tions now consuming such resources at a prodigious rate. The concept of an "optimum" level of population, which is implied in the recommendations of the Cloud committee, is an elusive one, however, for the optimum presumably would depend on the distribution as well as the size of the population and on a number of other variables, such as waste-control practices and the state of the technologies affecting the production and consumption of food and other resources.

Two Yale sociologists testifying before the Reuss subcommittee, Lincoln and Alice Day, said that if the present U.S. birth rate is to be reduced without resort to coercive restraints on family size (such as through economic sanctions or involuntary sterilization), much effort must be devoted to establishing social conditions conducive to the two-child family. For one thing, they said, the present "pervasive emphasis . . . on marriage as the only 'normal' adult status and on childbearing as a lifetime career for women" should be abandoned.

Also, in the Days' view, in order to give married women better opportunity for other satisfying activities besides childbearing, there should be more child-care facilities, more attractive part-time jobs, and public transportation facilities allowing easy, inexpensive movement between the home and centers of education and employment. The Days indicated, too, that a social system that allowed older people to lead more satisfying, independent, and dignified lives would mean that they would have less reason, when younger, to rear large families as a form of old-age social and economic security.

Preston Cloud also offered some provocative recommendations for reducing the birth rate. Among these were proposals that the Congress and the President exhort, by formal declaration, all American couples to have no more than two children; that tax and welfare laws be redrafted to discourage the bearing of children after the second; that legal restraints on homosexual unions between consenting adults be repealed; and that abortions be legalized for all women desiring them and be performed free for indigents.

One imagines with difficulty President Nixon's ever presenting such a birth control package in a fireside chat with the American people. Yet, the rapid change in attitude over the past decade, at the White House and in Congress, about birth control should give encouragement to Cloud and other advocates of strong remedies. As the birth control issue has now evolved, becoming increasingly a question of broad social concern, less and less is heard of considerations once regarded by many as paramount. For instance, on this issue, Pope Paul VI, whose encyclical "Of Human Life" was issued little more than a year ago, is already becoming, in the United States at least, the forgotten man.

Indeed, some advocates of birth control, such as Garrett Hardin, a biologist at the University of California at Santa Barbara, now speak boldly of eliminating "compulsory pregnancy"—that is, by allowing abortions on request. And it is true, in fact, that about one-fifth of the states have liberalized their abortion laws in the last few years, at least to the extent that no longer is an abortion allowed only in cases where continuing the pregnancy poses a threat to the woman's life. Furthermore, the California Supreme Court recently overturned the conviction of a physician who had referred an unmarried woman to an abortionist, partly on the grounds that a woman has a "fundamental right to choose whether to bear children."

Just how much concern the American public feels about mounting population pressures, on U.S. social institutions and on the environment, is a matter of conjecture. Judith Blake Davis, a demographer at the University of California at Berkeley and a witness before the Reuss subcommittee, says of the public at large that it is "still under the impression that children are glorious, and the more the merrier" and that the idea of a growing population producing a deteriorating environment is not one that generally figures in the calculus of the average American. The sudden interest within Congress and among the conservation groups in birth control suggests, however, that complacency is coming to be replaced with growing alarm.—LUTHER J. CARTER

Medical Schools: At the Center, the Problem Is Unreimbursed Costs

In July, President Nixon warned of a "massive crisis" in health care and said that "unless action is taken both administratively and legislatively in the next two or three years we will have a breakdown in our medical care system which will have consequences affecting millions of people throughout the country."

A chorus of alarm rising recently from the medical schools appears to confirm the President's diagnosis. Cuts in National Institutes of Health (NIH) in the support of biomedical research have hit the medical schools hard. And a wider public has begun to realize how important NIH grants have been in giving de facto support to medical education and patient care in teaching hospitals. But no matter how painful the reduction in research funds has been, the causes of distress in the medical schools are less simple and more serious than that.

Since World War II, the American medical school has become part of a large, complex institution, the academic medical center, in which medical education, research, and patient care are carried on interdependently. The crisis in medical care is often attributed to a shortage of doctors and a shortage of hospital beds. It can be better understood in terms of the growing deficits which most medical centers are running in all phases of their activities—education, research, and patient care (particularly patient care). And the deficits in most cases are far too large to be covered, as they often were in the old days, by a university stretching its budget or by a quick appeal to the community.

Hospital costs have soared in part, of course, because of the revolution in medical science and technology since World War II. Innovations such as intensive-care units for heart and burn

Basic Research: Britain Tries to Measure Payoff

London. The educational and cultural values of basic research have long been recognized, but, as science becomes increasingly expensive, interest has focused on the question of its economic value. This interest shows itself in all countries with big research budgets, but it is particularly acute in Britain whose large and talented scientific community finds many of its ambitions thwarted by a weak economy and government preference for investing in activities that promise a quick return. Because of this, Britain's basic researchers hold a big stake in demonstrating that "curiosity-oriented" research can turn out to be extremely profitable. And for this purpose the Department of Education and Science, which is the principal agency for supporting such research, has announced a series of inquiries aimed at quantifying the economic benefits of basic science. This is no easy task, as witness the quietly buried Project Hindsight, which the U.S. Defense Department conducted several years ago in a controversial attempt to measure the payoff from its massive investment in basic research. The British effort, however, starts out with both greater humility and greater ambition, and merits notice for being what is probably the most carefully conceived attempt now under way to deal with this tricky problem.

To coordinate the inquiry, the department's Council for Scientific Policy has set up a working group under the chairmanship of Harry G. Johnson, an economist who is on the faculties of the London School of Economics and the University of Chicago. Johnson's group has commissioned studies of science-based industries by researchers at Manchester and Lancaster universities and by the program analysis units of the Ministry of Technology and the United Kingdom Atomic Energy Authority. In addition, the department last month published a 25-page pamphlet that is described as a "prospectus" for conducting the studies. Titled *An Attempt To Quantify the Economic Benefits of Scientific Research*, the pamphlet* was written by I. C. R. Byatt, who was until recently senior economic adviser to the department, and A. V. Cohen, scientific secretary of the Council for Scientific Policy. The basic strategy they propose calls for assessing the commercial payoff from basic research by attempting to calculate what the effects on discounted net profit would have been if essential discoveries had either been accelerated or delayed. The authors emphasize the difficulty of this task and express the hope that their proposal will stimulate widespread discussion.

—D.S.G.

*Copies may be obtained from Her Majesty's Stationery Office, London; 50 cents.

patients and such sophisticated procedures as open-heart surgery and organ transplants have extended both the limits of medical treatment and the costs. Less dramatic but no less important in pushing up costs have been the more numerous and expensive diagnostic tests and drugs given hospital patients. And specialization, not only among physicians but among medical support workers, has multiplied effectiveness and also costs. Most medical schools are now involved in education not only of medical students, interns, residents, and nurses but also of various aides and semiprofessional technicians and therapists.

In addition, changes in political and social attitudes are profoundly affecting medical economics. For many years hospitals were notorious for the low wages they paid aides and orderlies and workers in such service jobs as those in hospital kitchens, laundries, and parking lots. This may have been rationalized as exploitation in a good cause, but the changing social perspective and labor market of the 1960's, as well as tougher union activity, is making these traditional policies obsolete.

Even more important, however, is the fundamental question of who gets medical care and on what terms. The influence of this question on the medical schools was illustrated by the announcement early in October that three medical schools in New York City—New York Medical College, New York University School of Medicine, and Albert Einstein School of Medicine—were facing acute financial crises, and that one, at least, is on the brink of suspending operations because of "inadequate reimbursement."

The reimbursement bind afflicts medical schools through their teaching hospitals and is attributed chiefly to the effects of the federal Medicare and Medicaid programs, which are designated to pay the medical costs, respectively, of the elderly and the indigent. Financing for the programs differs, but the critical point is that Medicare and Medicaid payments are pegged below true costs. (Later articles will discuss the impact of federal programs on medical care and the attitudes of organized medicine as a major limiting factor in changing the medical care system.)

Broadly speaking, hospitals—especially big teaching hospitals—in the past applied a double standard in service and charging. The poor were treated free or at reduced cost in clinics and wards. Patients able to pay entered a usually superior system of private care and in many cases helped to subsidize the "public" patients. With the passage of Medicare and Medicaid, however, hospitals which operated by "Robin Hooding" had to come to terms with the Johnsonian principle that there should be equal medical care for all, regardless of ability to pay. The movement has been reinforced by actions of young medical professionals who have also been demanding the abolition of the old double standard of care. Most hospitals are moving to change the old system, and are finding it very expensive.

Hospitals as a group are deplorably weak on cost analysis, and this is a fundamental problem. Extreme examples are the public hospitals which had scruples or rules against charging indigents and failed to bill even those eligible for Medicaid and Medicare. The billing operations of many public hospitals are appallingly obsolete, and, in fact, hospital administration is a notorious managerial backwater. Third-party payment plans such as Blue Cross impose their own cost definitions, and these may often fall short of covering full costs. Reports of hospital

overcharging, waste, and inefficiency have moved Senator Philip A. Hart (D–Mich.) to schedule Senate hearings, and the horror stories of maladministration are likely to stand out in hearings precipitated mainly by the rise in hospital costs.

In the academic medical center the problem of cost reimbursement for patient care is compounded because faculty and postgraduate medical students—particularly residents—are involved in teaching, research, and patient care in proportions that are very difficult to disentangle. Faculty members often provide care for public patients which they never bother to record so that charges can be made.

More sensitive is the question of charges for faculty services to private patients. Increasingly, medical schools are applying a formula which captures, for the medical school, faculty members' private fees beyond a specific total amount in any year. The system is a great source of friction in many medical schools.

It is against this general background that the effects of NIH research cutbacks should be viewed. The cuts have direct impact because careers in academic medicine are largely made on the basis of accomplishments in basic and clinical research. Medical schools also depend heavily on NIH to support the education of biomedical research manpower through training grants and the grant money which flows into the payment of research assistants. The downtrend in NIH research and training grants will inevitably mean a slackening in the supply of high-quality faculty for new or expanding medical schools.

In the medical schools the damage being done is not limited to the blocking of individual careers. NIH is dedicated to the increase of biomedical knowledge, and its chosen instrument is the project grant awarded an individual on the basis of open competition against his peers. The trouble is that, in a time of scarcity, an individual's loss of a research grant often means that a medical school may lose a man on whom it depends, in a particular area of knowledge, not only for research but for teaching and patient care as well. The impact is potentially severe because a very significant percentage of medical school faculty receive at least part of their regular salary through research grants. The figure last year was authoritatively put at nearly 50 percent. This is why, when a faculty member loses his grant, the medical school may lose the faculty member.

The relationship between NIH and the medical schools is now akin to the situation in some societies where a person who saves another's life contracts a permanent responsibility for the one saved. Nothing in the law says that NIH is responsible for preserving the medical schools as a national resource, but NIH has been instrumental in creating the system, which has great promise and great problems, and NIH is being looked to for help.

At this moment there appears to be neither legal sanction nor available funds to do much. Senator Jacob Javits (R–N.Y.) has called for what in effect is a $100 million federal emergency purse for the medical schools, but he has not gotten much response. The Health Professions Assistance Act is up for renewal by next 30 June. The act provides for loans for medical students and other health professionals and "improvement" grants for the medical schools. Congressional debate on the bill should provide an opportunity for discussion of the state of the medical schools.

First aid—for example, the passage of a law creating scholarship aid for medical students, to increase their number—might only make things worse. The problems of the medical school can be successfully dealt with only in the context of the problems of the medical center of which the medical school is an indivisible part. Efforts to respond are being made at NIH and elsewhere, but there are as yet no real signs of a grand strategy to meet the health crisis. The medical schools can perhaps take some consolation in the thought that at least someone in a key spot understands their problem. Health, Education, and Welfare Department assistant secretary Roger O. Egeberg was dean of the University of Southern California Medical School for 5 years before he came to Washington.—JOHN WALSH

RECENT DEATHS

Claude H. Barlow, 93; researcher on intestinal parasites; 9 October.

John H. Bailey, 91; ophthalmologist and past president, Brooklyn Ophthalmological Society; 19 October.

John A. Bianchi, 67; psychiatrist and diplomate of the American Board of Psychiatry and Neurology; 17 October.

William Dameshek, 69; emeritus professor of medicine, Mount Sinai School of Medicine, City University of New York; 6 October.

Jules Henry, 64; professor of anthropology, Washington University; 23 September.

Nicholas A. Michels, 78; professor emeritus of anatomy of Jefferson Medical College; 27 October.

Oswald E. Morton, 72; former dean, College of Arts and Sciences, St. John's University, New York City; 12 October.

Theophilus S. Painter, 80; former president, University of Texas; 5 October.

Orlando Park, 67; former professor of biology, Northwestern University; 23 September.

Irving M. Rollins, 51; medical director of the Tobacco Institute of Washington; 26 October.

Ashley L. Schiff, 37; associate professor of political science, State University of New York, Stony Brook; 2 October.

Milton Schneider, 58; past director of the Waldemar Medical Research Foundation; 27 October.

Gordon H. Seger, 62; former associate chief, general medical sciences division, National Institutes of Health; 12 October.

Henry S. Sharp, 67; professor emeritus of geology and geography, Barnard College; 20 October.

Waclaw Sierpinski, 87; professor of mathematics, University of Warsaw; 19 October.

J. Murray Steele, 69; professor of medicine, New York University School of Medicine; 13 October.

Edward A. Suchman, 54; former professor of sociology and public health, University of Pittsburgh; 10 October.

Robert F. Titchen, 44; physical chemist and founder of the Operations Research Council of Washington; 9 October.

Frank E. Todd, 74; former chief, agriculture research branch, U.S. Department of Agriculture; 23 September.

Thomas J. Webb, 69; former director of physical and inorganic chemistry research, Merck & Co. Inc.; 26 September.

Harold D. Wright, 47; professor of mineralogy, Pennsylvania State University; 7 July.

Carl C. Yount, 86; orthopedic surgeon and professor emeritus, University of Pittsburgh; 11 October.