

what price

Scientific Books?

By Curtis G. Benjamin

Many specialized scientific books that should be published for the general good of science, says the author, cannot be accepted for publication because of high printing costs and their limited audiences. What is needed, he proposes, is a research program carried out by the publishers themselves that will aim at reduced costs and increased speed in printing scientific material.

WHENEVER two publishers of scientific books get together for more than a few minutes they always find themselves speaking gravely and shaking their heads dolefully. They compare notes on what is happening to the book industry in general and to them in particular. The burden of their complaint, of course, is the steadily rising spiral of costs and prices. They have no trouble in agreeing that its rate of ascent is leading the whole industry rapidly to ruin—upward in this case, not downward.

Almost everybody is troubled in these times by high costs and high prices. A publisher, like every other person of imagination, likes to magnify his troubles. But the publisher does indeed have more than his share of troubles on this score. Owing to the unusual economic pattern of his business, he has a double worry—not only must he worry a great deal over the costs and prices of the books he publishes, but he must worry even more over the costs and prices of the books he *cannot* publish. For it is a fact that high costs and “ceiling” prices (prices above which the publisher presumes that books cannot be sold today) are increasingly eliminating many valuable scientific books from publishers’ lists. Most of these are specialized books that would appeal only to a limited audience. Some of them are the first works of young scientists which should be published for their authors’ professional advancement. All of them are books that should be published for the general good of science.

Many of these works would have been economically acceptable for publication 20 or 30 years ago when costs and prices as well as markets were low. Most of

them would have been acceptable ten years ago when markets were much larger but costs and prices were still comparatively low. But very few of them can be published today with costs what they are, with prices generally considered to be at “ceiling” heights, and with markets leveled off or decreased in size. “Ceiling” prices are wholly subjective, of course, having their existence only in the minds of book sellers and book buyers. Markets can be measured objectively, but as we shall see later, their size usually expands or contracts in accordance with the buyer’s subjective thoughts as to proper and improper prices. This whole problem has more than clinical interest to scientists, even though they can do little about it, except perhaps to give the publisher some helpful advice.

Usually the first dreadful question asked of a publisher by an aspiring author of a specialized scientific book is, “About how many copies do you have to sell to get back your costs?” Thirty years ago the answer was, “About fifteen hundred to recover out-of-pocket production costs, and another fifteen hundred to regain editorial, promotional and overhead costs.” Having made such sales, the publisher had thereafter a satisfactory margin for profit. And with taxes being what they were, he could, of course, keep nearly all the profit he made.

Later, in the '30's and on into the early '40's, the answer to this question became 2500 plus 2500 copies, or about 5000 copies that must be sold before a satisfactory profit position could be reached. These sales

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requirements applied to books that could be priced and sold readily at the then going rate of approximately 1¢ to 1½¢ per page, e.g., \$4.00 to \$5.00 for a 400-page book.

Every publisher knows that hundreds of monographs, reference books and advanced texts were published successfully under those minimum requirements. True, many of these books represented long-term investments; returns from them were slow but rather sure. In fact, books of this type constituted a good part of a successful publisher's "back list"—the titles that sold steadily year after year. They were substantial bread for his bread-and-butter operation. The butter always came, of course, from a few well-established introductory textbooks. Indeed there was a time when successful introductory texts provided some extra profits which could be plowed back into the publication of marginal, "prestige" titles. But rising costs and increased competition have all but killed this practice. Those days and those extra profits are gone, perhaps forever.

Today when the hopeful author asks how many copies must be sold, the publisher scowls and hedges miserably.

"Well, it's almost impossible to say," he answers tentatively. Then, having looked darkly at the ceiling for a moment, he adds, "But if you can keep the manuscript down in size and hold the illustrations to an absolute minimum, and if our production costs don't go up twice again before you finish the manuscript, and if we can establish a price that may seem high for this particular book, we ought to get all our costs back on the sale of about eight thousand copies." Having said this, he looks as if he wants to pinch himself to see if it is really he who has named this figure. But there is no need for this; the accounting department has long since convinced him of the reality of the situation. And a required sale of eight thousand copies at a "high" price—whatever that may mean in these days—usually brings the author back to the same plane of reality. Then, more often than not, his writing plans are postponed indefinitely or abandoned altogether.

It can be said, of course, that as bad as this situation is, it is only relatively bad. A good number of comparatively specialized scientific books continue to be published each year. Many of these titles are published only because they were projected several years ago; they could not be accepted today, and often they are produced with a rather sure loss in sight for the publisher. Moreover, markets for other books which would have been considered as specialized twenty, or even ten, years ago have grown so much that a publisher now can be as sure of a sale of eight thousand copies as he was of five thousand copies ten years ago, or of three thousand copies twenty years ago. But there remains the crying need for many even more highly specialized volumes in the newer and more narrow fields of science. And the unhappy publisher must face the economic facts: he cannot fill this urgent need for books that will sell no more than three thousand or five thousand copies today. It is the old story of spe-

cialization: more and more about less and less. On an absolute scale, specialists still work in the same small groups, although the total scientific population has had a great relative increase. This phenomenon—this scientific advance towards ever higher and higher degrees of specialization—has prevented an easing of the publisher's problem, an easing which might otherwise have come with the rapid growth in our total population of scientists.

Now, it is obvious that the publisher would be less frustrated and scientists would be more adequately served in their more narrow specialties if—and this is an upper-case IF—specialized books could be published and sold at prices much higher than the highest of our present "ceiling" levels. This is, of course, the nub of the whole problem. It is a very rough nub, and one which none of the leading scientific publishers has yet dared to seize firmly. In fact most publishers have shied away from highly specialized books which at present costs would have to bear prices that might look exorbitant to many of their oldest friends and best customers. In doing so they have been guided more by fears bred of business policy than by economic judgments.

Are these fears justified? How badly do a few hundred specialists in a given field need and want the highly specialized scientific book written by one of their chief specialists? How high can the publisher go in pricing such a book without being called a robber?

As mentioned above, a rate of about 1¢ to 1½¢ per page was considered to be a fair and acceptable price level for an advanced science book in the 1930's. During the next decade the rate rose to 1½¢. In 1952 the price of this type of book should be 2¢ per page, and most publishers now must push their prices toward that level. In doing so, however, they are encountering sales resistance and hearing unpleasant murmurs among the customers—and this in spite of the fact that the prices of books have not yet risen nearly so much as the prices of other similar commodities.*

Would these murmurs rise to an angry roar of protest if an intrepid publisher were to take his courage in both hands and start the production of specialized books of great scientific importance that had to be priced at 3¢ or even 4¢ per page? Would he soon find his ears bent, his head bloodied, and his action likened to the more antisocial exploits of the James brothers? More important, would such books at such prices be bought by more than a few resentful customers? The answers to these questions will not be known until

* A recent industry-wide survey indicated that prices of a large sampling of college textbooks were increased by only 39% in the period 1939-51, while the index price of all wholesale commodities (U. S. Bureau of Labor Statistics) increased by 130% in the same period. Production costs of the textbooks included in the survey increased by 62%. There has been no similar survey of prices and production costs of the type of scientific books with which this article deals, but it is safe to say that the figures would be somewhat higher, probably about 50% increase in prices and 90% increase in costs over the same twelve-year period.

some very brave publisher, flouting tradition and risking his reputation, boldly tries to make a go of it at unprecedented price levels.

Meanwhile, it is of some practical importance to note that the acuteness of the publisher's pricing problem increases in direct ratio to the size of the book published. Also, it is at least academically interesting to note that psychology plays a part in this that is almost as important as economics. The publisher makes sales readily and hears few ugly murmurs when he prices an important scientific monograph of two hundred pages at \$4.00. He sells briskly and hears no murmurs at all when the size is 300 pages and the price is \$4.50. But when he publishes books twice as large and containing twice as much of equally valuable material—the 400-page book that must be priced at \$8.00, or the 600-page book priced at \$9.00—then many potential customers just sit on their hands with hard, hurt looks in their eyes. And when it comes to a 600-page book at \$12.00, or even an 800-page book at the same price, the publisher usually is left sitting on large unsold stocks with the same sort of hard, hurt look in his eyes. Many people simply have balked at paying more than \$10.00 for a book, no matter how large or how useful it may be. So the steadily increasing bulk of scientific subject matter and scientific books has spelled double trouble for the publisher.

One solution to this size-cost-price problem is multi-volume publication, and at times the publisher is forced to this solution. Instead of a 600-page book at \$9.00, he issues a set of two volumes of 300 pages each, handsomely boxed, at \$10.00 "The Set." The net return from the added dollar is spent on the cost of boxing and the extra cost of binding and handling two units rather than one, so in the end the publisher is no better off in his cost-to-price ratio. But in certain cases the boxed-set idea leads to many extra sales. Most buyers apparently feel that they are getting much more for their money, but the publisher knows that the device is artificial. And he knows that he will have to find more direct and less clever ways than this if he is to solve his basic problem successfully.

The most obvious way to solve the cost-price problem would be the reduction of costs through technological improvements in the printing industry. This has been suggested by more than one scientist who has listened politely but not too patiently to a detailing of the publisher's story of woe, such as the foregoing. Admittedly this advice is the most logical that can be offered to the publisher and to that small segment of the printing industry which is concerned with the composition and printing of scientific books. But sadly enough almost nothing has been done in this direction. Some important and promising research on composition and printing processes is now under way in several places, among which the development in Cambridge of the Higonnet-Moyroud composing machine by the Graphic Arts Research Foundation is a notable example. But all this is largely concerned with "straight matter" rather than mathematical and technical composition,

and with high-speed, long-run printing for mass production. The result of this research eventually may bring substantial benefits to magazine and general book publishers, but at present it promises little or no benefit to the scientific book publisher who still must depend on monotype or hand composition and on short runs on presses that were invented and perfected many years ago.

Indeed, the scientific book publisher might be justified in taking a rather sour attitude towards technological improvement in printing. Often the same scientists who tell him that research and development may be his only salvation will add in almost the same breath that scientific books composed wholly by hand in Great Britain or on the Continent are far superior to our American books which are composed largely on that new-fangled technological marvel, the Monotype machine—a machine which was invented in 1887 and perfected over the next four decades. In other words, hand composition of type, a method invented by Gutenberg in the fifteenth century and brought to perfection in the eighteenth century, is better for many scientific books than is the most modern technical method available in 1952.

But the scientific book publisher must not allow himself to be encouraged to look backward rather than forward, because he, too, is convinced that technological improvement probably is his only way to economic salvation. How, though, is he to win his way to that salvation? Caught in an economic dilemma, he cannot possibly afford to contribute substantially to the large, comprehensive research and development program which is needed. (He might have done so several years ago, but it was not raining then and the roof seemed sound enough.) Nor can he expect his contracting printers to finance a large program of their own. They have large investments in their present equipment and methods; also they have, for the present at least, more work than can be done by their present equipment and methods. (No rain is falling near them and their roofs seem sound enough.) Finally, the printers' unions cannot be expected to help finance, or even to favor, a program for technological improvement that might substantially reduce the amount of labor required to produce new scientific books. (Approximately 80% of the costs of manufacturing a new scientific book is labor cost. This indicates the main reason why mounting production costs have been so difficult to control in the post-war years.)

So, much as he has needed the help of scientific research and development, the scientific book publisher has only scratched his head and wondered where the money is coming from. After a certain amount of scratching he usually has reduced his thoughts to the possible source that is so familiar to needy scientists and educators everywhere—the large foundations. Why not? Why shouldn't one of the large foundations be interested in financing a research program that would aim at reduced costs and increased speed in the printing of scientific material? It makes sense from many

points of view. It would be a great boon to scientists individually, to scientific societies in the production of their reports and journals, to the Government in its desperate effort to handle the sea of scientific reports that threatens to engulf a dozen or more governmental research agencies—and, of course, to the scientific book publisher.

Well, why not, indeed? Certainly this would be the ideal solution to the problem. But in his heart the publisher knows that it is not likely to be the real solution. Why should one of the foundations or the Government interest itself in this research problem unless the scientific publishers themselves show more concern and enterprise for its solution? No, the publishers themselves, either individually or collectively, must somehow get the ball a-rolling, even if at first it must be only a small ball with low velocity. They know—or should know—that an industry which says it cannot afford to do any research to improve its processes or products is writing its own death warrant.

So the publishers themselves must finance a research program that at least will outline the technological problem which the industry faces and will reveal promising lines of attack towards a solution. Once this has been done, once the profitable avenues of approach have been more clearly seen, then publishers may reasonably look to the foundations, or even to the Government, for substantial help in financing a much larger program that in good time should push the problem through to solution.

Such a research program should be undertaken, of course, with a long look ahead. Meanwhile, publishers must give more attention to all possible economies in the manufacture of scientific books. Also, they must insist that their authors give much more attention to all possible economies of word, symbol and thought in the writing of scientific books. The surest way of making less expensive books is to make them smaller.

More important, publishers must ask scientists generally to take a more realistic attitude towards the present realities of costs and prices. If scientists are to continue to be served with the number and kind of books that they want and need in their many, many specialties, there must be a general break-through of the psychological barrier of subjectively imposed price "ceilings." And this break-through must come principally in the minds of older rather than younger scientists. The older teacher of a graduate course often finds it much harder to ask his students to buy a specialized treatise of 400 pages at \$8.00 than the students do to pay that price for a book they want and need. Usually it is no more difficult for a graduate student to come by \$8.00 today than it was for the teacher himself to come by \$4.00 or \$5.00 twenty or thirty years ago when he was a graduate student. But no one should be surprised at this psychological quirk, for it all depends on your basing points. Most grandmothers in 1910 objected strenuously to paying 30¢ a dozen for eggs, the price of which had soared outrageously from 20¢ at the turn of the century.

Books

Ultrasonics. By P. Vigoureux, 163 pages. John Wiley and Sons, Inc., New York, 1951. \$4.00.

One of the interesting aspects of modern acoustics is the great attention currently paid to sound that is not heard by human ears. Inaudible sound was more or less academic in Lord Rayleigh's day, but modern electronic equipment has made it possible to produce with relative ease compressional waves in material media at frequencies exceeding 100 megacycles/sec. This in turn has stimulated research on the properties of such high frequency waves and their various effects on the media through which they pass. An idea of the growth of this subject may be gained from the fact that at a recent international congress on ultrasonics in Rome (June, 1950) ninety-six papers were presented covering not merely the general theory of ultrasonic radiation and its generation, but also its physical properties (e.g. absorption and dispersion in fluids), its engineering applications (e.g. flow detection in metals by the ultrasonic reflectoscope), its biological implications (e.g. the action of ultrasonics on bacteria) and finally its increasing use in medicine (e.g. clinical studies of the employment of ultrasonics in the treatment of nervous disorders).

It is inevitable that this tremendous growth of interest in inaudible sound should stimulate the writing of books on the subject. The volume under review is a welcome addition to the list of those currently available. The author is a well-known British authority on quartz piezoelectric vibrations and underwater sound. In his introduction he states that "the object of the present work is to introduce the reader to the technique and to the simpler aspects of the theory of propagation of ultrasonics in fluids". He has succeeded admirably in producing a book which for its size provides a better introduction to the subject than any other now in print.

Some twenty pages are devoted to the various methods of generating ultrasonic radiation with special reference to piezoelectric and magnetostrictive oscillators. The description is clear and direct and accompanied by helpful diagrams and figures. There is unfortunately no reference to the recent ceramic vibrators like barium titanate.

There is a short chapter on the theory of sound propagation in fluids, including references to viscosity, heat conduction, and relaxation as mechanisms for absorption and dispersion. By far the larger part of the volume is devoted to a discussion of the observational