DERMATOMYCOLOGY

A course entitled "Medical Mycology (Dermatomycology)" will be held at the University of California–San Francisco School of Medicine, September 16-18. The fee is $225.

Contact Extended Programs in Medical Education, University of California–San Francisco School of Medicine, Rm. 569-U, San Francisco, CA 94143; or call (415) 666-4251.

PROGRAMS OF THE UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

The School will offer four postgraduate programs in the coming months: "Community Health: An Interprofessional Course and Workshop on Baltimore's Major Health Problems" (September 16); "Behavioral Aspects of Adolescent Health Care" (September 24 and 25); "Selected Topics in Family Practice — Fall Series" (September 30-November 4); and "Advances in Retinal and Corneal Diseases" (October 12).

Contact the Program of Continuing Education, University of Maryland School of Medicine, 10 S. Pine St., Baltimore, MD 21201; or call (301) 528-3956.

RADIOLOGY

The Department of Radiology of Harvard Medical School will offer three programs in the coming months: "Computed Tomography" (September 19-23); "Chest Disease" (October 18-22); and "Angiography, Interventional Radiology, and the New Imaging Modalities" (October 25-28).

Contact the Department of Continuing Education, Harvard Medical School, 25 Shattuck St., Boston, MA 02115; or call (617) 732-1525.

VASCULAR SURGERY

A program entitled "Vascular Surgery" will be held in Denver, Colo., September 20-22.

Contact the Office of Postgraduate Medical Education, The University of Colorado School of Medicine, 4200 E. Ninth Ave., Box C-295, Denver, CO 80262; or call (303) 394-5241.

SICKLE CELL DISEASE

A conference entitled "A Decade of Progress in Sickle Cell Disease: Scientific and Humanistic Advances" will be held at the Hyatt Regency Crystal City, September 20-22, in Crystal City, Va. The fee is $50.

Contact Harold J. Ashby, The Howard University Center for Sickle Cell Disease, Washington, DC 20060; or call (202) 636-7930.

SURGICAL PATHOLOGY

A symposium entitled "New Solutions to Old Problems in Surgical Pathology" will be held in Bethesda, Md., September 20-22.

Contact Cynthia L. Fowler, The Foundation for Advanced Education in the Sciences, National Institutes of Health, Bldg. 10, Rm. B1-L-101, Bethesda, MD 20205; or call (301) 496-5272.

FOOD SAFETY LAWS

A conference entitled "Food Safety Laws: Delaney and Other Dilemmas" will be held at the Capital Hilton in Washington, D.C., on September 23 and 24. The fee is $385.

Contact Elizabeth M. Ollen, Boston University School of Public Health, 80 E. Concord St., Boston, MA 02118; or call (617) 247-6201.

PROGRAMS OF THE UNIVERSITY OF WISCONSIN

The University will offer four programs in the coming months: "Seminars in Pediatrics" (September 24 and 25); "Update in Medicine and Technology for the General Dentist" (September 24 and 25); "Aging and Illness in Primary Care: The Second Symposium on Basic and Clinical Science Foundations" (October 14 and 15); and "Suicide Assessment and Intervention" (October 19, October 20, November 8, and November 9).

Contact Sarah Z. Aslakson, Office of Continuing Medical Education, 465B WARF Bldg., 610 Walnut St., Madison, WI 53706; or call (608) 263-2856.

NEURORADIOLOGY AND HEAD AND NECK RADIOLOGY

A course entitled "Basic Review and Recent Advances in Neuroradiology and Head and Neck Radiology" will be held at the Copley Plaza Hotel in Boston, September 28-October 2. The fee is $450.

Contact Harvard Medical School, Department of Continuing Education, Boston, MA 02115; or call (617) 732-1525.

ANESTHESIOLOGY

The State University of New York–Upstate Medical Center will offer the "17th Annual Refresher Course in Anesthesiology" at the Hotel Syracuse, September 28-October 2. The fee is $375.

Contact Ms. Selma Abdo, Office of Continuing Education, Upstate Medical Center at Syracuse, State University of New York, 766 Irving Ave., Syracuse, NY 13210; or call (315) 473-4606.

CARDIOPULMONARY IMAGING

An international symposium entitled "Clinical Applications of Cardiopulmonary Imaging" will be held at the Hyatt Lake Tahoe in Lake Tahoe, Nev., September 29-October 2. The fee is $375.

Contact Educational Resources Associates, P.O. Box 369, Brookline, MA 02146; or call (617) 738-8859.

CORRECTION

Case Records of the Massachusetts General Hospital (Case 28-1982) (1982; 307:169-79). On page 172, in the right-hand column, the last sentence of the second paragraph should be changed to read as follows: "Retroperitoneal-lymph-node, hepatic, and bone-marrow involvement is also common."

SPECIAL REPORT

DEVELOPMENTS IN HEALTH CARE IN NICARAGUA

NICARAGUA is much in the news these days because of political turmoil in Central America. Charges and countercharges abound on military and political matters, but little has been reported on developments in health and medicine in Nicaragua. One of us (D.C.H.) spent several weeks in the spring of 1981 in the capital city of Managua and in more remote parts of the country. The other (R.G.) made two visits to Nicaragua in 1980 and worked in the Nicaraguan Ministry of Health as a health-services administrator during the last nine months of 1981. In this report we describe the efforts and changes that have taken place in medicine and public health since the Sandinista revolution.

In July 1979, a coalition of guerilla groups called the Sandinista Front for National Liberation overthrew the Somoza dictatorship after a four-year war that cost 50,000 lives. Before that, in 1972, this country of 2,800,000 had suffered an earthquake that leveled the center of the capital city, killed 20,000 people, and

destroyed every acute-care hospital bed. Another 10,000 or more still needed care because of injuries sustained during the earthquake.

Health conditions in Nicaragua under the Somoza regime had been abominable, even worse than in most of its Central American neighbors. Thirty-five per cent of the urban population and 95 per cent of the rural population lacked access to potable water. The Somoza regime paid so little attention to health matters that even such basic data as birth and death certificates were collected for only about 25 per cent of the population. The National Social Security Institute, which was designed to provide medical care for working people, covered only 8 per cent of the population. Another 20 per cent were covered by various state programs for indigents. Several churches ran highly respected hospitals, but for the most part they treated only those who could pay cash. The National Guard had relatively good medical services, including those in most specialties, through a system of hospitals and clinics of its own. The present government estimates that 90 per cent of medical services were directed to 10 per cent of the population. More than half the doctors and medical beds were located in the capital city.

Malaria, tuberculosis, and parasitism were endemic in much of Nicaragua. One third of the people contracted malaria at least once in their lives. Measles was a great killer of children. In malnourished children, measles may be accompanied by an overwhelming and often fatal bacterial pneumonia, usually of staphylococcal origin. Studies of malnutrition in recent years have estimated that between 46 and 83 per cent of Nicaraguan children were malnourished. These same studies have indicated that a high proportion of these children (25 to 45 per cent) had the more severe secondary and tertiary types of malnutrition. Life expectancy at the time of the revolution was 52.9 years. Infant mortality was estimated at between 120 and 140 per thousand (as compared, for example, with Panama's purported rate of 30 per thousand). Among the top 10 causes of death in children were bacterial diarrheas, tetanus, measles, whooping cough, and malaria, all of which can be largely controlled with elementary public-health measures.

In the light of the health problems, some of which are mentioned above, the achievements since July 1979 have been remarkable. About 70 per cent of the population, as compared with 28 per cent in 1979, now has regular contact with medical care. People have flooded the hospitals and health-care centers in the cities and the newly opened health posts in small towns. There has been a broad educational campaign to communicate the message that all people who live in Nicaragua are now entitled to health care. Health posts, staffed by nursing aides and visited by physicians weekly, have been set up in tiny hamlets. Medical and nursing students accompany migrant agricultural workers who travel to harvest cotton, coffee, and other cash crops. Emergency training and a basic medical kit have been provided to health workers at remote haciendas. Psychiatric day centers have been set up in more central towns, and a traveling dental service reaches areas where such services were never available before.

The most important measures have been public-health programs. Diphtheria–pertussis–tetanus, measles, and bacillus Calmette–Guérin vaccinations have been administered to hundreds of thousands of children. Health campaigns enlisting the general population were mounted in early 1981 to vaccinate children, remove environmental hazards, and eliminate breeding sites of the *Aedes aegypti* mosquito, transmitter of dengue fever. A massive literacy campaign in 1980 was also used for health education. One hundred thousand young people went into the countryside to teach peasants how to read and write. While living and working with the people they were instructing, the "literacy brigades" taught elementary health principles. One in 10 literacy workers received a week's health training. He or she was responsible for distributing preventive medicines and antimalarial agents to other literacy workers. They introduced basic sanitary engineering in many areas.

Despite these efforts, the prevalence of malaria continued to rise. Throughout Central America, malaria control had lost ground because the promiscuous use of insecticides in cotton and rice farming had led to resistance of the Anopheles mosquito vector to conventional means of control. In 1978 approximately 4.4 people per thousand contracted the disease. Control efforts were paralyzed by the war, and the incidence of malaria rose to 7.3 per thousand in 1979. By 1980 it had gone up to 9.4 per thousand. In November 1981, the most recent and largest health campaign mobilized 80,000 trained volunteers to distribute antimalarial drugs to an estimated 75 per cent of the country's population, to be taken in a uniform three-day regimen. Regular monthly statistics indicated a 98 per cent decline in new cases of malaria in the month after the campaign. Continuing education and epidemiologic vigilance are now in progress in the hope of minimizing malaria transmission. Recent flooding in Nicaragua will put this program to a severe test.

Although vaccination coverage for poliomyelitis was thought to be good, there were still 37 cases in 1981. Because of this, 500,000 doses of polio vaccine were distributed in January of 1982. Health institutions were still too few and coverage too incomplete to vaccinate the population well. Thus, volunteers who have been trained through the division of health education in each locality go from door to door on selected days to provide polio vaccine.

Results in the fight against tuberculosis are even harder to measure. A nationwide treatment protocol has been established. All persons with respiratory ill-

ness that lasts longer than 21 days are supposed to undergo x-ray and laboratory studies in search of tuberculosis, particularly in areas where it is endemic, such as mining regions. The rate of dropping out from treatment in 1980 was lowered to 40 per cent. In 70 per cent of medically attended births, bacillus Calmette–Guérin was given to the newborns. Since only an estimated 40 per cent of Nicaraguan births are attended by health professionals, this leaves many infants without coverage. The present goal is to vaccinate 60 per cent of all children under five years old through local health centers.

The deadly problem of infant diarrhea is being attacked in an innovative way. Oral-rehydration centers have been set up all over the country, and an educational campaign has been instituted to teach mothers to bring children with diarrhea to such a center. There, balanced electrolyte and glucose solution can be given by mouth to the sick child. Staffed by auxiliary nurses, these centers are usually equipped only to provide primary attention, and they refer gravely ill infants to physician-staffed centers. Although only 170 rehydration centers were initially planned, popular demand and community action have brought the number of centers to 226. About two thirds of the centers, including most of the large and important ones, were reporting encounters with patients by June 1981. In the first 21 months of the program 92,000 children were treated for diarrhea. Eighteen per cent had serious diarrhea (5 to 10 per cent dehydration), and another 2 per cent had grave diarrhea (more than 10 per cent dehydration). A total of 2420 (2.6 per cent) needed intravenous therapy, and 17 (0.02 per cent) died. Almost two thirds were under the age of one year when they were treated. This program is likely to have a striking effect in reducing infant mortality.

Nicaragua has recently experienced a baby boom of surprising proportions for a country that already had a high fertility rate. The natural rate of population increase was about 3 per cent per year during the past decade. In 1980 the rate of increase jumped to an estimated 4.5 per cent. Even if the rate has since returned to 3 per cent, as some observers believe, the population will double in less than 25 years. The subject of family planning is a difficult one. Most Nicaraguans are Catholic. Indeed, four government ministers, including the foreign minister, are priests. Most contraceptive services are provided through the private International Planned Parenthood affiliate in Nicaragua by contract with the Ministry of Health. A campaign to disseminate birth-control information is being planned according to the format developed for sanitation, vaccination, and nutritional education. Although abortion is not legal, it is not an uncommon practice. Often the abortion is initiated at home, and the patient appears at a hospital for completion of the evacuation. In the first half of 1981, 1271 incomplete abortions were treated at the Vélez Páez Hospital. During the same period, the hospital recorded 10,217 births and 153 neonatal deaths. The first hospital-initiated therapeutic abortion in Nicaragua was performed in that institution late last year.

Technical and professional health training has been greatly expanded. A second medical school opened in Managua in 1981 to supplement the original one in León. The new school takes advantage of the wealth of clinical material available in the capital. The total class size has been increased from 100 to 500. The number of nursing students has also increased fivefold. Technical-career programs have been set up to train such practitioners as dental assistants, x-ray technicians, and biostatisticians. Postgraduate medical education never really existed in Nicaragua except on a haphazard apprenticeship basis. At present, residency programs are being set up in medicine, surgery, pediatrics, and obstetrics–gynecology. These programs will probably involve two years of hospital work in Nicaragua, followed by an additional one or two years abroad. Dr. Norman Girón, nephrologist and director of the Antonio Lenín Fonseca Hospital, is in charge of the medical residency. He explained that it is impossible even to plan for a full training program in Nicaragua at this point, but that a solid foundation can be given by people available in the country. The most promising residents would then have the opportunity to complete residency training in Cuba, Mexico, the United States, or Europe.

International aid has been of crucial help in health care. Organizations such as the United Nations International Children's Emergency Fund, Oxfam, the World Health Organization, the Organization of American States, and the European Economic Community have given substantial aid. West Germany has set up an entire small hospital in the north. Aid has come from Sweden, Norway, Austria, Belgium, Italy, and Canada. More than two dozen countries, mostly from the Americas and Western Europe, have sent medical supplies and personnel. More than 400 doctors, nurses, and technicians came in the emergency period after the revolution. Most of the 300 foreign health workers now in Nicaragua are physicians. The majority are Mexican and Cuban, and almost all work in remote rural posts. Broad assistance comes from the World Health Organization and the Pan American Health Organization. Their strategies for the provision of basic health services and their wide experience in implementation are enthusiastically applied. In the first year after the revolution, substantial assistance was given by the United States. Programs for supplemental food distribution, hospital construction, and sanitary engineering were largely supported by the U.S. Agency for International Development. At present, however, only private assistance from the United States continues, in such fields as rehabilitation medicine, family planning, and ophthalmology.

Changes in the fields of curative medicine are occur-

ring more slowly than those in public health. The concept of a unified health system (Sistema Único de Salud) was established in 1979, and the structure for regionalization of care throughout the country has been outlined. Effective administration in nine health districts has been established. Other plans remain largely on paper, since the plants, personnel, and funding necessary to implement them are not yet available. A new children's hospital is ready to open in Managua, except for the lack of funds for equipment. There are four main hospitals in Managua and smaller hospitals and health centers scattered around the country. To provide coverage, medical manpower has been spread very thin. In spite of international help, care has been extended so widely that there are shortages everywhere. In Managua this problem has been exacerbated by the referral of many seriously ill patients from remote areas for more sophisticated care. Each hospital in Managua acts as a referral center for a designated part of this country. The Antonio Lenín Fonseca Hospital, for example, with only 300 beds, is the referral hospital for 265,000 people of the northwestern part of the country, as well as the primary hospital for about 160,000 people of Managua. Nicaragua did not suffer a mass exodus of physicians after the revolution, as some had expected. About 300 of the total of about 1300 doctors are believed to have emigrated.

The average physician, after spending six to eight hours at the hospital or clinic, will return to perhaps four hours of private practice in his or her office or home. A doctor will make more money during this time than during regular salaried service. This supplemental private practice is not discouraged by the government. It provides a source of extra income for physicians, which helps them maintain the standard of living that they are used to, and also provides service with fewer long waits and more pleasant surroundings for those who can afford to pay. The question of professional independence and control is complex. On the one hand, most physicians are expected to work in a hospital or clinic, and their pay for this work is low for upper-middle-class Nicaraguans, though of course extravagant for the average citizen. On the other hand, the professional association of physicians, FESOMENIC, has a seat on the State Council, which is a basically consultative group that represents various major social forces, including business and labor groups. Through its seat on the State Council, the medical association has a direct role in formulating and voting on national legislation. Furthermore, the professional societies are more active now than ever before in advising on health policy, setting standards of care, and promoting in-service education.

Immediately after the revolution, there was a crisis in the availability of pharmaceuticals. The new government was greeted with a staggering debt acquired by its predecessor, and foreign pharmaceutical companies wanted that debt settled before sending any more drugs. The Sandinista government accepted responsibility for the debts in exchange for favorable terms of repayment. Increased numbers of visits by patients have greatly increased the demand for drugs. Nicaragua's private and public pharmaceutical manufacturers have increased production by several hundred per cent. Still, drugs remain the largest import item in the health budget. Spot shortages of drugs constantly occur. There is also a problem with x-ray and laboratory equipment. Companies that had been contracted to service this machinery have been unable or unwilling to do so. Cash in advance is required for all repair work. Some parts dealers have stopped investing in new equipment and allowed inventories to dwindle. Thus, when equipment breaks, it may be out of commission for months for lack of a single part. One machine must be cannibalized to fix another. There have been instances of outright fraud with unnecessary or inappropriate repairs. Officials at the Ministry of Health have no interest in going into the equipment-maintenance business, but circumstances are forcing them to do so.

At the time of the revolution, there were 18 beds per thousand population; a minimum of 30 per thousand is recommended by the World Health Organization, and 70 per thousand are available in the United States. These beds were in a total of 42 hospitals, which included several private and church institutions. One private hospital closed last year when its doctors emigrated. In the country as a whole, despite the destruction of the war, there were 15 per cent more beds in 1980 than in 1977. These beds were created through hastily equipping wards still under repair from the bombings, putting beds in some small health centers, and adding beds to already crowded rooms and halls in established hospitals. These measures are still insufficient to meet the demand. At times patients are two to a bed, babies two to a crib, and premature infants two or three to an incubator.

As compared with 1977, the last year before the major disruption of the war, Nicaraguan hospital admissions rose by 31 per cent in 1980. Since the number of beds rose by only 15 per cent, there was clearly an intensification of bed use. The number of surgical interventions rose by 43 per cent, and attended deliveries rose by 21 per cent. Preliminary data from 1981 indicate a further rise of 25 per cent over 1980. The rise in outpatient visits was more dramatic — from 2.5 million in 1977 to 5.0 million in 1980.

Five new hospitals are under construction. These should add 947 more beds by 1983. Four are outside the capital city and will replace or supplement hospitals built as long as 100 years ago. In 1978, the combined budget of the various agencies dealing with health in Nicaragua totaled 202 million córdobas. By 1981, that figure had risen to 1212 million córdobas. In spite of inflation and a great rise in overall government

spending, the portion spent for health rose incredibly, from 6 to 17 per cent of the national budget.

To put all these developments in health care into a broader context, some other changes should be noted. In 1981 a 10-year program was initiated to develop self-sufficiency in the production and distribution of basic foodstuffs. Thousands of new housing units have been constructed, and 10,000 homes have been provided with sanitation. Twenty-four thousand latrines are being built per year. Funds are being sought to increase latrine production, because at this rate it will take 10 years to meet the demand. The number of students in the country has risen from 500,000 to 800,000. Although increases have occurred at all levels of the educational system, the largest rise has been in higher and adult education. This is a direct result of the literacy campaign of 1980, which reduced the illiteracy rate from 52 per cent to 12 per cent of the population. ("Literacy" for this purpose is defined as reading and writing at a third-grade level.)

In just three years, more has been done in most areas of social welfare than in the 50 years of dictatorship under the Somoza family. Much more remains to be done, and new problems created by the revolution itself demand attention. However, the process is continuing. These changes in housing, nutrition, sanitation, and education and the developments in health care that we have reported point to a broad and profound change in the nature of Nicaraguan society.

Kennebec Valley Medical Center
Augusta, ME 04330 DAVID C. HALPERIN, M.D.

Columbia University
School of Public Health
New York, NY 10032 RICHARD GARFIELD, R.N., M.P.H.