comes, however, and there would be little chance of recouping the debt that GAO calculates has accumulated.

In the midst of this debate over the future of the enterprise, the development of the next generation of enrichment technology is being placed in jeopardy. Two years ago, when it cancelled the gas centrifuge plant, DOE decided to push ahead rapidly with the development of a laser process for enriching uranium that promises to cut enrichment costs in half. Known as atomic vapor laser isotope separation, or AVLIS, the process was viewed as the key to the long-term competitiveness of U.S. enrichment. The United States then had at least a 5- to 7-year lead in the technology.

A plan was drawn up to demonstrate the technology in the late 1980s, with the goal of operating a commercial plant around 1992. As the federal deficit mounted, however, funding for the AVLIS program was cut back and the timetable was stretched out. Now the Administration has proposed eliminating all direct funding for AVLIS in FY 1988, on the grounds that developing the technology should be the responsibility of the enrichment corporation.

The House Science, Space, and Technology Committee has approved a bill to provide $100 million for AVLIS next year, but this would reduce the payback to the Treasury, which would run counter to the House budget resolution. Congress is expected to provide enough to keep the program going but the timetable is likely to slip.

Nobody is now expecting Congress to provide the funds for an AVLIS production plant, however. "We cannot afford to spend scarce federal dollars on something that should be paid for by the utilities," says one key House staff member. In the meantime, Japan and France have both announced plans to develop AVLIS technology, and the U.S. lead is slipping.

The U.S. enrichment program has reached the point at which Congress will be forced to make some politically difficult decisions. The Department of Energy itself has managed to pull the business back from the brink with some severe and painful cost cutting, but only Congress can settle the dispute over the accumulated debt and the overall structure of the program.

"This is a profitable niche of the nuclear business internationally. The United States has a low-cost base and a lead in the technology. The only way we can be beaten is for the United States to choose not to compete," says Longenecker. The political and financial price of competing, which would involve writing off past mistakes, may be too high for Congress to pay, however. ■

COLIN NORMAN

Libraries Stunned by Journal Price Increases

U.S. subscribers have been hit hard by the decline of the dollar; research libraries also believe they are being exploited by journal publishers

RESEARCH libraries across the country face large cancellations of subscriptions to scientific journals next year because of leaping prices. Although there have been substantial increases in the prices of American journals over the 1980s, the real crisis has been precipitated by the decline of the dollar overseas.

The prices of United States journals rose close to 10% this year, according to Charles Hamaker of Louisiana State University (LSU), and overall prices have jumped by 14 to 18%. The result has been that research libraries have experienced big cost overruns this year. Harvard University, which has the nation's largest academic library with 106,000 periodicals, exceeded its budget this year by $480,000. Librarians around the country report that next year's subscription lists will have to be cut back by 5 to 15%. The University of California, Berkeley, with 92,000 serials, ran $300,000 over its $2.5-million budget and is cutting back its list by 8 to 12%. Book budgets are being eaten into in some cases to make up shortfalls.

"The crisis of library funding for serials is something that literally hit us in the fall of last year" with the drop in the dollar, says Hamaker, who has been devoting considerable time to analyzing the situation. This occurred after subscriptions had been ordered for the current academic year, so subscription-paring exercises will be going on all summer.

With European journal publishers becoming increasingly dominant in the international market, American consumers are being hard-hit. Hamaker says, for example, that three major foreign publishers—Elsevier of the Netherlands, Springer of West Germany, and Pergamon of England—account for 25% of the serials budget at LSU. Foreign journals account for 40% of the titles and 60% of the costs.

The price for *Brain Research*, Elsevier's "hottest" journal, says Hamaker, rose this year from $2871 to $3826. A press release from Stanford University reports that the prices of French journals have increased by 42%, Italian by 28%, and Japanese by 25%. One of the biggest offenders is Germany's Verlag Chemie, which, according to Jay Lucker of the Massachusetts Institute of Technology (MIT), increased its U.S. prices by 61.1% from 1985 to 1986. The publisher has explained that it has incurred higher costs, including problems from a printers' strike, but librarians generally do not find the explanations convincing.

Libraries are also complaining that subscription prices for American journals are rising at a considerably faster rate than the rate of inflation as measured by the Consumer Price Index. Richard Dougherty of the University of Michigan, which is cutting back its materials acquisitions by 10%, says there has been a 36% increase in the past year in the price of publications from the American Chemical Society (ACS). *Chemical Abstracts* went from $6400 to $8400 in 3 years. According to a December 1986 article in *Physics Today*, the price of physics journals increased 32% from 1985 to 1986. Sheila Dowd of Berkeley says a review of core journals—most of them domestic—in 15 disciplines showed a 2-year price increase averaging 31.9%.

Library officials are responding to the crunch by giving presentations to educate faculty members about the situation, and by instituting reviews to find out which journals can be dispensed with. Professional associations are also getting involved. The 26-member Research Libraries Group, for example, is conducting a detailed survey to ascertain which journals will be retained at which institutions over the next few years.

Librarians are having a uniform reaction to the situation: they do not see any way out of the bind in the short term other than substantial cancellations, and they are blaming publishers, particularly foreign ones, for profiteering by raising prices beyond what is necessitated by economics. They also say that some British and German publishers are engaging in "discriminatory" pricing by charging North Americans more than other international customers.

Publishers are charging what the market will bear, contends Gay Dannelly of Ohio State University. "What they're going to be seeing this coming year is how much the market can *not* bear." Other librarians echo that sentiment, saying publishers are in danger of killing their markets by overexploitation. "The general feeling is that libraries will pay anything," says Lucker of MIT, which was hit last year with a 15% increase in journal expenses. Shirley Echelman of the Association of Research Libraries says publishers assume libraries are an "inelastic" market, but the fact is, "there are going to be massive cancellations."

One problem, as Brown University provost Maurice Glicksman points out, is that "market forces are not at work," inasmuch as journals are not comparable—"quality determines the need to purchase." And Hamaker observes that a company like Elsevier, which publishes 590 journals, has a monopoly in many fields. "A very small group of publishers is responsible for 75% of our problem," says Dougherty of Michigan.

Another problem is the rapid proliferation of journals, particularly in the more active areas of science, such as computers and molecular biology. This results in hyperspecialization, otherwise known as "twigging." Michael Keller of Yale University can name seven computer journals off the bat, five of which have made their appearances within the past few years. There are "far too many journals being chased by far too few dollars," says Michael Bowen, the ACS director of books and journals.

This has resulted in a vicious cycle that began some years ago but which has been exacerbated by the currency situation: as the numbers of subscribers to journals diminish, prices are raised to keep income stable; this in turn drives away more subscribers. This phenomenon promises to lead to further damaging price increases next year. Indeed, Joseph Boisse of the University of California, Santa Barbara (which this year exceeded its journal budget by 25%), says he has received notices from two foreign publishers that further price rises will be necessary because of anticipated subscription cuts.

Among the trends that have conspired to create the present situation, according to Hamaker, is that over the past 10 years increasing numbers of scientific organizations have turned printing and distribution of their publications over to commercial publishers. Publications by nonprofit organizations tend to be cheaper, in part because they have larger distributions and more individual memberships. Page charges in some cases also keep prices down.

Also adding to general information costs has been the Reagan Administration's "privatization" policy, which has resulted in commercial publishers taking over the production of government documents that had previously been sold at cost. Another trend has been the purchase by foreigners of American journals and information services, which has been accelerated by the favorable position of European currencies vis-à-vis the dollar.

Although research libraries have made some attempts to negotiate with publishers about the worsening dilemma, no solutions have yet appeared on the horizon. Bowen of the ACS says the shrinkage of the subscription base, which has been going down between 0.5 and 1% a year, is a factor in price increases. But the main factor, he says, is that "our journals are growing in size." The *Journal of Physical Chemistry*, for example, has gone from about 5000 pages in 1982 to 7000 in 1986. *Organic Metallic Chemistry* has grown from 1800 to 2600 pages. He says that if libraries want to keep costs down, they "should not continue buying journals that are outrageously priced."

Nonetheless, he says "I have a lot of sympathy with the library community. If I were in their shoes I'd be saying the same things."

Not so sympathetic is A. F. Spilhaus, Jr., of the American Geophysical Union. Spilhaus says price increases of AGU journals have been necessitated by increased paper and postage costs (paper went up sharply a half dozen years ago), as well as increased pages. For example, the *Journal of Geophysical Research* "has more than doubled in price but it has doubled in size." Spilhaus thinks some foreign journal publishers are indeed price-gouging. He also says domestic commercial publishers are charging at rates up to ten times that charged by nonprofit societies.

Says Spilhaus: "Libraries have caused the problem by buying stuff that is unreasonably expensive . . . libraries have to learn better how to evaluate the value of journals. As long as they are relying on dollars per title they are not being economically realistic. I have told them hundreds of times that *they're* the problem."

Commercial publishers are also unapologetic. David Swanson of Academic Press, a major U.S. journal publisher, says that comparing journal prices to inflation as measured by the Consumer Price Index is irrelevant, because the price index does not take into account rising costs of such factors as paper, typesetting, and postage. He acknowledges that "falling unit sales clearly has had an effect" on prices.

Robert Miranda of Pergamon Journals Inc., the U.S. arm of the British company, says that labor costs have been the largest factor (aside from the decline of the dollar) in pushing up prices. He also says editors are getting more submissions, which raises the costs of processing manuscripts. Librarians have accused Pergamon of making fantastic profits—Keller says their profit margin went from 25% to 40% between 1980 and 1986—but Miranda says that is for the whole enterprise, not the journals. He also says that, contrary to accusations, Pergamon's American price is 20% lower than its overseas price.

There is no consensus on how the problem of escalating journal prices will be resolved. In the long run, electronic publishing looms. The next few years will probably see a number of partial solutions. Resource sharing and arrangements for the development of complementary collections among libraries will undoubtedly increase, although this means some can no longer aspire to having "comprehensive" collections. Some librarians suggest that instead of subscribing to certain journals they may subscribe to services that provide copies of single articles. Dougherty believes that technology has advanced to the point where it will be feasible for some private societies to reassume the publication of journals that have been turned over to commercial publishers. More pressure will be put on publishers to stabilize prices. Publishers, for their part, may decide that twigging has gotten out of hand and move toward consolidating some journals. There is a widespread belief that many small-circulation journals will go out of business.

The situation is now in flux. Says Boisse: "nobody has been able to see where this is going to end." ■ CONSTANCE HOLDEN

Briefing:

AAU Renounces Pork

In a rare mail ballot, the heads of 55 of the nation's leading research universities have voted 43 to 10, with two abstentions, to observe a moratorium on seeking pork barrel funds from Congress to build facilities. The vote, by members of the Association of American Universities (AAU), followed a lengthy and at times heated debate at the AAU meeting last month over how the association should react to the growing practice of universities seeking special appropriations for individual facilities. AAU president Robert Rosenzweig notes in a letter to the association's members that the AAU will not force compliance with the moratorium, but he suggests that breaking the moratorium would undermine the AAU itself. "Seventy-eight percent of [the] members have voted in favor of a difficult, but they believe necessary course of action. Those who voted on the other side will, I am confident, give serious consideration to what that means." ■ **C.N.**