Greenberg Resumes News Editorship

Daniel S. Greenberg has returned to Washington after 2 years of reporting on science affairs from Europe and will resume his duties as news editor. John Walsh will become foreign editor, based in Washington, with responsibility for developing international coverage in the News and Comment section.

nel that the civilian sector cannot—it can move workers around to where they are needed and can assure itself that exactly the desired number of each kind of worker will be trained. Nonetheless, it seems possible that a health care system with more allied health professionals and fewer doctors, dentists, and registered nurses, if well designed, could be a partial solution to the nation's health manpower shortage.

This solution, if it is to be achieved, will depend partly on a restructuring of the health care delivery system and partly on the development of new kinds of allied health occupations.

The greatest portion of the growth in the employment of allied health professionals has been in the hospital setting. To some extent, this is a natural result of the functions of the hospital: surgery, tissue identification, and elaborate diagostic procedures require many helping hands. But hospitals also employ more allied health professionals because they are cooperative practice situations, better able to make efficient use of ancillary personnel than the doctor working alone. As cooperative practice becomes a more prevalent mode of care outside of the hospital—a slow but inexorable trend—an increased role becomes possible for the allied health professional.

One model for the private practice of the future was furnished recently by the Allegheny County Medical Society in Pennsylvania. The Society established a "group" practice consisting of one physician, an office nurse, public health nurse, social worker, technician, and secretary. The practice handled 2500 persons in a low-income area of Pittsburgh and was reported to be successful. Nonphysicians had more than the usual responsibility, and patient acceptance was high.

The Allegheny experiment made use of at least one professional, a social worker, not normally associated with the health team. But the greatest potential for a more significant role for the allied health professional may lie in the development of new kinds of these professionals—generalists whose education and training would place them between the nurse and the physician on the spectrum of workers. One such job, the physician's assistant, already exists on a small scale, and more schools are beginning to offer training for it. The first program for physicians' assistants began at Duke University in 1965. The Duke curriculum is 2 years, and there are 29 graduates already working in private practices and hospital settings. A survey conducted by officials of the program indicates that these physicians' assistants increase the productivity of the physician 30 to 50 percent. Among his functions—depending on the supervising physician—may be taking detailed patient histories, doing extensive physical examinations, collecting specimen data, applying and removing casts, suturing superficial wounds, and changing dressings.

Several schools, including Duke, are also developing 4-year baccalaureate programs for physicians' associates who would have still greater responsibilities. One economist, Henry Greenfield, has suggested that we need a whole continuum of medical degrees—bachelors, masters, and doctors of medicine—to make the most efficient use of manpower.

While the Administration continues its niggardly approach toward all health programs, it will remain an academic question whether to promote this kind of manpower or that one. But as long as physicians, in whose training the taxpayer invests tens of thousands of dollars, say that one-half to three-quarters of their time is spent in routine burdens, it is clear that something more is called for than just seeking to increase their numbers.

—JOEL KRAMER

Joel Kramer is a former Science *news intern, now doing free-lance work in the Washington area.*

Smithsonian: Natural History Is Undernourished, Panel Finds

To most people the Smithsonian Institution is the national museum, and a museum is commonly thought of simply as a place for the display and safekeeping of antiquities, objects of art, works of science and technology, or specimens of natural history. The Smithsonian was conceived from the outset, however, as an institution that would be deeply engaged in research—a function of the Smithsonian that has, in fact, increased substantially over the past decade. On the other hand, the Smithsonian also has devoted substantial attention and resources in recent years to broadening its educational activities, by such means as innovations in the display of exhibits, more tours for school children, the holding of folk festivals, and the launching of *Smithsonian*, its new magazine. In sum, the Smithsonian is a far more complex and diversified organization than most people, including most members of Congress, realize.

As such, the institution, which looks to Congress for nearly two-thirds of its $55-million budget, could be well served by a sympathetic committee of congressional overseers able to help interpret and explain the Smithsonian's manifold activities to the House and Senate. Now it appears that precisely such a role has been assumed by an obscure subcommittee of the House Committee on Administration. This body, known as the Subcommittee on Library and Memorials, recently completed 7 days of hearings on the Smith-

sonian, these hearings having allowed the first comprehensive congressional review of the institution conducted in well over 100 years.

Some witnesses were critical of the Smithsonian and its secretary, S. Dillon Ripley. For instance, Senator Barry Goldwater of Arizona, an aviation buff, complained that the Smithsonian's "top brass" had seriously neglected the Air and Space Museum and also the Museum of Natural History. Early this year the General Accounting Office, an auditing and investigative arm of the Congress, reported that the Smithsonian had in some instances followed careless practices. For example, the institution was said to have failed to keep a proper inventory of art works not on display and to have purchased office furnishings with money appropriated for construction work. And questions also had been raised within the institution's board of regents about the venture into magazine publishing.

Further, one witness at the hearings and some members of the subcommittee questioned plans for the Joseph H. Hirshhorn Museum and Sculpture Garden. This museum is now being built to house a collection of modern art which Hirshhorn, who comes to philanthropy by way of a career as an adventurer on the securities market, will donate. The propriety of naming the museum for Hirshhorn was again questioned, and the architectural plans for the museum, which some people believe will look like a huge gun turret, were criticized.

Despite these complaints, however, the subcommittee, chaired by Frank Thompson (D–N.J.), found in its review of the Smithsonian's activities more to praise than to criticize. After a meeting of the subcommittee on 14 August to outline a report on the hearings, Thompson told *Science*: "The tone of the report will not be critical. Rather, I think we'll be patting them on the back." He indicated that, while the various criticisms that have been made will not be overlooked, these have been "minor."

A member of the House Education and Labor Committee, Thompson has interested himself deeply in cultural affairs and was a sponsor of the legislation establishing the National Foundation on the Arts and the Humanities. Others on the subcommittee, such as John Brademas (D–Ind.), a Rhodes scholar who has made affairs of higher education one of his principal interests, also contribute to making this panel one which, from the Smithsonian's standpoint, is almost ideally constituted.

Thompson said that, chiefly, the subcommittee's report, along with its published hearings, will serve to provide Congress with an extensive review of the Smithsonian's history, its current activities, and its future plans. Included in the latter are plans for a big-dish radio telescope which would be the largest of its kind in the world and which would cost at least $39 million. The subcommittee is recommending an initial $2-million authorization for the

Corn Blight Threatens Crop

A new strain of fungus is blighting cornfields from Texas and Florida in the South to Minnesota and Wisconsin in the North. The extent of the damage will not be known until the September crop report is in, but Department of Agriculture officials have estimated that 10 percent or more of the field-corn crop may be destroyed.

The new strain of southern corn leaf blight, *Helminthosporium maydis*, attacks the leaves, stalk, and ears of the corn plants. George Irving, Administrator of the Agricultural Research Service, said there is no effective treatment for an infected field, but there is a fungicide which can be sprayed on corn to prevent development of the fungus. This fungicide, called Zineb, a carbamate, must be sprayed repeatedly to prevent growth of the fungus; the treatment is too expensive for use on field corn, Irving said. (Almost all of the corn grown in the United States is field corn, fed to dairy and beef cattle, hogs, and poultry.) The chemical is being used on fields of sweet corn, which is the kind people eat, and on seed corn. Agriculture Department officials said they were conducting no tests on the toxicity to humans of Zineb-treated corn. According to information from the Food and Drug Administration, Zineb has low toxicity. The FDA has set food tolerance levels for Zineb.

The best means of controlling the blackish-brown rot, according to Irving, is the use of resistant seed. The fungus attacks those plants that carry the *T* gene for male sterility, and about 70 to 90 percent of the corn hybrids grown in the United States have this gene. Seed companies plan to buy up disease-resistant seed if damage to the corn crop is extensive, and seed stocks may be multiplied by winter plantings in Latin America and Florida. The Agriculture Department plans to release two new strains of corn this fall, but seeds from these blight-resistant varieties will not be available in quantity to farmers until 1973 at the earliest. The department is also planning studies of the genetics of the fungus, sources of plant resistance, and the association between disease susceptibility and the *T* gene.

The fungus has been observed intermittently in the United States for many years. In 1969 the new, more virulent form was found in Illinois, and it was found in the 1969-70 winter crop in Florida. Southern corn leaf blight flourishes in a warm, moist climate; wind carries the spores, and moisture is needed for the spores to germinate. If the weather turns hot and dry the impact of the current blight may be blunted. Even if damage is extensive, some of the corn may be salvaged; recent feeding tests on cattle at agriculture experiment stations in the South have shown no toxic effects of the diseased corn. The effect of the fungus on the nutritional value of corn has not yet been determined, however.

Irving said the United States has some field corn stockpiled, less than a full year's supply, but the Agriculture Department does not plan to make decisions on measures such as restricting exports until the extent of the damage is known. Major producers of corn products, however, have already increased their prices for corn syrup and cornstarch, and the price of a bushel of corn has risen 26.5 cents since 7 August, to $1.56 as of 2 weeks ago. In trading corn futures, the bushel price rose 27 cents last week, to $1.53 for December. The prices of corn-fed animals may increase also.—NANCY GRUCHOW

selection, purchase, and preparation of a site for this facility, which probably would be built somewhere in the southwestern United States. A start on constructing the telescope, which would fill one of the long unmet needs of radio astrophysical research, is at least several years away.

In his testimony before the subcommittee, Ripley said that, on becoming secretary of the Smithsonian in 1964, he took advantage of new quarters that had been built for scholarly activities by expanding the professional research staff. The number of full-time professionals on this staff has increased from a total of 243 in 1965 to 310 today. Ripley said, moreover, that increased research support—in the form of technicians, greater opportunities for field investigations, and automatic data processing—has been provided.

In order to reduce the hazard of having an internal seniority system that might block initiative and convert scientists into permanent administrators, Ripley has had department chairmen serve in rotation from the ranks, and for limited terms. He also put an end both to prepublication review by the secretary of professional papers and to a burdensome requirement that each staff member report annually on his research. Henceforth professional accomplishment was to be evaluated by committees of peers established in the major research units.

Development of closer ties with academe was promoted by such means as encouraging staff members to teach at universities, allowing students and other investigators easy access to Smithsonian collections, and providing stipends for visiting scholars. In addition, an advisory council made up principally of academicians was set up to advise the institution on its policies bearing on research and higher education.

The Smithsonian's operating budget has been growing substantially, having increased from $46 million to $55 million over the past 3 years. Nevertheless, all of the institution's scientific programs are reportedly pinched for money. According to Sidney R. Galler, assistant secretary for science, especially is this true of the Museum of Natural History. Galler explains that this museum is, by law, required to function as a national repository for natural history collections. This means that it must accept all scientifically significant collections that are offered by universities and other institutions no longer financially able to maintain them. In part for this reason, the museum's curatorial responsibilities have been growing faster than its budget. And demands are placed on the museum not only by the scientists who use its collections but also by various federal agencies, from the Department of Agriculture to the F.B.I., seeking assistance in identifying specimens.

In the subcommittee hearings, Richard S. Cowan, director of the Museum of Natural History, described the museum's plight in detail. If the professional research staff of the Smithsonian as a whole is now much larger than ever before, the Museum of Natural History has not shared in this growth. Indeed, one of its major units, the Department of Vertebrate Zoology, actually has fewer scientists now than it had in 1967; and the museum's ratio of technicians to scientists is less than one to one. "Using highly trained, productive young scientists to do routine, repetitive chores is a gross misuse of

FDA Extends Ban on Cyclamates

On 14 August the Food and Drug Administration extended its ban on cyclamates, an artificial sweetener, to include all dietary foods and fruits. Cyclamates have been found to be a cancer-inducing drug in experimental animals. The FDA ban requires that all foods and drugs containing cyclamates be off the market as of 1 September 1970.

The decision is a reversal of a previous FDA ruling that would have permitted foods containing cyclamates to be sold to diabetics and dieters on a prescription basis after 1 September. The earlier ruling, which took effect in January, was based on the conclusion that, for some diabetics and dieters, use of cyclamates could be safe if the intake of the drug was limited to less than 780 milligrams per day.

On 14 August, however, the FDA's Medical Advisory Group on Cyclamates issued a report that reviewed the safety and efficacy of the drug. That report lowered the recommended safe daily dosage of cyclamates from 780 to 168 milligrams. The lower figure would be equivalent to the sweetening power of only 21 calories of sugar. The benefits from such a small caloric reduction would thus be negligible, and the Medical Advisory Group therefore recommended that all cyclamates be banned.

Hardest hit by the new ruling will be the canning industry. Robert L. Gibson, president of the California Canners and Growers Cooperative, the nation's leading packer of dietetic canned fruits, called the ruling a "severe blow." The cooperative now has about 3 million cases of canned fruits in its warehouses, which had been packed before the initial FDA ruling and which the industry had expected to sell as dietetic foods. According to industry spokesmen, the ruling will affect the sale of a total of about $31.5 million worth of canned fruits and foods.

The main alternative to cyclamates as an artificial sweetener is saccharin, which is 17 times as effective as cyclamates as a sweetener but which leaves a bitter aftertaste. Another possible substitute is a new combination of a dipeptide and an amino acid, which has been developed by G. D. Searle & Company of Chicago. The drug is not yet on the market, however, and there are still several tests to be conducted on it.

Since its original ruling of last January, the FDA has come under increased pressure from the Congress and consumer groups to extend its ban on cyclamates. At the same time, the food and canning industries have opposed the extended ban, citing the fact that no instances of cyclamate-induced cancer in humans have been reported. The FDA made its decision on the basis of tests conducted by the Abbott Laboratories which showed that cyclamates can produce cancer in rats. Under the law, the FDA must prohibit the use of any drug which has been shown to be harmful to animals even when there is no evidence that it is harmful to humans. The Medical Advisory Group did not recommend tests of cyclamates on humans, stating that the potential risks of such tests outweighed the possible benefits.—T.P.S.

scarce talents if not a criminal mismanagement of human resources," Cowan said. The $460-a-year travel allowance and $200-a-year supplies-and-equipment budget for each staff scientist would not satisfy the needs even of many graduate students, he added.

Galler points out that the funds appropriated for the museum have been substantially less than the amounts requested. Last year's appropriation, for instance, was about half a million below what was asked. "Our problem is that we are dealing in the executive branch [Bureau of the Budget] and in the Congress with practical-minded, problem-oriented people who think of taxonomists and systematists as guys with green eyeshades or with pith helmets and butterfly nets," Galler said. "They don't realize that [in order to cope with environmental problems] baseline data are essential and that those data are derived through taxonomic and systematics research in the national collections."

As Cowan has noted, by studying the national collections, researchers can determine such things as the natural radiation levels found in planktonic organisms collected before nuclear weapons tests, the load of metallic compounds carried by organisms before air pollution reached its present levels, and the biochemical makeup of organisms collected before DDT and other persistent pesticides came into use.

In past testimony before congressional committees the top Smithsonian officials, while not overlooking needs of the Museum of Natural History, apparently failed to emphasize them. The message given to the Thompson subcommittee was more pointed. The subcommittee's report on the hearings, which is due to appear in September, will call for more ample federal funding for the museum. It may also, however, reflect the belief of subcommittee members that Smithsonian officials should have given the museum higher priority in seeking funds and in allocating those that have been available. Yet the hearings, while broad in scope, were not deeply probing; the record is deficient with respect to how the institution sets its priorities. But certainly some scientists at the museum resent the fact that a number of new Smithsonian programs have been started in recent years while their own programs were financially undernourished.

All told, this seems a propitious time for the Smithsonian's affairs to receive the attention of a group such as the Thompson subcommittee. For the institution to be held more closely to account for its policies and priorities would be healthy. And by advising the appropriations committees and the Congress on the Smithsonian's needs, the subcommittee may serve as a quietly effective in-House lobby.

—LUTHER J. CARTER

RECENT DEATHS

Robert W. Buxton, 60; chairman, surgery department, University of Maryland School of Medicine; 14 August.

Hugh D. Duncan, 60; professor of sociology, Southern Illinois University; 8 August.

Morton Hamburger, 60; senior member, Cincinnati University College of Medicine; 29 July.

Douglas G. Haring, 76; professor emeritus of anthropology, Syracuse University; 25 August.

William A. Hilton, 91; professor emeritus of zoology, Pomona College, California; 10 August.

Louis B. Hoisington, 87; professor emeritus of psychology, University of Oklahoma; 21 July.

Edgar Huenekens, 84; professor emeritus of pediatrics, University of Minnesota; 23 July.

Muriel M. Hunt, 73; founder, Boston School of Dental Nursing and Mechanical Dentistry; 6 July.

Warren C. Hunter, 75; former chairman, pathology department, University of Oregon; 6 July.

James H. Johnson, 79; former vice president, Virginia State College; 15 July.

Elmer T. Jones, 78; retired entomologist, U.S. Department of Agriculture; 25 July.

Ernest V. Jones, 88; professor emeritus of chemistry, Birmingham–Southern College, 21 July.

Kenneth E. Kellogg, 59; professor of physiology and biophysics, Loma Linda University School of Medicine; 19 July.

Hayward Keniston, 87; former dean, University of Michigan College of Literature, Science and the Arts; 10 August.

William E. Keppler, Jr., 48; extension professor of forestry, North Carolina State University; 2 July.

Otakar Machotka, 70; professor of sociology, State University of New York, Binghamton; 29 July.

Vladi Marmo, 55; director, Geological Survey of Finland; 23 August 1969.

Arnaud C. Marts, 82; former president, Bucknell University; 11 July.

William R. Mickelsen, 47; professor of mechanical engineering, Case Western Reserve University; 27 June.

L. Wallace Miller, 67; professor emeritus of natural science, Chico State College, California; 6 May.

Natalie J. Moir, 55; anthropologist, New York University School of Continuing Education; 19 August.

Hans Molitor, 74; founder and first director, Merck Institute for Therapeutic Research; 5 August.

Rouvime Poliakoff, 90; former professor of engineering, Moscow Technical Institute; 30 July.

Max Reiss, 70; director of research, neuroendocrine research unit, Willowbrook State School, New York; 27 July.

Shawn Schapiro, 45; associate research physiologist, University of California, Los Angeles; 9 August.

Milner B. Schaefer, 57; director, Marine Resources Institute, Scripps Institution of Oceanography; 26 July.

Anthony J. Scullen, 80; former dean, School of Engineering and Architecture, Catholic University; 8 July.

James Simsarian, 63; retired chief, international scientific and technical affairs division, Bureau of International Organization Affairs, U.S. State Department; 24 July.

Benjamin Sullivan, 55; professor of psychology, University of Wisconsin, Milwaukee; 30 June.

Theodore T. Tsaltas, 46; professor of pathology, Thomas Jefferson University Medical College; 15 August.

Otto Warburg, 86; Nobel prize-winning biochemist and cancer researcher; 1 August.

Bernal R. Weimer, 75; former professor of biology, Bethany College; 19 July.

Theodore P. Wright, 75; retired vice president for research, Cornell University; 21 August.

William W. Zorbach, 53; professor of chemistry, Michigan Technological University; 28 June.

Erratum: In "Global energy balance" by D. A. Berkowitz (31 July, page 426), line 19, column 3 should read: "2.7×10^{-2} watt/m^2 of land area."

Erratum: The second sentence of the cover legend (24 July, page 313) should have read "Mercury, whose apparent diameter is about 1/160 that of the sun, . . ."

Erratum: In "L-Dopa: effect on concentrations of dopamine, norepinephrine, and serotonin in brains of mice" by G. M. Everett and J. W. Borcherding (15 May, p. 849), a reference [G. Bartholini, M. DaPrada, A. Pletscher, *J. Pharm. Pharmacol.* **20**, 228 (1968)] should be added to the first complete sentence on page 850.