tions of U.S. chemical companies has magnified the changing pattern of capital spending within the U.S. At home, the parent chemical companies' spending still went up in 1976 from 1975 but only in line with inflation, according to Commerce and C&EN surveys. For 1977, capital spending surveys show a decline in planned increases in a level probably below inflation (C&EN, March 14, page 9).

Chemical capital spending outside the U.S. is running counter to the trend for U.S.-owned foreign affiliates in all industry. Spending for all industry is still expected to rise 12% in 1977 over 1976 to reach $28.9 billion, Commerce says. □

Francis Crick, others decide to leave U.K.

England is losing several distinguished chemists. Sir Francis Crick has decided to join the staff of Salk Institute in La Jolla, Calif., on a permanent basis. He has resigned from the U.K. Medical Research Council's Laboratory of Molecular Biology in Cambridge after 28 years there.

In June, fellow Nobelist Sir Derek Barton will quit London's Imperial College of Science & Technology. He will settle in Gif-sur-Yvette near Paris as director of Institut de Chimie de Substances Naturelles, part of the French government's Centre National de la Recherche Scientifique (CNRS). Following soon after will be Dr. Roger Parsons, a specialist in electrochemistry on the faculty of Bristol University. He will head CNRS's electrochemical laboratory at Bellevue, also a Paris suburb.

Considering the comings and goings of scientists of international renown, the move normally would pass all but unnoticed. But Crick's prominence—he shared the 1962 Nobel Prize in Medicine with Dr. James Watson and Dr. Maurice Wilkins for elucidating the structure of deoxyribonucleic acid—and the fact that he reputedly made his decision largely on financial considerations have magnified the event.

Friends of Crick say that a tightening of the U.K. tax laws in 1974 went far in prompting him to go. Until then, British residents weren't taxed on income earned outside the country so long as they didn't repatriate it. Now, such earnings are subject to taxation. The stricter ruling affects Crick and others like him who spend some of their time each year on the international lecture circuit or visiting research establishments in various countries.

Mandatory retirement at age 65, only four years off, was another factor in Crick's case. Because salaries of top academic people in the U.K. have been "frozen" for the next five years as part of the government's anti-inflation drive, he faced a pension that would have been unrealistically low taking into account yearly cost of living rises.

Dermot A. O'Sullivan, C&EN London

Fill in

Editorials

Government

New science adviser faces variety of problems

Calm, cautious, and judicious. That's how a Presidential science adviser should be, as the years have defined him, and that's just about how Dr. Frank Press was April 8 during his confirmation hearing as designated director of the Office of Science & Technology Policy. Press, appearing before the Senate Commerce, Science & Transportation Committee, gave a series of largely predictable answers to questions posed by committee chairman Adlai E. Stevenson Jr. (D.-Ill.) and Sen. Harrison Schmitt (R.-N.M.). Sen. Edward M. Kennedy (D.-Mass.) appeared briefly to introduce Press, a Massachusetts constituent, and ask him a few questions. Press is currently chairman of the department of earth and planetary sciences at Massachusetts Institute of Technology.

Press: impeccable credentials

Press' credentials as science adviser and OSTP director appear impeccable: member, National Academy of Sciences; past member, National Science Board; chairman, Committee for the Scholarly Communication with the People's Republic of China; adviser to the Arms Control & Disarmament Agency, Agency for International Development, Interior Department, National Aeronautics & Space Administration, and Defense Department. His expertise on the seismological aspects of nuclear testing don't hurt in an Administration bent on changing the rules of arms control.

As OSTP director, Press will be running a lean office, with at the most 20—possibly 15—professionals. President Carter will be organizing the White House staff and may merge OSTP with the Office of Telecommunications Policy, a prospect the current OSTP staffers believe would overbalance the office on the side of too much specialty in one field. OSTP has a host of formal duties that go well beyond the much looser function of the old Office of Science & Technology.

As science adviser and OSTP director, Press also will be chairman of three panels that come under OSTP: the Intergovernmental Science, Engineering & Technology Advisory Panel, the President's Committee on Science & Technology, and the Federal Coordinating Council for Science, Engineering & Technology. Press doesn't take over an organization begun de novo. Each of these groups was organized under Press' predecessor, Dr. H. Guyford Stever, whom President Ford named as full-time science adviser last summer. Press will be able to carry forth Stever's legacy and shape it to the Administration's own purposes.

The Intergovernmental Science, Engineering & Technology Advisory Panel, whose executive director is Louis Blair, was established under the OSTP Act to help improve the utilization of science and technology by state and local governments. It is composed largely of governors, mayors, and state legislators.

The President's Committee on Science & Technology, the outside advisory group similar to the old President's Science Advisory Committee, will be undergoing a sweeping membership overhaul, since its members were appointed during the previous Republican Administration. Its chairman, Simon Ramo, and vice-chairman, William O. Baker, have both left the committee, but Ramo has agreed to aid in the reconstitution of the group. He and Baker last fall put together a thick volume of issues developed by two panels assembled in 1975. Press will be using the tome's answers to such questions as OSTP's role in shaping patent policy as important homework in reviewing major issues in science and technology.

Finally, as chairman of the Federal Coordinating Council for Science, Engineering & Technology, Press will be responsible for developing policy positions for President Carter on issues that run across agency lines. The council currently is putting finishing touches on a report on climatic change and its consequences.

The work of an Office of Science & Technology Policy may appear to be general, since there are so many issues that must be dealt with. But each issue is obviously highly specific—such as the availability of uranium to meet light-water reactor needs now that Carter has decided to eliminate the breeder reactor program.

Thus, much will depend on Press' management style in running a small office with an enormously broad mandate. Says OSTP executive officer William Montgomery, "We'll have to be selective in what we tackle. We need a plan so objective that it can be laid out and the priorities set. And we must leave enough

resources available to deal with issues nobody can anticipate. If you don't have a plan you wind up reacting to external pressures all the time. We have to sit down and list the things we need to accomplish."

Press probably has all the lists he needs, especially with the issues book left him by the Baker-Ramo committee. At the moment, according to Montgomery, he is concentrating on establishing good working relations with the White House staff so that he has access to the President when he needs it. Very few Presidential advisers can reach the boss directly by dialing a telephone extension.

Press already has talked enough with the President to have reached a dialogue on top-priority issues. In statements prepared for the hearing, he said important steps had been made in reversing what he called the "downward trend" in the support of basic research. He said it was time to re-examine the industrial R&D effort to comprehend why that sector of R&D has not expanded. The entire subject of innovation will come into intense study during the Press regime, since the Administration is concerned about the eroding U.S. position in technological innovation.

Press says he intends to bring the scientific and engineering societies into the national science policy dialogue. He sees them as an "extended system of eyes and ears" monitoring emerging developments in science and engineering with their own professional concerns. He cites as a model of White House-society interaction the American Physical Society's study of nuclear reactor safety completed last year.

It is difficult to assess just what Press as a person, as science adviser, as scientist, can add to Presidential decision making. Problems have become more global, more intertwined, much more related to international economic policies than in the past, when international science policy in its mildest form related to scholarly exchanges and at its most intense to the arms race. Press, in other words, may indeed have to have a plan and a perspective to be more than just a yes man to the President.

It may well be that the test of his stewardship will be in advising on international relations and thus through his relationship with National Security Council head Zbigniew Brzerzinski. Brzerzinski has ideas of his own on the international ramifications of technology and its impact on the relations between nations. The challenge will be in the balance between economic and humanitarian motives in technology—or know-how—transfer. Know-how could well be used as a foreign policy tool—an item of trade or a lever to gain concessions. Press says he wouldn't favor holding back U.S. technology when meant for humanitarian ends.

It seems that it will be in the international economic area where his advice will most bear watching.

Wil Lepkowski, C&EN Washington

Climate study proposal gets mixed reviews

The freaky weather encountered across much of the country this winter, droughts in the West and record snow and cold in the East, has prompted efforts by the House Subcommittee on Environment & Atmosphere to shape a coordinated federal climate research program. The subcommittee's proposal got its first public airing earlier this month, but it did not draw rave reviews from Administration witnesses who appeared at the hearings, although all agreed climate research is a necessity.

The subcommittee's draft bill calls for spending an additional $50 million on climate research in fiscal 1976, including increased satellite monitoring of global climate conditions, basic research on ocean-atmosphere interactions, and the effect of human activities on climate. It also would set up a national climate program office, probably in the National Oceanic & Atmospheric Administration, to coordinate all federal climate research now scattered among a number of agencies. Within a year the office is to come up with a five-year plan detailing which federal agencies should be involved in climate research, how much funding and staffing is needed for the various programs, and specific milestones to be accomplished.

It sounds simple enough but the Administration isn't buying, at least for now. For example, Howard W. Hjort, director of agricultural economics for the Department of Agriculture, directly told the subcommittee that the legislation is not necessary. "In all good conscience," Hjort said, "I cannot support the provisions of the bill that assign the responsibilities for assessing the impact of climate on agriculture to another department, to a lead agency, or to a national climate program office." And NOAA administrator Robert White warned the subcommittee that a "crash program, no matter how lavishly funded, will not suffice." He also says t the "Administration is not prepared endorse all the specific provisions of t subcommittee bill."

Brown: Ignorance about climate

Part of the problem between the A ministration and the subcommittee m be one of timing. An Interdepartment Committee for Atmospheric Scienc (ICAS) consisting of representatives fro NOAA, USDA, the National Scien Foundation, the State Department, an the National Aeronautics & Space Ad ministration, among others, recentl completed a draft proposal of its own o a national climate program. That propos has yet to be approved by the heads of th agencies involved or adopted by the Ad ministration.

As described by Dr. Edward P. Todd ICAS chairman, ICAS's draft recom mendations, although more detailed i content, sound much like those suggested by the subcommittee. They also show just how far is the U.S. from being able to predict or control the climate. ICAS identifies five categories in which priority research efforts are needed:

- Impact assessments of climatic variability on crop yields, energy demand, land and water resources, transportation, and other activities.
- Diagnosis and projection of observed climate variations, particularly seasonal and interannual anomalies and fluctuations.
- Research to gain better understanding of natural climate variability and of man's potential impact on climate.
- Observations by satellite and other means to help determine the earth's radiation budget, air composition, sea-air interactions, and other factors that induce climate variability.
- Management of the vast array of measurements needed for climate research and services—oceanic, atmospheric, hydrologic, solar, and other types of data.

Under the ICAS proposal, NOAA would be the lead agency for climate research but each of the other agencies involved would continue to set its own budget and obtain its own funding. Given the layers of clearance the ICAS proposals go through before they are adopted, it probably will be at least a year before the Administration can act on them.

However, despite lack of Administration support, subcommittee chairman George E. Brown Jr. (D.-Calif.) indicated at the hearings that the subcommittee probably will go ahead with its bill. He made the point that "a hesitancy to proceed with interdisciplinary and interagency efforts has prevailed for too long," adding that "the impact of climate variations is too great to allow another year to go by without taking some major steps toward reducing our ignorance about climate and climate change." Thus, the subcommittee hopes to have a final package ready by May 15, Congress' self-imposed deadline for reporting legislation containing new spending proposals for fiscal 1978. □

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SPEECH BY NIELS REIMERS PRESENTED BEFORE THE
LICENSING EXECUTIVES SOCIETY
ANNUAL MEETING, NEW ORLEANS, NOVEMBER 1978

Good afternoon, members and guests of the LES. It is a new experience being on this side of the microphone, and I thank you for the confidence you have shown in me. I am very much looking forward to the coming year as LES-USA President and hope to demonstrate your confidence was not misplaced.

Each of us is involved in the business of innovation and transferring technology. Technology transfer is an explosive growth industry of ever-increasing interest to our governments, whether our government is a developing country or developed country--or something in between. This is because of the potential of technology for attaining, retaining, or regaining a favorable economic position where technology enables leveraging labor with intellectual product. Countries with technology are concerned about keeping a healthy rate of industrial innovation to maintain a favorable balance of payments and standard of living, and countries without technology see technology as a means of achieving an enhanced level and quality of employment and a higher standard of living.

Increasingly, we are seeing signs of the politicization of technology, along with a number of other factors which will influence our "technology transfer business" in the future.

It is important to look at these factors that will influence our future livelihood as professionals in the business of innovation and technology transfer. Through the pages of our professional journal, Les Nouvelles, other public sources, and our own experiences, we can observe the following events of interest.

1. As technology can be said to "seek its own level," high labor content industries are moving to low labor cost locations. This shifting has been occurring at a higher and higher rate.

2. Central economy (generally Warsaw Pact) countries have been making major technology acquisitions, generally by a single buying source within the central economy country from competing private enterprises in Western free economy countries.

3. OPEC nations have made substantial acquisitions in downstream petrochemical technology and now are beginning to acquire a broad manufacturing base in other market areas through acquisition of the latest technology.

4. Developing countries are vigorously seeking technology from developed countries. They are also promoting adoption of a code of conduct. In the rhetoric of discussions about the code, technology is defined as a human right rather than a property right. Central economy countries, whose economic systems have failed to achieve more than minimal innovation, have quietly joined this position.

5. The People's Republic of China, in making its "big push forward," is making major technology acquisitions and is sending large numbers of students to Western universities.

6. Meanwhile, in the U.S., our investment in R&D as a percentage of GNP continues to fall along with the balance of payments. And of the R&D that is performed, more is in response to regulatory than market pressures. The Federal Government increases its role "as the sole arbiter and controller of research and development in the U.S. to the detriment of innovation and creativity" while "the nation's best researchers spend professionally more time in describing potential results of research and administration than in actually doing the research."

Not let's take another view of the situation from a different angle.

1. While technology has brought prosperity, enabling governments in developed countries to achieve policies that, in varying degrees, result in satisfying basic needs of all citizens through the expansion and redistribution of income, the same policies have tended to reduce the desire to strive and take risks, which factors are so necessary in innovation. Investment of surplus income goes to vacations and expensive restaurants.

2. Meanwhile, in the central economy countries, the clamor of the public increases for the material goods already enjoyed by the public in free economy countries. Ironically, incentive mechanisms are increasing in central economy industries

to enable competition with developed, free economy countries, while reward incentives are eroding in those same countries.

3. In the U.S. (and certain other countries), where legislators of our government, and executives of industrial organizations, are dependent, respectively, upon votes and satisfied stockholders, decisions enhancing short-term events increasingly appear to be made rather than the harder decisions necessary for long-time viability of the respective entities. Illutrations of this trend are seen in congressional actions (or lack of) on the energy issue and the reduction in industrial research with long-term payout potential.

4. In Germany and in Japan, where ownership of companies is more controlled by banks and private families, industrial decision making appears to be directed more to long-term goals. In central economy and other autocratically ruled countries, five and ten year plans are commonplace.

5. Recently, U.S. technology has become an element of politics. Also, many allege that dumping in the U.S. market is being done by other countries of output not absorbed in their home market, which situation leads to increasing demands for tariff barriers.

I am sure most of you could add more factors from your observations of the world scene which may shape our future. One possible future scenario from the selected factors that I've mentioned to you today would hold that the developed free economy countries, leaving aside perhaps Germany and Japan,

are in for some very difficult times indeed. U.S. Patent Counsel, Don Banner, in reviewing our present "technological posture," observed that action must be taken "or what we have known and enjoyed as the "American Way of Life," shall become a thing of the past." This summer, I studied policies and practices of innovation of basic research in Europe and can definitely say that many European government officials also are worried about trends in their technological innovation affecting the Belgium, English, Norwegian, etc., "ways of life."

Assuming developed free economy countries, and, from my point of view, particularly the United States, do have a problem as hinted at by the foregoing discussion, what can we do? Probably many things. Let me mention one.

There is at present an increasing recognition in the U.S. of the importance of industrial innovation and that a political momentum is building which all of us can help to direct. The "action" will be in the political arena and many of you members have participated and are participating in this process. The time is ripe to propose legislative or other remedies. I ask each of you to propose your "ultimate fantasy," to borrow the expression of a recent student inventor, of a solution. Let us hear about it, either through the pages of Les Nouvelles, through a proposal for legislation in Congress (which our Law and Government Relations Committee would certainly like to receive), or whatever. Let us hear from you.