft paper is printed with color, embossed with a cloth or leather pattern, and coated. Prices range between ten and twenty-five cents per square yard (against twenty-five to forty-four cents for lower grades of cloth), depending on quality and finish. Their strength is less than that of average cloth but is adequate for many tradebooks. (Schoolbook cloths must meet specifications set by state boards.) After widespread acceptance, paper substitutes declined in use when libraries objected to their relatively short life. Unfortunately, this experience has made librarians wary of any substitutes for cloth.
MARSHALL LEE

Actually, some recent products have properties equal to the cheaper lines which cloth manufacturers offer as competition to substitutes. More promising are plastics, such as vinyl, which are superior in most respects to even medium-grade cloth, but not yet perfected for book use. When they are, a basic overhaul of state textbook requirements will be called for. A study in this direction is now being made by the Book Manufacturer's Institute.

A major cost-saving feature is the three-piece binding. By using a machine which can put different materials on sides and spine for about the same cost as making a one-piece cover, it is possible to have cloth at the hinges (where the strength is needed) and a much cheaper paper on the sides, with a substantial over-all saving. The esthetic advantage is a larger choice of possible materials, colors, and combinations. A variation is the two-piece cover which uses different materials on the upper and lower halves of the case. While there is also a standard machine which can accomplish this, it is a less efficient operation, and is seldom used.

Printing cloth by offset before the cover is made (rather than stamping the finished cover) is under some circumstances economical, but preprinted covers have been used mainly on non-jacketed books. Comparatively few trade titles appeared in this fashion, but in textbooks, which normally have no jackets, a major trend is underway.

During the last few years, competition has transformed the typical school book cover from a somber, stamped cloth to a brightly colored pictorial design. Since design has not always kept pace with expanding graphic resources, many covers today are merely gaudy. This is most unfortunate when one realizes that the visual means employed are capable of producing great works of art.

A drawback of preprinted covers is the fact that they must be handled in sheets rather than in the much faster roll form. Attempts to use roll-fed equipment encounter difficulty in registering printing with casemaking. Another technical problem, the protection of the printed surface against abrasion, was solved through the use of close-bonding inks and protective coatings. Lately, considerable success has been achieved in this field. A method which is used on series, textbooks, and other very large runs is the application of an over-all design by the textile printing process, after which the cloth is finished. Titles are then stamped on finished covers.

Perfect binding, the process of trimming and gluing the back of a book instead of sewing, has been used for many years on paperbound
books, but the discovery of suitable adhesives was necessary before it became practical to bind hard-cover books in this manner. The strength of such bindings is now comparable, if not equal, to the sewn ones. It would appear to be only a matter of time before this process is improved sufficiently to be put to general use.

Other technical improvements in binding have been of relatively minor nature with the exception of building-in machines, which perform in a few seconds the final binding operation which formerly involved placing each book in a press, to be left for twenty-four hours to dry.

Some advance has been made in the supply and use of colored pigment leaf for stamping covers. More colors are now available and designers have exercised more ingenuity in utilizing them. Multicolor stampings in one impression have been exploited to the maximum. Magnesium dies have cut deeply into the use of brass for stamping. Priced by area rather than difficulty of design, magnesium dies provide important economies under some conditions. They are, in quality, still inferior to brass.

Colored endpapers have had more use in spite of tight budgets. One firm has recently introduced a line of paper specifically for end-sheet use which are colored on one side. Another company is about to offer a new line of dyed-through stock for this purpose.

In cover materials there has been a large expansion. The cloth manufacturers first introduced a line cheaper than the lowest priced prewar material (about thirty-five cents per yard against forty-two cents) and then, after Korea, offered a still cheaper line (about twenty-five cents per yard) to compete with substitutes and three-piece covers. They also added many colors. More recently there has been competition in the medium grade field, with at least two firms offering new lines at savings of five to six cents per yard. Paper suppliers enlarged the choice, and some papers are now available in rolls for three-piece covers.

The problem of providing a binding of sufficient strength for library use (and thereby obviating the need for pre-binding) occupied the attention of tradebook publishers. Side-stitching, far from satisfactory, has been the most successful solution thus far.

The design of paperback covers and hard bindings have been drawing closer together. Paper covers have moved from lurid illustration to the excellent designs of the better lines, while hard binding is moving from the stamped cloth to the printed multicolor design.
The employment of top graphic artists for the design of "quality" paperbacks was a significant esthetic development. The first publishers of these series set very high standards which the competition kept up. While these books are sold to a presumably discriminating market, this applies also to many tradebooks which do not have jackets of such fine design. These developments have had an important bearing on the evolution of the jacket.

In most respects, the jacket is a duplication of the book’s cover. Only as a sales device, with a temporary protective function, is it unique. Considering that it is rarely removed by the book’s owner, its relation to the cover becomes dubious. For several years, efforts have been made to combine the two features. The problem is to give the cover the selling and protective attributes of the jacket, while retaining its permanent esthetic and structural value. The technical aspect is solved through offset printing on cloth (whereby any effect can be achieved) and the use of coatings or plastic lamination. Artistically, there has been less success because a “selling” design tends to shout while a “permanent” design tends to whisper. At least, so goes the argument. In “quality” paperback covers designs attract attention and yet are handsome enough for the home library. The solution is simply in finding good designers. Depending on the size of editions, the savings involved in non-jacketed books can be from half to the full cost of the jacket. The problem of the “blurb” is solved by printing it on the first page of the book or the back of the cover at no cost, on a separate slip or the end paper at little cost.

In the design of jackets the trend in quality has been upward. The value of good design in this field seems cumulative. Each time a superlative jacket appears, standards are raised generally due to emulation and even imitation. The example of the best paperback covers has had beneficial effects.

Styles in jacket design have tended to derive from technical developments. The transparent overlay sheets with their characteristic luminous color had a strong influence. The split-fountain technique, whereby several colors can be printed side by side simultaneously, has also been much in evidence. Its most obvious characteristic is the rainbow effect achieved when the colors are allowed to run into each other. By this technique striking results can be had at very low cost.
Physical Development of Bookmaking and Printing

A more modest effect can be obtained by the use of colored varnish. On jackets where varnish is necessary, color can be added at practically no extra cost. Varnishing and lamination with plastics have been used increasingly as more products are packaged in glossy wrappings.

Jacketing can now be done by machine and will probably be entirely mechanized within a few years.

In 1947, the Book Jacket Designers Guild was formed. It sponsored a series of excellent annual exhibitions and aimed to raise standards. It withered away by 1953 due to lack of interest, a rather unfortunate development since the displays and accelerated the spread of good influences in jacket design.

Heightened competition in publishing resulted in a wider acceptance of the value of design and focused greater attention on its problems. As with jackets, publishers sought the participation of graphic designers from other fields. Since book design is a semi-technical field, these attempts have not always been successful. Amateur book design is on the decrease, although it is still responsible for a large proportion of American books. Somewhat higher standards generally, have been evident in the past five years. The two problems which beset the profession are the lack of educational facilities and the serious dearth of regular, professional criticism of book design. Schools like Yale, Carnegie, Rochester, and Pratt Institute, offer valuable courses and many other universities provide for book design instruction in their evening programs, but there is no school which has a full curriculum for book design as found in the graphic schools of Europe.

Unlike other artists, book designers have no external means of determining the effect of their work. Unless his contributions are included in one of the few exhibitions such as the Fifty Books of the Year, the chances are that the designer never hears a word of criticism or approval. Some efforts in this direction have been made by trade journals and the clinics of the American Institute of Graphic Arts, but comparatively little has been accomplished. A basic difficulty is the fact that evaluations by literary critics without graphic qualifications is no more desirable than comments by design critics who have not the time to read the texts.

The controversy between schools of design came to a head in 1951 when the “Books for Our Time” exhibition was opened in New York under the auspices of the Trade Book Clinic of the American Institute of Graphic Arts. The basic division occurred between those who
felt that the book designer should give graphic expression to the author's work and those who believed that the book should be visually neutral. Since this writer was the Exhibition's Chairman it suffices to state that arguments existed without evaluating them.

The A.I.G.A. has broadened its activities during the last few years to encompass nearly all types of graphic design. Previously, the emphasis was on books, almost to the exclusion of all else. The present trend has been of value to book people in making them more aware of related fields. Special clinics in tradebooks, textbooks, and magazines have been formed. In 1947 a school was established in New York City by the A.I.G.A. where one can learn printing by experience. Exhibitions of broad interest and high quality are being offered. The enlarged outlook of this organization has benefited all concerned.

The main currents of bookmaking since World War II have been irregular but show a definite wave of advance. Technology has gone forward, but mainly to the benefit of large editions. While this has been of value in expanding the book-reading public, it has left another problem, the profitable publication of good, limited-interest books, in as bad need of solution as ever.

A less welcome advance has been in the costs of book manufacturing. While business has had its ups and downs, prices have moved steadily upward and there is no immediate prospect of relief.

In design, a modest general advance is discernible, with textbooks leading the way. Sharp competition in this field has resulted in considerable over-design, but it is probable that a cutback will take place before long.

Materials have seen improvement in quality and variety, but a major advance awaits development of entirely new, probably pure plastic, materials. This would appear to be not very far off.

Radical changes in bookmaking are becoming possible, but are not likely to come about soon. The means are at hand for a complete departure from the conventional book; probably microfilm read from a pocket viewer with built-in light and magnifying lens. However, the complex apparatus and 500-year tradition of bookmaking will not give way so quickly—and there is good reason to question whether they should.