with graduate degrees were in the attentive group compared with only 12 percent of those whose education ended with high school. Other "significant predictors of attentiveness" were political activism, maleness, and youth (being in the 18 to 34 age group).

The question of the extent to which public opinion influences science and technology policy decisions remains an enigma. Identification of the attentives group may be a step toward unraveling it. A next step could be the survey NSF is supporting to examine the linkages between the attentive public and what are termed "opinion leaders," that is, the 2000 or 3000 people who, because of personal prestige or positions held, are called on to give testimony before Congress or provide other formal or informal advice on science and technology issues. After that, if opinion polling is up to the task, it will be time to consider who it is among the public that the lawmakers and bureaucrats really listen to.

Meanwhile, the status report on public attitudes toward science and technology reflects solid support. Those who ponder long term implications, however, may be given pause by the decline in the percentage of nonattentives who say the benefits of scientific research outweigh the harmful results. Between 1957 and 1979 the favorable majority declined from 87 percent to 66 percent, an erosion averaging about 1 percent a year. Should that continue, science and technology would before too long face a deficit in public opinion.—JOHN WALSH

Science Magazines: The Second Wave Rolls In

Six new publications are about to hit the street, though changes in the tax laws may make this wave the last

The splash made by the first wave of new science publications has lured several entrepreneurs into this newly discovered consumer market. Six new magazines, with startups running between $3 and $7 million, are on the drawing boards or the newsstands. In general, the magazines inhabit editorial niches more specialized than the first wave.

"Basically," says John D. Klingel, a consultant who has helped launch both the first and second wave, "the publishing world never saw how broad the field of science was. Today, that's changing. There are literally thousands of business magazines, and the same thing is happening in the world of science publishing."

The first wave, which started building around 1980, featured general interest publications such as *Science 80* (now *Science 82*), *Discover*, an expanded *Science Digest*, *Omni*, and the addition to the *New York Times* of its science section. Though success for the second wave seems likely, according to industry observers, there are a few clouds on the horizon. The cost of putting out a magazine is rising as such things as postage get more expensive. Further, the second wave may well be the last. The new tax law that goes into effect in 1982 will lessen the incentive for investors to sink millions into magazines. For the moment, however, the presses are running, with a vengeance:

• *Technology*. The premiere issue is dated November/December 1981. It is a glossy, no-nonsense, 100-page publication aimed at managers and businessmen who want to put technology to work, and will expand from 6 to 12 issues a year. Each issue has a major article that explores a given technology in depth. The first was industrial ceramics, "the future beyond plastics." In line with its utilitarian approach, the magazine offers information kits (two versions, $45 and $195) for readers who want an exhaustive bibliography or a complete set of reprints. Also offered are experiment kits. Pegged to the first issue was a ceramic injection molding kit (at $50 or $115) so readers could try ceramic injection for themselves. Editor and publisher of *Technology*, based in New York, is Robert B. Shnayerson, formerly the editor of *Quest*. The money behind the venture has been put up by Binx Selby, a 38-year-old biologist from Colorado whose experiments with microprocessor-based computers led to the founding in 1973 of NBI, now ranked among the top three U.S. firms in the sale of word processors. In 1976, Selby set up PureCycle, a firm that produces microprocessor based water recycling units.

• *High Technology*. Aimed at the engineer and technologist, the premiere issue of 116 pages is dated September/October 1981. It will expand to monthly publication. Editors say articles are written at the intellectual level of *Scientific American*. The third issue has a comprehensive and well-illustrated review entitled "Fusion energy: Still an elusive target." The money behind *High Technology* comes from Bernard A. Goldhirsh, 41, an MIT-trained engineer who roamed the world after graduation as a boat bum and then proceeded to found *Sail* magazine in Boston. Goldhirsh further shook the New York publishing world by starting up his very successful magazine aimed at small business, *Inc.* After selling *Sail* for $17 million, Goldhirsh sunk much of the money into *High Technology* and its sister publication:

• *Technology Illustrated*. This is a popular, 100-page magazine with articles in its premier issue (October/November

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1981) that explain how cars are aerodynamically designed, how engineers plan for earthquakes, and how a microwave oven works. "Here's the first magazine," reads some ad copy, "devoted to simplifying technology, so that non-technical minds can share the wonder and fascination of the technological innovations that are changing our lives." It will eventually go monthly.

• *American Health*. Founded by Owen Lipstein, 30, the general manager who helped get *Science 82* off the ground, the magazine is based in New York. "The real idea," says Lipstein, "is that health is now mainstream. It's no longer for geriatrics and vitamin freaks. All the baby boomers are getting older, getting into their 30's and realizing they are not going to live forever." Lipstein's pitch got a sympathetic hearing on Wall Street, where he pulled together $5 million in venture capital. The first issue, around 100 pages, is due in March 1982. The editor is T. George Harris, 57, the founding editor of *Psychology Today*. Upcoming articles include "The last sneeze: New hope for allergics," "The chemistry of the blues," and "How extra-strength everything works." If the layout of the magazine looks familiar, it's because the art director is Will Hopkins, who helped design *Science 80*.

• *Science Week*. A tabloid to appear in the fall of 1982, the publication will be aimed at professional researchers and science watchers. Production will be in Washington, D.C., and done in conjunction with the *Chronicle of Higher Education*. The worldwide correspondents of the *Chronicle* will be utilized, although the national editorial staff will be separate. Funds for the project, rumored to be around $3 million, are coming from the Philadelphia empire of Eugene Garfield, 56, who founded and presides over the Institute for Scientific Information. ISI is also gearing up to publish its own newsletter:

• *Current Controversy*. Slated for the science professional, it will contain not original articles but short digests gleaned from articles in the 7000 professional journals, newspapers, and magazines that ISI indexes for its information services. The 30 digests in the eight-page preview issue cover such topics as "Do we need the space shuttle?" "Should universities get a piece of the action from DNA research?" and "Are social sciences budget cuts justified?" The first issue of the monthly publication is due in early 1982.

• *Nature*. The venerable British journal is clearly not a newcomer, but it too is expanding to meet the new market for science news. It is adding new pages and correspondents to cover the politics of science in the United States. Expanding from one reporter to five, the U.S. staff will include two full-time positions in the Washington bureau and three part-time reporters based in Boston, New York, and California.

Those exploring the newly discovered realm of scientific information voice only a few concerns about their ability to meet consumer demand. The price of paper today is stable, but 2 years ago it pushed upward every 3 months, and publishers worry that another price spiral might put a crimp in their business. A more immediate concern is postage.

"There are literally thousands of business magazines," says consultant Klingel, "and the same thing is happening in the world of science publishing."

"What's starting to affect profits," says consultant Klingel, "is that the 3rd class advantage is shrinking." Many of the new magazines use 3rd class mail for soliciting new subscribers. They often mail out millions of letters, and consider a 3 to 5 percent return as very encouraging. The 2nd class rate, at which most magazines are mailed, has also been rising. "The post office," says Eric Shrier, managing editor of *Science 81*, "is raising the price per piece, so going to a lighter paper will not help."

What might slow the founding of new magazines are changes in the tax laws. "We raised $5 million," says Lipstein, "In part because we sold the idea in 1981. It would be harder to sell this year. The general idea is that I'm selling losses. The stiffer the tax laws, the bigger the incentive for a rich guy to invest in something like a magazine during its first years of operation. What the Reagan tax rewrite did was to drop the tax rate from 70 to 50 percent. That means they are no longer giving as much to the government, and therefore are less inclined to find tax shelters." Though the economics of building new magazines are changing, Lipstein believes that the business, in one form or another, will survive and even thrive. "As long as I can remember, people have been saying it is all over for magazines. and there have been some visible failures. But the demand and the profits are there."

To sidestep the cost of paper and postage, a few of the new magazines are experimenting with electronic publishing, where a reader with a mini computer and a modem can call up information over the phone lines. According to the technical director of *Technology*, Stephen Kindel, the parent company of the magazine, known as Technology Information Corp., is now working on such a proposal, though he would not go into details. Computer whiz kid Selby, the president of the Corporation, would seemingly be in a perfect position to undertake such a project.

Established publications are also taking the plunge into the electronic future. The *New York Times* for years has run "The Information Bank," a computerized retrieval system that makes available abstracts from the *Times* and 70 other publications in specialized fields. In June 1980, the *Times* went on-line, so that the entire text can now be called up on the screen of a home computer. The annual data base is expected to contain more than 90,000 articles, each accompanied by sidebars explaining when, where, and how the story was run.

Whether any of the science magazines will follow the lead of the gray lady remains to be seen. As Schrier observes, paper magazines are not going to disappear since "you can fold them up and take them on a plane." Still, the savings in space, energy, and resources that are offered by the impending revolution in electronic publishing are tempting. Further, it would be mildly ironic if the science magazines, after saturating the public with news of the technological breakthroughs all about them, did not pursue the opportunities at their own front door. In any event, the new wave of paper outlining advances in science and technology is about to swamp the consumer and increase the problem of where to store all the old issues.

—WILLIAM J. BROAD