Medicine and Dentistry and the New Jersey Institute of Technology, both based in Newark. The system has so far not excelled in practicing interinstitutional or regional cooperation, but this is one of the things that Dungan sees as being cultivated in a new phase of filling in gaps and "fine tuning."

The higher education authority's major responsibilities are for planning, budgeting, and program approval, the latter being necessary to oversee the first two functions. Most critics of DHE concede that such prerogatives as program analysis and program approval are necessary for state monitoring of the system but argue that a dilemma is virtually guaranteed by the arrangement. Bloustein notes that "inquiry can become a form of management." Work-load studies, for example, can be used to deprive the institution of its legitimate role. The underlying argument is that only if the institutions are permitted to control how the funds allotted them are spent will they develop the institutional morale on which quality education depends.

In a period of slow growth or no growth, DHE in New Jersey and similar agencies in other states become more powerful and the tensions greater. When budget cuts were made in New Jersey, a state which is still seriously in arrears in providing higher education opportunities for its citizens, every effort was made to avoid cutting enrollment, reducing student aid, or boosting tuition substantially. Research, therefore, by process of elimination, was vulnerable to the knife. (Although Rutgers was spared the bloodletting which would have been required if the governor's emergency cuts had been imposed, university officials are still struggling to effect internal economics to minimize firings and program cuts for the current fiscal year. Rutgers will operate on total funding of some $120 million, virtually the same as last year's budget, itself an austerity budget which necessitated a hiring freeze.)

It is revealing that most people within the higher education system assume that Dungan should be a defender and advocate of the system.

Another view is that DHE in New Jersey and similar agencies elsewhere should apply enlightened principles of public administration and that its views will sometimes be at variance with academic aspirations. DHE, in other words, should interpret the governor and the legislature and his board to the higher education system and vice versa. It is unfortunate that there is no consensus on how to reconcile public accountability and institutional autonomy, and the painful question for public higher education will continue to be where to draw the line.—JOHN WALSH

Science in Vietnam: The Postwar North Seeks American Assistance

Arthur W. Galston, professor of biology at Yale University, who in 1971 was one of the first two American scientists to visit mainland China in 22 years, has just returned from a 3-week visit to another closed country—North Vietnam. As after the China trip, Galston has brought back masses of information about that country's science and also a message, that the North Vietnamese are anxious to increase contact with American scientists.

Galston visited North Vietnam from 7 to 28 June, only 6 weeks after Ambassador Graham A. Martin's helicopter exit from the American embassy in Saigon ended U.S. involvement in Vietnam and marked the North's victory over the South. Galston went representing the Scientists' Institute for Public Information (SIPI) as chairman of that group's task force on Indochinese scientific aid. He also shipped $500 worth of scientific equipment and laboratory samples to Hanoi, which were donated by another private group, the Society for Social Responsibility in Science, of which Galston is the president. Besides touring and meeting with officials, Galston did some scientific work while there: he helped set up a three-room laboratory for plant cell culture at a large new research center near Hanoi; he delivered six lectures on current topics in botany and plant biology to an audience of about 50 scientists.

Like his ground-breaking trip to China, which anticipated the later easing of tensions between that country and the United States, Galston's trip to North Vietnam could be a bellweather. The North Vietnamese allow very few Westerners—and very few Americans—to visit. Yet they allowed Galston in. Moreover, the message he brought back—that the North Vietnamese are interested in strengthening ties with Americans—could signal some break in the impasse that has had both countries hurling accusations at each other of having violated the terms of the 1973 peace accords. (The U.S. government now does not extend diplomatic protection to Americans who travel to North Vietnam, Cuba, and some other "enemy" countries. Moreover, most forms of assistance to North Vietnam are prohibited under the 1917 Trading with the Enemy Act. It is not known which forms of scientific aid would be barred as economic in character, and which would be allowed because it was deemed humanitarian.

Having sent its emissary to Hanoi and back successfully, SIPI now plans its own, private program of scientific aid to North Vietnam. The organization plans a 2-year fund-raising campaign to raise $1 million to bring Vietnamese students and scientists to the United States, to send American scientists there, and to provide books and equipment.*

Scientific activity has continued in North Vietnam although hindered by wartime constraints on manpower, funds, and secure facilities, Galston says. Two outstanding features of North Vietnamese science are their commitment to long-term development of basic science, and a certain eclecticism in adapting the models of more scientifically advanced countries to their own needs.

Admiration of the South

Galston told *Science* that the way science is organized in North Vietnam reminded him somewhat of the Chinese system, somewhat of the Russian system, but mostly of the French system, stemming from several generations of French colonial rule. Now, North Vietman's leaders openly admire innovations made by the Americans in South Vietnam which they think have been successful, such as the widespread educational emphasis on engineering and electronics and the system of 2-year, community colleges.

The North Vietnamese leader who seems in charge of implementing this long-term commitment is a 39-year-old, Russian-trained solid state physicist, Nguyen

*The address for the Scientists' Institute for Public Information is 49 East 53 Street, New York 10022.

An example of modernity in North Vietnam is the Hanoi Institute of Technology, which was built with Soviet aid.

Van Hieu. Hieu reports directly to the Prime Minister, Pham Van Dong. He is chief of the Vien Khoa Hoc Vietnam, which literally translated means Vietnamese academy of sciences, but which is more aptly known as the Science Research Center, now being completed a few miles northwest of Hanoi. Hieu is the chairman of the center's physics institute, and, like several other scientific leaders there, an elected representative to the National Assembly.

In talks with Hieu and with Pham Van Dong, Galston was impressed with their commitment to basic science and the close relationship Hieu seemed to enjoy with Van Dong. (Until very recently, Hieu and his center were under a government commission, the State Committee on Science and Technology, which runs most of the scientific activities of the country.) "They don't need to be sold the lesson that American scientists are always trying to sell in Washington, that to have good applied technology and rapid development you need, first, good basic science," Galston says.

The Science Research Center is almost finished; it has 500,000 square feet of laboratory space and the cost, which was borne by the Russians, Galston estimates is a minimum of $10 million. It will house six, eventually seven, institutes, which are now scattered about in temporary buildings and tents near the site. The disciplines represented will be physics, mathematics, biology, geology, oceanography, and computer science, and eventually a chemistry institute will be added too. Hieu arranged to have his old Russian alma mater, the international physics center at Dubna, donate $500,000 worth of physics equipment to the center. But toward equipment, as well as toward other matters, the North Vietnamese seem to display the talents of an international collector: they had a Hungarian-built computer with American integrated circuits in it, a French centrifuge, a Chinese-built nuclear magnetic resonance machine, and several other instruments built in East Germany. One indication of the pragmatic conditions under which scientists at the center are now working is a nearby French-built military bunker, left over from wartime, which is now used to house a radiation source.

The new center is obviously planned as the future jewel of North Vietnamese science. Almost everywhere else, Galston found the laboratories, equipment, and manpower available in a paltry state. "They're down to the minimum number of people needed to keep a discipline going," he says. For example, at the University of Hanoi, laboratory facilities are small, poorly equipped, and generally "in pitiable condition." Galston was told that the new research center would be the focus of the government's efforts to strengthen science; presumably its know-how will gradually strengthen other science institutions.

Galston's optimism that North Vietnamese science will soon be far stronger than it is today is partly based on the enormous quantities of Western scientific literature he found there. When previously visiting North Vietnam en route to China in 1971 (*Science*, 22 October 1971), he was surprised by the numbers of Western periodicals in the libraries. On this trip, at the new center, Galston found a complete library of photostat copies of every specialized journal he uses in his own field, and many, many others. There were also complete photostat sets of *Science* and *Nature*, with the newest issues arriving only weeks after their publication in the West. Both the Soviet Union and China distribute only photostat copies of *Science*; but the Soviet authorities censor many of the news articles (see page 703). Since the North Vietnamese receive their copies of *Science* from China, their libraries have the complete, uncensored version.

Other problems, besides that of bringing the country up to par in basic science, seemed to concern North Vietnamese leaders. One is the issue of unification with the South. In science and education, unification will probably be patchy at best, since the two countries have developed along different lines for decades. But despite a host of difficulties Galston found the leaders in the North to be openly admiring of many features of science and education in the South; they planned to incorporate them in the North when the much-discussed (but still not formalized) unification takes place.

Another issue of great interest was the health effects of herbicide spraying, which was initiated by the Americans in the South during the war and halted in 1971 after there were reports of an unusual number of stillbirths and birth defects in sprayed areas. Galston asked to visit the South to collect soil samples for ongoing U.S. studies of the persistence of herbicides, but he was not allowed to go. However, he met a respected Vietnamese surgeon who is known in the West, Ton That Tung. Tung told him that in the North liver cancer—usually a rare illness—has been an increasing cause of death; it was in eighth place before herbicide spraying began, and rose to second

Arthur W. Galston, with North Vietnamese research biologists, at dinner.

place after the spraying began. Tung attributes the dramatic rise to a contaminant of herbicide, known as dioxin, and has published his views.†

Matthew S. Meselson of Harvard University, another American scientist who has corresponded with Tung, says he is aware of Tung's views, but does not know of an explanation for how the herbicide, which was sprayed in the South, would have entered the diet of people in the North. Meselson added that, if indeed herbicide spray were linked to liver cancer, one would expect a dramatic rise in liver cancers in the South. But, so far as he knows, these statistics have not been sought out.

On the larger question of improving science to aid in North Vietnam's reconstruction, Galston believes that the country has a way yet to go. "This won't be achieved without a massive infusion of new equipment and other forms of aid," he says.

Government experts, who have been following the situation in North Vietnam closely, confirm that the country's leaders are genuinely interested in receiving aid from the West as well as from the Soviet Union and China. "They have said they will take aid from anyone, and they don't much care where it comes from," says one expert. "They have sometimes given the impression they are dissatisfied with what they're getting from the Russians and the Chinese." Galston notes that North Vietnam is famous for being the only country to have received aid simultaneously from those two mortal enemies, China and the Soviet Union.

Unlike Galston, who clearly thinks it appropriate for Americans to respond to this call for aid, Secretary of State Henry Kissinger has been quoted as writing off any American assistance to reconstruct North Vietnam with the words: "Let their friends help them,"—a reference to the Soviet Union and China. In recent press conferences, he has somewhat more elegantly said the same thing about aid to the North and the South. However some government experts are assuming that North Vietnam will remain fairly independent of the Soviet Union and China, and hence that there could be a role there for Western assistance and influence.

Galston adds his own view that there is a moral aspect to the question of aid from American scientists. "American science played an outstandingly important role in the destruction of that country. Why not let it play a role in reconstruction as well?"—DEBORAH SHAPLEY

† Ton That Tung, *Chir. Mem. Acad. Chir. (Paris)* **96**, 836 (1970); *ibid.* **99**, 427 (1973); *Lancet* **1975-I**, 527 (1975).

RECENT DEATHS

Vernon M. Albers, 73; professor emeritus of engineering research, Pennsylvania State University; 15 May.

Alvin G. Anderson, 64; professor of civil engineering, University of Minnesota; 1 July.

Wesley M. Baldwin, 95; former professor of anatomy, Albany Medical College; 16 June.

George Barnhart, 56; master dental and maxillofacial prosthetic technician, Zoller Dental Clinic, University of Chicago; 23 June.

Guy G. Becknell, 96; professor emeritus of physics, University of Tampa; 23 May.

Bedrich Boucek, 70; paleontologist and former president, International Paleontological Union; 5 June.

Moffatt G. Boyce, 74; professor emeritus of mathematics, Vanderbilt University; 10 July.

Murray F. Buell, 69; professor emeritus of botany, Rutgers University; 2 July.

William Bulen, 53; senior investigator, Charles F. Kettering Research Laboratory; 26 June.

Mary K. Carl, 56; dean, School of Nursing, University of Delaware; 25 May.

Dan E. Christie, 59; professor of mathematics, Bowdoin College; 18 July.

Anthony C. Cipollaro, 74; clinical professor emeritus of medicine, Cornell University; 5 July.

Lester R. Dragstedt, 81; professor emeritus of surgery, University of Chicago; 16 July.

Theodore Drapanas, 45; chairman, surgery department, Tulane University; 24 June.

Harold E. Finley, 69; professor of zoology, Howard University; 19 July.

John T. Hamilton, 50; professor of psychology, University of Lethbridge, Canada; 1 June.

George W. Hargreaves, 72; professor emeritus of pharmacy, Auburn University; 1 July.

Minnie W. Harris, 87; former professor of physics, North Carolina State University; 8 July.

Malcolm C. Henderson, 71; former professor of physics, Catholic University; 18 July.

Gordon M. Tomkins, 49; professor of biochemistry, University of California, San Francisco; 22 July.

Herbert A. Wahl, 75; professor emeritus of botany, Pennsylvania State University; 16 July.

Joseph H. Walsh, 73; former dean, College of Education, Butler University; 30 June.

APPOINTMENTS

Jay D. Scribner, chairman, urban educational policy and planning program, University of California, Los Angeles, to dean, College of Education, Temple University. . . . **Dale W. Zinn**, assistant dean, College of Agricultural Sciences, Texas Tech University, to dean, College of Agriculture and Forestry, West Virginia University. . . . **Stanley Burnham**, professor of physical and health education, University of Texas, Austin, to dean, School of Applied Sciences and Arts, San Jose State University. . . . **Donald R. Peterson**, professor of psychology, University of Illinois, to dean, Graduate School of Applied and Professional Psychology, Rutgers University. . . . **John C. Hitt**, associate dean, Texas Christian University, also to dean, Graduate School at the university. . . . **Charles B. McCall**, associate dean for clinical affairs, University of Texas Southwestern Medical School, to dean, College of Medicine, University of Tennessee Center for the Health Sciences. . . . **Karl G. Heider**, fellow, Center for Advanced Study in the Behavioral Sciences, to chairman, anthropology department, University of South Carolina. . . . At the Tulane University School of Medicine, **C. Thorpe Ray**, clinical professor of medicine, to chairman, medicine department and **A. Arthur Gottlieb**, professor of microbiology, Rutgers Institute of Microbiology, to chairman, microbiology and immunology department. . . . **Jack C. Geer**, chairman, pathology department, Ohio State University, to chairman, pathology department, University of Alabama, Birmingham. . . . **Albert M. Potts**, professor of ophthalmology, University of Chicago, to chairman, ophthalmology department, University of Louisville. . . . **Richard Topazian**, chairman, oral surgery department, Medical College of Georgia, to chairman, oral surgery department, University of Connecticut.

Erratum: Morris Muskat (Letters, 6 June, p. 973) refers to "the only certain new net [oil] supplies we can count on by 1985 . . . when the Alaskan pipeline is operating." The amount cited should have been "1 to 2 million barrels per day."

Erratum: In the cover legend of the 27 June issue, the telescope at the Max Planck Institute for Radioastronomie, Bonn, Germany, should be described as a 100-meter telescope.

Erratum: In the box on the National Medal of Science Winners (11 July, page 121), Britton Chance's affiliation should be the Johnson Research Foundation, University of Pennsylvania.

Erratum: In the appointments column of the 11 July issue, it should have read "at the University of Maryland School of Medicine: **Thomas B. Ducker** to chairman, neurological surgery division and **G. Robert Mason** is chairman, surgery department."

Erratum: The ordinate of Fig. 1A in the report by R. Berezny and D. S. Coffey (25 July, page 292) should read "10^3 count/min per 100 μg of DNA" rather than "per μg of DNA."