riculum in the primary schools, the council has cooperated with the Nuffield Foundation which has played the same role, if on a more modest scale, as the National Science Foundation in the United States.

Projects on science and mathematics are still in the relatively early stages, but these projects (which are coordinated) emphasize the so-called "discovery" approach to learning. Stress is on more informal class organizations and on new materials that encourage children to take initiative in learning. As in the United States, a mathematical rather than arithmetical approach is being evolved. In science, which formerly meant nature study, concepts relevant to the physical sciences are being introduced by simple experiments, such as those involving insulation and conductivity.

The transition is in a fairly early stage and most schools seem to be operating with eclectic mixtures of old and new attitudes and techniques. The forces of change gained impetus this year, however, from the publication of "Children and Their Primary Schools," a report of the Central Advisory Council for Education in England of which Lady Bridget Plowden is chairman. The Plowden report makes the "progressive" case in detail and with some eloquence. Like the Conant report on the American high school in the later 1950's the Plowden report argues that the best schools should be emulated by the rest.

It is clear that the committee conceives of educational reform as a social corrective. A major recommendation of the report was that "educational priority areas" be created. The report asks that, as a matter of national policy, schools in areas where children are most seriously handicapped by home and neighborhood conditions be made "as good as the best in the country." This means "positive discrimination," such as limiting class size to 30, providing a teacher's aide for every two classes, and a salary supplement of £120 for the teachers.

Though some Plowden recommendations, such as those urging that corporal punishment be outlawed and that the age of transition from primary to secondary education be raised from 11 to 12, apply specifically to the British situation, many of the other 200-odd recommendations confirm that reform in Britain and the United States is moving on parallel lines. Dominant themes are that instruction should be based on results of current research in child development and learning theory, that the school should be made more responsive to the community, and that compensatory education should be extended in order to avoid waste of human resources.

The Plowden report is the latest of a series of ambitious reports on education at every level in Britain, and the series is soon to be rounded out with a report on the public schools. The latter is expected to suggest how that privileged sector can be related more closely to the total education system. The Plowden design for primary education has gained wide acceptance. That it will be implemented as an earlier design for universities was implemented is now thought unlikely. Change in primary education is a slow process because of the size of the enterprise, the fragmentation of authority, the fundamental conservatism of educators, and the matter of money. Not only are the pressures that brought devaluation of the pound squeezing public expenditures, but primary schools must compete for education funds at a time when universities are expanding. The government is deeply concerned with its controversial program of conversion to comprehensive secondary schools which will be discussed in another article.

Secretary of State for Education and Science, Patrick Gordon Walker, in mid-November made an interim statement, on progress on the Plowden report, which left its partisans far from overjoyed. Some £16 million have been earmarked for replacing the worst school buildings, but these funds are merely to be diverted from money already allocated. Apart from increasing "flexibility" by allowing children who enter primary school to attend part time and by announcing an inquiry into the system of teacher training, no major steps are in immediate prospect.

In some ways, the situation directly parallels that in the United States where cuts in poverty funds have limited efforts to expand programs of the headstart variety. Race in the United States and class in Britain generate variants of the same problem. In both countries, while reformers have succeeded in getting their principles embodied in government policies, they have yet to gain effective support of the middle class for paying the stiff costs of social reform through the education system.—JOHN WALSH

NIH: As the Time Approaches for Shannon's Retirement

Next September, 1 month after reaching age 64, James A. Shannon will be at the mandatory retirement age for Public Health Service officers. Barring a Presidential waiver, which does not appear to be in the offing and which he neither seeks nor wants, Shannon will accordingly step down as director of the National Institutes of Health, a position which he has held since 1955.

The imminence of a change in the directorship of so large and powerful an agency as NIH would normally evoke considerable speculation and controversy. But biomedical politics is extraordinarily astir with speculation and controversy over the Shannon succession. For the vacancy—for which there is no successor yet named nor any candidate visibly in the lead—impends at a time when great decisions are brewing on the federal role in health affairs, and there is no doubt that Shannon's successor will be in a position to play a major role in helping to determine those decisions. It can also be said that, when Shannon leaves the federal service, the last of the postwar giants will be gone from the relationship between science and government. For, to the extent that any major government enterprise can be considered the work of one man, the billion-dollar-a-year National Institutes of Health is the work of James A. Shannon.

Though NIH is situated inside the Department of Health, Education, and Welfare as an appendage of the tradition-encrusted Public Health Service, Shannon cultivated direct, close, and fruitful alliances with the U.S. Con-

Leaders in the Federal Health Role: During a recent visit to the White House, left to right, William H. Stewart, Surgeon General; Philip R. Lee, Assistant HEW Secretary for Health and Scientific Affairs; James A. Shannon, NIH Director, and John Gardner, HEW Secretary.

gress. And, as a result, he and his colleagues ran and expanded NIH with a degree of sovereignty probably unmatched by any other subdivision of government. The personal element in NIH's fortunes was, in fact, singled out for admiring and apprehensive notice in 1965 when a White House study panel, chaired by Dean Wooldridge, observed that, though run "wisely and well in the public interest . . . an activity of the scope and importance of NIH should not be dependent on the unusual qualities of a few individuals to compensate for its own built-in inadequacies." The study, titled, "Biomedical Science and its Administration," was in large part evoked by congressional criticism of NIH's rapid growth and managerial techniques. Since then these criticisms have been intensified (*Science*, 3 November), and the turbulence has been further compounded by a variety of doubts, some expressed by President Johnson himself, concerning the linkage between biomedical research and the delivery of bedside medical services. Stated oversimply, in the debate over the government's health activities there are, at one extreme, those who contend that NIH, under Shannon, has evolved into an organization that is concerned with science rather than with sick people and, at the other pole, those who contend that the first view is preposterous —that basic science, as supported and conducted by NIH, is the *sine qua non* of the therapies that are impatiently called for by the advocates of improved medical services. In any case, there is no doubt that Shannon has skillfully orchestrated and pacified a most diverse and unruly constituency. Under the guise of research, he got federal money into the financially collapsing medical schools of the nation at a time when Congress and the American Medical Association viewed federal aid to education as felonious. In alliance with voluntary health organizations, he emphasized disease and pills in his relations with Congress, while, at the same time, emphasizing free and unprogrammed basic research in his relations with the scientific community. And, at NIH headquarters in Bethesda, Maryland, he built up a research operation of such quality and vigor that researchers and visitors there have been known to remark that NIH is different, that it really isn't like a government research establishment. This is unfair to the other oases of scientific quality that exist in the federal service, but there is no denying that NIH has managed to escape and soar beyond the intellectual deadness that afflicts many research centers, in or out of government. So, with Shannon's departure date less than 10 months off, and no replacement yet identified, there is considerable interest in the process that will govern the selection, as well as in the rumored candidates for the job.

As for the process, it is relatively simple, on the face of it, but, as is the case with any job that involves relations with a diverse, powerful constituency, a simple selection process can overlie quite complex dealings and calculations. The law specifies that the appointment is a two-step affair—nomination by the Surgeon General and approval by the Secretary of HEW. Now, it is said to be Shannon's view that his successor, regardless of who he may be, should be appointed at once —in fact, should have been appointed a few months ago—so that there will be considerable overlap in service of the departing and arriving directors, especially for the preparation of the fiscal 1969 budget. However, the view of Surgeon General Stewart, expressed in an interview with *Science*, is that "if we are getting the kind of person I think we're getting, an apprenticeship is not required." The selection, he says, will, therefore, be announced "in the spring." Does this suggest that the nominee is already on board at NIH, or, perhaps, that Stewart has no taste for a Shannon-run indoctrination period for the new director? Stewart does not say. The appointment, he states, should not be made until HEW carries out a reorganization plan that is now in the works. Central to this plan, as far as the health area is concerned, was a proposal to establish a post of undersecretary of health. Into the scene, however, there came NIH's long-standing critic, Representative L. H. Fountain (D–N.C.), who on 9 November wrote to the House Committee on Interstate and Foreign Commerce to protest a Senate-passed amendment that would have included a health undersecretaryship in the so-called Partnership for Health Bill. Fountain took the position that Congress should review any HEW reorganization plan, and, further, that possibly Congress should strengthen the Office of the Surgeon General rather than provide HEW with still another administrative layer. Last week, following references in floor debate to opposition to the undersecretaryship, the authorization for this position was knocked out in conference. The reorganization may proceed, but without the undersecretaryship.

What, if any, effect this has on Stewart's timetable for selecting Shannon's successor is not clear, but it is not likely that the selection process, as explained by Stewart, will be affected. Stewart described this process as follows. He spent the year prior to last spring soliciting advice on the cri-

teria for the directorship and collecting names, about 100 of them, from acquaintances throughout the biomedical community. The criteria, Stewart said, turned out to be fairly consistent: the new director should be acceptable to the scientific community; should be a relatively young man—rather than an "elder statesman," should probably have an M.D.; and "ought to have the sense of how big organizations are run and how decisions are made." Then, he explained, he sought the counsel of three persons: Michael E. DeBakey, the distinguished heart surgeon from Texas, who is a longtime health adviser to the government; Colin M. MacLeod, former deputy director of the Office of Science and Technology, who is now vice president for medical affairs at the Commonwealth Fund; and Robert W. Berliner, director of intramural research at the National Heart Institute. After eliminating all persons over age 65 on the list, Stewart said, he and his advisers further reduced the list and ended up with "10 to 15 most likely candidates." Stewart said that he has interviewed, or plans to interview, all of them, and that, within a few months, he plans to give Secretary Gardner a list of "3 or 4, but with my own choice clearly identified."

As for who these candidates are, Stewart will not say, and seems to enjoy presiding over the riddle of the Shannon succession. A frequent guess is Ivan Bennett, MacLeod's successor at OST, but that is no more than a guess. Also mentioned is DeBakey, but he has reportedly taken himself out of the running, and besides, there is an anecdote making the rounds which suggests that Gardner chooses to look elsewhere. As the story goes, President Johnson, at a recent meeting with various administration officials with academic backgrounds, remarked to Gardner that he had a perfect successor for Shannon—DeBakey. Gardner was reportedly noncommittal, and the next day, it is reported, Johnson asked a White House aide to assess the origin of the Secretary's apparent coolness. Subsequent to this, DeBakey is said to have eliminated himself.

Also mentioned is Frederick L. Stone, director of the National Institute of General Medical Sciences. And then, in the prevailing speculations many others are mentioned, ranging from seemingly very likely candidates to some who seem so remote from serious consideration that it appears the speculators are doing little more than pulling names out of the phone book. For those who are concerned abut the future of NIH, there is, nevertheless, a major ground for optimism. However the administration's Vietnam performances may depress many segments of the scientific and academic communities, there is no doubt that Johnson is dedicated to the promotion of good health for the nation, and even many of his most violent critics concede that he can rarely be faulted on the quality of his domestic appointments. But as time draws close for Shannon's departure, that still tells us very little about his successor.

—D. S. GREENBERG

APPOINTMENTS

J. A. Jacobs, head, department of geophysics and director, Institute of Earth Sciences, University of British Columbia, Vancouver, to Killam Memorial professor of science, University of Alberta, Edmonton. . . . **Miroslav Synek**, associate professor of physics, De Paul University, to professor of physics, Texas Christian University and **C. A. Quarles**, physics staff, Brookhaven National Laboratory, to assistant professor of physics, Texas Christian University. . . . **Joseph D. Novak**, associate professor of biology and education, department of biological sciences, Purdue University, to professor of science education, Cornell University. . . . **Bruno Sachs**, chief project engineer, Doehler-Jarvis Division, National Lead Company, to an additional post of adjunct professor of mechanical engineering, University of Toledo. . . .

RECENT DEATHS

Thomas G. Andrews, 52; former chairman of the department of psychology, University of Maryland; 4 November.

George W. Burpee, 83; past president of Consulting Engineers; 7 November.

Damon V. Catron, 52; chairman of the department of nutrition and food science, College of Agriculture, University of Missouri at Columbia; 4 November.

Rufus E. Clement, 67; president of Atlanta University; 7 November.

James D. Coronios, 64; retired professor of psychology, St. Lawrence University; 28 October.

Casimir Funk, 83; pioneer in vitamin research, president of the Funk Foundation Research Laboratory, and resident consultant for the U.S. Vitamin Corporation; 19 November.

Joseph J. Graham, 58; professor of paleontology, School of Mineral Science, Stanford University; 15 November.

Matthew Luckiesh, 84; director of the lamp division, lighting research laboratory, General Electric; 2 November.

Elmer V. McCollum, 88; professor emeritus of biochemistry, School of Hygiene and Public Health, Johns Hopkins University, and discoverer of vitamins A, B, and D; 15 November.

Bayne M. Norton, 64; Bowler professor of chemistry, Kenyon College; 27 October.

John R. Overman, 45; associate director for collaborative research, National Institute of Allergy and Infectious Diseases; 6 November.

William S. Pott, 74; former president of Elmira College, New York; 7 November.

James A. Reyniers, 59; director of the Germfree Life Research Center, Florida, and founder and former director of Lobund Institute, University of Notre Dame; 3 November.

M. E. Rose, 56; Robert E. Taylor professor of physics, University of Virginia; 10 November.

Rudolph G. Schmieder, 69; associate professor emeritus of biology, University of Pennsylvania; 23 August.

Dwight L. Scoles, 83; professor emeritus of chemistry, Albright College, Pennsylvania; 7 November.

Emanuel Singer, 81; founder of the American College of Chest Physicians; 5 November.

John Tee-Van, 70; retired general director of the Bronx Zoo and the Coney Island Aquarium; 5 November.

Maurice J. Thomas, 65; chairman of the department of educational administration, University of Pittsburgh; 4 November.

Frank L. Weaver, 76; retired head of the Federal Power Commission's river basin division; 12 November.

Erratum: Because of a typographical error, the appointment of George W. Fischer (Appointments, 17 November, p. 895) was in error. The correct information is: George W. Fischer, director of resident instruction of the College of Agriculture, Washington State University, to the University of Washington as executive director of the Eleventh International Botanical Congress which will be held on the university campus in 1969. He will hold the title of professor of botany.