

A topical and selective report of the seventy-ninth annual meeting of the American Public Health Association and related organizations, San Francisco, Calif., October 29–November 2, 1951.

The Practice of Public Health

International Health

All Races, Creeds Can Work Together for Health

Because men of all races and creeds can work together easily in the field of public health, the World Health Organization is best fitted of all international agencies to spearhead a movement for the social and economic betterment of underdeveloped countries, Frank G. Boudreau, M. D., executive director of the Milbank Memorial Fund, told the APHA.

Pointing to the danger of two contrasting worlds, the one healthy and prosperous, the other—three times as large—suffering from poverty, disease, and premature death, Dr. Boudreau declared that a program to bring hope of relief to underdeveloped countries was the only alternative to continued armament races and war.

Terming present support of WHO “unimaginative and half-hearted,” he called on the peoples, as well as the governments, of the prosperous countries to rally to its assistance. The National Health Council, he announced, has decided to organize a United States Citizens' Committee for WHO, to educate Americans in the potentialities of world health, and to show them the stake that will be lost if the World Health Organization program is inadequately backed.

If contributions to world health continue on the present limited scale, Dr. Boudreau warned, we may lose our chance to wipe out within a few years some, if not all, of the ancient scourges of mankind: malaria, plague, yellow and typhus fevers, and cholera. Present means and methods of control for these diseases are far more effective than anyone imagined possible a few years ago.

Advances at Stake

Another lost opportunity might be the chance to rid the world of the worst manifestations of the deficiency diseases—beriberi, scurvy, rickets, and pellagra—which still claim millions of victims, though brought under control in the advanced countries.

We may lose the chance, he continued, to share in building up and utilizing a great stockpile of knowledge and experience in health maintenance and disease prevention for the benefit of all countries.

At stake also is the prospect of building up throughout the world a united front against disease by strengthening weak health services and sharing personnel, supplies, and equipment. The advantage of international cooperation, Dr. Boudreau pointed out, is that experience acquired by any country can be used freely by all, and that costly equipment need not be duplicated unnecessarily.

Contributions to Peace

“We may lose the chance to build peace into the minds of men,” Dr. Boudreau declared, through failure to promote world-wide programs of mental health, aimed at replacing aggressiveness and the competitive spirit by sympathy and cooperation. “Our problem is to make the challenge of peace appeal to men more strongly than the excitement of war.”

An inadequate international program, the speaker continued, will jeopardize our chance to learn by experience how to work together, by practice in the field of health in which all men believe, and in which there is no need for competition, since the supply is unlimited.

World society in this industrial and scientific age, Dr. Boudreau concluded, cannot exist without some

This section completes the report of the APHA meeting. The first part, printed in January, covered programs and administration, public health in civil defense, food and nutrition, health of mother and child, and laboratory developments. The sources, aims, and editorial policies which shaped the report are outlined on page 97 of the January issue.

form of world government; but that government must be built brick by brick, and the field of international public health offers the best area in which to lay its foundation.

WHO Carries on 100-Year International Health Effort

The World Health Organization has inherited the responsibility of carrying on and developing further the work done in more than a hundred years of international cooperation in the control of disease, Brock Chisholm, M. D., Director-General of WHO, told a general session of the APHA.

Among the responsibilities inherited from the health section of the League of Nations, the Office International d'Hygiene Publique, and the United Nations Relief and Rehabilitation Administration, the Director-General noted, are epidemiological notification services, biological standardization, medical aspects of narcotics control, and many other functions.

The International Health Conference which adopted the constitution of the World Health Organization in 1946 added extensively to these earlier fields of work, defining health in much wider terms than ever before, and giving WHO responsibilities never before delegated to an international health agency.

While the constitution protects national sovereignties completely, Dr. Chisholm declared, it has introduced a new principle of international law which makes health regulations adopted by the World Health Assembly far more effective than previous international conventions. The 79 nations which have signed the constitution have agreed to be bound by such regulations, unless they "contract out" by notifying WHO, within a specified time, of reservations or of their intention not to accept the regulations. The difficult process of ratification by each government of an international convention is thus avoided.

WHO is not a "supranational" health agency, the speaker emphasized, but it "stands ready to help,

in whatever ways are most useful, each nation to take the next appropriate steps in the development of the health services available to its people."

The Coordinating Function

The money currently being spent on international health flows from many sources and through a variety of channels. Among these, Dr. Chisholm enumerated the United Nations International Children's Emergency Fund, the United Nations Expanded Program for Technical Assistance to Underdeveloped Countries, the United Nations Food and Agricultural Organization, the United Nations Educational, Scientific and Cultural Organization, the Technical Assistance Program of the United States (Point IV), and the British Commonwealth Technical Assistance Plan (The Colombo Plan).

WHO has great responsibility in relation to all this work, but its first stated function, Dr. Chisholm recalled, is "to act as the directing and coordinating authority." More and more this coordinating function is occupying WHO's attention and resources.

Social and Political Problems

The problems facing WHO are social and political as well as technical, the Director-General reminded his audience. Among the conditions tending to prevent effective transplantation of health techniques, he cited unstable government, obsolete land tenure systems, ignorance, poverty, low productivity, graft and corruption, excessive nationalism, excessive birth rates, and "sacred cows" of many colors, shapes, and sizes. "These are the main problems in all international work, including international health," he declared.

"We must not insist that our ways are right and best for other peoples," Dr. Chisholm asserted. "We can only help peoples to take the next steps along the pathway of their own development. . . . We may

hope that, with some assistance, their development may be more orderly, more humane, and faster than ours has been."

Full implementation of WHO's functions as outlined in its constitution is still far in the future, the Director-General acknowledged; but sane and fairly well-balanced progress is being made in many directions, all contributing toward the stated objectives of the organization—"the attainment by all peoples of the highest possible level of health."

"Sound, Constructive Vision" Of Future in Constitution

The World Health Organization is amply endowed with authority and admirably staffed for the accomplishment of its mission, in the opinion of C.-E. A. Winslow, Dr. P. H., editor of the *American Journal of Public Health*. In his introductory remarks to the general session on international health of the APHA, Dr. Winslow referred to the WHO constitution of 1946 as "a remarkable document in its breadth and vision."

The constitution is notable not only for its broad statements of objectives but for its specific mention of far-sighted functions. The inclusion of mental hygiene, nutrition, housing, accident prevention, and medical care "represents a sound and constructive vision of the public health of the future which is substantially in advance of the actual practice of most health departments of the United States."

WHO is not limited to over-all standardizing and coordinating activities, Dr. Winslow pointed out, but may also render direct service to individual nations or areas.

WHO also is authorized to conduct research, to improve standards of teaching and training in medical and related professions, and to enter the vast field of public health education.

International Health Precedents

Reviewing the half century of international public health activity which led up to WHO, Dr. Winslow cited the Pan American Sanitary

Bureau, established in 1902, as the first permanent organization created for multilateral international action, and the International Office of Public Health, set up in Paris in 1909, as the first such organization with a world-wide scope.

These agencies laid emphasis primarily on quarantine regulations, "a useful but negative function." The more modern concept of an international health program which involved cooperation in building up within each nation a sound and effective program of disease control and health promotion was first demonstrated by the International Health Commission of the Rockefeller Foundation, established in 1913.

The Health Organization of the League of Nations, however, was the first "really effective machinery for a continuing attack on the problems of disease on a world-wide scale." Though not a member of the League, the United States, Dr. Winslow recalled, was always represented on the Health Committee, the central body responsible for the health program.

Comparing WHO's \$6,100,000 budget for 1950 with the \$250,000 budget of the League's Health Organization to demonstrate the increased scale of the present program, Dr. Winslow declared that "It is not dollars which ultimately count but the men and women who spend them." He closed with a tribute to WHO's staffs, and to Dr. Brock Chisholm, Director-General, who, he declared, has molded "a weapon of great and living power for the attainment of the objectives of world health."

REGIONAL EFFORTS

Better National Service, PASB Program Aim

The long tradition of inter-American collaboration for health, when combined with the wide divergence in health conditions and in health services in the Americas, provide an ideal situation for the development of international health programs, Fred L. Soper, M. D., director of the

Pan American Sanitary Bureau, told the APHA.

Since 1949, Dr. Soper pointed out, the Pan American Sanitary Bureau has been serving as the regional office of the World Health Organization, and the programs of the two agencies are closely coordinated. Even though the nations in the Americas pay a double assessment, one to WHO and the other to its regional agency, the \$2,300,000 available for the combined WHO/PASB operations in 1951 is "entirely inadequate to the needs and opportunities of the region," he said. An additional \$2,700,000, however, is made available for supplies and personnel through the United Nations International Children's Emergency Fund (UNICEF) and from technical assistance funds of the United Nations and the Organization of American States.

Personnel Problems

Since 1918, hundreds of fellows from all over the Americas have been sent by the Rockefeller and Kellogg Foundations and by the Institute of Inter-American Affairs to the schools of public health in the United States and Canada. As a result, Dr. Soper said, a uniform approach to the problems of public health administration has grown up, which is important in getting agreement on policies and programs.

A basic principle under which the regional office operates, the speaker said, is that every activity should contribute to the development of the national and local health services within the country and should preferably result in a permanent increase in the budgets of these official services. Another basic principle is that no program not justified by the potential economic and social conditions of the district serviced should be developed. The WHO/PASB office "must not become a relief organization except in case of extreme emergency," Dr. Soper declared.

In stimulating the development of health projects in a country, the regional office is committed to the

ultimate objective of the development of general health services with well-rounded programs. Such general services require highly trained staffs and an effective administrative organization, Dr. Soper emphasized.

The failure to get adequate salaries and suitable working conditions—especially protection against political manipulation and interruption of tenure—has resulted throughout the American Republics in a "terrific" loss of trained personnel over the years, the speaker asserted. The regional office gives preference to the training of those individuals who are working under conditions which justify anticipation of long-term employment.

Though it is not possible to improve personnel for general health services, Dr. Soper said, there are a number of serious specific problems which can be solved by personnel with a short period of intensive training in the application of a single technique. The importance of such problems as malaria, yaws, yellow fever, and venereal disease, for which relatively simple and economical solutions are now available, justifies the organization of special campaigns without awaiting the development of general health services. Such campaigns are particularly important when they lead to the possibility of vector or disease eradication, Dr. Soper said.

Programs

There are in the Americas a number of exotic and indigenous diseases—such as onchocercosis, hydatidosis, schistosomiasis, and bartonellosis—which are limited in extent but which are either spreading or are potentially dangerous. The regional office, said Dr. Soper, "feels a very special responsibility for these diseases and is on the alert for opportunities to aid in studies of measures for their control and possible eradication."

Two eradication programs are under way in the Americas, he said, one for the eradication of yaws in Haiti, and the other a continental program, begun in 1947, for the

eradication of the *Aedes aegypti* mosquito. Although there seems no immediate threat of the introduction of the yellow fever virus into the United States, the time may come, he pointed out, when this country may desire to foment international programs for the eradication of other insects or diseases, in which case it would be to the advantage of the United States to have the principle of regional responsibility for eradication fully established.

WHO Strengthens National, Local Services in SE Asia

Despite tremendous public health problems and limited resources, WHO has shown that it can stimulate the governments of southeast Asia to increased efforts for the health of their people, according to Chandra, Mani, M. D., director of the southeast Asia regional office.

This region, which includes Afghanistan, Burma, Ceylon, India, Indonesia and Thailand, contains nearly 500 million people, Dr. Mani noted, of whom 80 percent are illiterate. Average annual income is about 50 dollars a year, and the per capita expenditure on health is no more than 20 cents. Communicable diseases claim an enormous number of victims every year. The infant mortality rate averages about 150 per thousand. "Poverty, hunger, and disease are arrayed in force against the people."

Although there can be no quick solution to the major health problems, the regional office has achieved good results by confining its activities to a few well-chosen fields, Dr. Mani explained. WHO has concentrated on helping governments in the control of malaria, tuberculosis, and yaws, and in the field of maternal and child care. In all these programs, and in the related field of nursing, emphasis has been laid on the training of local personnel. "We conceive our function as essentially to strengthen local and national health services," the speaker said, "and to provide guidance in the sound development of national health programs."

Control Programs

As a result of WHO assistance in controlling malaria in large tracts of fertile land in India which had long been sparsely populated because of the disease, new possibilities are envisioned for colonization of neglected areas, with a substantial improvement in the food supply, Dr. Mani declared. In Afghanistan and Thailand, the success of malaria control projects launched in rural areas with WHO assistance has stimulated the governments to further efforts on an unprecedented scale.

In the field of tuberculosis, international assistance is being directed primarily to providing training facilities in modern methods of diagnosis and prevention, the speaker said. BCG vaccination, introduced into India and Ceylon in 1949, has made good progress. Of the 4 million persons tuberculin-tested in India, almost 2 million were positive reactors, Dr. Mani observed, and of the remainder about 1½ million have been vaccinated.

Another success has been the anti-yaws campaigns launched a year ago with WHO and UNICEF assistance in Thailand and Indonesia. In an area where previously the incidence of yaws was up to 20 percent, the disease has been controlled, he said.

The two great difficulties, Dr. Mani stated, have been the lack of trained health personnel and the shortage of vital supplies and equipment.

Dr. Mani noted that the question of population control is receiving much greater attention than previously in southeast Asia. "Family planning can play an important role," he declared, "but much greater research is required to develop methods applicable and acceptable to the East."

BILATERAL PROGRAMS

U. S. Point IV, Other Aid Complement WHO Efforts

The United States is prepared to push beyond the present reach of

the WHO—which is limited by the concept that no one nation should contribute more than one-third of WHO's basic budget—and is doing so in one-third of the countries of the world, through its bilateral programs, the APHA was told by Henry van Zile Hyde, M. D., director of the Health and Sanitation Division of the Institute of Inter-American Affairs, and United States representative on the Executive Board of WHO.

Coordination for programs in this hemisphere, he explained, is achieved by monthly meetings in Washington attended by officials of the United States Public Health Service and of the Institute of Inter-American Affairs, under the chairmanship of the regional director for WHO. In southeast Asia, the ministries of health in the various countries have set up coordinating committees which include representatives of WHO and United States Public Health Service officers. The international health movement is "a single unified movement pressing toward a common goal," Dr. Hyde declared.

Programs in Action

The emergency program launched during World War II by the Institute of Inter-American Affairs in cooperation with 18 Latin-American Republics has set administrative patterns and modes of action for bilateral health development, the speaker said. This program has stressed the development of local health services, environmental sanitation, training of health workers, and public health education. Dr. Hyde termed the Servicio Cooperativo, the administrative unit in which United States technicians work with the more numerous personnel of the host country within the ministry of health but under the direction of the chief of the institute field party, a "singularly significant achievement" in intergovernmental technical cooperation.

Noting that the institute paid less than \$3,000,000 to the Servicio funds in fiscal 1951, while the 17 cooperating Latin-American governments contributed a total of \$13,287,000,

Dr. Hyde observed, "This is not in the remotest sense a give-away program. It is truly cooperative effort to overcome problems that are of immediate concern to the entire hemisphere. . . ."

Reviewing bilateral health action in Greece, where United States Public Health Service officers form an important component of the Economic Cooperation Administration mission, Dr. Hyde noted as outstanding accomplishments the virtual elimination of malaria and the strengthening of the national health services, especially in sanitary engineering and nursing.

In southeast Asia, Formosa, and the Philippines, where the bilateral program also operates through ECA, emphasis has been given to malaria control. An aggressive attack is being made on trachoma in Burma, Viet-Nam, and Thailand, he said. The program also includes rehabilitation of hospitals and laboratories destroyed during the war. At the same time, the development of effective permanent national and local health services is the ultimate goal.

Dr. Hyde said that the United States Public Health Service supplies the technical support and much of the personnel for both the ECA operations—now being taken over by the Mutual Security Administration—and the programs of the Technical Cooperation Administration of the Department of State, now expanding in Latin America, Africa, the Near East, and the Far East.

Tuberculosis Key Element In Alaska's "Frontier Health"

Public health in Alaska is still "frontier public health," C. Earl Albrecht, M. D., commissioner of health of Alaska, told the health officers' section.

Foremost among the problems making for a frontier situation is tuberculosis control, Dr. Albrecht said. The death rate from tuberculosis among the native population is 600 per 100,000. The need for hospital and surgical resources is dramatized by the numbers of children crippled by tuberculosis.

Another very trying situation, the speaker said, is the condition known as "permafrost." In 60 percent of the land area of Alaska, the earth is permanently frozen a few feet below the surface. This creates problems of water supply and sewage disposal which engineers have yet to solve.

Through the cooperation of the United States Children's Bureau, the Alaska native service, the Alaska Department of Health, and the United States Public Health Service, a plan has been developed to take public health services to people scattered over great areas along the coast lines and the major rivers. Mobile health units are employed, Dr. Albrecht explained, three of these being floating health centers, one a railroad unit, and one serving the highway.

Due to the health-conscious Alaskan population, a cooperative legislature, and the support of the Public Health Service and the Children's Bureau, a well-rounded public health program is under way, the speaker said. A challenging amount of work remains to be done, he emphasized, and the rapid influx of American defense workers has raised new problems of environmental health.

3 Million Saved in Japan By Health, Welfare Action

Modern, nation-wide public health and welfare programs have saved the lives of three million Japanese during the Allied occupation, according to Brigadier General Crawford F. Sams, M. C., United States Army, chief of the public health and welfare section of General Headquarters, Supreme Commander of the Allied Powers. General Sams told the health officers' section of the APHA that the mean annual death rate of 18.7 per 1,000 population for the 7-year pre-occupation period was reduced to 10.8 in 1950.

The death rate from tuberculosis has been reduced to 145.4 per 100,000 in 1950 from the peak of 280 per 100,000 in 1945 by a control program which included the use of BCG, the general said. Immunizations for ty-

phoid and paratyphoid fevers, and improvement in environmental sanitation for the dysenteries have sharply reduced morbidity for the enteric diseases, the second leading cause of death in Japan, he added.

Organization

In contrast to the United States, where public health and welfare legislation is largely State or local, authority in Japan is derived from the National Diet, General Sams pointed out. Since there was only a primitive health and welfare organization in Japan in 1945, it was possible to establish an efficient administration pyramiding down from the Ministry of Health and Welfare, through departments in each prefecture (state) government, with health center districts within each prefecture.

Medical service districts, welfare districts, and social security districts coincide geographically with the health center districts, General Sams explained, so that the four fundamentals of health and welfare are incorporated into a single organization. Each health center district contains at least one completely organized and staffed health center and as many branches as needed.

Since there were no schools of public health in Japan, an institute of public health was established as a teaching institution. To supplement its program, a model health center which is primarily a training institution for health center personnel is located in each prefecture. In addition, General Sams stated, a school of hospital administration was established in 1948 for training directors of the 3,700 hospitals in Japan.

A national institute of health has been established, he said, which carries out research, biologics assay, and the training of health personnel in conjunction with the institute of public health. The national hygienic laboratory, charged with establishment of minimum standards and the assay of all drugs, medical devices, and cosmetics, is also directly under control of the ministry of health and welfare.

Epidemiological Investigations

IMMUNIZATIONS

Injections, Paralysis In Polio Linked

An analysis of relationships between immunization and poliomyelitis, based on a study of 1,300 children 5 years of age or less who had had poliomyelitis in 1949 and 1950, was presented by Dr. Morris Greenberg, M. D., M. S. P. H., Harold Abramson, M. D., Helen M. Cooper, and Helen B. Solomon, of the bureau of preventable diseases, Department of Health, New York City, to a joint session on immunization of the epidemiology, health officers, laboratory, and maternal and child health sections.

They felt that a relationship existed between the site of injection and the site of paralysis, when injections of diphtheria toxoid, pertussis vaccine, or tetanus toxoid had been given not more than a month before the onset of the paralysis. They did not feel, however, that such a relationship existed when penicillin or other agents had been given. No increase in bulbar cases or deaths resulted from previous injection, it was stated.

Hazard Small in Infants

Dr. Greenberg and his colleagues said that the study showed the extra hazard of poliomyelitis as a result of recent inoculations to be small in children under 1 year of age, and negligible in infants under 6 months of age.

During nonepidemic years it appears that immunizations may be given to infants under 1 year of age throughout the year, they felt. Routine immunizations may well be suspended in older children during the poliomyelitis season and extended during epidemic years to infants 1 year or more of age. Therapeutic and immediate prophylactic injections should not be discontinued at any time, they stated.

Before the same session on immunization problems, data connecting injection sites and the site of paralysis in poliomyelitis were reported by Robert F. Korn, M. D., Robert M. L. Albrecht, M. D., and Frances B. Locke, of the bureau of epidemiology and communicable disease control of the New York State Department of Health.

New York State Study

In a study designed to test British and Australian reports of an association between injection site and subsequent paralysis site, 2,137 cases of poliomyelitis in all age groups were studied. Control information covering a 2-month period prior to onset of the disease was gathered from members of the patient's household (6,055 persons) and from neighboring families on either side of and across the street (14,710 persons).

Injections were found to be nearly twice as common among poliomyelitis patients as among the controls in each age group. Of paralytic patients not injected, only 34 percent had arm involvement. Of patients with arm injections 8 to 14 days prior to onset of the disease was paralysis. Sixty-two percent of those injected 15 to 21 days before onset, and 50 percent of those injected 22 to 28 days before onset had arm involvement. The same correlation applies to leg injection and paralysis, they reported.

Adult Protection

Repeated small doses of diphtheria toxoid, either separately or combined with tetanus toxoid, may offer a more practical means of mass immunization of adults, Geoffrey Edsall, M. D., Army Medical Service Graduate School, Washington, told the session.

Dr. Edsall pointed out that the Schick test has certain limitations and presents difficulties, particularly

in mass use. The use of purified toxoid has reduced the incidence of reactions, he said.

NEW CONCEPTS

Herpangina in Children Related to Coxsackie

Herpangina, a mild disease of children characterized by the appearance of minute blisters and ulcers in the throat, is probably more widespread than has been supposed and apparently occurs in epidemic form, Roger M. Cole, M. D., Joseph A. Bell, M. D., Edward A. Beeman, M. D., and Robert J. Huebner, M. D., of the Microbiological Institute, Public Health Service, reported to the epidemiology section.

As a result of careful observation of several communities and of a variety of ill persons in hospitals over a period of 14 months, the investigators were able to confirm and to establish some definite facts concerning the etiology and epidemiology of herpangina.

Herpangina, it was reported, occurs principally in the late summer and early fall months and is spread from person to person. Primarily a disease of children under the age of 4, it has been suffered by persons up to the age of 60. Sex or race have no apparent influence on the occurrence of the disease. The length of the incubation period ranges from 1 to 10 days. Dr. Cole and his co-workers found two cases of repeat attacks of herpangina: two different types of group A Coxsackie viruses were shown to be responsible for the disease, neither type conferring immunity against the other.

The investigators reported that while the distribution of various Coxsackie viruses was fairly widespread in the communities under study, the role of these viruses in the natural causation of illnesses other than

herpangina is not yet evident. These viruses have been isolated from cases of several paralytic and nonparalytic disorders, including poliomyelitis, summer grippé, myalgia, and pleurodynia (muscular ailments), aseptic meningitis, and some fevers of unknown origin, but there is insufficient evidence at present to indicate that these viruses actually cause these illnesses.

The relation of the Coxsackie virus to poliomyelitis has been greatly overemphasized, Dr. Cole and his group feel. "There seems to be no evidence in the published literature to support the idea that Coxsackie virus occurs more frequently in persons with poliomyelitis than could be anticipated by coincidence," they said.

METHODS

Studies of Hypertension, Administrations Needed

Four significant discoveries from a review of the literature on hypertension and high blood pressure are: (1) there are no consistent standards for blood-pressure measurement; (2) there are no established criteria for defining hypertension; (3) there is no existing study on hypertension based on a scientific population sample; and (4) none of the studies indicate the actual extent of the problem, so reported E. Gurney Clark, M. D., of the School of Public Health of the Faculty of Medicine, and John A. Morsell, Ph. D., research associate of the Bureau of Applied Social Research, both of Columbia University, to the epidemiology section.

An epidemiological approach to hypertension would mean an attempt to describe its incidence, prevalence, trends, and distribution by age, race, sex, and the like, they felt, reporting on a 3-day symposium to review and to appraise the natural history of essential hypertension.

One section defined terms, established criteria, and introduced the concept of the natural history of essential hypertension. Section 2 elucidated causes. Sections 3 and

4 reviewed specific agents, the environment, and human characteristics. Section 5 gave research suggestions to fill the gaps in our knowledge as defined by the work of the previous sections, they said.

Eight basic problems, including the role of psychological trauma, heredity, and constitutional factors, the relation of blood pressure to illnesses and to normal life, as well as questions implicit in the preceding paragraphs are under study, they said.

Hospital Practice

Applying epidemiology to the field of administrative medicine is a change in subject matter only for the epidemiologist, A. Daniel Rubenstein, director of the division of hospitals of the Massachusetts Department of Public Health, said before the epidemiology section.

The value of epidemiology has been proved in communicable disease fields and is now being used more broadly in the fields of noninfectious conditions, such as alcoholism, cancer, diabetes, and other chronic diseases, he said.

In one instance, an epidemiological method was used successfully to determine the number of maternity beds needed in a new hospital. It was found that the number of beds planned were twice the number of births expected. This, in turn, led to a State-wide survey of maternity beds as well as births. Hill-Burton funds helped to standardize obstetric facilities throughout the State.

Mental Disease

As with the common cold and some other nonfatal diseases, the epidemiology of mental disease must begin with the study of cases during life, Ernest M. Gruenberg, M. D., and Bernard M. Kramer, Ph. D., of the New York State Mental Health Commission, Hilda F. Silverman, M. A., of the New York State Department of Health, and Charles V. Willie, M. A., of Syracuse University, jointly told the statistics section.

Conditions under which mental

diseases are more or less likely to occur—information vital to epidemiology—will be studied by investigation of incidence in different neighborhoods of one community, they said. Previous work indicated there are variations in the rate of mental disease hospitalizations, but did not reveal whether the variations were in incidence or use of the hospitals or both.

The group is planning to study prevalence of unhospitalized cases later. Some of the difficulties involved will be lack of awareness by the patient (as in loss of memory in organic brain disease) and attempted concealment of disease in other cases.

DISEASE STUDIES

Pleurodynia Study May Aid in Polio Problem

Because of many similarities which seem more than coincidental, the study of pleurodynia may assist in solving some of the problems of poliomyelitis, according to Alfred S. Lazarus, Ph. D., Elizabeth A. Johnston, M. S., and James E. Galbraith, M. D., of the Department of Public Health and Preventive Medicine of the University of Washington School of Medicine and Grays Harbor County Department of Public Health.

A 1950 outbreak of epidemic pleurodynia in Hoquiam, Wash., was described to the laboratory section by these scientists. They pointed out that the symptoms of pleurodynia—fever, abdominal pain, nausea, headache, stiff neck, and pain in throat, chest, and extremities—resembled poliomyelitis, without the paralysis. Almost three-fourths of the patients were under 20 years old. The causative agent was identified as a group B Coxsackie virus on the basis of symptoms and pathological changes in experimental animals.

Types of Polio Virus

Thirty-four new strains of poliomyelitis virus, representing three

types, were described, and the method of typing discussed by Charles F. Pait, M. D., U. Pentti Kokko, M. D., and John F. Kessel, Ph. D., of the Department of Microbiology of the University of Southern California School of Medicine.

They told the laboratory section of the frequency and geographic distribution of the 34 strains, making comparisons with similar data on 100 strains they had previously typed.

Respiratory Diseases

Triethylene glycol vapor (TEG) reduced air-borne bacteria by an average of 65 percent in Navy barracks, but did not reduce the number of acute respiratory infections, the United States Naval Medical Research unit No. 4, New York, reported to the epidemiology sections.

A concentration in excess of 2.5 micrograms of TEG per liter of air was maintained in one of the four dormitories in each of two barracks, and lesser concentration in a second dormitory. The other two dormitories were controls. Ten companies (662 men) were assigned the TEG dormitories, and 10 companies (660 men) occupied the controls.

Weekly examinations, supplemented by information from the regimental infirmary, were used to determine the occurrence of respiratory infections. Diagnoses of streptococcal infections and influenza were determined by bacteriological and serologic studies. Only 20 men from the control group and 21 men from the test group escaped respiratory infections, according to their report.

Anxiety States

An investigation of the causes of anxiety states revealed that 50 percent of the children of patients suffering from these conditions develop evidence of the disease, according to Mandel Cohen, M. D., of the Massachusetts General Hospital in Boston, speaking before the conference of professors of preventive medicine. Only 5 percent of the children of controls showed evidence of the

disease. Patterns of illness are not merely imitative, as children often show other symptoms than parents, he said.

In describing the anxiety state, Dr. Cohen stated that the disease is expressed in a wide variety of symptoms, cardiovascular and gastrointestinal as well as those referring to the autonomic nervous system. Clinical tests used to validate diagnoses of "chronic neurocirculatory asthenia" included the tread-mill test, basal metabolic examinations, hyperventilation when inhaling carbon monoxide, cardiovascular measurements, oxygen used in exertions, threshold of pain, and excretion of vitamins and kesteroids.

In discussing prevalence and incidence by sex, he noted that onset was always before 35 years of age. A 20-year follow-up of 153 patients showed that 13.3 percent were well, 25 percent had symptoms but no disability, 45 percent had mild disability, and moderate to severe disability was found in 16.7 percent.

Histoplasmosis

Clayton G. Loosli, M. D., J. Thomas Grayston, M. D., E. R. Alexander, B. S., and L. W. Combs, M. D., of the department of medicine, University of Chicago, reported to the epidemiology section, the first instance in which histoplasma infections have occurred in man when the source of the infection has been determined.

The disease arose simultaneously in three males of one family in Indiana, they said. The diagnosis was established by sputum and bone marrow culture and by skin tests positive to histoplasmin.

Since the farm silo which the three men had been cleaning during the preceding 2 months seemed the most likely source of the infection, methods used for detection and isolation of the *Histoplasma capsulatum* were adapted after those suggested by Emmons and applied to the silo and its immediate neighborhood. Numerous positive findings were obtained. The authors concluded that the most probable source of the fungus is the soil.

Yaws In Guam

Yaws relapse of a violent type found in four outermost villages of Guam was reported by Commander Robert E. Rock, M. C., United States Navy, to the epidemiology section. Treatment of 1,030 children consisted of 4 doses each of depository penicillin and bismuth subsalicylate.

The lowest relapse rate 5 to 7 months after treatment was found in the village with the best DDT fly-control and the best trash clean-up, Commander Rock reported. The lowest rate occurred in the village having the poorest success with fly infestation. A third village closely approximated the first in its relapse rate. The fourth village had left too many untreated yaws cases to make valid interpretations.

Scabies and its treatment did not appear to influence yaws relapse. However, chickenpox could be considered an exciting high-degree factor of influence in yaws, according to Commander Rock.

Heart Disease

The prevalence of rheumatic heart disease among Colorado children is not significantly higher than that among children elsewhere in the United States, the American School Health Association - was told by George J. Maresh, M. D., H. Jackson Dodge, M. D., and John A. Lichty, M. D.

The Colorado State Health Department, Colorado Heart Association, and the University of Colorado Medical School conducted a 2-year survey of sixth-grade children in 41 Colorado counties, in which 11,199 auscultation examinations were made by physicians experienced in pediatric cardiac diseases. Historical information was obtained by questionnaire.

A prevalence rate of definite heart diseases (all types) of 0.94 percent was revealed, with 0.66 percent due to rheumatic diseases and 0.26 percent due to congenital defects. This county sample represented 89 percent of the total population of the State of Colorado.

TB in the Navy

An estimated 20 to 30 percent of naval personnel with tuberculosis had had X-ray examinations which were reported negative, before admission to the hospital. Upon review, however, the X-ray plates were either found to be technically unsatisfactory or to contain definitely suspicious shadows, according to Commander Sidney A. Britten, M. C., United States Navy, Deputy Director of the Preventive Medicine Division of the Bureau of Medicine and Surgery.

Although the total new-case rate for all forms of tuberculosis was low (59 per 100,000), there were marked variations for specific types of personnel. In 10 to 15 percent of the cases, contact with tuberculous friends and relatives outside the service was known.

Three new control measures applied during 1951 were: (1) routine annual chest X-ray examinations, wherever practicable, of dependents of naval personnel who are 15 years of age or over; (2) tuberculin testing and periodic retesting of naval hospital staff personnel; and (3) immediate reinterpretation of X-rays of all recruits whose tuberculin skin tests are doubtful or positive, Commander Britten reported.

Alcoholism and Suicide

Deaths from alcoholism as a primary cause during 1938-48, as recorded by the medical examiners of Massachusetts, totaled 1,555 or 3.29 per 100,000 population, said Johannes Ipsen, Jr., M. D., superintendent of the State Institute of Laboratories, Merrill Moore, M. D., associate in psychiatry at Harvard University Medical School, and Leo Alexander, psychiatry instructor at Tufts College Medical School, all of Boston, Mass.

Reporting to the epidemiology section, they said that of 106,579 medical examiners reports on deaths for the 11-year period, 7,968 mention alcoholism. It was decided that 2,579 were cases of alcoholics dying from other diseases or injury, they stated.

Alcoholism was found more frequently among persons dying from certain poisonings, particularly barbiturates. Of 1,195 persons attempting suicide, 143 were alcoholics, and 4.9 percent of these were successful in their suicide attempts. Of the nonalcoholic group, 11.8 percent were successful suicides.

Dr. Ipsen and Dr. Moore estimated an alcoholism prevalence of 1.0 to 1.3 per 100 people in Massachusetts based on the sampled violent deaths.

Lung Cancer

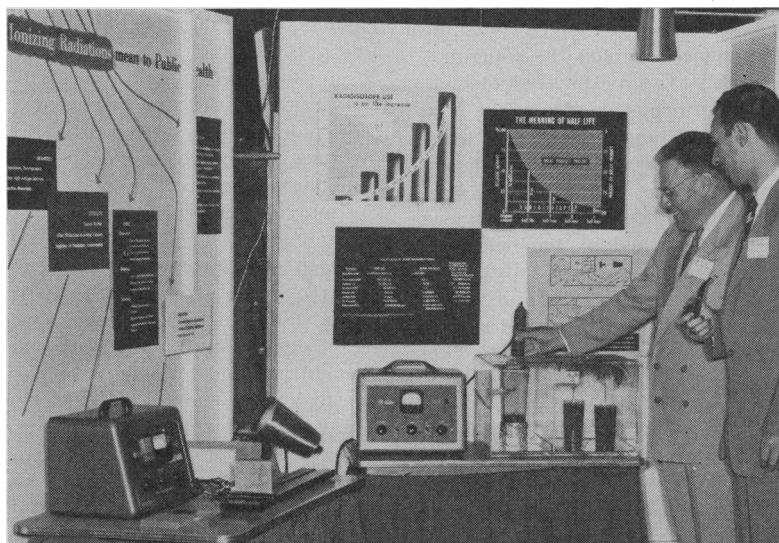
It is only by routine X-ray surveys that lung cancer can be discovered while still asymptomatic and in the silent and curable stage, Lewis W. Guiss, M. D., chairman, cancer committee, Los Angeles County Medical Association, told the Public Health Cancer Association.

Preliminary findings in the incidence of lung cancer through a mass chest X-ray survey of 1,867,201 persons during a 10-month period in Los Angeles was described by Dr. Guiss. Of this total, 64,745 were

asked to return for confirmatory re-examination, and 54,648 complied. The X-rays were found to be essentially negative in 14,344 of the re-examined cases. Old healed disease was shown in 9,216. Other diseases, including neoplasm suspects, were found in 5,646.

Tuberculosis and cardiovascular conditions, it was believed, were being picked up accurately, but some neoplasm suspects might be overlooked. A thoracic surgeon, plus a high index of suspicion, added to each reviewing team, raised the percentage of persons suspected of having neoplasms.

Of the confirmatory 5,646 cases of other chest disease, 3,500 were placed in the chest tumor registry. This showed an incidence rate for tumor suspects of 1.9 per 1,000 examined and is significantly higher than incidence rates shown by other chest X-ray surveys, Dr. Guiss pointed out. The total incidence of possible tumors detected by chest X-rays in 10 surveys was shown to be 0.8 per 1,000, he continued. He attributed the incidence rate of the Los Angeles



A Geiger counter is used to demonstrate radioactive labeling of flies as part of the exhibit presented by the Public Health Service at the San Francisco meeting of the American Public Health Association. The demonstrator is Dr. Samuel C. Ingraham of the Division of Engineering Resources. Observer is Assistant Sanitary Engineer Morton Goldman of the Environmental Health Center.

County survey to either a high index of suspicion or an actual increase of lung cancer in that area.

Lost cases were problems in treat-

ment and follow-up and were due to a number of factors, which Dr. Guiss enumerated. He presented tabulations of the X-ray findings, disposi-

tion of patients to physicians, clinics, and hospitals, and statistical classifications of diagnoses under malignant and benign tumors.

Statistical Methods

CHRONIC DISEASE

New Indices, Periodic Observations Necessary

Chronic disease is almost always not in a static state, despite the usual connotation of the word "chronic," Philip E. Sartwell, M. D., associate professor of epidemiology at John Hopkins University, and Margaret Merrell, Sc. D., associate professor of biostatistics, told a joint session of the epidemiology and statistics sections and the Biometrics Society.

They pointed out that changeability and variation in so-called chronic conditions brings up two questions for discussion: (1) the need for additional indices to describe these changes; and (2) the point that the interpretation of prevalence and incidence figures is more involved in chronic than in acute diseases.

The kind of morbidity index needed for studying a disease will depend on the purpose for which the information is to be used, and by whom, said Dr. Sartwell. The brief period of illness in acute diseases does not furnish much information of interest to an epidemiologist, but the variety of changes which occur during a chronic illness "are of the greatest relevance to our understanding of its epidemiology."

Eliminating from this discussion congenital defects and secondary physical or mental changes resulting from acute illness, Sartwell and Merrell then classified chronic disease roughly as: (1) conditions such as cancer, which progress rather rapidly and terminate fatally; (2) degenerative vascular disease, with slow progression of basic vascular episodes "punctuated by unpredicta-

ble acute episodes, such as coronary occlusion or cerebral hemorrhage;" (3) diseases like peptic ulcer, rheumatic heart disease, rheumatoid arthritis, and tuberculous infections, whose course is variable and may end in complete recovery, permanent disability, or death; (4) endocrine deficiencies, such as diabetes mellitus and thyroid deficiency, which may be controlled by substitution therapy; (5) diseases resulting from prolonged exposure to recognized environmental factor-chronic dietary deficiency diseases, chronic intoxications, and pneumoconiosis.

Other Landmarks Needed

Scales upon which to measure the rate of progression of chronic diseases throughout various stages are difficult to establish, said Dr. Sartwell. In some diseases no change except death has been classified, "yet, the longer the duration of the disease and the more variable its behavior, the greater the need for other landmarks than death in describing its course." An individual's ability to carry on his work might be a better index to disability than clinical or laboratory tests, in the authors' opinion.

Studies in tuberculosis mortality in the United States have shown that "it is the rate of progression rather than either incidence or prevalence, that furnishes the key to the . . . difference in mortality" between whites and Negroes, according to Dr. Sartwell. Progression rates are likewise needed in interpreting geographic differences in prevalence of disease, and in studying the effect of the time trend on prevalence ratios. Drs. Sartwell and Merrell felt that essentially all the problems of chronic disease revolve around

the time factor, since every characteristic by which a group of people is commonly classified, except their sex and race, can change with time.

They emphasized that, to advance present knowledge of chronic disease and better to interpret morbidity rates, there is need for more studies in which periodic observations are made of individual members of a population, rather than single surveys of prevalence, as has been done in the past.

Multiple Sclerosis

In many parts of the world today multiple sclerosis is thought to be "one of the most common chronic diseases of the central nervous system," according to Leonard T. Kurland, M. D., an epidemiologist at the National Institute of Mental Health of the Public Health Service, speaking before the epidemiology and statistics sections and the Biometrics Society.

A study was made in 1943 of the reported mortality in the United States and Canada, where language, medical terminology and practice, and hospitalization procedures would presumably be similar, in order to measure and compare the frequency of multiple sclerosis over a wide latitude. Results seemed to indicate that multiple sclerosis may be more prevalent or more severe among the white population in northern areas than in the South, said Dr. Kurland.

He reports further that intensive surveys carried out in 1949 to test the validity of inferences drawn from the 1947 analysis showed that the average annual death rate for multiple sclerosis is three to four times higher for Winnipeg and Boston than for New Orleans. Since an

apparent similarity exists between the prevalence ratio and the death rate in each of the three cities, he suggests that "mortality from multiple sclerosis may be useful as an index of prevalence," and that "the variation in multiple sclerosis distribution is related to some geographic factor rather than to differences in racial susceptibility."

Cancer Therapy

A method for measuring the effectiveness of cancer therapy, using three indices: (1) the "cure" rate; (2) the annual death rate from cancer; and (3) the percent of normal life expectancy, was presented to the statistics section and the Biometrics Society by Joseph Berkson, M. D., Sc. D., and Robert P. Gage, M. S., of the Mayo Clinic Division of Biometry and Medical Statistics.

As an illustration of their method, they divided a series of patients who had been operated upon at the Mayo Clinic for cancer of the breast into two groups, one without metastasis and one with metastasis.

The authors estimated that for the patients without metastasis, 64 percent have a normal life expectancy; for the 34 percent who were not cured the annual death rate will be 12 percent; and for the total group the life expectancy is 76 percent of that of the normal population. The results for the patients with metastasis may be similarly interpreted, but they are not so favorable.

Berkson and Gage pointed out that of prime importance is the degree of completeness of the follow-up of patients. In a recently completed follow-up of 8,000 patients surgically treated for cancer of the stomach, they obtained a trace rate of 99.4 percent for patients traced as long as 35 years.

MORBIDITY

Short-Range Predictions For Polio Described

Methods for appraising impending epidemics of poliomyelitis and of making estimates of total cases to be reported during a year were outlined

before the statistics section by F. M. Hemphill, Ph. D., of the Department of Public Health Statistics of the University of Michigan School of Public Health.

Dr. Hemphill demonstrated application of the method to the United States as a whole and to Michigan for epidemic periods in 1950. In this method, an expected number of cases per week is developed by computing a "theoretical distribution" based on two selected years' observations. The number of cases in each week of this distribution is considered to be subject to Poisson-type variation. A variance is computed for each week from this consideration and the mean plus three times the standard deviation is established as the "upper limit" of the number of cases expected in any one week. If this upper limit is exceeded for two consecutive weeks, then the total number of cases for the year would be expected to exceed the total number of cases for the "theoretical distribution."

Four methods for estimating the total poliomyelitis cases expected were discussed by Dr. Hemphill: (1) estimation of total cases for Pearson type III relationships; (2) estimation of total cases by proportionate comparison of theoretical and current distributions; (3) Cohen's method of estimating parameters; and (4) predication of total cases by percentage increment.

California Research

A research project to develop, analyze, and evaluate methods for obtaining adequate and current data on morbidity in the general population is now under way in California, Arthur Weissman, B. A., J. D., of the California Department of Public Health told the statistical and epidemiology sections.

Following recommendations of an advisory committee of representatives from physicians' and other organizations concerned with public health, three potential methods are being evaluated: (1) the use of operating program data for projecting illness rates for the general

population; (2) household sample survey methods; and (3) collection of illness data from samples of physicians and hospitals.

Before testing one or a combination of methods on a state-wide basis, Dr. Weissman said, the advisory committee felt that potential methods should be tested on a selected area. San José was chosen, on the basis of its population, both in numbers and because its composition resembles the State as a whole, and because the area is relatively self-sufficient in medical, hospital, and related services.

Dr. Weissman described the plan for pretesting and evaluating alternate methods of measuring morbidity. He states that emphasis is placed on the verification of illnesses reported in household sample surveys, but that the need to determine the extent of under-reporting of illnesses in these areas is of equal if not greater importance.

Family Record Study

In an experimental effort to design a method of investigation useful in securing accurate and complete information on morbidity and medical care among families, the University of California conducted a family record study in 1949, E. Richard Weinerman, M. D., Charlotte F. Muller, Ph. D., and Anne Waybur, A. B., of the University's Division of Medical Care Administration and Biostatistics, reported to the medical care section.

The study sample was made up of employees on the payroll lists of the University of California at Berkeley, most of whom were young, married, employed, white-collar, urban workers. The group included more females, younger children, and larger incomes than the general population.

The method used in the study, said Dr. Weinerman, was to avoid dependence upon memory for remote events, to create a continuity between the population sample and the research team over a period of time, and to provide a means of recording and correlating many dif-

ferent kinds of interdependent health information. It included a specially designed health record booklet, regular monthly visits by a trained interviewer, and an integrated inquiry into morbidity, receipt of health services, and health expenditures.

This pilot study demonstrates, the authors conclude, that the method described may be most useful in long-term studies of specific health problems, such as prevalence of chronic disease, receipt of health services, and expenditures for medical care.

FOLLOW-UP

"Not Observed" Element Key Factor in Estimates

In measuring incidence or prevalence of disease in given groups or samples of persons, the effect on his estimates of those in the sample who are "not observed" is one of the most difficult problems the statistician has to face, Albert P. Iskrant, M. A., and Quentin R. Remein, of the Division of Venereal Disease, Public Health Service, emphasized to the statistics section and the Biometrics Society.

They saw the problem as having two aspects: (1) the effect of nonrespondents on estimates of incidence and prevalence based on case-finding projects; and (2) the effect of nonrespondents upon evaluation of therapy based on follow-up of treated cases.

According to Iskrant and Remein, evidence from several case-finding projects indicates that respondents differ from the general population in color, sex, age, education, and economic status, and that nonrespondents differ from respondents with respect to prevalence of disease.

The authors report "there were no appreciable differences between the re-treatment rates" of two groups of patients studied by the Division of Venereal Disease, one followed routinely and the other intensively.

Cancer Survival Rates

In a paper given by Mardelle L. Clark, A. B., Jean Hall Gerende, B. S., M. S. P. H., and Mary B. Peeples, of the Armed Forces Institute of Pathology, an evaluation was made of the differences in follow-up rates of patients treated for primary carcinoma of the bladder when computed by the direct and by the actuarial methods. They felt that the over-all rates did not provide a sufficient basis for prognosis, since the rates vary in direct ratio to the severity of the disease.

Actuarial Method

"The so-called actuarial method of computing survival rates is self-contradictory and, as such, cannot be used for building up a statistical theory for the evaluation of the role of chance on the varying outcomes of treatments of patients," Evelyn Fix, Ph. D., of the statistical laboratory of the University of California, maintained before the statistical section and the Biometrics Society.

She pointed out that in dealing with data on moderate numbers of individuals and in trying to use these data for comparisons either of different methods of treatment or of different systems of symptoms it is essential to have at hand an appropriate statistical theory to guard against unwarranted conclusions.

To be useful, Dr. Fix emphasized, "such theory must be based on a system of assumptions that are as close to the actual phenomena as possible, and these assumptions must be mutually consistent."

DENTAL RESEARCH

Persons, Not Teeth, Unit of Clinical Sample

"More and tighter dentist-statistician relationships are necessary in public health dentistry today," A. L. Russell, D. D. S., of the National Institute of Dental Research, Public Health Service, emphasized before the dental health and statistics sections.

Public health dentistry has three

main objectives, Dr. Russell added—education, treatment, and prevention. To reach these objectives, the dentist must know what facts are pertinent and available and how to procure and evaluate them.

In planning a program, Dr. Russell said that "it is considered good practice to make a preliminary needs survey . . . to determine the magnitude of the community problem and to determine the proportions in which education, treatment, or prevention are most applicable as a solution." He went on to say that the data "can be recorded on a single examination form . . . designed for quick tabulation and adaptable to . . . methods in common use." A specific program can then be planned to meet the actual needs of the community.

Dr. Russell cited an instance in which it was found that the referral program had failed because local dentists would not accept children as patients. After three of seven local dentists had taken a short course in dentistry for children the referral system was reinstated. Had the survey shown different findings another approach might have been used.

Successful "trouble-shooting," as Dr. Russell describes this method, is dependent upon accurate diagnoses, for, unless the raw data sent in from the field have been assembled according to well-established principles and can be depended upon they are worthless to the statistician.

Planning the Key

Dr. Russell says that "it is a truism that the statistician is more useful during the planning phase of a survey than he can be after the raw data have been assembled for tabulation and analysis." Surveys are pre-planned "from the statistical point of view." Evaluation of a given program begins with a resurvey, using exactly the same procedures as those in the original survey. The statistician then analyzes the results to determine whether the observed differences are real, and the dentist decides whether they are meaningful.

In discussing the flouridation program, the Public Health Service officer stated that "flouridation of the water supply does not do away with the necessity for dental education and for dental care, and these elements of the program will continue to require reappraisal and modification."

Dr. Russell stressed the importance of the contributions made by public health dentists to basic knowledge and methods of control of oral diseases, even though "research per se" is not their primary duty.

Most difficult in evaluating research finding, according to Dr. Russell, is for the dentist and the statistician to evaluate someone else's findings, using only data found in a published report. The dentist must make the decision on the value of any measures suggested by such a report, basing such a decision on contemporary opinions, published analyses by dependable groups, or on direct clinical tests which he himself may make.

An adequate study, said Dr. Russell, should include (1) a concise but exact description of methods or criteria; (2) evidence that adequate numbers have been studied, although a small-sample study may be highly conclusive; (3) strict and direct control; (4) simple, clear logic; and (5) conclusions fully supported by evidence. It is best to withhold judgment on a single study

until it has been duplicated and the conclusions confirmed at least once.

Dr. Russell called attention to a point which the statistician should recognize at a glance—the *person* is the unit of sampling in a clinical dental study and not the number of teeth being studied.

RECORD SYSTEMS

Medical Students Taught Certification

The "minimum effective dose" (m. e. d.) for the teaching of death certification to medical students is "believed to be a continuance program of repeated indoctrination, experience, study, and discussion that builds desired appreciations and habits step by step as the student's medical education progresses," the American Association of Registration Executives and the statistics section of the Western Branch were told by Adolph Weinzril, M. D., and Carl E. Hopkins, Ph. D., of the University of Oregon Medical School.

Teaching of future physicians should produce, they felt, active appreciation of the need for data, of the registration and vital statistics system, of the common sources of error and how to prevent them, and of the physician's key role in the system.

Drs. Weinzril and Hopkins said they tried "one-shot" lectures on

"the why's and how's of medical certification" and rejected them as ineffective. They said their m. e. d. was effective "only if due attention is paid to the basic elements of the learning process." Whenever possible, the necessary verbalizations need to be accompanied by exercise, on the part of the student, of the primary senses and motor activities. The sequence of drive-stimulus-response-reward must be repeated over and over in an expanding context of collateral medical knowledge, they found, emphasizing that "the entire process seems to work best in a comfortable, nonauthoritarian climate of feeling."

State-Local Project

Now under development in California is a long-range plan that will transform records, reports, and reporting procedures from a "millstone around the neck" of administrators into an efficient, useful tool in program planning, operation, and evaluation, the statistics section heard from Paul W. Shipley, B. S., chief of the bureau of records and statistics of the California State Department of Public Health.

He reported that for the first time in the State the personnel responsible for program planning and operation of both the State and local health departments have pooled their resources in an orderly approach to solving "this most complex problem."

Environmental Health

WATER AND SEWAGE

17 Million Served by Individual Sewage Units

Only 40 percent of the 4,400,000 individual household sewage disposal systems in the United States were installed under organized State or local health agency control, V. G. MacKenzie, B. S., officer in charge, Environmental Health Center, Pub-

lic Health Service, reported to the engineering section. These systems serve 17 million persons, compared to 75 million served by public sewer systems. Trends indicate the importance of individual systems will not be reduced, he said. Forty percent of the homes being built with Federal mortgage insurance assistance depend upon individual systems for sewage disposal.

Reporting on studies of septic tank performance characteristics, Mr.

MacKenzie emphasized factors of capacity, shape, compartmentation, depth, inlet and outlet arrangements, and other factors affecting operation. The removal of suspended solids was taken as the criterion of tank performance. He also stressed the variations in composition and volume of household wastes as a basic consideration in design standards.

Concerning the effect of household detergent use on soil absorption

systems, additions of detergent and soap, respectively, to tank effluents indicated no differences in clogging tendencies, Mr. MacKenzie said. Similar studies with grease-soap and grease-detergent tap water suspensions showed greater clogging for the soap. Tests with wash waters from a home washer, using soap and detergent alternately, showed no differences in clogging rates when applied to soil cores. Both soap and detergent washer wastes clogged soil more rapidly than normal septic tank effluent.

Mr. MacKenzie said that the septic tank is not a complete disposal system but a unit of a process for disposal of waste liquid into the soil—a medium that is sensitive to the heavy waste loads placed on it and susceptible to damage from abnormal changes in those wastes. This and all factual information concerning septic tanks should be considered in the design, operation, and servicing of each individual tank installation, he concluded.

The Membrane Filter

A method for bacteriological analysis of water which promises a substantial reduction in time, material, equipment, labor, and space, and yet will, in all likelihood, be more certain and precise than present methods, was described to the engineering section by Harold F. Clark, M. A., and Paul W. Kabler, M. D., bacteriologists from the Environmental Health Center, Cincinnati, of the Public Health Service.

The apparatus consists of a funnel and receptacle and is made of stainless steel. The sterile membrane is placed on a porous plate in the receptacle, and the funnel is clamped over it. Removal of the bacteria is effected by passing the sample through the funnel. The method permits use of large quantities of sample, 500 ml. or more, they stated.

Dr. Alexander Goetz made the membrane filter apparatus, and it was supplied through the Army Chemical Corps. The filter is prepared from a cellulose derivative and will quantitatively remove bac-

teria from water samples. Bacterial counts by the membrane filter technique require filtration of a representative amount of sample, choice of a suitable medium, incubation, and counting the colonies, according to Clark and Kabler.

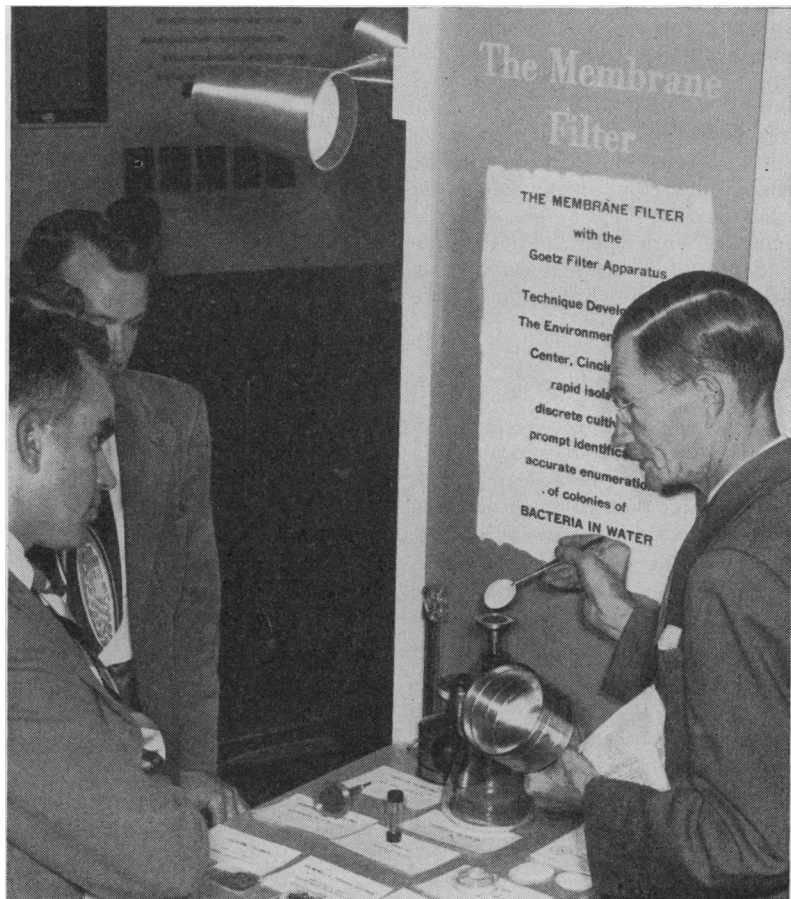
They reported that coliform determinations require about 18 hours instead of 3 or 4 days needed by present procedures. Details of this procedure were described in *Public Health Reports* for July 27, 1951.

Differential Media

The membrane filter method for the culture and identification of bac-

teria is unique in that it enables the bacteriologist to transfer growing organisms to two or more enrichment and/or differential media at any period in their growth cycle, Dr. Kabler and Mr. Clark reported in another paper before the laboratory section.

Each organism provided with suitable nutrients will produce a visible colony. The incubation time and temperature depend on the species of bacteria to be grown and the medium used. All components of the medium used with the membrane filter technique must be in solution. The formulae of most



The Goetz membrane filter apparatus is demonstrated by Harold F. Clark, bacteriologist of the Environmental Health Center, who has developed some of its uses in sanitary bacteriology. The filter was on display as part of the Public Health Service exhibit-demonstration at San Francisco. The filter technique was described in *Public Health Reports* for July 27, 1951.

media for conventional uses must be modified for best results with the membrane, they stated.

Species Identification

Concomitant with growth of the colonies on the membrane, the problem of group and/or species identification must be considered. Efforts have been made to develop differential media which produce a characteristic color change in or around the colony, inhibit unwanted groups or species, and exhibit both inhibition and characteristic color reaction, they said.

The results of experiments with seven media for growth of several species of bacteria were described and evaluated by Dr. Kabler and Mr. Clark. A modified Endo medium was found very good for the demonstration and enumeration of coliform organisms. Bismuth sulfite was excellent for growing *Salmonella typhosa*. For other *Salmonella*, preliminary enrichment on tetrathionate broth followed by incubation on brilliant green (Kaufmann) gave high recovery rates.

Sewage Water Reclaimed

A 2-year sewage reclamation study by the University of California sanitary engineering research project indicates that although no satisfactory basis for the design of sewage spreading areas has been determined, it is possible to reclaim water from sewage by spreading, the engineering section was told by project members, Arnold E. Greenberg, S. M., and Harold B. Gotaas, Sc. D., research engineer and director.

Planned reclamation is a comparatively recent development, designed specifically to produce a usable water, and is receiving serious consideration in water shortage areas. In their study of sewage effluent spreading on uncultivated land, Mr. Greenberg and Dr. Gotaas concluded that a bacteriologically safe water can be produced from a good sewage plant effluent and that a chemically satisfactory water can be produced

from the final effluent of a plant treating domestic sewage.

A percolation rate of 0.1 foot per day can be expected from spreading a final sewage plant effluent on Hanford fine sandy loam. Resting and spreading of the spreading basin will maintain maximum percolation rates. Mosquitoes will create a nuisance requiring control, they said, and control of algae odors may also be necessary.

Water Pollution Control

A discussion of the comprehensive and sweeping changes in State laws for the control of water pollution enacted by the 1949 California Legislature, creating a State and nine regional water pollution control boards, was presented to the engineering section and National Association of Sanitarians by Vinton W. Bacon, executive officer of the California State Water Pollution Control Board.

The new legislation establishes by definition the concepts of "contamination," "pollution," and "nuisance." The authority of the State and local departments of public health is restricted to cases involving contamination. Abatement of pollution and nuisance rests with the State and regional water pollution control boards.

Control of waste discharges is exercised through treatment-plant effluent or receiving-stream quality requirements. This abolishes the former "permit" system which required advance review and approval of plans and specifications for proposed waste treatment and disposal facilities.

Coordination of water pollution control activities of all State, regional, and local agencies is a prime objective of the new legislation, continued Mr. Bacon. Pollution control is decentralized and placed on the regional level, with regional policies being established by a five-member board appointed from within the region. Control is based on a case-by-case study and analysis of water uses rather than by a fixed rule, Mr. Bacon said.

Food Handler Training Pays Large Dividends

Information thus far accumulated in a number of California communities in a survey by the State Department of Public Health indicates that food-handler training pays substantial dividends, Ralph L. Tarbett, B. C. E., associate sanitary engineer of the department, told the sanitation section of the Western APHA Branch.

Mr. Tarbett said that, although positive conclusions cannot be made at present, there is evidence of dividends in improved restaurant sanitation, better relations between the restaurant industry and local health departments, and increased public support for the program.

The State Department of Public Health began the survey of the effect of food-handler training at the request of the 1950 California Conference of Local Health Officers, which had gone on record as favoring education and inspection as parts of a food sanitation program. Consultants from the American Public Health Association, United States Public Health Service, and the University of California School of Public Health aided in planning the methods, forms, and techniques used in the survey, he said.

Much of the criticism of health departments regarding food sanitation is the lack of uniformity in recommended practices and legal interpretations of laws, Mr. Tarbett noted. He felt that these studies, in addition to measuring the value of food handler training courses, will tend to combat this criticism and develop closer relationships between the State and local health departments.

Local Sanitation

Other sanitation activities at State and local levels were discussed at meetings of the Conferences of State Sanitary Engineers and Municipal Public Health Engineers. John M. Helper, C. E., State sanitary engi-

neer of Michigan, stated that the widely practiced food handler training program is not accepted in Michigan, due to the large turnover of personnel in food handling businesses. He felt that this activity should be critically re-examined as a health department program.

Other speakers stressed that where local sanitation personnel are available, sanitation work can and should be done by them, but there is a considerable job for State health departments in providing sanitation for small communities and rural areas. It was also pointed out that the need for sanitation personnel must be based on environmental units rather than population units.

The engineers' conference also heard a panel discussion of interstate milk shipment program responsibilities. F. L. Woodward, chief, section of environmental sanitation, Minnesota Department of Health, told the joint session that the role of the United States Public Health Service in the program is to rate State survey and laboratory people and to disseminate information and data regarding milk supply ratings. Otherwise, it is a program of the milk producing and receiving States, he said.

Other panel speakers commented on reciprocal milk programs among local health jurisdictions within the States and on different legal and technical aspects of reciprocal milk shipments.

Checking Specifications

Why should sanitation personnel depend upon building departments to do their job for them? Should they not check the sanitation items in building plans and specifications, rather than depend upon someone who may be less qualified or less interested in those items? These were questions presented to the engineering section and the National Association of Sanitarians by Frank A. Gohr, M. P. H., and Jordan F. Hiratzka, B. S., sanitarians, Department of Sanitation and Public Health, student health service, University of California at Berkeley.

In stressing the desirability of using a check list of sanitation items for reviewing building plans, they pointed out that of 44 local health departments queried in California, less than one-third used any form of a check list. While many of this third used applicable codes, such usage is unsatisfactory since they include much material extraneous to sanitation, thereby requiring numerous books and pamphlets to do a satisfactory checking job. Also, codes and ordinances in general usually contain such nebulous terms as "adequate," "sufficient," "satisfactory," etc., they continued. Is it not better, they asked, to incorporate sanitation items from these and other sources into a single volume, replacing vague terms with definite concrete standards?

Such a check list and manual has been used since early 1951 by the Department of Sanitation and Public Health at the University of California. From past experiences and national and local codes, ordinances, standards, and practices, the department has assembled into one volume pertinent, specific items relative to sanitation and public health in building construction, renovation, and repairs.

The check list and manual is sufficiently broad and versatile to include diverse phases and different categories of construction embodied in medical, laboratory, and classroom buildings and has won unanimous approval of key building and construction personnel at the university they said.

MANPOWER

5,000 Engineers Now in Public Health Activity

There are an estimated 5,000 engineers in the United States participating in public health activities, Francis B. Elder, M. S. P. H., engineering associate, APHA, reported to the engineering section. Data assembled by the section from 1949 through 1950 revealed that the average of the continental United States

is 3.2 sanitary engineers per 100,000 population. The range in States is from 1.4 engineers per 100,000 in Kentucky to 7.7 in the District of Columbia. Mr. Elder noted that Alaska has a ratio of 5.4 and Puerto Rico 0.5 engineer per 100,000.

Public health agencies ranked highest in employment of sanitary engineers, with 1,365, or 28 percent of the total. Of this group, 651 are employed by State agencies; 290 by municipal; 263 by Federal; and 82 by special districts. Consulting offices employ 1,239, or 25 percent of the total, and various public works, 868, or 18 percent.

Mr. Elder said that less than 15 percent of the engineers are not practicing sanitary engineers. Over half give more than 75 percent of their time to such duties. Sixteen percent devote half to three-quarters of their time, and 17 percent devote less than 50 percent of their time to sanitary engineering activities.

Thirty-two percent of the engineers are in the age group 35-44, said Mr. Elder. There were only 115 younger than 25 years, but 622 older than 60. Sixteen years is the extent of education for 43 percent of the engineers, while 20 percent have had 18 or more years. Only 4.5 percent have 12 years or less of education, of whom 79 percent were 45 years or more old.

Mr. Elder said that 188, or 11 percent, of the sanitary engineers are in the regular service of one of the military departments of the Public Health Service and 1,681, or approximately one-third, hold reserve commissions or are on active duty with those establishments.

Half of Undergraduates Stay

Approximately 51 percent of the undergraduate sanitary engineering students and 77 percent of those who take graduate work in sanitary engineering follow the profession for which they were educated, Arthur P. Miller, C. E., Division of Engineering Resources, Public Health Service, reported to the engineering section. This conclusion is derived

from past and present studies conducted by Mr. Miller and Walter A. Lyon, senior assistant sanitary engineer (R).

Mr. Miller presented data from these studies in discussing the flow of men into the sanitary engineering profession, the degree to which they are prepared to carry out their work, and their numbers and distribution. He pointed out that, with few exceptions, most sanitary engineering undergraduates have available to them only a modified civil engineering curriculum. Also, he continued, there are wide variations of opinion among institutions offering undergraduate training as to the scope and content of the curriculum. He said the number of such institutions has risen from 21 in 1938 to 40 in 1950, and 57 universities now offer graduate education in sanitary engineering.

From 1951 through 1954, 419 sanitary engineering graduates are expected to be available for employment, but Mr. Miller estimated that only 210 would enter and remain in the profession. Sanitary engineering appears to have arrived at the time when losses due to retirement and death will be increasingly felt, he said.

The Public Health School

If schools of public health are to help in the manpower crisis, the field of public health must be so redefined that it will have an appeal based on the professional background and aptitude of those who are trained in the professions, Henry F. Vaughan, Dr. P. H., Dean of the University of Michigan's school of public health, emphasized to the engineering section.

The responsibility of recruitment should be shared alike by the school of public health and the employing agencies, said Dr. Vaughan. To make the maximum use of the shrinking personnel reservoir we must evaluate the various jobs in terms of the skills required. For example, the job of the physician must be so defined that he can be relieved of administrative details which can be carried out by lay per-

sonnel. The physician should be conserved for medical work; the engineer for engineering activities, he said. This would make a public health career more attractive to the prospective student.

Dr. Vaughan stressed that the object of schools of public health is to train those now required and to be required by the health agencies. Since the practice of public health is constantly changing, the training job is not an easy one, he said. Training must be comprehensive and must deal with the community as a whole even though certain public health functions may be the responsibilities of other than public health departments.

The emergency type of health service has been superseded by a program emphasizing health education, Dr. Vaughan continued. Budgets, personnel management, recruitment, merit systems and understanding community social needs, control of the chronic diseases, and a program of gerontology have replaced the problems of the exotic diseases. Complexities of stream pollution, sanitation, and atomic, chemical, and bacteriological warfare are now facing us, he said.

To meet these changing situations, said Dr. Vaughan, the school of public health must provide additional training for professional people with diversified backgrounds essential to the completeness of the public health team; develop new types of personnel to meet the needs of general service; train a few specialists; and provide continued education for those who are already employed in the health services.

The Engineering School

The role of the engineering school in meeting the manpower crisis was discussed at the engineering section meeting by S. T. Harding, consulting engineer, Burbank, Calif. The development of special engineering courses to meet defense needs should be withheld until these needs are properly defined by adequate authority, declared Mr. Harding. He stressed that while the current manpower crisis is immediate, it should

be met with the minimum disturbance of the long-time objectives of engineering education.

Whenever specialized training or accelerated programs are necessary to the defense effort, the engineering colleges are equipped to meet these needs in plant and faculty and have experience in the last war to serve as a guide. Until then, said Mr. Harding, they can serve best by continuing their standard undergraduate training.

He felt that in encouraging students to enroll in engineering courses, short-time conditions should not be stressed except as a matter of emergencies and patriotic service. The prospects for an engineering career should be presented for average economic conditions rather than for depressions or booms, he said.

Some accelerations of engineering courses may be practicable, but compressing the 4-year curriculum into three unbroken years of study was generally unsuccessful in the last war, Mr. Harding continued, because students can become mentally as well as physically stale. As an alternative, he proposed the elimination of liberal arts courses and the segregation of studies into specialties.

AIR POLLUTION

20,000 To Be Studied In Detroit-Windsor

A comprehensive study of the effects of air pollution on the health of citizens in the Detroit-Windsor, Ont., area is now being planned by The International Joint Commission in Controlling Air Pollution, the engineering and industrial hygiene sections were told by J. R. Menzies, chief, Public Health Engineering Division, Department of National Health and Welfare, Ottawa, Canada. This is probably the first occasion when the technical and scientific resources of two nations have been combined in a joint effort to determine the effects of air pollution on public health, he reported.

The tentative proposal is to include 5,000 family units in Detroit and Windsor, which will provide

morbidity data on approximately 20,000 persons. The family units will be divided into six groups based on their socioeconomic status and the air pollution intensity to which they are subjected. Mr. Menzies said special attention will be directed to diseases of the respiratory system.

Much of the engineering data to be used in conducting this study has been collected by the commission since 1949, when it began an investigation seeking means of controlling and reducing the amount of smoke, soot, and fly ash produced by Detroit River vessels. The investigation was then broadened to include the emission of objectionable industrial gases and particulate matter in the highly industrialized area.

The Engineering Approach

New techniques and methods for measurements and removal of air contaminants were described to the engineering and industrial hygiene sections by Hamnett P. Munger, Ph. D., in charge of air pollution research, Battelle Memorial Research, Columbus, Ohio. Dr. Munger described a directional dirt-fall collector which he felt to be of particular value in highly industrialized areas. With the use of this collector it should be possible to determine the direction from which the major contaminant comes, he said.

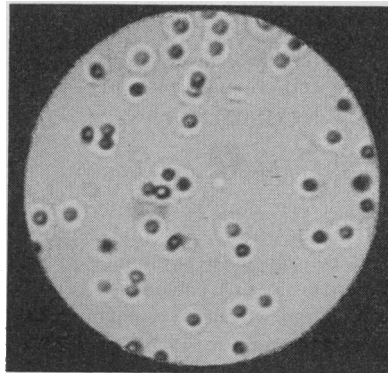
A low-velocity wind tunnel, condensation nuclei recorder, miniature Venturi scrubber, and other equipment are now being perfected to furnish specific information concerning air contaminants, continued Dr. Munger. He also presented newer developments in the means of sampling and analyzing aerosols.

In stressing the role of meteorology and topography in the accumulation of contaminants in industrial areas, Dr. Munger described kite-balloon methods for measuring meteorological parameters and topographic effects. In applying these techniques to industrial problems, he said, each situation must be studied, plant by plant, to obtain the most economical method for reducing air contamination.

Smog Diminished

The Los Angeles smog problem is diminishing, Gordon P. Larson, director of the Los Angeles County Air Pollution Control District, reported to the engineering and industrial hygiene section. He said that due to the control district's efforts air pollution from common visible sources is being controlled, with the result of a decreasing number of intense smog days, improvement in visibility conditions, and public recognition of a noticeable improvement in general atmospheric conditions.

Mr. Larson said that some groups maintain that medical research is the answer to the air pollution problem and argue that controls should not be instituted until the effects on health have been determined for each pollutant. This would involve waiting many years until expensive and time-consuming studies can be completed, he continued, and the public's alarm about smog requires that some air pollution action be



—Micro-photo from air pollution district, county of Los Angeles.

The smog particles seen here under the electron microscope were collected in Los Angeles County from smoggy air with a micro-impactor which impinges the tiny particles on glass slides. It is believed that these particles are largely responsible for reducing visibility. Their size is in the order of 1/25,000 of an inch in diameter. They appear to be comprised of both liquid and solid particles. Magnification 2700 X.

taken now. The application of control techniques is the most that anyone can do at present, he said.

In the past 3 years Los Angeles area industry has expended seven and a half million dollars to control pollutants at the source, he continued. The metals industry is now collecting 85-99 percent of its metallurgical fumes, and the dust producers, which include processes such as milling and grinding, have collection efficiencies well above 95 percent.

Mr. Larson said the requirements for the collection of dusts and fumes were specified after a detailed study of contributing sources, economic factors, and available engineering techniques. A limit for sulfur dioxide emitted by chemical plants and refineries has eliminated local crop damage from this gas, he said, adding that odor problems from rendering plants and fertilizer, paint, and canning industries have been successfully resolved in every instance.

Smoke particles from commercial and industrial plants have been reduced by 60 percent, he continued, but public rubbish burning still presents a problem which is now being attacked. Mr. Larson felt that successful control of smoke, dust, fumes, and odors indicates that similar results can be achieved on other pollutants as they are discovered.

Strong Laws Needed

Air pollution control laws must be made strong in both coverage and penalties, even when conciliatory and educational measures are contemplated in their enforcement, the Committee on Air Hygiene reported to the engineering and industrial hygiene sections. Chairman H. A. Whittaker said that public educational measures are of real value as propaganda mediums but are of little use if the law governing air pollution is weak. He felt that the primary accomplishment of educational measures is to keep the public aware of the existence of the law.

In discussing the two legal approaches to air pollution control—public or private nuisance, and specific legislation—Mr. Whittaker noted that nuisance cases are difficult to prove in industrial areas since the plaintiff, whether a private citizen or a public body, must prove that the nuisance exists and is caused by the specific source sought to be abated.

The simplest type of specific air pollution legislation is a State law declaring smoke and/or other forms of air pollution to be public nuisances per se, he continued. Or the State can take the more direct approach of using its constitutional police powers to enact laws to forbid or regulate various practices for the general welfare and comfort of the people, regardless of whether or not they constitute nuisances.

In presenting other examples of specific legislation, Mr. Whittaker stressed that it is not necessary to so draft an ordinance that it imposes unreasonable conditions and restrictions. He felt that simple direct routes should be taken to curb pollution, citing such steps as limitation on permissible emission from stacks, prohibition of new construction which includes design faults that would fail to limit excessive emission, and inspection of existing installations to seek similar design faults.

There is a strong trend to empower air pollution administrative agencies to adopt their own rules and regulations, Mr. Whittaker reported. He cited the New York City smoke control ordinance (1949), which permits the administrative bureau to establish emission standards, as an example of how simple such a law may be.

INDUSTRIAL PRACTICES

Studies Urged for Workers Exposed to Noise

Reporting on the effects and controls of industrial noise, Charles I. Barron, M. D., of the Lockheed Air-

craft Corporation's medical department, recommended that serial audiometric studies be performed on all individuals exposed to industrial noise and corrective action taken to prevent permanent hearing impairment. He also told the industrial hygiene section that predictive tests are needed to detect noise-susceptible individuals prior to job placement.

Exposure to excessive or prolonged noise may cause irritability, head noises, headaches, nausea, anorexia, insomnia, inability to concentrate, and poor neuromuscular control, explained Dr. Barron. Noise interference with speech communication and auditory warning signals results in diminished efficiency, increased accident rates and poor morale.

Noise is best controlled at its source, Dr. Barron said. Wherever possible, spatial isolation should be practiced but elimination, redesigning or replacement of machinery may be necessary, as well as structural isolation by cells, chambers, walls, and partitions. Various ear protectors afford adequate auditory protection from 85 to 140 decibels, but beyond this level transient exposure and frequent personnel rotation is necessary, he said.

Diesel Engines Underground

In determining permissibility for use of diesel engines underground with reference to avoidance of an unhealthful or poisonous atmosphere, there are more important factors than tests for toxic constituents in the engines' exhaust gases, the engineering and industrial hygiene sections were told by S. H. Ash, E. M., chief, safety branch, Bureau of Mines, and senior engineer (R), Public Health Service. These factors are adequate ventilation, mechanical efficiency, proper fuel, and efficient exhaust-gas conditioner, and maintenance of engine, conditioner, and water level in the conditioner, he said.

Although it is imperative that mine or tunnel operators know how much fresh air is required to pre-

vent an unhealthful atmosphere of toxic gases and fumes from diesel engines, it is more important to them and to the miners to know when a healthful or a dangerous atmosphere exists, said Mr. Ash. Estimates of the ventilation required for diesel engines must depend on knowledge of the rate at which toxic exhaust gases are produced by the engine under all conditions of operation. But many samples from diesel engines are not true criteria of the anticipated performance of the engine since it produces the toxic constituents of exhaust gases at varying rates under different conditions, he continued. Dependence should be placed on the quality of the general air under systematic sampling.

Mr. Ash stated that his experience and that of several States where diesel engines are or have been in operation shows that, if ventilation is supplied such that the general air contains carbon monoxide in the range of 0.001 (10 ppm) to 0.002 (20 ppm) percent, any diesel engine in use today in these places can be operated safely.

Dangers From Insecticides

The methods available to public health departments for safeguarding the health of aviators who apply poisonous organic phosphorus insecticides were discussed at the industrial hygiene section meeting by Ralph R. Sullivan, M. D., M. P. H., director, industrial hygiene section, Oregon State Board of Health. He said that accidents frequently occur among these crop-dusting pilots because they do not know or comply with recommended precautions and measures for protecting themselves from such poisoning.

Dr. Sullivan continued that the rapid and tremendous increase in the use of toxic insecticides, not only by the professional applicator but also by the amateur gardener, makes it imperative that information about their chronic effects be widely disseminated. He cited a case report in which a crop-dusting pilot averted a crash through information gained from an instruction program of the Oregon State Board of Health.