Science and Public Health Research in Alaska

Alaska, one of today's "new frontiers," is witnessing an important growth in scientific undertakings. Not the least of these are investigations in public health and related fields of science. Reviewing development of the Public Health Service's Arctic Health Research Center at Anchorage, the late Dr. Joseph W. Mountin wrote:

"In the past, public health activities have developed in the wake of civilization. Now public health is presented with an opportunity to lead civilization, to pioneer in new fields. By uncovering some of the problems of human life and adjustment in low-temperature areas, public health can become a creative force in opening up new frontiers. At the same time it can make potentially significant contributions to basic knowledge."

Reader's Guide

Last September—4 years after the beginnings of the Arctic Health Research Center—the Third Alaskan Science Conference was held at Mt. McKinley National Park under the sponsorship of the American Association for the Advancement of Science's Alaska Division, which grew out of the first Alaskan Science Conference in Washington in 1950.

Conference topics in 1952 ranged from agriculture, forestry, and botany to zoology and wildlife, and from anthropology to sociology, economics, and education. *Public Health Reports* has selected 10 papers for reporting "in brief." These represent only a few of the many topics touching upon the difficulties of introducing modern technology and methods of living to an old civilization and primitive methods of living. With one exception, all the briefs deal with specific health topics.

The exception is a paper of Dr. Margaret Lantis on the role of science in general and social science in particular in a pioneer environment which lends itself as an ideal laboratory for scientific research. This discussion is presented in the form of two briefs.

The Trend of Science

PHR brief

The scientist is a person who lives for and in the future. He is a dreamer with self-discipline. His objective is to state generalizations, principles, propositions, tendencies, and laws that are the bases for prediction.

The scientist must always stand the test of prediction, for prediction is an essential part of scientific method. Even though a paleontologist or archeologist is concerned with reconstruction of the past and does not expect to see trilobites or Mousterian man on earth again, he uses history to formulate principles of anatomic or cultural change. In other fields, the use of prediction is even more immediate.

But philosophers state principles, and everyone predicts. Any person functioning as a scientist is different, however, in his use of exact methods, in his willingness to reveal these methods to others without distortion, and in his integrity and impersonality in stating his observations. Thus, he is, or should be, always conscious of standing the test of the future. He constantly seeks new ideas, new methods.

The scientist disciplines himself in formulating exact plans for research. He disciplines himself to be a meticulous observer and recorder, to make careful reports and cautious claims, and to accept criticism.

The scientist not only sees what will happen, he tries to understand why it will happen. As he learns more of the why, he becomes more accurate in predicting. He is either a watcher or a tinkerer—the natural historian or the experimenter. Both are necessary. Generally, the watchers have preceded the tinkerers. They had to see what was there before they started working on it. Just to go out and collect was important and sufficient 50 or 75 years ago.

Experimental Biology

In the past 50 years, the Biological Survey, the Reindeer Service, and others in Alaska have made field experiments, necessarily uncontrolled for the most part; hence, with more hope than prediction. Then, in 1948 the Arctic Health Research Center of the Public Health Service was established. Its work leads us to the real objective of science, from a humanistic standpoint: treatment and prevention. Along another line of development is biological engineering, one form of which is exemplified in the Fishery Products Laboratory, another new institution in Alaska. There is also the Agricultural Experiment Station. But laboratory experimentation in special fields of zoology and physiology is recent in Alaska.

In other new programs in Alaska, the scientists are, as usual, looking ahead, in application as well as in the formulation of theory. This is especially true when we are studying behavior. Are the southeast Alaskans successfully combating tuberculosis while the interior Indians are not? Ten or 50 years later, no doubt one can say what happened, but he may have difficulty answering the questions of why and how. It is important, therefore, to study events while they are happening, not after they happen.

The modern scientist is just the opposite of the popular stereotype who mounts moths on pins but is unaware that caterpillars are destroying the orchard. Even if he is not an economic entomologist, the modern scientist, because he is so interested in processes, in the dynamics of life, is a Johnny-on-the-spot, watching the processes as they occur.

The Social Sciences

Sociology has suffered from both internal and external difficulties. Internally, there was too much and too early emphasis on social pathology. The curriculum contained courses labeled "criminology," "social disorganization," and "problems of social welfare." Ecology seemed to become only a study of blighted areas of cities. Lectures on "the family" dealt chiefly with family disintegration and divorce. The sociologist and some of his fellow social scientists always seemed to show up the worst in the community. Just by trying to be disciplined scientists, they antagonized many laymen, especially civic boosters.

The psychologist has had the same difficulty whenever he went beyond a study of special

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abilities. In the study of the dynamics of the personality, there was more "abnormal" than "normal" psychology. And the layman felt uncomfortable and suspicious. Instead of being reminded how remarkably subtle and clever, yet consistent and strong, is the individual personality, he was made to feel that he was full of irreconcilable conflicts and about to go off his rocker.

Fortunately, in sociology, social anthropology, and social psychology the early stage of discovering all the awful things that are wrong with man—his logic-tight compartments, sibling rivalry and Oedipus complex, racial prejudice, and culture lag—has been passed.

Now, in psychology we are hearing about ego strength and ego ideals; in anthropology, about the cultural values—the commonly shared concepts that people live by; and in sociology, about the processes of achieving consensus or agreement. These topics of study are not only positive, they are dynamic.

The Natural History Stage

It is hard to experiment in the field of human relations when it is still in the natural history stage. We who make field studies as well as theorize about people and politics are the natural historians of man, trudging up and down the hills of society. But we now have a much better understanding of scientific problem and the formulation of hypothesis. And we have more sense in the use of special tools for field study; for example, opinion polls. It does seem that in many fields there is a renascence of good old field observation, a refined natural history done with remarkable new tools.

Some of the social scientists also are seeing the value of a well-rounded natural history, not because they went too rapidly and exclusively into experimentation but because they tried prematurely to formulate rigid laws. Economists, for example, have found that economic man is at the same time social man and political man. Another difficulty, or supposed obstacle in social science, is the complexity of human behavior. Actually, it is not as complex as, for example, the chemistry of the human body. The only difficulty is simply the lack of data: the number of scientific observers for such a very big subject is very small.

The Social Sciences

PHR brief

Where does Alaska fit in the trend of science? What should the scientist study in Alaska? Clearly Alaska needs people working in basic social science, studying processes of the formation of a new society. For nowhere—certainly not in Alaska—is there now enough of basic science in the field of social relations. Yet few areas offer better opportunities to study the social dynamics of a city virtually from the beginning than does Anchorage with its population growing so fast that it's almost a demographic explosion. Social organizations are multiplying in Alaska like rabbits in Australia.

Alaska offers a manageable field for study. Its communities, although growing, are not yet too large or too suburban to be studied profitably as functional entities. Whether the communities and the clubs and the customs are just starting or are dying, as some Alaskan villages are, the interrelationships throughout the Territory and between it and the States can be studied. Migration can be stated more exactly in Alaska than, for example, in a single State.

Every real scientist accepts the necessity of prediction. And Alaska needs prediction, if it is not to become a neglected social and political jungle. It needs not only the field observer and the basic scientist, it needs also the man who will apply the generalizations to specific problems. Everyone suffers from the malfunctioning of social institutions, and some suffer from the changes that must be made. The social scientist may be unwilling to commit himself on a prediction, or he may make a mistake when he does commit himself, but we need him in Alaska so much that we can risk giving him a crack at the job.

The Study of Man

Except in the specific field of health, there is no research agency in Alaska comparable to the Geological Survey and the Fish and Wildlife Service for studying the most important animal

By Margaret Lantis, Ph.D.

of all: man himself. The Geological Survey is studying the processes of solifluction and the boundaries of permafrost. Because of its work, engineers today and in the future can build better on permafrost.

In contrast, no one is learning how to handle the processes of competition and cooperation so that there won't be a "frost-heave" in the community every summer when migratory workers come in. No one is studying the shifting boundaries between private development of a new area and government development.

A scientific discipline's usefulness depends not only on its ability to do the necessary job but on its being given the opportunity to work. Many of the natural and physical sciences have had this opportunity in Alaska; now the social scientists need their chance. I don't want to imply that they are completely absent from Alaskan research, for I know of 11 recent and current social science studies. Four are being made by economists, and others are by anthropologists, physicians, housing specialists, and church workers. Sociologists and political scientists, however, are absent.

Every frontier region has to reach a certain stage of social organization before it can support professional specialization. Each of the American frontiers in succession seems to have gone through similar stages. Alaska offers just as exciting opportunities to the sociologist or social psychologist as to the archeologist who finds there ancient cultures beautifully kept on ice. Alaska contains all the stages of modern American culture, not on ice but decidedly viable and excitable. Alaska has little deadwood in its society and few vested interests.

Ready for Study

Alaska is at the right stage of general cultural development to accept professional social study of itself. Of course, we can expect public opposition to social science in Alaska; we can also expect disappointing and inadequate work by the social scientists. It is hard enough to understand an ant colony. How much more difficult to study ants with ideas!

At Alaska's present stage of readiness, perhaps it only wants to know how big it's getting to be. Perhaps it only wants to know how many robbers it has in order to decide how many cops it needs. Such counting of heads or sticky fingers is not enough. Instead of merely surveying the social pathology of the Territory, or of surveying anything, we need to study dynamic processes. Although Alaska is not the only new society and new economy that might be studied, and even though many processes at work there may have been observed elsewhere, it does offer a fine new opportunity that should not be missed. I suppose volcanologists did not make any stupendous discoveries from Paracutin, but I'm sure some of them managed to get to that cornfield where a little volcano was sprouting.

Socioeconomic Trend

What should we study in Alaska? Examine, for example, the socioeconomic trend of development, and consider what we must know in order to accommodate that trend, to adjust to it.

Agriculture will increase in some parts of Alaska, but as in Norway and Sweden, mines, manufactures, and fisheries can support a growing population and economy far better than agriculture. A nonagricultural region like Alaska can be economically useful in production of raw materials, in processing and manufacturing, and in provision of services including trade. Until recently, the Territory's economy has been based almost exclusively on the exploitation of natural resources: fur-bearing and oil-bearing animals, fish, minerals, and, to a small extent, timber. With the exception of fish, virtually all products were shipped out unprocessed.

Now that the Alaskan economy is getting its new start by means of a construction boom, the first requirements are for local processing plants to provide construction materials, power to run the plants, local skilled labor, and the service trades. Getting out raw materials with modern technology means few men and much heavy equipment. Processing plants and especially the service facilities require workers. A particular type of economy facilitates or even requires a particular type of society and political organization. Little enough is still known about the relations between economy, society, and politics; and Alaska is just the place to

study them. As examples, I suggest studies of the following questions as necessary and practical:

Concepts of capital. What are the attitudes of old settlers, of newcomers, of the different native peoples toward land—land as an investment, as a place to live?

The people and their skills. What types of people are coming to Alaska? What has been their level "outside"? What skills do they have that they are not using? What new skills are they acquiring?

Community structure and political structure. What do new settlers miss most in community life and in political system? What do the native peoples miss most in their present stage of partial acculturation?

Understanding Mankind

In sum, we have three dynamic relationships to study: the people and their material resources; the people and their socioeconomic system; and the people and their political system.

There is, of course, no political system without people. One can talk about a system, but I mean the ideas that individuals live by—their unstated assumptions, their expectations, their struggles to get what they want, in a job or a place in the community. To learn about these cultural values, one does not mimeograph the kind of questions I have just phrased and then distribute a questionnaire. This is a job for professionals, and a tough job even for them.

To make life more satisfactory for Alaskans, one must study Alaska. But in undertaking the processes of behavior in any group, one understands more about mankind and contributes to basic science.

Enteric Diseases

PHR brief

Vital to the control of enteric diseases in Alaska is the provision of safe and adequate water supply and sewage disposal systems.

Of the 63 communities in Alaska with populations of 200 or more, only 29 have limited water distribution systems. Only 5 have community sewage disposal facilities. In the other 223 Alaskan communities, individuals obtain water from single premise wells, community wells, rivers, lakes, lake ice, or snow fields. These communities and villages dispose of sewage through single premise systems, by scavenger service, or by dumping the collected wastes not far from the dwellings.

Contaminated water supplies and improper sewage disposal have been the major causes of the gastroenteritis outbreaks recently compiled for the period 1900–52 from records of the Alaska Department of Health, Alaska Native Service hospitals, and from other government reports and personal correspondence.

The data are incomplete in some instances because of incomplete reporting and loss of records. One case on the record does not preclude the existence of others, and sometimes only deaths were reported. No cases of bacillary dysentery, for example, were reported in 1944 from the Kuskokwim area where records give this disease as the cause of 97 deaths.

It was not until 1936 that the first public health laboratory was established for the Territory, and diagnostic bacteriological laboratory services became available to hospitals, physicians, public health personnel, and field nurses for enteric disease studies.

But the history of the outbreaks does indicate the extent of enteric diseases, such as typhoid fever, paratyphoid fever, and bacillary dysentery caused by *Salmonella* and *Shigella* organisms. Cases have been reported from Barrow to Ketchikan and from Unalaska in the Aleutian Islands to the Canadian border.

In 10 areas where hospital care, medical facilities, and transportation are available and the reporting is therefore more complete, records indicate that salmonellosis and shigellosis are endemic.

The first mention of an outbreak resembling bacillary dysentery was in 1807 in Unalaska, but until 1900 there were no medical records of

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enteric cases in Alaska. From that date to July 1952 a total of 274 cases (24 deaths) of typhoid fever, paratyphoid fever, and salmonellosis were reported. On record for the 1937–51 period are 340 cases, including 110 deaths, of bacillary dysentery and shigellosis.

Typical Typhoid Outbreaks

Typhoid carriers have been found in the Norton Sound, Nushagak, and Anchorage areas. In 1900, two cases of typhoid fever were reported from Golovin on Norton Sound. These two persons were found to be "healthy" carriers of *Salmonella typhi* in 1941 during an epidemiological investigation of a typhoid fever outbreak in the Golovin-Elim area. And one of them, a trader who visited the villages along Norton Sound, was linked with the outbreak. From 1900 to 1941 there were 24 cases, 3 of them fatal. The carriers were placed under medical care, and no further cases have been reported from this area.

Typhoid fever may have spread to Norton Sound from the Dawson area, Yukon Territory, Canada, where an epidemic occurred in the spring and summer of 1898 during the Klondike gold rush. Deaths were reported to be from 10 to 12 a day during the epidemic. River water was indicated as the source of the infection.

Since 1936, 7 outbreaks of typhoid fever, 4 of them waterborne, have been reported from the Nushagak area, center of salmon fishing and cannery activity. During the fishing season, the Eskimo and Indian families from the surrounding villages move into crowded tent camps with no sewage facilities except convenient bushes or creek banks. They get drinking water from the most convenient pond, creek, or well. In the largest community, a local well is the town supply. Drinking water is collected by clearing away the surface debris of paper and dog hair and dipping the water out. Dogs and men have the same easy access to the well water—there is no curbing or cover. In addition, the well is at the base of a bluff in a ravine that drains the village graveyard 150 feet away. Diarrhea has been prevalent among the children, and villagers expect that some of the children will die every year from this disease.

Altogether, 42 cases (6 fatal) of typhoid fever are on record for the Nushagak Bay area since 1936. In 1951, the mother of a child with typhoid fever was discovered to be a carrier of *S. typhi.* Several other possible carriers have been detected.

In the Anchorage area, carriers were found in the 1947, 1950, and 1952 outbreaks of typhoid fever. *S. typhi* was isolated from the 17 children and from the carrier, the mother of one of the children, in the 1950 outbreak, occurring in a congested area outside the city limits. Residents were dependent on shallow wells of 6 to 12 feet deep for water and single premise sewage disposal.

Diarrhea Prevalence

The rumors of diarrhea outbreaks that frequently sweep villages and the delayed reports that reach the Alaska Department of Health are typical of dysentery reporting in Alaska. The outbreaks commence during or shortly after the spring breakup and continue to the end of summer.

In the 1948 outbreak in the Barrow area, there were 105 cases (1 death) during a 5-month period. A field team isolated *Shigella paradysenteriae* from stool specimens of 3 cases. The following year bacillary dysentery was reported from Anaktuvuk Pass and *S. paradysenteriae* was found in 5 cases. In both outbreaks contaminated drinking water was indicated as the source.

The Unalaska bacillary dysentery outbreak in 1949 was the first opportunity for a complete epidemiological team — physician, sanitarian, and bacteriologist with field laboratory equipment—to investigate an outbreak in Alaska, determine the etiological agent, and offer sanitary and medical aid. Investigation proved the epidemic to be a waterborne bacillary dysentery outbreak caused by *S. paradysenteriae.* Recommendations were made for improving sewage disposal methods and relocation of the water supply.

The Unalaska bacillary dysentery outbreak teric diseases are Fairbanks-Nenana, Kotzebue Sound, Kuskokwim, Juneau, and Ketchikan.

In all the outbreaks, whether waterborne or foodborne, poor sanitation plays an important part. Influx of people into crowded areas increases the health hazards already complicated

by unsatisfactory basic sanitary facilities, since the newcomers bring with them their own diseases, and carriers of typhoid fever and parasitic infestations are undetected in this group.

Animal-Borne Diseases

PHR brief

The study of diseases transmissible from lower vertebrates to man has been carried on since 1948 in Alaska by the Arctic Health Research Center. Emphasis to date has been placed on diseases of helminthic origin.

Hydatid Disease

It has been recognized for many years that the tapeworm *Echinococcus granulosus* exists in North America and that the wolf and the moose are essentially involved in its natural life cycle. Ruminants other than the moose may also serve as intermediate hosts, and dogs and foxes often harbor the adult parasite.

Postmortem examinations of canine animals as well as the moose have disclosed that this parasite is common in Alaska. As high as 25 percent of the sledge dogs in certain villages have been found infected. The necessarily close association between man and dog in Alaska provides ample opportunity for human infection, which occurs as a result of the ingestion of tapeworm eggs eliminated in the excreta of canine animals. Living conditions in the far north often make impossible the sanitary precautions necessary to prevent human contact with the parasites.

On St. Lawrence Island, a much more pathogenic form of *Echinococcus* has been found. Its natural life cycle involves the arctic fox and at least two species of small, mouselike rodents; thus, the development of an effective control program would not be feasible should this tapeworm become established on the mainland. Dogs are as readily infected through eating infected rodents as are foxes, and it is probable that most of the human infections are attributable to eggs disseminated by infected dogs. It is hoped that introduction of this disease into continental North America can be prevented by rational quarantine measures. Stringent control of dogs, particularly on St. Lawrence Island, is recommended. An educational program is badly needed to inform the people of the importance of this disease.

By Robert Rausch, Ph.D., parasitologist, Arctic Health Research Center, Public Health Service, Anchorage.

Trichinosis

An investigation of the prevalence of trichinosis in Alaskan mammals was undertaken in 1949. It was found that a wide variety, including bears, dogs, wolves, foxes, and wolverines, often harbor *Trichinella spiralis*. The parasite was also recorded from tree squirrels. A white whale was found infected, and larvae were recovered from hair seals. It is probable that trichinosis is transmitted to man from bears more often than from any other group of Alaskan mammals. Polar bears are sometimes eaten under conditions which preclude adequate cooking. The problem of trichinosis, however, is not considered a serious threat to human health in Alaska.

Diphyllobothriasis

A survey of possible terminal hosts of cestodes of the genus *Diphyllobothrium* has disclosed their occurrence in a variety of mammal species, including, besides man, bears, dogs, and foxes. They have also been observed in gulls and eagles. No comprehensive survey of the fish intermediate hosts of this tapeworm has been made, but it is obvious that in certain areas most trout exceeding 6 inches in length are infected. Some contain so many plerocercoids that fishermen consider them unfit for food.

No attempt has been made to evaluate the importance of *Diphyllobothrium* to human health. In regions where fish make up a high proportion of the diet (for example, lower Kuskokwim-Yukon country) incidence of human infection is high. Treatment so far has little value because of the probability of immediate reinfection.

If it can be established that a single species of *Diphyllobothrium* occurs in the various car-

nivores, birds, and man, the problem of control will be complex. Infected birds particularly would serve to maintain infection in fish. Much work remains to be done on this problem.

Diseases of Nonhelminthic Origin

Important in Alaska among diseases of nonhelminthic origin is rabies. Known to be enzootic over most of the Territory, it constitutes an ever-present threat to public health. Almost every year there is an outbreak among wild or domestic canids somewhere in the Territory, but so far it has not been reported to attain epizootic proportions.

The great numbers of stray dogs to be found at any time around the larger towns, particularly Anchorage and Fairbanks, constitute an animal reservoir through which rabies might spread rapidly if once introduced. There is no provision for dog control outside the limits of incorporated towns, and control within their limits is far from adequate. No program for vaccination of dogs has been established, and there is little expectation of any.

Tularemia in man is rarely reported in Alaska, although it has been known for several years that it does occur. With increasing sport hunting of hares in the populated portions, this disease may attain some importance.

Various other diseases—brucellosis, leptospirosis, ratbite fever—have been investigated to some extent in Alaska, but their present status is indefinite. It is anticipated that these diseases and many others will receive attention in coming years.

Hydatid Disease Control

PHR brief

Hydatid disease is a global problem, representing a serious public health menace on every continent. Recent studies have shown that the disease is spreading from major foci of infection and have also discovered endemic areas that were heretofore unrecognized.

By Benjamin D. Blood, D.V.M., M.P.H., chief, veterinary medical service, Pan American Sanitary Bureau, Washington, D. C.

Noting the importance of hydatidosis both as a human infection and as a cause of losses in food supplies, the Third World Health Assembly (1950) requested the World Health Organization "to lend technical assistance for its eradication upon request of government authorities." In the Western Hemisphere, the Pan American Sanitary Bureau has provided assistance and international coordination to member governments in their antihydatidosis activities. Control efforts emphasize anthelmintic treatment of dogs, centralized slaughtering with sanitary waste disposal, and public health education.

Control Points

The cycle of the parasite *Echinococcus granulosus* may be interrupted by prevention of infection of the primary host (dogs, foxes, wolves, and so forth) and by prevention of transmission from the canine host to other animals.

Proper disposal of the organs of animals containing hydatid cysts will prevent the infection of dogs. Organized meat inspection to accomplish this is not practicable in all parts of the world. Furthermore, meat inspection would have no effect upon the cycle of the hydatid parasite when the secondary hosts are wild animals, a situation which obtains in Alaska.

Canine Control

It therefore appears that the most practical method of interrupting the cycle of this parasite is to attack it in its primary host, the canine. In dogs, mass deparasitization may be practiced. The great strides in hydatidosis control in Iceland are attributed in large measure to enforced limitations on the number of dogs and the periodic anthelmintic treatment of all dogs. A similar approach has been followed in Argentina, where antiechinococcal treatment of dogs is given free. This work was begun in Patagonia in 1948 and has since been carried on extensively in several other parts of Argentina. Large-scale antiparasitic treatment of dogs has also been practiced in southern Brazil.

Mass deparasitization of dogs requires community organization and enlightened public cooperation. Dog owners must be encouraged to have their dogs treated, and individual action

should be supplemented by public clinics. The dramatic action of the most widely used deparasitization drug, which purges within a few minutes, affords opportunity to demonstrate to a dog owner the existence of parasites in his dog.

Obviously mass deparasitization cannot be practiced on wild canids nor on stray dogs. However, the methods used to apprehend and eliminate the ownerless dogs may be equally applicable to the wild carnivores which carry the adult tapeworm.

A Distemperlike Disease

PHR brief

Death or incapacitation of a large proportion of a community's dogs is a real disaster in the far north. When an Eskimo community is deprived of its dogs, it loses the principal means of transportation. The Eskimo lives by hunting, and his dogs are his only draft animals. The loss of dogs also impairs national defense in the northern perimeter, since without a dog team extended ground scouting is impossible in the winter.

Modern transportation has complicated the control of animal diseases in Alaska as it has human diseases. For example, a New York City dog can reach Barrow by air express in less than 30 hours. This hypothetical dog may have had rabies immunization and may have been passed as "healthy" by a thorough veterinary examination. Yet, if he travels by air, he can become acutely ill in Barrow from a disease contracted in New York.

Point Barrow Epizootic

A severe epizootic of canine distemper, or a clinically related disease, occurred at Point Barrow, Alaska, in the fall of 1951 and continued into the winter. About half the dog population, an estimated 500 dogs, died or had to be destroyed because of the effects of the disease. Administration of penicillin and streptomycin and destruction of incapacitated dogs probably hastened the natural end of the epidemic. The distemper is continuing enzootically in Barrow.

Early in July 1952, a similar or identical disease that may have been carried from Barrow by wildlife appeared among the dogs at Anaktuvuk Pass, an isolated village 200 airline miles from Point Barrow across the Arctic Slope. In the summer this terrain is traversed only by wild animals. In the winter a trip between the two places is seldom made.

The symptoms of the disease observed in the dogs at Barrow and Anaktuvuk were about the same as those of the canine distemper caused by the Laidlaw-Dunkin virus. The extreme virulence of the distemper seen in Barrow and Anaktuvuk dogs was notably different from that ordinarily seen in the States.

Chorea and other neurological disorders in the Alaskan dogs commonly coexisted with the acute symptoms of nasal and eye discharge. Neurological symptoms—hyperexcitability, chorea, paresis, and sometimes convulsions—do not ordinarily occur early in the course of the disease in the States. The course of the disease in some of the Barrow dogs was peracute—death occurred within 24 hours of the onset of symptoms. In some instances, entire teams collapsed while out on trek and had to be destroyed.

Immunization Project

Immunization studies were started in August 1952 at Barrow, Anaktuvuk, and Wainwright to evaluate the possibility of controlling the disease by blanket or partial inoculation with attenuated canine distemper virus vaccine. All dogs available at Anaktuvuk (about 190) were inoculated to test blanket administration of attenuated virus vaccine.

At Barrow, some of the dogs brought to the immunization clinic were given vaccine and others were given a placebo. Selection was made by a random number system. Although response was poor—only 121 dogs were brought in—it may be possible to learn how vaccinated dogs and litters, with half the pups vaccinated, fare in an enzootic area.

By Karl R. Reinhard, D.V.M., veterinarian, Rocky Mountain Laboratory, Public Health Service, Hamilton, Mont.

The same random inoculation system was used on the 178 dogs brought to the clinic at Wainwright, a village possessing about 200 dogs. Two dogs had died the previous winter of a disease reported as similar to that in Barrow. Half the dogs were immunized to determine if this immunization level would induce pack immunity and protect the dogs of Wainwright against future extension of the disease from Barrow.

Mosquito Control

PHR brief

Mosquito control among Alaskan civilians is still rather primitive. It is almost wholly unorganized; is only slightly mechanized; and is improvident in that only small stores of materials and equipment are maintained. Civilian control is strikingly primitive in that the only measures used are those that give temporary relief. Little effort is made to prevent future attacks by destroying insects in vulnerable but nonbiting stages. Little is done on more than an individual or single family basis.

The military control program has achieved a high degree of organization and mechanization. Airplane spray is stored in strategic locations. Frequent estimates of the insect populations at widely separated bases are sent to the headquarters at Elmendorf Air Base. When the severity of the mosquito attack warrants, a spray team in a specially equipped C–47 is dispatched to do the necessary spraying.

The civilians, largely dependent on their bottles of repellent, lack organization and must pay for their projects. Even though the Territory is generally prosperous, the demand for capital is great. When the well is not yet dug and there are no windows in the house, insect control is apt to rate a low priority on the list of projects.

By Charles S. Wilson, M.S., entomologist, Arctic Health Research Center, Public Health Service, Anchorage.

Obstacles to Control

Many Alaskans would be willing to spend large amounts for mosquito control by stateside standards, but without organization they can do little.

For example, an aerosol spray unit for protecting single premises was an early product of the Arctic Health Research Center. In actual operation, this apparatus seems suitable for single family use. The problems of manufacture and supply have not yet been solved, however. Without the protection of a private patent, no manufacturer wants to produce the special nozzles required. Without an assured market, merchants are reluctant to stock the airplane type of spray solution required. If a market were available for only 50 units, the picture might change, but at present the device is used chiefly by the Air Force and by some nonprofit summer camps. Both groups are sufficiently organized to obtain insecticide before the mosquito season. The Air Force makes its own nozzles. The summer camps obtain them from the Arctic Health Research Center in return for cooperation in testing.

Around Fairbanks and Anchorage are civilian areas where many military personnel live off-post. These would benefit from an extension of the military spray operations. Although the organization of cooperative projects would seem to be advantageous, military regulations require: first, waiver of claims; next, right of entry to any private property sprayed by military planes; and third, contribution toward the cost according to the interest of the parties concerned.

Spraying property without legal authorization is trespass. Direct negotiation with each landholder for permission to spray may be possible in isolated areas, but it is practically impossible in the residential and surburban districts of Fairbanks and Anchorage. Some means must be found for obtaining blanket authorization and general assessment of the costs before spray programs can be developed for urban districts. Organization will certainly be called for if the advantages of airplane sprays are to be utilized.

The Alaska Department of Health has authority to spray private property when there is

threat of epidemic. Annually recurring mosquito seasons are not epidemics within the usual meaning of the term, although it may be argued that the itching sores resulting from insect attacks constitute diseases. However, the department has too many serious problems definitely falling within its province to be likely to seek authority for compulsory mosquito control.

Future Projects

The present program of insect control of the Arctic Health Research Center is largely devoted to development of methods and equipment for spraying with light airplanes such as those used by "bush" pilots. The chance of success seems fairly good, and if suitable methods and equipment for light planes are developed, the possibilities of acceptance and use appear to be very good. The greatest need, however, is for protection of the homesteader and isolated worker.

With bush pilots in the mosquito control business, the work will be mechanized, and the necessary stores of insecticide and equipment will be maintained by the pilot or his organization so that the word "improvident" will no longer apply. If costs can be made sufficiently low to permit wide use of airplane sprays, the necessary organizations will almost certainly develop. Then the advantages of mosquito larvicide may be utilized, attacks on the vulnerable larvae of black flies will become possible, and Alaskan insect control will have emerged from its primitive condition.

Mastoiditis

PHR brief

When large segments of a country's population are afflicted with a disease that interferes with education and ability to earn a livelihood, this disease becomes a public health problem.

In Alaska, mastoiditis is a public health problem. An incomplete survey of the population indicates that about 3,000 persons are afflicted with chronic mastoiditis of one or both ears.

Costs for surgical treatment of mastoiditis amount to about $1,000 per patient, including costs of transportation to a hospital, of hospitalization, of drugs, and of residence in a convalescent home until recovery. When hearing has been so badly impaired that even a hearing aid is not effective after surgery, persons must be sent to speech centers, at a further expenditure of money for transportation, subsistence, and tuition.

The great prevalence of mastoiditis in Alaska is due to many factors. It is estimated that 90 percent of the cases are among the Eskimos, Indians, and Aleuts. These people have become so inured to hardships that they tend to underestimate the importance of any ailment that is not immediately and obviously a threat to life. Other reasons for the prevalence in Alaska of this now "obsolete" disease are the distance of these people from adequate medical care; ignorance of the importance of the common cold, of tonsillitis, and otitis media and of how to recognize and treat these afflictions; and the lack of readily available hospital beds and of funds for carrying out simple, efficacious programs of prevention and treatment.

Proposed Prevention

Educational efforts must be directed to nonmedical persons in the small villages who are interested in the health of their fellow citizens. They should be taught the value and proper use of simple nasal decongestants.

The nurses of the Alaska Department of Health and the Alaska Native Service should be taught the proper use of intranasal medications and of an agent applied topically in the external ear. They should also recognize the importance of removing tonsils and adenoids from children who have demonstrable hearing loss during head colds. The nurses should be required to report the names and other data on all patients who have a history of earaches or hearing loss with common colds, repeated attacks of otitis media, chronic otitis media, and chronic mastoiditis. For cases of chronic mastoiditis, which is recognizable by its continual

By Milo H. Fritz, M.D., Anchorage, consultant in ophthalmology and otolaryngology to the Alaska Department of Health.

discharge and extremely foul odor, the nurses should be taught the value and use of glycerite of hydrogen peroxide in keeping ear cavities clean and sweet and also that it does not cure the underlying pus-forming or suppurative process.

Itinerant physicians working for both government agencies and physicians in more or less fixed installations who have an orbit of activity in surrounding towns and villages should be taught how to administer a general anesthetic in the field and how to remove tonsils and adenoids.

Coordination With Universities

Another physician and I have gone to small villages from time to time and removed from 20 to 30 pairs of offending tonsils and adenoids in a period of 2 or 3 days. Two or three summers of this type of activity with university-sponsored physician-anesthetist teams and equipment would go far in reducing the continued development of cases of chronic mastoiditis.

Two universities (Duke University and University of Oregon) have participated so far in a program of sending members of their resident staff to Alaska for 6 months' training under supervision of the consultant certified by the American Boards of Ophthalmology and of Otolaryngology. It is hoped that other university medical schools may be encouraged to include such training as part of their formal residency programs.

Two Water Systems in Northern Canada

PHR brief

Water works engineers in Northern Canada and Alaska are faced with unique design and maintenance problems. Preventing the freezing of water and sewer lines is paramount to design and maintenance in northern climates, a factor which raises both construction and operating costs many times higher than those in more temperate regions. Avoiding the winter cold, utilizing the sun's radiant heat in winter and summer, yet keeping excavation to a minimum and maintaining the lowest possible maintenance expenditures are some of the problems to be met. Temperature variations of different types of soil under various moisture conditions in disturbed and undisturbed ground and in various climatic regions need to be determined.

Two all-weather underground water supply systems installed within the last few years in the Northwest Territories of Canada have proved successful.

Yellowknife

One system is at Yellowknife, where the mean annual temperature is 22° F., and the top of the permafrost is 10 feet or less from the surface of the ground. Annual precipitation is 10 inches, and snowfall is sparse. Water is pumped from a bay, chlorinated, heated, and circulated through a grid system 3,500 feet from the pumphouse. Part of the water is returned to the pumphouse for reheating and recirculating.

Each main and house connection has a return line beside it. Water lines are of cast iron pipe, laid at 5 feet 6 inches minimum cover and to grade for drainage. Both 6-inch supply and 4-inch return mains, which are side by side, are insulated with approximately 1 foot of compacted moss on the top and sides and from 0 to 2 inches underneath. Extremely fine sand with granite outcroppings covers the area.

Meters and recording thermometers are located on discharge and return water lines in the pumphouse, and thermometer wells are located in the mains at the manholes. The water is heated from November through May. Originally installed in the pumphouse were two 60-hp. and one 80-hp. return tubular boilers, but one firebox and diffuser has been reduced to give roughly 15 hp. capacity. Under normal conditions, two ¾-inch copper lines are used

By Stanley S. Copp, M.S., sanitary engineer, Department of National Health and Welfare of Canada, Edmonton, Alberta.

for heating the water, one injecting into the recirculation line and one into the intake well. Outgoing water from the pumphouse is maintained at about 41° F. During March, when 80 percent of the outgoing water is recirculated, the temperature of the return water is about 40° F. On June 30, 1952, 1 month after heating was discontinued, the discharge temperature was 50° F., and temperature of the return water was 46° F.

Of the 37 fire hydrants, all of the dry barrel type, on the grid system, 8 froze last year. The most serious freezing occurs when circulation fails and the bottom of the hydrant freezes, but this happens infrequently. Caps and spindles at the top and at the drain opening at the bottom freeze often. Above-ground freeze-ups are thawed with blow torches; those below ground, by placing a fire pot in the manhole box overnight. Alcohol antifreeze is applied to caps, packing, and so forth, and hydrants are checked twice a week.

Five major breaks caused by frost action in the winter of 1952 were repaired without interruption of service. Excavation of breaks with jackhammers takes about 2 weeks per hole because of the hardness of the frozen ground. Bits are dulled and broken at about the same rate as in breaking concrete. Powder cannot be used because of the proximity of pipes, and holes cannot be backfilled until the frost is gone. Any interruption of service longer than one-half hour results in freeze-ups. None of the 142 service connections located at an average depth of 5 feet were frozen under normal operating conditions.

Fort Smith

About 175 miles farther south at Fort Smith is a system which preheats the water and utilizes bleeders at dead ends. The settlement has a mean annual temperature of 25° F. The soil is a fine sand.

Two intakes drilled horizontally through 40 feet of solid rock into rapids on the Slave River supply water to pumps on the edge of the river. From there, the water is pumped to a treatment plant on the top of the bank. Alum and soda ash are added, and the water is spirally mixed upward, settled, filtered, chlorinated, and stored in a reservoir under the plant. The treated water is then heated and pumped through a pressure tank to the distribution system.

Transit pipe is used for the distribution system, which is laid at an average depth of 10 feet and a minimum depth of 8 feet. Minimum depth for house connections was specified for 8 feet, but some are laid at only 6 feet and are frozen several times during the cold weather.

The temperature of the river water varies from 32.8° to 65° F. In January, water leaving the plant at 42° F. is cooled to 35° F. at the end of the system. On April 7, 1952, the 4-inch main at the end of the system froze, disrupting two services. The frost penetrated 14 feet at this point. The two intakes from the river froze, and a gasoline pump had to be used to pump water over the ice to the wet well. Several house connections were frozen for a short period, two for more than a day.

Conclusion

Permafrost, which reaches nearly to the surface at Yellowknife, is not the insurmountable obstacle it was once considered to be. It is hoped that these two experiences may lead to less costly systems which permit other supplies to be installed and operating expenditures lowered. Installation costs may be lowered by consolidation of settlements so that lengths of water lines may be kept to a minimum and expenditures shared. With the installation of more water supply systems, the northern areas may become more developed and modernized, and waterborne epidemics may be reduced or eliminated.

Water Pollution Studies

PHR brief

Comprehensive physical, chemical, and biological investigations of the waters of Alaska were initiated by the Alaska Water Pollution Control Board in the summer of 1951. New industry

By Amos J. Alter, C.E., M.P.H., administrator, and William L. Porter, M.P.H., chief of field investigations, Alaska Water Pollution Control Board, Junea.

and an increasing population in Alaska, as well as a territorial-wide awakening to the health and economic threat of polluted streams, coastal waters, and lakes, have prompted Alaska to plan for the orderly use of her waters. Alaska is in a strategic position for practicing preventive water pollution control rather than the more expensive corrective control.

Ward Cove Study

In order to develop the water resources of Alaska, careful and complete investigation of water assets and liabilities and logical matching of type and extent of water use must be undertaken. The first attempt to evaluate water assets and liabilities is being made at Ward Cove, located on Tongass Narrows about 5 miles northwest of Ketchikan. The Ketchikan Pump Company is constructing a pulp mill at this location. The cove is 1 mile in length and at mean lower low water tide it contains about 25,500 acre-feet of water. It is surrounded by heavily forested mountain slopes. Rainfall averages about 150 inches annually. Discharging at the head of the cove is Ward Creek, a swiftly moving stream dropping quickly from the mountain slopes to the cove.

Observation of the following characteristics of water in the cove was begun October 1, 1951, for completion on September 30, 1952: types and numbers of marine plants and animals; water temperature, turbidity, and color; tidal movement and exchange; fresh water discharge into the cove; type, strength, and general characteristics of wastes entering the cove; dissolved oxygen concentration, percentage of oxygen saturation, and 5-day biochemical oxygen demand; most probable numbers of coliform bacteria; total solids, dissolved solids, ignited dissolved solids; and pH, chlorides, sulfates, iron, magnesium, and calcium.

Preliminary Report

Almost 4,000 physical, chemical, and biological examinations were completed by August 7, 1952. Calculations based on the data collected will reveal the degree of waste treatment and/or dilution necessary for orderly use of the waters of the cove and will provide a background of basic data necessary for later evaluations. A preliminary review of the observations presents interesting trends.

Chemical. Dissolved oxygen concentrations during the winter and spring were generally 80 percent of saturation or over. During the summer months the upper water strata were supersaturated during the day as a result of biochemical photosynthesis. There was a decrease of dissolved oxygen in the lower depths during the fall to the extent of a noticeable oxygen sag.

Chlorides, sulfates, alkalinity, and calcium varied inversely as the water temperature; pH varied directly as the water temperature. No trend is yet apparent for solids, magnesium, and iron in analyses of samples from October 1951 to January 1952.

Biochemical Oxygen Demand. The biochemical oxygen demand (B.O.D.) was generally below 0.5 ppm except during July and August. At that time it increased to over 1 ppm.

Physical. Temperatures of surface waters ranged from 4° C. in March to 16° C. in August, and from 5° C. in March to 10° C. in August at the 100-foot depth. Turbidities ranged from 0.32 to 3.2 ppm. Color was generally less than 5 ppm.

Biological. There is abundant marine life on the shore, on the bottom, and in the waters of the cove.

Hydrological. The fresh water current from Ward Creek has little effect on the cove waters except during or near flood run-offs, and then it is limited to the top few feet of surface water near the creek mouth and to an area of from 100 to 200 feet in width through the center of the cove.

Nearly all the movement of the tidal waters to and from the cove is surface movement above mean lower low water. This condition of little or no current at lower depths extends into Tongass Narrows.

Approximately 95 percent of the dissolved oxygen replaced by diffusion to the cove waters takes place above 15 feet below lower low water. The two important sources of reoxygenation of cove waters are the tidal exchange and diffusion above mean lower low water. Any large biochemical oxygen demands at the lower depths would probably result in a septic condition because at these depths oxygen would be replaced slowly. The most critical period with regard to maintaining an adequate dissolved oxygen

concentration was during the period of highest water temperatures, from July 31 to August 7, 1952.

Anchorage Food Study

PHR brief

Alaska is almost completely dependent on long supply lines from the west coast of the United States. Their possible disruption in times of emergency must be considered in civil defense planning.

To obtain estimates of actual food consumption and to compare Alaskan food habits with those of the continental United States, Anchorage and its vicinity were surveyed in 1950 and 1951. Because of the large numbers of military dependents and transient workers in the area, no reliable estimates of the civilian population were available to serve as a population base for the survey.

Food Consumption

Anchorage residents eat well. But Alaskan food habits differ in several ways from those in the States. Food costs are high in Alaska, but wages and salaries are high also and may compensate for the price increases. The higher costs may be disproportionate for some types of food. Perishable foods, and some items not ordinarily considered perishable, may be of poor quality. Finally, the population has an unusually large proportion of young people.

Of milk products other than fresh milk, two-thirds of Anchorage consumption is canned milk, almost five times the average consumption in the States. While consumption of milk and milk products in Alaska is 65 percent of that in the States on a retail weight basis, consumption on a whole milk equivalent basis is 84 percent of that in the States.

Egg consumption is only slightly less. The price of eggs increases in the following order: boat, airborne, local.

By Edward M. Scott, Ph.D., biochemist, and Edward S. Weiss, M.P.H., statistician, Arctic Health Research Center, Public Health Service, Anchorage.

Frozen meat, poultry, and fish are shipped by boat. Meat and fish supplied from local sources are about two-thirds wild game and fish, with moose, caribou, and salmon predominating. Meat consumption is unexpectedly high, possibly because meat prices on a percentage basis may not be as high as those of other foods when compared with prices in the States. The high meat consumption compensates to a considerable extent for the low intake of milk.

The consumption of butter and margarine is almost identical with that in the States. However, only one-fourth as much bacon, salt pork, and lard is eaten in Anchorage, probably because of the instability of these products. Use of shortening other than lard is somewhat greater in Anchorage.

The consumption of potatoes in Alaska is understandably high, since prices of this vegetable, particularly the local product, are quite reasonable. Citrus fruit and tomato consumption is low. Consumption of other fruits and vegetables is almost equal to that in the States. Less grain products are eaten in Anchorage, but more sugar compensates for this.

Civilian food consumption was determined by a census of food imported by rail, by truck, and by airplane, and by an estimate of local production in 1950. Direct air shipments, which consisted of meat, produce, and eggs, were actually enumerated for one airline and estimated for another. Truck shipments supplied only a few grocers, and the amount shipped was estimated from the gross sales of these retailers. Distribution of truck shipments into food classes was assumed to be the same as that of rail shipments since both were shipped by boat to Alaska.

The amount of food shipped by rail was estimated by sampling the records of the Alaska Railroad. To determine food classes, 24 of the 126 ships with food consigned to Anchorage in 1950 were selected as a sample with regard to season and type of ship. Every food item, in all more than 5,000, on the ships' manifests was recorded and tabulated to furnish the sample from which the total rail shipments were estimated.

The Alaska Agricultural Experiment Station estimated local agricultural production, and the

Fish and Wildlife Service estimated wild game and fish consumption.

Food Supplies

The amount of food stored in Anchorage was also determined to provide an estimate of the average period of storage before consumption and of the length of time food stores would last if supplies were cut off.

Dollar value inventories of all retailers' stocks were compiled as of January 1, 1951. A representative sample of retail inventories was selected. The items in each sample inventory were actually enumerated to provide a basis for calculating total food class inventories from total dollar value inventories. Supplies of wholesalers and miscellaneous food handlers were also enumerated. Those of restaurants were estimated from a sample of dollar value inventories.

The average storage life of imported foods was found to be 36 days for all food classes. For fresh and frozen meat, poultry, and fish it is 21 days; grain products, 76 days; dairy products excluding butter, 34; canned citrus fruit and tomatoes, 55; and other canned fruits and vegetables, 82.

These results indicate that in the event of complete stoppage of normal supplies to Alaska, there would probably be enough staple foods to last until some emergency method of supplying food could be set up. However, many perishable items would become unavailable almost immediately, necessitating some substitutions.

PHS films

Laboratory Diagnosis of Trichophyton Infections

PART I. Ectothrix Infections of the Beard and Scalp Caused by *Trichophyton mentagrophytes* and *Trichophyton faviforme*.

PART II. Endothrix Infections of the Scalp Caused by *Trichophyton tonsurans* and *Trichophyton violaceum*.

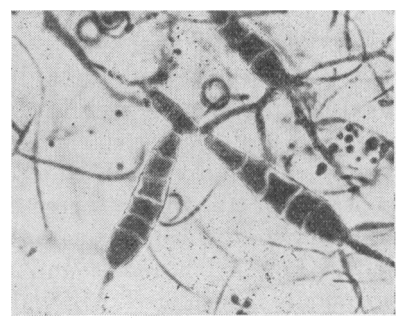
35 mm., sound, color, Part I—13 minutes; Part II—10 minutes, 1952.

Audience: Laboratory technicians (bacteriologists and mycologists), State and local health department laboratory directors, medical and veterinary students, dermatologists, and physicians and nurses interested in this problem.

Available: Loan—Public Health Service, Communicable Disease Center, 50 7th St., NE., Atlanta 5, Ga. Purchase—United World Films, Inc., 1445 Park Ave. New York 29, N. Y.

These films are designed to aid in teaching the procedure for identifying the etiological agent responsible for certain types of ringworm infections involving the hairs of the scalp and bearded areas. The preliminary procedures and final observations by which the medical technician (bacteriologist or mycologist) or dermatologist may isolate and identify the responsible fungi are depicted.

Characteristic suppurative lesions caused by ectothrix *Trichophyton*.



Microscopic mount for *Trichophyton mentagrophytes*.

The films show the possible sources of *Trichophyton* infections, the method of examining the patient and of obtaining and examining the clinical material. They show the cultural methods used for isolation and the techniques for identifying the fungus agent when it is isolated. Part I is concerned with ectothrix infections, and part II with endothrix infections.

PHS publications

The Composition of the Sanitary Engineering Profession

The sanitary engineer is largely a North American phenomenon, the result of efforts to protect health and prolong life through an attack on the environmental influences which cause disease.

In order to determine the nature of the sanitary engineer—who he is, where he works, what his activities are, his age, professional and educational background—an analysis was made by the Division of Engineering Resources, Public Health Service, based upon data loaned to the division by the American Public Health Association. The data were originally collected by the American Public Health Association for the purpose of establishing the Roster of Public Health and Sanitary Engineers.

The survey was conducted from the spring of 1949 to October 1950 by a self-coding questionnaire. A total of 10,757 questionnaires were sent to persons whose names were obtained from the membership lists of various engineering associations and professional engineering registration lists. There were 6,368 respondents of whom 4,933 felt that they met the definition of a sanitary engineer as set forth by the National Research Council. Following careful editing with respect to educational and professional qualifications, 4,116 remained as the base group for the study.

On the basis of the survey it is estimated that there were, in 1950, 5,000 sanitary engineers in the country—33.2 per million population. Of those who participated in the survey, two-thirds devoted more than three-fourths of their time to sanitary engineering activities (discussed as group I); about 19 percent between 50 and 75 percent of their time (group II); and 19 percent less than 50 percent of their time (group III).

A relatively small proportion (35 percent) of sanitary engineers has a formal sanitary engineering education. There is a considerable rise in the educational level, as is seen in the shift toward more sanitary engineers in the "master's" and fewer in the "no degree" levels in the younger age groups. Sanitary engineers in group I are better educated than those in group II and III. In group I, 28 percent have reached the master's level; for groups II and III the percents are 13 and 11, respectively.

The civil engineering curriculum has provided the basis for the undergraduate education of most of the members of the profession. In regard to experience, broadly speaking, almost half of all sanitary engineers have obtained a significant part of their professional experience outside the field.

The various branches of the engineering profession have between 1.6 and 18.3 percent of their members engaged in research activities. Therefore sanitary engineering, with only 1.9 percent of its personnel doing research, ranks low in this respect.

The four leading types of activity are public health, designing, consulting, and municipal. About 80 percent of all sanitary engineers are in some way connected with water and sewage programs.

The data on the characteristics of the sanitary engineering profession are given in the form of tables, charts, and other graphic devices. Age, numbers, education, types of degrees, activities, and professional area are covered by these statistics which are presented in individual tables or correlated in various combinations.

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Lyon, Walter A., and Miller, Arthur P.: The Composition of the Sanitary Engineering Profession. (Scientific Manpower Series No. 2, Office of Education, Federal Security Agency) 1952. 36 pages; tables; charts. 15 cents. A limited number of copies are available upon request to the Division of Engineering Resources, Public Health Service, Washington 25, D. C.

Cancer Morbidity Series

Cancer illness among the residents of Birmingham, Ala., and Detroit, Mich., is covered in publications 8 and 9 in the Cancer Morbidity Series. Both cities showed an increase in cancer incidence in the past 10 years, according to the reports.

In the Birmingham area the incidence rate during 1948 was 71 percent greater than in 1938 and the mortality rate was 24 percent greater. The incidence increase in Detroit in the 10-year period was 59 percent. These increases in incidence may have been due in part to better reporting by physicians, improvements in diagnostic and case-finding methods, and aging of the population.

The Birmingham survey showed that of all the cancer cases diagnosed when the disease was localized, 87 percent survived 12 months. In cases not discovered until regional involvement had taken place, 66 percent survived 12 months, and in cases not diagnosed until remote metastasis had occurred, only 33 percent survived a year.

Similarly, in Detroit, 78 percent of cases of early diagnosed cancer, 54 percent of those discovered after regional involvement, and only 22 percent of cases diagnosed after remote metastasis survived 1 year.

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Cancer Illness Among Residents of Birmingham, Ala. Cancer Morbidity Series No. 8. (Public Health Service Publication No. 216) 1952. 49 pages; tables, charts.

Cancer Illness Among Residents of Detroit, Mich. Cancer Morbidity Series No. 9. (Public Health Service Publication No. 217) 1952. 48 pages; tables, charts.

Single copies of these publications may be obtained from the National Cancer Institute, Public Health Service, Bethesda, 14, Md.

PHS publications

Office of Defense Mobilization Pamphlets

Maintaining the worker's health and the employability of women, the elderly, and the disabled are subjects covered in four Office of Defense Mobilization pamphlets.

"The Worker and His Health" estimates sickness absenteeism in industry to be 400–500 million mandays a year, an equivalent of almost 2 million men absent from their jobs for a year. More than 90 percent of the illnesses have nonoccupational causes. Experience in plants, the pamphlet states, has shown that in-plant health services can reduce losses from sickness absenteeism by one-third to one-half. The value of in-plant health programs is stressed, and steps for their development are suggested. Local health departments, medical and dental societies, visiting nurse associations, employer associations, labor organizations, and other firms with in-plant health services are referred to as the best sources from which to obtain information on how to initiate an in-plant health program.

Women, and handicapped and older workers have production and safety records as good as or better than other workers, the pamphlets, "A Job for Women," "The Disabled Can Work," and "Production at Any Age," claim. Increasing numbers of women are finding employment in industry. The Bureau of the Census estimates that 19 million women, or 30 percent of all workers, are in the civilian labor force today.

"A Job for Women" outlines the importance of matching the woman worker's physical, mental, and emotional capacity against the demands of the job to assure successful placement.

"The Disabled Can Work" states that through rehabilitation many physical and mental handicaps can be eliminated or reduced to enable workers with disabilities to meet demands of selected jobs. When the disability is properly treated, the person trained for and placed in the right job can meet the requirements as well as anyone. Advances in medical knowledge, improvements in prosthetic devices, development of specialized rehabilitation centers, and the establishment of vocational rehabilitation and placement programs have made it possible for thousands of disabled men and women to resume active lives and enter the labor force as self-supporting citizens. The plant medical department plays an important part in aiding the placement of the handicapped worker.

"Production at Any Age" cites the older person's need of productive activity with pay checks. Industry, the community, and the Nation have a stake in the usefulness and economic productivity of older workers, the pamphlet states in emphasizing the necessity of breaking down current prejudices against hiring this group. Industry can help provide much needed information for proper placement of older workers through careful study of job requirements, conditions of entry, and the productivity of older workers. In-plant health services can also contribute much to the health and productivity of the older worker, through periodic physical examinations and other preventive services. Similarly, benefits would accrue to all the workers from the preventive services of such in-plant health plans.

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The Worker and His Health. (Office of Defense Mobilization, Health Resources Advisory Committee) Washington 25, D. C., 1952. 8 pages; illustrated; references.

A Job for Women. (Office of Defense Mobilization, Health Resources Advisory Committee) Washington 25, D. C., 1952. 8 pages; illustrated; references.

The Disabled Can Work. (Office of Defense Mobilization, Health Resources Advisory Committee) Washington 25, D. C., 1952. 7 pages; illustrated; references.

Production at Any Age. (Office of Defense Mobilization, Health Resources Advisory Committee) Washington 25, D. C. 7 pages; illustrated; references.

Copies of these publications are available upon request to the Division of Occupational Health, Public Health Service, Washington 25, D. C.

Clean Water Pamphlets

"Till taught by pain men really know not what good water's worth." This quotation from Lord Byron prefaces each of four pamphlets which deal in a personalized way with the pollution problem in its respective river basin area.

Based upon the longer technical reports of the cooperative State-Federal drainage basin surveys, the pamphlets present the story of pollution in terms of the interests of the people in each area. They describe the cities which are situated along the rivers, their industries, and what each is contributing to the pollution problem in terms of dangers to health, agriculture, recreation. The pamphlets tell what the cities are doing about the pollution problems—which are and which are not treating their sewage. And finally they tell what the people must do to correct the problem.

These four pamphlets are part of a group of 15 that are being prepared in connection with the longer drainage basin surveys.

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Clean Water for the Pacific Northwest. (Public Health Service Publication No. 201) 1952. 6 pages; illustrated. 5 cents.

From the Hudson to the Potomac: Clean Waters. (Public Health Service Publication No. 202) 1952. 6 pages; illustrated. 5 cents.

Cleaner Water for the Ohio. (Public Health Service Publication No. 203) 1952. 6 pages; illustrated. 5 cents.

Clean Water for New England. (Public Health Service Publication No. 199) 1952. 6 pages; illustrated. 5 cents.

Keeping Our Hospitals Operating— A Study of Supply and Equipment Requirements

Results have now been published of the study undertaken by the American Hospital Association and the Public Health Service to determine the maintenance, repair, and operating (MRO) requirements for civilian hospital equipment and supplies.

The operating workload of the survey was carried principally by the Divisions of Civilian Health Requirements and Hospital Facilities of the Public Health Service. Survey questionnaires were mailed to all continental United States non-Federal hospitals of 15-bed size or larger that were on the American Hospital Association's mailing list, including nonmembers. Presented in the report are the estimated requirements for 585 hospital items, based on replies from over 2,600 hospitals of every type and size throughout the country. The number of hospitals which returned replies represents about 55 percent of the hospitals queried. Long-life items are reported in terms of national 5-year requirements; short-life items in terms of national 1-year requirements. A detailed breakdown of the survey data is included for further use by researchers in this field. The survey is the most comprehensive ever undertaken to determine what equipment and supplies are required by hospitals.

During a period of mobilization, accurate knowledge of essential civilian needs is necessary for making proper decisions and allocations respecting any segment of our economy, the report notes. Hospital specialists, who had personal experience with allocations during World War II, favored the study, because of the handicaps that they previously had encountered.

In summarizing the survey, the introductory section of the report cites the uses of the estimates as follows:

1. By agencies of the Government—in preparing and analyzing proportionate civilian and military hospital requirements in this field.

2. By distribution agencies—as a factor in distributing critical materials.

3. By hospital administrators—in conducting intensive studies of institutional operation.

4. By the manufacturing industry—as a factor in considering adequacy of productive capacity.

5. By the combined manufacturing and distributive industries—in designing distribution operations.

The MRO study of hospital equipment and supplies is a part of the overall surveillance of supply-and-demand relationships with respect to health material that is being conducted by the Public Health Service.

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Keeping Our Hospitals Operating. A study of supply and equipment requirements. (Public Health Service Publication No. 272) 1953. 191 pages; tables. 45 cents.

Community-Wide Installation of Household Garbage-Grinders

This is a joint publication of the Indiana State Board of Health and the Public Health Service prepared in answer to many requests from city governments, sanitary engineers, and the plumbing industry for information on the results of the Jasper, Ind., experiment. In December 1949, Jasper became the first municipality to undertake the elimination of garbage collection through the installation of home garbage-grinders. The project was begun after an epidemic of hog cholera resulted in the refusal of contractors to collect Jasper's garbage. In the 18-month period of this study 900 household garbage-grinders were installed, servicing 75 percent of the population.

The report is preliminary, since the restaurants and food service establishment have not as yet installed garbage-grinders. In addition to background information on the development of the project it discusses the effect on the sewerage system, water consumption, refuse collection and disposal, fly densities and rodent infestation.

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Erganian, George K., Belter, Walter G., Graber, Ralph, C.: Community-Wide Installation of Household Garbage-Grinders. (Public Health Service Publication No. 224) 1952. 41 pages; illustrations, tables, charts. 20 cents.

The Sanitary Landfill In Northern States

In 1948 the North Dakota State Department of Health invited the Public Health Service to participate in a study of the use of landfill techniques to provide a sanitary solution to the refuse disposal problem in cold climates. The city of Mandan, North Dakota, was selected for the study, which began in 1949.

A report of the Mandan project appeared in the March 1952 issue of *Public Health Reports*. This publication presents a more detailed and technical discussion of the experiment including the selection of the first and second sites, plans of operation, and details of construction of the landfill. An outline for a small community operation is given with information on temperature studies, physical and chemical analyses, and a tabulation of operational costs for a 1-year period.

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Weaver, Leo, and Keagy, Donald M.: The Sanitary Landfill in Northern States. (Public Health Service Publication No. 226) 1952. 31 pages; illustrated, tables, charts. 20 cents.

Publications for which prices are quoted are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Orders should be accompanied by cash, check, or money order and should fully identify the publication (including its Public Health Service publication number). Single copies of most Public Health Service publications can be obtained without charge from the Public Inquiries Branch, Public Health Service, Washington 25, D. C.
