The Decades Ahead from a Publisher's View

Edward E. Booher

What is the purpose of looking ahead 25 years? Is it an exercise in never-never-land thinking—making assumptions, guesses, and speculations which are sufficiently remote in time to avoid challenge? Perhaps it is, but it may also be a handy cushion against imminent events that are more likely to occur in 5 or 10 years than in a quarter of a century.

Hence, it seems to me that the real usefulness of crystal-ball-gazing lies in the fact that it provides a frame of reference, a set of guideposts. Let me give you an example. Projections of gross national product are inevitably imperfect; they miss the mark by a finite percentage. But the ability to make the projection at all is tremendously valuable; the projections help us to understand our national economy and provide us with specific bench marks. We are indeed better able to deal with the future with an imprecise GNP projection than with none at all.

As I look at the publishing industry today I feel that its qualitative changes are at least as important as its quantitative growth and expansion. And because I feel the performance and attitude of publishers are of importance to our society I would like to speculate on the future as I perceive it. It is, I might say, a rosy future.

Predictions

I will start with a series of predictions.

1) There will be no major war. A reduction in our military commitment in the next few years could free at least $10 billion, and perhaps as much as $25 billion, a year for other uses, and I think those other uses probably would be largely improvements in the educational and cultural aspects of our society. That would mean great opportunities for those of us who are supplying programs and materials for instruction and learning.

At the moment, however, all available funds are going into Southeast Asia, and the immediate chance for any large increase on the education front is remote. Despite this, and despite the fact that Congress is reluctant to appropriate funds for new things, it appears now that federal funds to be spent in fiscal 1968 to buy materials of instruction will be just as great as funds spent for this purpose in fiscal 1967, and that is very meaningful as a long-term portent, in view of the general temper of Congress and the general situation.

2) There will be greater international stability. I believe that a growing number of major countries outside the United States will have gotten over their worst growing pains and therefore will represent substantial and more stable markets for our goods. More major countries will have the kind of expectations, the standards of living, and the standards of education that will make them of interest to U.S. investors.

3) We are going to have a stable U.S. economy, with no major recessions.

4) In our affluent society we will be able to spend whatever we need to spend to make education and learning serve society fully and at all levels. By "all levels" I mean from the cradle to the grave. This is not to condone wastefulness or inefficiency. It is, however, to emphasize the value of investing in human beings. A human being is, for my money, the most important and almost the only capital we have. I am deeply convinced that money spent for the education of any human being is very well spent, and this ties in with my first prediction—that once we are in a more peaceful situation there will be a large release of funds.

5) We will have more centralized government. The big challenges like defense, economics, education, transportation, and air and water pollution transcend state lines. They are too big to be handled piecemeal. Efforts to meet the challenge may start on a regional basis, between states, but I think the federal government will have to step in.

6) The federal government will be more strongly entrenched than ever financially, and regional associations sponsored both by the states and by the federal government will assume increasingly the role now played by individual states. At the same time, large metropolitan or urban centers will continue to be islands that find association with each other more constructive and productive than association within their own state or region. I think that New York City has a lot more in common with Philadelphia or Chicago than it has with the rest of New York State. I think the association of cities—big urban centers with common problems—makes great sense, just as the association of big states, such as New York, Connecticut, and New Jersey, makes sense.

7) This country's major domestic concern will be to improve the quality of American life. In 1967 our major domestic concerns are poverty and education. In 1977 these will still be major concerns, but we will have comparable programs to improve cities; to create new transportation systems; to control air pollution, water pollution, and noise; and to increase the country's cultural wealth.

I believe that the U.S. business and industrial machine is one of man's greatest creations. It runs incredibly well and not only supports America in most affluent fashion but maintains a large military machine and a sizable foreign aid program as well. It is a great tribute to the American business community that we have such a machine and that it works as well as it does.

But its future—its continued smooth running—is, in my opinion, no longer dependent on the factors that have made it what it is today; it depends, rather, on resolution of some of the larger issues that are eating away at the heart and soul of American so-

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ciety. I mean our big-city ghettos, environmental control, and economic and social assimilation of minority groups —Puerto Ricans, Negroes, Mexicans —to name three problems that are very much in the news and right on the surface. These can and will destroy our business system if we don't do something about them. I hope that the business community does not stand aside and wait for someone else to act. The talent and enterprise that have contributed so much to our business system need to be employed in the solution of these other problems as well, and I predict, therefore, that the American business community will in the decade ahead involve itself deeply with these issues. If it does not, we will, I feel, be in for some radical changes.

8) The school program in the United States will have been extended at the lower end to grades "minus 1 and 2." Instead of starting first grade at age 6, all children will start to school at age 4. At the same time schooling will have been extended at the upper end to grades 13 and 14, with the open-door-college concept pretty much accepted universally. Fourteen to 16 years of schooling will be required.

9) There will be a greater diversity in education. I think the innovators will have more influence than they have now; yet many schools will not change at all. And that means that the range of things we will be doing in the fields of publishing and production of materials will be even greater than it is now.

10) Computer-based information systems will be operative long before 1977 —probably by 1972. The computers will make obsolete many of the present forms of collecting and disseminating information, and leadership in the information business will be with the organizations that can process and transmit data in many different forms. The federal government will be a big factor in this business. In this connection, I think it is going to be difficult to work out an ideal system whereby copyrighted material can be stored and delivered by computers—difficult but not impossible. Good first steps in that direction are already being made.

11) The federal government will probably create an extremely important enterprise known as the National Institute of Learning, similar in its independence and its functioning to the National Institutes of Health. This will be a national research and development center in the areas of learning, genetic psychology, anthropology, and other social and behavioral sciences, but its focus will be on the child and the school; its objective will be to help create and provide ever-higher standards of useful and effective education. This is just a guess, but I have a very strong feeling that by 1977 this national center will be a reality.

12) A considerably greater percentage of the national income will be devoted to the pursuit of culture and self-improvement than is now the case. This will, of course, result in large part from the enormous increase in leisure time, coupled with the high degree of affluence, that will especially characterize this country and Europe. I mean all of Europe—western *and* eastern—as well as the U.S.S.R.

You can draw your own conclusions as to what this will mean to the publishing industry if we are doing the job I think we ought to be doing in supplying interesting and useful printed materials for people who have more time and money than they have ever had before in their lives, a need to know more things than they have ever had to know before, and the desire to be productive and useful.

13) There will be much more updating of material things, such as we now have in our automotive industry: we add some modifications and call it the 1968 model. Along with this, there will be more disposables—disposable clothing, disposable housing, and, of course, disposable books.

Foreseeable Trends

Now, having made these predictions, I want to discuss some of the forces which will affect the future if the predictions come true.

The first force is education in general and the concept of a continuous-learning society in particular—one in which the individual never stops learning. Continuous education must be the overriding institution of society. We have no choice. We cannot tolerate illiteracy; economically we cannot afford it because a literate man can produce not only something for himself but generally something for someone else. In addition, in a society where everyone votes, it pays to have the voter know something.

We are also faced with the geometric increase in information. It continues to proliferate at a fantastic rate, and it is the job of education to teach people how to separate the important from the unimportant, how to find the information they must have, and finally how to use information.

Another force that will be important in the years ahead is the individualization of instruction and learning—independent study. We are talking no longer about a class of 30 pupils but about a learning area with 30 individuals in it. There is a big difference; in one case we are talking about teaching a group, and in the other we are talking about reaching every person in the group as directly as possible in an effort to meet his individual needs as completely as possible.

In the publishing business this will mean that materials will proliferate in a fashion that we are just now beginning to experience. The old single textbook, while still in use in many places —if not most—will be supplemented, possibly replaced, by an abundance of other printed materials—manuals, pamphlets, paperbacks, and, I suspect, some forms that haven't yet been invented.

But the student and the teacher will also have at their disposal a host of other learning materials, some printed on film, some recorded on disks or magnetic tapes—and, of course, there is always the probability that they will have access to a computer terminal.

We are well on our way to individualized, independent instruction in the classroom and outside it, with teachers and without teachers. While somewhere between 5 and 7 million students are now enrolled in correspondence courses in the United States, I believe we have just begun to see the application of this old, old teaching technique. New discoveries in learning theory and the application of these in the field of educational technology make independent study by correspondence more feasible, more viable than ever before.

Other forces that will affect the future of education in our society are the development of new firms and enterprises in the fields of publishing and the production of instructional materials, through acquisition, merger, and innovation. My own company, McGraw-Hill, has acquired a wide range of enterprises outside of traditional book publishing. We now produce films, filmstrips, and transparencies, and we build

and install a planetarium that incidentally provides the institution that buys it with a completely controlled environment for large-group instruction. The domed structure has controlled temperature, controlled lighting, and controlled sound, and constitutes a hemispheric screen on which anything can be projected. We also produce standardized tests, and are working on a system of evaluation for establishing their validity. McGraw-Hill, of course, is not alone in these efforts. Random House and L. W. Singer are now part of RCA; Holt, Rinehart and Winston is part of CBS; the American Book Company is part of Litton Industries. On and on it goes. I am convinced that this movement will produce a quiet revolution that will greatly benefit education in this country and throughout the world.

Still another force, and one about which there is great talk, is the application of the systems concept to instruction and instructional materials. There is nothing complicated or mysterious about this. It simply means that more than ever before we are defining the objectives of instruction for a given person for a given subject, and then utilizing in a rational manner all the tools available in the wide field of instructional material to meet that objective.

Finally, there is the need for education in the vast and developing world of emerging nations. All the means and materials I have talked about will be used in resolving the issues and solving the problems that this challenge presents. In addition, the transmission of information by satellite and by other microelectronic means will surely become increasingly important.

All these trends, together, make the world of publishing, as we have called it in the past, not only an exciting challenge, but one that needs—that demands—a high order of intelligence, talent, and dedication, to say nothing of financial resources.

Deep-Sea Tides: A Program

Walter H. Munk and Bernard D. Zetler

Tidal mathematicians have traditionally stood along the coastlines and looked longingly to sea, speculating on what the tides are offshore. They have seized upon the tide records obtained at a few island outposts and have expended great effort in producing cotidal charts of the oceans, with lines connecting points at sea at which the time of high water is thought to be simultaneous. The patterns on these charts have been quite complex, the most interesting feature being the locations of amphidromic points. These are the geographic positions where theoretically there is no tide, the cotidal lines radiating about them in various directions, with the tidal amplitude presumably increasing with distance from the amphidromic point. Inasmuch as the response of the ocean basins to the tide-producing forces is frequency-dependent, the more ambitious mathematicians have drawn their charts for each of the large tidal constituents, both diurnal and semidiurnal. Despite the application of the best techniques and all available data in their efforts, speculation has been an important ingredient in the completed charts, and one is forced to the conclusion that the best is none too good.

It appears as though modern technology has caught up with the problem and that there is hope of obtaining within a relatively few years objective measurements of the tide at positions on grids spanning the oceans. This is exciting in itself, but even more exciting is the anticipated solution of many other geophysical problems as a by-product of the program.

Several different engineering groups are developing tide gages for deep-sea measurements. Snodgrass (*1*) has built a self-contained capsule that is dropped to the sea floor, records absolute pressure *in situ*, and is subsequently recalled by acoustic signals from a surface vessel. Some success has already been achieved with the instrument, but many failures have demonstrated need for greater reliability—which entails duplication of critical circuits, quality control of individual components, long periods of pretesting, and pretesting under severe environmental conditions.

The U.S. Coast and Geodetic Survey has made some successful measurements of the tide at depths slightly less than 300 meters over the Atlantic continental shelf; it has an active developmental program underway to increase the depth potential of the gage and to improve its reliability. Martin Vitousek, University of Hawaii, has been involved in related research—the recording of tsunamis; although some problems are different in that he needs more frequent observations over a shorter period, there is significant similarity in the development program.

The effort has not been confined to the United States. Eyries, Service Hydrographique, Paris, has successfully tested a differential gage that is connected by wire to a surface buoy that transmits an analog signal to a nearby vessel. The Snodgrass and Eyries gages also record temperature because it is required for correction of pressure readings, but of course the temperature records are of great interest in themselves. Other foreign tidal authorities have shown marked interest in the program and stand ready to cooperate in an international program when the required instruments become available.

At a tide symposium (*2*) in Paris in 1965, an international working group on deep-sea tides was formed to organize systematic measurements and analyses of deep-sea tides. When the group met again in Moscow in 1966 to review the program, representatives of 11 nations attended and expressed some interest in the program; an associated committee (*3*) was formed to deal with theoretical problems related

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