China, United States Set Science Policy Dialogue

Meeting scheduled to discuss science and technology issues as Chinese seek policies to produce rapid results

Scientific cooperation between China and the United States, which has proceeded with a cautious buildup of education exchanges and joint research projects over the past decade, is being extended to include discussions of science and technology policy. Agreement that a series of bilateral conferences on the subject was desirable was reached when a group of American science policy experts* visited China last January. The first meeting is scheduled for next January in the United States.

In a report on the trip in which he drew on the observations of all members of the group, Library of Congress China specialist Leo A. Orleans cautions that "there continue to be large and important gaps in our knowledge about China's S & T [science and technology]." The most important reason for this, says Orleans, is that "because of recurring political permutations, China's goals and institutions have been in an almost perpetual state of flux. Consequently, the Chinese themselves are often unable to describe the current specific situation or exhibit caution in doing so."

Orleans observes, as have others, that the most powerful conditioning factor on science and technology remains the so-called Cultural Revolution. The decade-long upheaval, lasting roughly from 1966 to 1976, resulted in the denigration of science and education and the dispersal of scientists and engineers. The process of rebuilding the country's scientific and educational institutions remains a central preoccupation.

A professional China watcher since well before the Cultural Revolution, Orleans has had a special interest in Chinese education and manpower training; some of the most interesting observations in his paper are on those topics. He says that in the first phase of rebuilding between 1977 and 1980 the number of college graduates totaled 591,000. Some 196,000 of these were engineers, 159,000 teachers, and 93,000 were trained in medicine and pharmacy. Undergraduate enrollment for 1981–1982 is put at 1.3 million, with 400,000 in engineering. Constancy in Chinese priorities is indicated by the fact that, despite the ups and downs of policy, the proportion of engineering students has remained at about one-third of the total for the past 30 years, while science students have averaged 6 or 7 percent. The U.S. visitors were told, however, that the numbers of students being trained in law, finance, economics, and other social sciences were too low and would be increased.

Higher education in China obviously enrolls a small percentage of the eligible age group. As Orleans describes it, "Only four percent of the middle school graduates get into college, and the Chinese admit that to pass the entrance

*Study group members were Eugene B. Skolnikoff, Massachusetts Institute of Technology, chairman; Richard C. Atkinson, University of California, San Diego; Harvey Brooks, Harvard; Leo A. Orleans, Library of Congress; Richard P. Suttmeier, Hamilton College.

Southern Biotech Goes Bankrupt

After failing to persuade investors to put up any more money, Southern Biotech filed for bankruptcy on 28 May, thereby becoming the first major failure in the crowded race to commercialize biotechnology. The Tampa-based company, which went public just last August with a stock offering of $5.5 million, has been in financial and legal difficulties for some time (*Science*, 4 June, pp. 1076–1082).

Southern Biotech's bankruptcy petition, which was filed in Florida, lists 128 creditors and liabilities amounting to almost $2 million. The company claims to have assets of $3.4 million, most of which is believed to be its stockpile of leukocyte (or alpha) interferon produced from white blood cells. With the recent production by other companies of highly pure interferon from genetically modified bacteria, the market value of Southern Biotech's natural, less-refined product is open to question, however.

In spite of Southern Biotech's near terminal financial condition, the company's directors are still hoping that it will someday rise from the ashes. They have filed under chapter 11 of the bankruptcy law, which means that they are seeking approval of a plan to hold off paying creditors while the company is reorganized. Southern Biotech started life 5 years ago as a company that bought blood from prisoners and sold the plasma to a pharmaceutical company. That part of the firm's operation currently is still profitable and it would form the nucleus of any reorganization. In addition, company officials are still hoping to find a market for the stockpile of interferon. These plans require court approval.

Southern Biotech officials cited two principal reasons for the company's failure: the inability to sell interferon, and the collapse of a plan to launch a joint venture with a major chemical corporation. The latter is a reference to prolonged negotiations with Monsanto to establish a plasma separation facility. Monsanto abruptly broke off talks in mid-March.

Among those owed money by Southern Biotech are the company's scientists and other employees who were informed on 30 April that there was no cash left to pay their salaries. They were given a promissory note due on 31 May, but there was no money to pay that either. John M. Kilgore, Southern Biotech's founder and president, told the employees in a letter dated 28 May that they have two options: they can be paid in company stock if legal approval can be obtained for such a transaction, or they can join the long line of creditors. Most of them are expected to take the second option. Other creditors include the Internal Revenue Service, which is owed $150,000, and Key Energy Enterprises, which is owed almost $1 million. Key Energy, a Tampa holding company, put up about $2 million to launch a joint venture with Southern Biotech to produce interferon, but Southern Biotech bought its partner out soon after the company went public and some $890,000 is still owed from that deal.—COLIN NORMAN

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examinations a student must almost surely be a graduate of one of the better 'key' primary and secondary schools, which account for only 10 or 11 percent of the total enrollment and which are all located in the cities. Since only about one percent of elementary school graduates enter 'key' secondary schools, the competition for getting into the better schools at the middle level is at least as keen as the competition to get into college. MOE [the Ministry of Education] hopes to establish one key middle school in each county in China to enable peasant youth to compete for college slots, but it will take a long time for this policy to affect the comparative advantage for urban youth in access to higher education and professional opportunity."

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Graduate education was a weak link in the education system even before the Cultural Revolution and scientists and engineers with graduate qualifications are in especially short supply. Formal graduate degrees were not awarded during the 1950's and 1960's, but Orleans says that a graduate apprentice system operated under which able students would pursue advanced study with a professor or academician. He says that the first post–Cultural Revolution graduate students were enrolled in 1978 and the first formal graduate degrees conferred in 1981. Long-range plans are said to call for achieving a level of 10,000 graduate degrees a year, 80 percent of them in science and technology. At that point it is suggested that it will no longer be necessary to send students abroad.

In discussing China's scientific leadership, Orleans, in passing, notes an ironic group of casualties of the Cultural Revolution. "S & T personnel in their thirties are rarely seen in positions of administrative or research responsibility. The problem stems not only from the closing of institutions of higher education, which lost the country several million professionals, but also the extremely low quality of the one million or so worker-peasant-soldier students who did graduate in the 1970's."

On the policy front, Orleans says that "the Chinese are searching for a 'science policy' that not only will be compatible with PRC's economic goals and political prerequisites but will also produce rapid results." The Chinese concede that after the 1978 conference called to redirect efforts in science and technology, they were overambitious, for example, putting disproportionate emphasis on basic research. Now there has been "a turnaround," says Orleans, with the emphasis on linking science and technology more closely to "economic goals and needs."

The new agreement on policy discussions is between the Chinese Academy of Sciences and the U.S. National Academy of Sciences. On the American side, a steering committee has been formed to plan the conference with Eugene Skolnikoff of Massachusetts Institute of Technology as chairman. Details are still being worked out, but agenda topics agreed upon in January reflect the new pragmatism embraced by the Chinese. Main topics of discussion will be R & D in industry, manpower and training, and the social impact of R & D spending. Skolnikoff says that both sides are proceeding on the understanding that if the first conference is productive, a second one will be held a year later in China and further dialogue considered.

At this point, China's science policy, as portrayed by Orleans, is very much in transition. Government organization still retains the heavily centralized bureaucratic structure adopted from the Soviet Union after the Chinese revolution, although efforts to modify it are being made. Science policy activities are given some prominence, but appear to be an adjunct to planning operations and science policy organizations seem to lack sophisticated analytic capacities. Orleans warns that the current rapid reorganization of government makes it difficult for outside observers to perceive where power over science and technology really lies.

If much about the Chinese R & D establishment appears inscrutable from the American perspective, the uncertainty seems to work both ways. In his paper Orleans notes that the Chinese assume that the United States as a world leader in science and technology should have some straightforward answers on science policy "that should be adapted and adopted by the PRC. The explanation that our 'science policy' is evolutionary rather than creationist and therefore grows out of innumerable decisions (and indecisions) within the various sectors of government, industry, and academia was understood but only reluctantly accepted."—JOHN WALSH

Slaughter to Quit NSF for University of Maryland

John B. Slaughter is resigning as director of the National Science Foundation (NSF), after less than 2 years of a 6-year term, to become chancellor of the College Park campus of the University of Maryland.

Slaughter, an electrical engineer, was appointed to head the NSF by President Carter in 1980. From 1977 to 1979 he had been the Foundation's assistant director for astronomical, atmospheric, earth, and ocean sciences, leaving to become academic vice president and provost of Washington State University.

Reluctant to return to Washington, D.C., after only a year, he is said to have been heavily wooed by the Carter Administration, keen among other reasons to appoint respected blacks to prominent public positions.

During his period as director, Slaughter has kept a low public profile in battles over reductions in NSF support for areas such as science education and the social sciences. However, he has also seen research funds increase significantly, and has backed efforts to raise career prospects for black scientists.

Currently named among possible successors are William Nierenberg, director of the Scripps Institute of Oceanography, and the present deputy director, Donald Langenberg. But the Reagan Administration may well look toward industry.

—David Dickson

$15-Million Gift Launches New Global Think Tank

Many believe there is a significant gap in the think tank landscape, in that there is no major institution in this country taking a science-based look at global resource and environmental issues.

Now the John D. and Catherine T. MacArthur Foundation, that maverick funder of geniuses, has ridden into the breach with $15 million for the purpose of establishing the institute for World Environment Resources Inc. To be based in Washington, D.C., the

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