lenge examination in the practitioner's specialty.

► The U.S. should produce enough physicians to meet its own needs instead of relying heavily on some 40,000 foreign-trained physicians who currently comprise 14 percent of the active physicians in this coutry. The U.S. should also help other countries improve their systems of medical education and health care.

► Foreign-trained physicians who have responsibility for patient care in this country should pass tests equivalent to those for graduates of U.S. medical schools.

► The production of physicians should be increased by substantially expanding existing medical schools and building new ones. Paradoxically, the doctor shortage is worsening even though the ratio of physicians to population is improving. This is because various demands cut into the amount of time available for direct doctor-patient contact.

► Universities should supervise the formal education of all health professionals, including such graduate training as internships and residencies, in order to eliminate the present "uncoordinated" system in which as many as five different groups may be involved in educating a single individual.

► Programs for health care of the disadvantaged should be given highest priority.

► Health-insurance organizations should provide coverage of outpatient as well as inpatient health services so that patients and doctors will no longer be inclined to choose hospitalization when less costly outpatient services would do as well.

► Highest priority should be given to development of methods that will assure easy access to adequate health care, possibly by giving a community health organization or a single ombudsman-like individual responsibility for assuring access.

► Though the commission stopped short of recommending extension of prepaid-group-practice arrangements, it spoke favorably of such plans, particularly of the Kaiser Foundation Health Plan in California, which delivers "high quality medical care for 20–30 per cent less than the cost of comparable care obtained outside the plan."

None of the commission's suggestions is new in the sense that it has never been proposed before. The significance of this report is that, for the first time, an influential, highly visible group has taken up suggestions previously espoused by occasional lonely voices. Says Philip R. Lee, assistant secretary for health and scientific affairs in the Department of Health, Education, and Welfare: "The recommendations are far more radical than anything that has been proposed by presidential commissions or other formal advisory groups that I'm aware of."

The proposals are bound to provoke opposition. Hospitals that have enjoyed an easy cost-plus world are not apt to clamor for change. Many doctors may balk at judging their peers or at being judged in return. And government officials who fought 20 years to enact Medicare are said to be "tired" and reluctant to jeopardize their programs by upending current payment schemes. Moreover, various government agencies have a vested interest in torpedoing specific recommendations. The military, for example, probably won't like a suggestion that it stop using Selective Service procedures to procure doctors to care for military dependents and retired personnel residing in this country. Nor would the Public Health Service, which now serves as a substitute for the military obligation of health professionals, enjoy losing this status. The proposals could easily get bogged down in years of squabbling, but the commission warns that "time is short." Chairman Miller told a press conference that the nation had "problems to solve" until the early 1960's—now it has "catastrophes to prevent."

—PHILIP M. BOFFEY

Education Reform: Britain Tries It Top to Bottom

London. As if taking a text from Darwin, the Victorians made competitive examinations the basis of a system of selection that has shaped British society for a century. Admission to a university depends on the aspirant's success in a sequence of national examinations. A university graduate's career prospects can be profoundly influenced by the class of degree he earns in the formidable final exams. But perhaps the most crucial tests of all have been taken by children in England and Wales at the age of about 11. The so-called 11-plus examinations have determined whether the child in the state school system will join the minority getting the academic schooling that will enable him to compete at all for a university place.

The 11-plus examination is on the way out in Britain, and its passing signals the cresting of a wave of reform and reorganization that is affecting British education at every level. Behind these efforts at reform are an equalitarian attack on the class bias of the education system and a practical realization that the system is failing to meet the needs of a modern industrial society.

Since the war, the British have had the daunting experience of rapidly expanding university capacity and of spending more than their Western European competitors on research only to see themselves outdistanced in rate of economic growth. Disturbingly, there are empty places for scientists, engineers, and technologists in Britain's otherwise overcrowded universities, and the proportion of secondary-school students interested in science has declined.

Faith in the simple formula that spending on technical education and research brings economic felicity has proved naive, and the British have been compelled to inquire into questions of management, professional values, and social attitudes. One of the results, reinforced by acceptance of the post-Freudian principle that early influences on the individual are decisive, has been a rise in sentiment for reform of primary education, which, in Britain, covers the ages 5 to 11.

The mechanics of reform in Britain are dictated by the structure of an educational system that is neither as centralized as the French and most other

continental systems nor as thoroughgoing in its delegation of authority by the national government as the American.

Schools are operated by more than 160 local education authorities in England and Wales. Primary and secondary education is financed almost entirely through local taxes. The local education authorities also provide training colleges for teachers, who normally take 3 years to qualify.

National control is exercised through the Department of Education and Science. The department's primary instrument of authority is its power to set national priorities and to control spending by approving or rejecting local proposals for building. It also seeks and administers legislation, such as that which sets the years for compulsory school attendance. These are now between the ages 5 and 15, and the minimum school-leaving age is scheduled to rise to 16 in 1970. Sometimes school laws, in effect, set goals rather than enforceable standards. The statutory maximums on class size are 40 for primary schools and 30 for secondary schools, but these levels are exceeded in many schools.

In the field, the traditional arm of the department has been Her Majesty's Inspectors of Schools, who have oversight of all schools, public and private. In the past, the best-known function of the inspectors has been the carrying out of "general inspections" of the schools and reporting of results to the department school managers and local education authorities. The HMI's are changing along with the schools. Many are specialists in curriculum, administration, or buildings and act primarily in the role of adviser. One veteran teacher remarked that the HMI's seem "much more human" these days. He recalls that, immediately after World War II and on his second day of teaching, an inspector turned up and "shot me down in front of the class."

The powers of the department are limited, however, by the principle of local autonomy. It is accepted, for example, that the headmaster and his staff shall have control over the curriculum and teaching methods in their school. They usually operate with considerably more freedom from influence from local school authorities and parents than would be the case in the United States.

In practice, this local autonomy means that many schools have yet to unburden themselves of the heavy legacy of the past. Whatever the hopes of

NEWS IN BRIEF

• **NATIONAL PARK BILLS**: The Senate has approved bills calling for the creation of a 61,000-acre Redwood National Park in northern California and a 504,500-acre North Cascades National Park in Washington State. The redwoods measure was approved by a 77- to 6-vote margin after an amendment was defeated that would have deleted a land-exchange provision from the bill. The Cascades bill was passed by a voice vote. In addition to the park, it calls for the creation of a half-million acre wilderness area adjacent to the park and a 105,000-acre national recreation area. Both bills now go to the House where they are expected to encounter stiff opposition. No action is anticipated on either bill in the House this session.

• **CHEMISTS' STARTING SALARIES**: Starting salaries for 1967 graduates in chemistry and chemical engineering averaged 7.4 percent higher than those received by 1966 graduates, according to the American Chemical Society. Beginning monthly pay for chemists with bachelor's degrees was $650, the society indicated, while chemists with master's degrees started at $775 and inexperienced chemists with Ph.D.'s received $1075.

• **HEAD START MEDICAL PROGRAM**: The American Academy of Pediatrics (AAP) will direct a consultation program in 2000 U.S. communities to supplement local medical programs of the Head Start child development project. A joint announcement by the academy and Sargent Shriver, director of the Office of Economic Opportunity which runs the Head Start program, said the AAP will begin by evaluating "the medical aspects of the Head Start program at the state and local level."

• **GHETTO STUDY**: A study of Negro youths has been given a $150,000 continuation grant by the U.S. Office of Education. The grant will support the third year of a 5-year study that the Harvard Graduate School of Education is conducting in the Roxbury section of Boston to trace the evolution of values, self-esteem, and career aspiration of Negro boys. A comparative study of white boys living in poverty areas near Boston is planned in an attempt to distinguish between the attitudes that arise from economic deprivation and those that are due to discrimination. Data will also be gathered about teenaged boys in Barbados, an underdeveloped, predominantly Negro society in the Caribbean. Robert Alan Rosenthal, lecturer and research associate in education, heads the study.

• **COLUMBIA'S HARLEM PROJECT**: Columbia University has announced a $2.7-million project as the first phase of a long-term project aimed at alleviating urban and minority group problems. Funds for the project were provided by a $10-million urban-minority grant from the Ford Foundation and will be used to improve the educational, housing, health, employment, and cultural conditions in Harlem. To coordinate the program, the university has created a Center on Urban-Minority Affairs which will be temporarily headed by Clarence Walton who was chairman of a five-man committee that drew up plans for the program.

• **POLLUTION TRAINING INDUCEMENTS**: The State of New Jersey is recruiting future pollution specialists at the high school level. Under the state's Clean Air and Water Scholarship and Intern Law that became effective 15 June, college students who major in fields related to air or water pollution may receive up to $3600 a year. The funds, which are available for a 4-year period, provide for room, board, and tuition. In return, the students must agree to work for the state during summer vacations and for 3 years following graduation.

• **ANOTHER BRAIN DRAIN STUDY**: A study of the migration of scientific and medical personnel from underdeveloped countries to the United States has been announced by the Adlai Stevenson Institute of International Affairs, an autonomous educational foundation. A 20-member study group will meet five times during the year in the institute's headquarters on the University of Chicago campus to examine trends and problems in several specialized areas including neurosurgery, nuclear reactor technology, computer sciences, pediatrics, and business administration. Cochairman of the group are Congressman John Brademas (D–Ind.) and Senator Walter F. Mondale (D–Minn.).

Aldabra: Reprieve for an Island

London. The scientifically valuable flora and fauna of Aldabra have a new lease on life. In the devaluation debate last week Prime Minister Harold Wilson told the House of Commons that Britain will not go ahead with plans to make the Indian Ocean atoll a military staging post. Biologists have argued that the Anglo-American project to develop the atoll with a jet landing strip and berthing facilities for ships would destroy a unique ecology (*Science*, 18 August). Because of its isolation (400 kilometers northwest of Madagascar) and its relative freedom from human intrusion, Aldabra is regarded as a natural laboratory for evolution studies, comparable to the Galapagos. The island is best known as the last habitat of a species of giant land tortoise and of an indigenous flightless rail. The Prime Minister's announcement on Aldabra is viewed here as a reprieve. The phrasing was, "We have decided not to proceed with the Aldabra project."

Government plans for reducing public spending following devaluation seem to be far from complete, and the fate of Aldabra is tied up with Britain's "East-of-Suez" policy. Withdrawal of British troops and aircraft from bases in Malaysia and Singapore has been planned for the middle 1970's. Britain, however, has a defense treaty with Malaysia, which entails a British capacity to bring troops rapidly to the area if necessary. Defense planners in Britain and the United States nominated Aldabra as a staging point on the most satisfactory route from Britain. The Defense Ministry has said that other islands in the Indian Ocean have been examined as alternatives and dismissed as unsuitable. Reconsideration of the Aldabra project therefore cannot be ruled out. The active "Save Aldabra" lobby here nevertheless is understandably pleased with developments. Preservationists admit that it is not clear whether the decision represents a postponement for budgetary reasons or action influenced by a recent scientific furor. There is no question, however, that a spirited campaign to make a public issue of Aldabra has been successful. The Royal Society's initiative rallied support among scientists and conservationists, and Aldabra has been the subject of a stream of articles and letters in the serious press. Credit is given Smithsonian and National Academy of Sciences officials in the United States for remonstrating with American defense authorities. The announcement in the House of Commons, according to the *Guardian*, was greeted with "loud laughter and prolonged ministerial cheers." This reaction was largely due to Tam Dalyell, a Labor Party member from a Scottish constituency, who fought an energetic battle for Aldabra in the Commons. Dalyell admits to interests in conservation and ornithology. He also has a reputation for asking awkward parliamentary questions on sensitive subjects. He was obviously well primed with relevant information and harried the Ministers with queries on points ranging from danger to aircraft from Aldabra's hovering frigate birds to the reliability of government estimates of costs of building runways on the atoll's honeycombed coral. Dalyell also carried on a lively correspondence with like-minded officials in the U.S. Government. Following the Government announcement, the feeling here is that plans for research on the island should be made immediately. A summer expedition left six people working on Aldabra. A relief party is scheduled to visit the island at Christmas, and replacements for the six will remain on the atoll until the rainy season begins, in March. The Royal Society is taking the lead in talks about long-term research plans. One suggestion is that the Darwin Foundation, which supports a small science station on the Galapagos, might serve as a model for Aldabra. The form of action is still unclear, but it is hoped here that research on Aldabra, like the effort to preserve it, will be a transatlantic affair.—JOHN WALSH

the 19th century reformers, British public education in its formative period was a no-nonsense effort designed to provide the lower orders with the learning they needed to become agricultural laborers, factory workers, and clerks. A minority of brighter children was schooled to enter grammar schools, the publicly supported secondary schools modeled on the contrarily named public schools. Until World War II compulsory education lasted only until age 12, and most children left school then. Many British school buildings are survivors of this epoch, particularly those in villages and in the decaying centers of cities where, as in the United States, the slum becomes the ghetto. Forms of the past live on in the school uniforms, in teachers being addressed not by surnames but as "Miss" and "Sir," and in a kind of discipline that can escalate from the "telling off" to the use of the cane.

British primary schools at present are a study in vivid contrasts. Wide differences are to be found between schools controlled by one education authority and another, and often between two schools controlled by the same authority. It is not uncommon to find "progressives" and "conservatives" in the same school. As a result of all this, it is hazardous to generalize about the extent of educational change in the primary schools.

The direction of change, however, is much less a matter for conjecture. Formerly, the spread of new ideas in the schools depended primarily on contacts among teachers. Now, HMI's and county borough advisers, occupying roughly the same positions as supervisors in American school systems, act as missionaries for new curriculum and teaching methods. And educational television programs for pupils and for teachers, broadcast in off-hours over the regular BBC, and commercial TV networks help to spread the message. Some observers say, however, that the new methods have not been proved by adequate research and that such research has not been sufficiently encouraged or financed.

A national Schools Council for Curriculum and Examinations was formed in 1964 specifically to organize change more quickly. All sectors of education are represented on the council, but in its curriculum projects it has, like the new wave of curriculum reformers in the United States, taken pains to involve classroom teachers every step of the way. In its efforts to renovate the cur-

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-