Population Problems Past and Present

THE IDAHO annual health conference is somewhat unique in that 3 solid days of general sessions are devoted to a single topic. The 1966 conference, held May 24–26, was, perhaps, more unique than previous ones. It was one of the first annual State health meetings dealing exclusively with population problems, and it was held at Sun Valley—one of the least populated towns in the sparsely populated State of Idaho.

Co-sponsored by the Idaho Department of Health, Idaho State Medical Association, Idaho Department of Public Assistance, and the U.S. Department of Health, Education, and Welfare, the conference featured 17 papers, each covering a different aspect of the population problem. In his keynote address, Governor Robert E. Smylie urged that the rights of people be kept inviolate. ". . . we must preserve human dignity," he said, "and we must provide a free choice. Our role must be for planning without coercion and with a sympathetic and genuine understanding of the needs of each human being." Most of the discussions indicated that the speakers and other conference participants followed the Governor's advice.

Because many of the points discussed at the Idaho meeting keep cropping up at other sessions on population planning, we are including in this issue of *Public Health Reports* brief summaries of the papers, covering the highlights of each presentation.

DEMOGRAPHIC ASPECTS

Population in the so-called "developing" areas of the world is increasing at a far greater rate than in the "developed" countries, according to Dr. Clifford A. Pease, assistant director, technical assistance division, Population Council, New York City.

The third of the world's population that lives in the developed areas—Europe, North America, U.S.S.R., Japan, Australia, and New Zealand—has a birth rate of about 21 per 1,000 and a death rate of 9 or 10, leaving a growth rate of 1.2 percent, Pease said. The other two-thirds has a birth rate of at least 40 to 45 and a death rate of 15 to 20, with a resultant growth rate of about 2.5 percent.

In 1960, he continued, 71 percent of the world's population lived in the less developed areas and 29 percent lived in the developed countries. Present trends indicate that by the year 2000, the population in less developed areas will increase to 80 percent of the world's total.

Pease stated that unless something is done to alter the situation, ". . . the rich will get richer and the poor will get poorer." He explained that better health services, agricultural developments, and other factors have increased the life-span in the developing countries, but that this has resulted in an accelerated population growth that tends to keep the people of underdeveloped areas in their traditional poverty-stricken place.

The speaker cited many examples of family planning programs in the developing nations, noting that in nearly all of these the objective is to lower the birth rate at a predetermined amount within a definite period of time. Major emphasis has been placed on the use of the intrauterine contraceptive devices, especially the "Lippes Loop" which, Pease said, has been most effective. He added that although these programs have not been functioning long enough to substantially lower the birth rate, there is every indication that this will occur in many places although probably not within the time allocated.

Pease said the population problem in the United States is a more selective one, affecting

different groups of the population and different geographic areas. For years, he stated, most physicians in the United States have made available to their private patients information on birth control. This has not been the case with lower income groups who depend largely on medical care facilities provided by municipal, State, or Federal Governments. As a result, these groups are most affected by the population explosion.

The speaker said, however, that increased interest in population problems is altering that picture and that family planning services are becoming more broadly available to all people. The fact that every child will be a wanted child may be one of the most dramatic and profound sociological changes of the 20th century, Pease concluded.

ECONOMICS AND POPULATION

It is a mistake to talk about a population explosion in sheer statistics, and particularly the statistics which the public views as synonymous with birth rate, said Dr. Louis Levine, assistant manpower administrator, U.S. Department of Labor. One must talk also about the age composition of the population, geography, income levels, racial characteristics, and stability of social institutions such as the family.

The population growth in the United States is continuing despite a declining birth rate because a large proportion of our population is of reproductive age. Levine noted that with most of our population growth in the two extreme age groups—the very young and the old—we have increased demands for services; we have consumers rather than producers. It is erroneous to believe that more people means more market and more consumption, he said; desires for goods and services must be backed by the buying power which results from gainful employment.

Levine cited the example of the Negro who moves into the urban slum area, lacking the skills or capability for participating in the economy, but still producing children. He also noted the problem of the 18-year-old who must make a choice between going beyond high school or entering into employment. Frequently that choice does not exist because the 18-year-old cannot be absorbed into our educational system, he said, with the consequence that the must enter the job market lacking the very qualifications the job markets call for—higher education and more technical competence.

In the older segment of the population, the speaker said, our economic thinking has not kept pace with our scientific advances. We have learned to keep people longer on the earth, but we do not allow them to participate meaningfully in our economy. People over 45 find job opportunities slimmer and slimmer.

Until we solve some of the economic problems of population growth we are not likely to succeed in population control. People have no reason to want to control families unless they have ambition, aspiration, and hope that there can be a good life, Levine said. We find that with economic gain and higher income, there develops a sense of responsibility with respect to children and the standard of living which parents want for their children.

Associated with this, he added, is a need for recognition within the health industry of its own failings and misfortunes. The demand for health services is growing constantly, but the supply and competence to provide these services is not keeping pace. We can no longer depend on people going into health services out of dedication to the good of mankind, but must make the health service field competitive with employment opportunities in other fields. Levine said we can no longer demand increasing education, higher qualifications, and at the same time have no provision for decent salaries, working conditions, and opportunities for advancement.

FOOD SUPPLIES

In our appraisals of the future, we have usually underestimated food production possibilities, stated R. F. Daly of the Economic Research Service, U.S. Department of Agriculture. Rapid advances in technology and the increased use of fertilizer have increased crop production despite reductions in the amount of land used for agriculture.

Citing production gains in the United States, Daly noted that the potential for expanding world food supplies to eliminate hunger is large. World acreage used for crops is estimated at 3½ billion acres, but there are potentially nearly 6½ billion acres of arable land. Better man-

agement of land use, coupled with expanded use of fertilizers, could greatly increase food production in the presently underdeveloped countries, he said.

Daly said that more "far out" possibilities of expanding world food supplies are being researched. Diets built around low-cost foods, plant proteins, and other more efficient sources of calories and nutrients could extend our capacity to feed more people. Algae and the leaves of many plants are substantial sources of energy and proteins, if we can improve the processing and palatability of these products. Inexpensive synthetic proteins and other foods also are being developed.

The long-run solution to world food deficits must be found within the countries having the problem, he stated; the United States cannot continue indefinitely to help close the world food gap by aid shipments.

PROBLEMS IN EDUCATION

Within the next two decades, the investment in education may be 10 percent of our gross national product, according to Dr. Lloyd Garrison, Region VIII representative, Office of Education. Currently, we invest about 6 percent of the gross national product in education at all levels, and we are not meeting the educational needs of our youth.

Up to this time, said Garrison, we have been content to push young people out of the 12th grade and into a world of work relatively unprepared to hold jobs successfully. Schools have provided the high school graduate not bound for college with few salable job skills. The rapidly changing needs of business, industry, and agriculture now provide little opportunity for the unskilled; consequently, our educational system must provide more vocational and technical education and this will increase educational costs by 50 to 75 percent.

Even larger problems face the institutions of higher learning, he said. In 1950, fewer than 2.5 million students were enrolled in colleges and universities. By 1970, college enrollments will be over 7 million and by 1975 may be 8.5 million. The problem of numbers to be educated is made more complex by the national needs for professional manpower and the rapidly rising costs of higher education.

As an example, Garrison pointed out that to maintain the present ratio of about one physician to 1,000 people, we would need about 11,000 more physicians than we expect to have in 1975. Even with maximum use and expansion of existing facilities, at least 20 more medical schools must be added to meet projected needs, he stated.

URBAN PLANNING

The living environment for the majority of the residents of major urban areas has deteriorated almost as rapidly as their economic welfare has improved, stated Robert T. Nahas, president of the Urban Land Institute, Washington, D.C. Automobile congestion, air and water pollution, racial tensions, constant uprooting and moving about of families, and increasing tax burdens have produced mental and physical anguish and a bewilderment embodied in the unanswered question, "What went wrong?"

By 1980, he said, approximately 80 percent of the population of the United States will be living in about 5 percent of the land area, mostly in the four major urban regions: the Atlantic seaboard, the Great Lakes, California, and Florida. We have the technical knowledge to solve or ameliorate all of the problems associated with such congestion, he added, but we need an aroused public opinion and the willingness to pay for the remedial measures.

Nahas listed the following as points of a simultaneous program that could improve urban environment:

- Population dispersal away from congested areas, with incentives to industry to locate near smaller cities and with encouragement to develop satellite cities.
- Family planning to cut down the population growth rate.
- A true urban renewal, redevelopment, and rehabilitation to remove blight in our central cities, with an emphasis on improved housing for the poor.
- Purchase of open-space land or scenic easements convenient to congested areas, and preservation of our natural parks and wilderness areas.
- Enactment and enforcement of air and water pollution laws.

• Incentives to local governments to encourage master planning and the enforcement of reasonable zoning regulations.

• Revision of property tax laws, which, he said, currently encourage and reward neglect in the old and shoddy and cheap construction in the new.

• An improved technology in the construction field and a revision of obsolete building codes.

• Regional agencies to solve regional problems transcending municipal boundaries.

There are harsh realities that have to be faced by urban planners, Nahas stated. One is that there is a saturation point beyond which the population of any given area or country should not increase if the desirability of the environment is to be preserved. Cities like New York not only should stop growing, but should perhaps lose population, both resident and commuter, if they hope to begin to cope with their problems. Congestion that forces a mass transit solution and the loss of the great personal mobility of the private automobile is a step backward for the individual as far as physical freedom and independence are concerned. There also is a limit to the number of unskilled and impoverished people any given community can absorb into its economic environment in a given period of time, regardless of the good intentions of the community's inhabitants.

We have not created an image of what a desirable metropolitan area of the future should be, Nahas concluded, not even an idealized conception toward which we might at least direct our efforts. "All of us in the land-use field must share the blame," he stated, "as must the sociologists, the politicians, and the professional planners."

SOCIAL WELFARE

The major social problems of health, employment, housing, and income security cannot be treated in isolation, but have to be treated in totality, said Dr. William T. Van Orman, Region VIII director, Department of Health, Education, and Welfare. Recognition of this premise was one of the principal characteristics of the legislation passed by the 89th session of Congress, he noted.

Other characteristics of the legislation that affected the Department and its constituent agencies included emphasis on our national convictions concerning equality of opportunity; the provisions for education, training, research, and development; and the effective use of cooperative arrangements with other Federal, State, and local agencies and organizations. Much of the legislation, he said, is directed at helping the 35 million people in the United States who live in poverty.

The war on poverty is a great national undertaking, Van Orman stated, and must have the active support of all Americans. It is not a problem that affluent Americans can solve merely through contributions to fund drives nor by their share of tax dollars in the welfare programs.

The proposals to eradicate poverty involve both large cost and serious risk, he stated, and there is always doubt that the people of this country are willing to accept these conditions. We have only to look at trouble spots such as Watts and Harlem to see the consequences of poverty and the disadvantaged, he added, and realize that there is a greater cost and risk if we do nothing.

PUBLIC HEALTH

The hallmark of the emerging approaches to public health problems is the partnership wherein we marshal all our available resources—public and private, local, State, and Federal—to achieve our objectives, stated Dr. Robert B. Dorsen, medical officer with the Public Health Service's former Division of Public Health Methods.

This premise was inherent in the health legislation enacted by Congress in 1965. As an example, he noted that title XVIII of the Social Security Act (Medicare) offers communities the opportunity to develop a comprehensive system of health services and provides physicians the opportunity to prescribe fully for aged patients without the restriction of family economics. The medical assistance provisions of title XIX broaden eligibility and pull together the various medical programs related to public assistance, he said. The intent is to develop a program of high-quality medical services that has not been provided in the past for substantial segments of the population.

Dorsen said that the regional medical programs (the heart, stroke, and cancer amendments of 1965) are aimed at linking medical research with medical care. These programs involve public health agencies, voluntary health agencies, medical institutions, and other organizations, he said, and the basic element is flexibility, with local determination and local cooperation and planning.

VOLUNTARY STERILIZATION

Under some circumstances, for some people, the surgical method of fertility control is the best one, according to Dr. H. Curtis Wood, medical director of the Association for Voluntary Sterilization, New York. He added that this method of birth control has not been as widely accepted as other methods, largely because of the philosophical issues and emotional reactions to the subject.

The legality of sterilization is misunderstood by both laymen and physicians. Sterilization on a voluntary basis is legal in every State in the nation, Wood said, and only two States—Connecticut and Utah—have any restrictive legislation regarding conditions under which the procedure may be done. Virginia and North Carolina have specific laws permitting sterilization. He also noted that there is no more reason for a physician to be concerned about a malpractice law suit for doing a voluntary sterilization than there is for doing any other surgical procedure.

Many people object to sterilization on the basis that it is permanent and irreversible, but there is a definite possibility of reversing the sterilization should an individual later change his mind, Wood stated. Figures differ on the success of reversal, he added, but one surgeon has reported a success rate of 85 percent in restoring fertility to men who had had vasectomies. Studies also have shown that psychological reactions following sterilization are almost uniformly good, contrary to some popular opinions.

Wood said that both the birth control pill and the intrauterine device have tremendous potential in helping to solve population problems, but that there also are problems and disadvantages with both of these methods.

"I see no reason," he concluded, "why people should not be permitted to make up their minds about how many children they wish to have and what methods they wish to use to control this fertility, including the surgical method."

ABORTION AND MATERNAL MORTALITY

The increasing importance of criminal abortion as a cause of puerperal mortality was outlined by Dr. Edwin M. Gold, professor of obstetrics and gynecology at New York Medical College.

A recent study in New York City, covering a 12-year period, showed that although 50 percent fewer therapeutic abortions were noted, puerperal deaths from abortions increased by 94 percent. The disastrous consequences of criminal abortion are obvious, he said.

The New York study also illustrated the disparity in incidence of therapeutic abortion according to ethnic and socioeconomic groups, Gold said. More than 90 percent of the therapeutic abortions were performed on white women. This is five times the number that were performed on nonwhites and 26 times the number for Puerto Ricans. He said the disparities were similar among different hospital groups, with the highest frequency in the proprietary or private hospitals (3.9 per 1,000 live births), next highest in the voluntary or community hospitals (1.9 per 1,000 live births), and lowest in the municipal or city hospitals (0.1 per 1,000 live births).

Both these observations put into sharp focus the medical responsibility, not only to equalize the opportunities for therapeutic abortion, where indicated, regardless of ethnicity, socioeconomic status, or hospital auspices, but also to develop a practical public health program designed to reduce the incidence of and legal sequelae of criminal abortion, Gold stated. Constructive recommendations to achieve these objectives must embrace legal as well as public health viewpoints, he added.

He said that public pressure for liberalization of current "restrictive and archaic" abortion laws is growing but that, so far, legislative attempts to amend the laws along the lines suggested by the American Law Institute have failed.

EDUCATION AND INFORMATION

Adults other than parents have an important role and a definite responsibility in teaching sex

education, said Dr. George Denniston, of the department of obstetrics and gynecology, University of Washington School of Medicine, Seattle. He suggested that too many parents have had inadequate sex education themselves and are therefore unable or unwilling to discuss certain subjects, leaving the children with attitudes that are wrong and information that is inaccurate.

The person who can best teach the subject to teenagers is someone who can relate to teenagers, Denniston said. This may be a parent, it may be a teacher in the school, or it may be someone in the community. One simple way to find out, he added, is to have a questionnaire in the school which can be answered by the youngsters without signing their names. The youngsters could list any person they would wish to hear, regardless of whether that person is a teacher in the school or not.

In listing the characteristics of a good sex education course, Denniston said it should begin early. Children ask questions about sex almost as soon as they can talk, and these should be answered in terms that are meaningful to them, he added. Courses in school probably should begin in about the seventh grade and continue through high school and college, with questions answered in terms consistent with the educational level of the students. Courses should be coeducational, should allow for free discussion, and should include instruction in physiology and anatomy. In Denniston's opinion, most physicians and nurses would not be good teachers because most of their training has concerned disease and abnormalities rather than the normal.

Denniston stated that when a sex education course is offered in a school, it usually ends up as part of physical education and that this was not a good place for it. Often such a course takes on the "locker room" aspect and does more harm than good. He said that teachers, armed with adequate information and the remarkably good audiovisual aids that are available, are the most qualified persons to handle sex education courses.

In noting that family planning education is an important part of sex education, Denniston said that in his opinion the intrauterine device for birth control is not nearly as popular nor as available in this country as it should be. He stated that many women discontinue using pills, either because they forget to take them or have side effects, or because of other reasons. The intrauterine device, which is nearly as effective, is more convenient and less expensive over long periods of time.

GENETIC IMPLICATIONS

The effects of retention of a deleterious gene in a family are so drastic that increased attention must be given to this aspect of family planning, cautioned Dr. Warren Winkelstein, Jr., professor of preventive medicine at the University of Buffalo School of Medicine.

He illustrated his point in a discussion of congenital retinoblastoma, a neoplastic disease that until recently was considered fatal. Today, it is possible to preserve the lives of almost 70 percent of children who carry the gene responsible for retinoblastoma, although they will be blind in one or both eyes. If they marry and have children of their own, however, one-half of the offspring can be expected to develop the disease.

Winkelstein said it is unlikely that most married couples who knowingly carry a deleterious gene such as that of retinoblastoma or phenylketonuria would wish to risk propagating children with these traits. It seems more likely that they will utilize alternative ways for realization of family life—adoption of children, or, in appropriate cases, artificial insemination.

Unfortunately, he added, few American communities offer genetic services such as clinical and laboratory diagnostic procedures, counseling, research, and the maintenance of a genetic register. The development of new knowledge concerning the identification of carriers of deleterious genes as well as the establishment of a wide range of specific services is needed.

CHILDREN'S BUREAU PROGRAMS

State health departments may use maternal and child health funds, under the provisions of title V of the Social Security Act, to provide family planning services as a part of their maternal and child health programs and to support training programs in population dynamics, maternity care, and family planning, stated Dr.

Alice Chenoweth, chief of the Program Services Branch, Children's Bureau. The Federal funds also may be used to collect and report data on family planning services. Objectives of these programs are to improve the health and strength of families and to provide freedom of choice in determining the spacing of children and size of the families.

Chenoweth also mentioned five other Children's Bureau programs which include activities relating to family planning. Among them are programs providing funds for research, training, medical care for women in low-income families, services for youth, and establishment of genetic counseling services as part of programs dealing with the mentally retarded.

MORALS AND ETHICS

The prolific impulse to create mankind over again in our own image is wrong; and, more to the point, it is probably unwise, stated the Reverend John P. Brown, of the Church Divinity School of the Pacific, Berkeley, Calif. Morality and prudence amount to the same thing: it is not in the best interests of the human race for any of us to try to impose himself on others. We should not merely restrain from imposing ourselves and our ideas on others; we should restrain from imposing carbon copies of ourselves and our ideas on others in the person of our children, he said.

Brown said that the original family planners were concerned with the mother's health, with the perpetuation of genetic defects, and with a decent chance for each child to find his way in the world. Financial or physical strength gives us no more license to impose ourselves on others genetically than it does socially or internationally. He added that the prolificacy we may admire in admirable people, we deplore in populations.

Speaking of the doubts some people and some groups have on whether or how population control can be right in principle, Brown stated that since population planning is ultimately necessary, it must be permissible, although ". . . like everybody else I have my worries about the means." He said he was disturbed by the unesthetic character of most contraceptive measures and he urged physicians to followup the short-time and long-time effects of the pill with the cautioning remark, ". . . don't take it absolutely for granted, at least until the present generation of women has made it through to old age."

RELIGIOUS AND POLITICAL VALUES

There are no a priori grounds of private morality which forbid government participation in and support of family planning programs, said the Reverend Dexter L. Hanley, director of the Institute of Law, Human Rights, and Social Values of Georgetown University, Washington, D.C. He added that he came to this conclusion with full respect for and adherence to Catholic doctrine and traditional Catholic teaching on the questions of morality in family planning.

Hanley emphasized, however, that the conclusion carries certain implications: that the government will not express a preference for one accepted medical procedure over another, nor lend its authority to one moral position rather than another. The government must be neutral; it cannot promote a Catholic viewpoint nor can it adopt the social, philosophical, and religious attitudes of others. It must allow each citizen full freedom of choice, and must refrain from all coercion, direct and indirect.

The reason which justifies government participation in and support of broad family planning programs is the general welfare, in terms of education, housing, health, and other problems, he said. This interest is dramatized abroad where there is need to prevent hunger and famine by bringing resources and population into balance. Hanley added that a sincere attempt should be made to coordinate and integrate family planning programs with counseling that touches on the social, economic, religious, medical, and personal issues that are involved as a means of avoiding a collapse of public morality.

In commenting on some of the more controversial issues, Hanley said he was opposed to present-day attempts to liberalize abortion laws since he felt abortion and family planning are differently related to the social interests of family and of human life. He supported, in principle, the proposal to provide contraceptive

counseling to unmarried individuals but said he ". . . was not in favor of allowing the guidelines to be set entirely by the applicant."

Discussing this position, he said that premarital and extramarital intercourse is a moral evil and that it also is a moral evil to procreate a child in circumstances where he cannot be born into a family. Morality requires cessation of an illicit relationship; but where, contrary to this moral and social precept, one still engages in the relationship, can it be said there is an obligation to procreate? Hanley continued that the essential moral evil is the illicit relationship rather than the contraceptive practice. He emphasized that doctors and counselors will have to be able to exercise discretion because there is a difference between the indiscriminate prescription for contraceptive devices and a prescription concerned with an individual who has already made a mature decision.

HEALTH DEPARTMENT CLINICS

Public health agencies belong in the family planning field since this is a part of good total health care, according to Dr. William A. Cassell, chief of maternal and perinatal health for the California department of health. He noted that, until recently, families of lowest incomes who relied upon tax funds for medical care were deprived of birth control knowledge and services which were available to other Americans through private resources.

In tracing chronological developments in family planning throughout the United States, Cassell also discussed the growth of public health family planning services in California. At the present time, he said, 29 California counties provide direct services, 9 are cooperating with private agencies in family planning activities, and 18 are somewhere in the planning stage. There are 71 clinic locations in direct service counties and 17 in cooperative service communities. An estimated 65,000 patients have been served in the 200,000 patient visits recorded at these clinics during the past 3 years.

Cassell stated that California may now extend its coverage because of legislation (the Casey bill) which went into effect on March 1, 1966. This bill allows people in four categorical aid groups to receive both care for illness and preventive services from private physicians, clinics, or hospitals of choice. He said this will cover from 10 to 40 percent of patients formerly eligible only for county hospital service, and that Planned Parenthood clinics now may make a charge for these groups of patients. The resultant savings in other clinic funds may permit broadening the scope of coverage, he added.

A CONGRESSMAN'S VIEWS

The national legislature has yet to explicitly accept the proposition that if it is legitimate for government to provide medicines to improve the quality of human life, it is equally proper for it to provide family planning services. This was a point stressed in a paper by the Honorable Paul Todd, Michigan Congressman, which was read at the conference. His statement added that Congress has obliquely accepted the proposition, however, by providing funds for the Department of Health, Education, and Welfare that can be used for family planning services and that he expected a more explicit statement of policy in the near future.

Todd's paper cited some of the birth control clinics now in operation and advised planners to adapt the program to the people rather than trying to adapt the people to the program. He urged coordination with welfare departments and voluntary organizations.

Population policy, if wise, not only can alleviate the crisis and minimize the problem, his paper stated, but can enable us to avoid inhuman and debilitating natural methods of control if we implement the policy promptly. The corollary is that family life can be strengthened in the process.

VIEW OF THE A.M.A.

The American Medical Association is not convinced that birth control is a religious issue, and many physicians do not consider it a moral issue, stated Dr. James Z. Appel, A.M.A. president. He said his association believes people should be educated thoroughly in matters of teenage marriages and family planning, and that methods of controlling conception should be available to those who desire them, without discrimination on an economic basis.

We strongly endorse good programs on health education and family spacing, he said. Such programs should make use of qualified

health educators in schools and colleges and family counselors in and out of the formal education system. The clergy, the physician, the social worker all have roles to play in such programs.

Appel noted that the A.M.A. endorsed the program initiated in the World Health Organization 3 years ago for studies and programs in human fertility.

He pointed out that the physician alone cannot solve the problem of how to bring information and family planning services to the people who have the most need for it. Sociologists, economists, clergymen, and others must join the effort. An equally difficult project is how to get these people to make use of the service once it is available to them. Appel concluded by stating: "Education, moral persuasion and even financial remuneration—bribery, if you will—are all being tried throughout the world. It will take a strong effort by many if the problems of population are to be solved."

Education Notes

Graduate Program in Environmental Health Engineering. The University of Texas offers programs of study in water resources, air resources, solid wastes disposal, radiological health, and general environmental health engineering. Specialty areas within these programs are emphasized in courses and research projects carried out by the faculty, supporting research staff, and graduate students.

Financial support through fellowships, traineeships, and research and teaching assistantships is available to qualified students specializing in wastewater treatment and renovation, general sanitary engineering and design, water resources management, water supply, air pollution control, solid wastes disposal, radiological health, and industrial hygiene.

Additional information is available from Prof. Earnest F. Gloyna, Engineering Laboratories Building 305, University of Texas, Austin 78712.

Program in Combustion-Generated Air Pollution. The University of California College of Engineering and Engineering Extension, Berkeley, is offering an 8-day program in combustion-generated air pollution, July 5–14, 1967. The program is designed for engineers involved with problems of air pollution originated by combustion, practitioners of medicine or public health, and persons in industry.

Emphasis will be placed on problems arising from sources in agriculture, industry, transportation, and incineration. Lectures and discussions will cover fundamentals of combustion, fundamentals of chemistry and chemical kinetics, meteorology and atmospheric chemistry, environmental effects of air pollution, human factors, legal aspects, and techniques of control.

The enrollment fee is $200.

For more information, write to Engineering Extension, University of California, 2223 Fulton Street, Berkeley, Calif. 94720.

Radiological Health Specialist Training Program. Financial assistance for graduate work in environmental engineering is available to a limited number of qualified students at the University of Florida.

Candidates for either the M.S. or Ph.D. degree will be given a broad base in traditional sanitary engineering, and the radiological health specialization may be adjusted to individual interests from courses offered by the departments of chemistry, physics, nuclear engineering, radiology, and bioenvironmental engineering.

Additional information may be obtained from the Department of Bioenvironmental Engineering, University of Florida, Gainesville, Fla. 32601.