Problems of the Physical Environment

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NOTWITHSTANDING our current international preoccupation with adventures in space, the environment requiring man's primary attention is the earth and its atmosphere. The land on which he builds and the soil which produces his food are no less important than when earthly time began. Water and air are still essential throughout every moment of life.

The total moisture and the total air have remained unchanged since earth was formed. The quantities of water descending on and flowing in our river basins have been substantially constant since the last glacial period, and yet we now hear of shortages. These, then, are not inherent, but manmade.

Fortunately, the changes in our environment have come not from great external forces but from man's own activities. I say "fortunately," because this places the changes within his control if he gains the necessary knowledge and exercises the necessary wisdom.

Water Use

We all fear that sooner or later we, wherever we are, will run out of water. Many accounts of shortages appear each summer, and predictions of future catastrophe accompany each population forecast. There is indeed a water problem, or, more accurately, many problems contributing to our anxiety about the adequacy of future water supplies.

First, let us look at the supply. Over the entire Nation the average 30-inch annual rainfall produces some 4,300 billion gallons daily. Evaporation, percolation, and unregulated runoff reduce the average daily availability to 515 billion gallons (*1*). In the aggregate there are also significant ground water resources, but nobody yet knows how great these may be.

Contrast this with the present overall daily use of 322 billion gallons and the predicted use in 1980 of 494 billion gallons, about 410 billion gallons of which will come from surface sources, and we would appear to be approaching the limit of our supply (*2,3*). Before concluding this, however, these figures deserve some scrutiny.

Those of us concerned with public health naturally think first of domestic water needs on the farm and in the city. The farm requirements, being satisfied almost entirely from ground sources, make no significant drain on the surface flows (*2*). Moreover, it has been estimated that our farm population will shrink to only some 5 percent of our national total, while our urban areas are growing to hold 85 percent of our people.

In 1960 our public water systems used about 22 billion gallons daily with 16 billion gallons daily coming from lakes, streams, and rivers. By 1980 perhaps 25 billion gallons daily will be needed from the surface, and the urban requirement may ultimately reach 85 to 90 billion gallons daily (*2,3*). This is less than one-sixth of the present total average amount available. Certainly then as a Nation we are not threatened with an early death from thirst.

Our present shortages of public water supply are essentially local phenomena. Our people have elected to concentrate in some regions where water resources are meager and in other areas where the resources are sufficient but underdeveloped.

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Fortunately, of the more than 1,000 communities, with more than 60 million people, where water rationing occurred in a recent year, the great majority suffered from inadequate facilities for the collection and distribution of water, not lack of water itself. Most municipal water systems have fallen behind the population growth and in the aggregate some $5 billion should be spent to remedy their deficiencies. Moreover, they should be planning new facilities that will be needed within the next 20 years and which will cost another $16 billion (*4*). The challenge here must be met through the use of economic and political means.

So far it would appear that the water essential for life itself is not scarce, and the ways to insure its continued availability are within our control, certainly during this decade and others to come. However, there is strong competition for this precious element because of its unique and irreplaceable qualities for the satisfaction of other needs of man.

Crop irrigation is today and promises to continue to be the greatest single consumptive use of water, now requiring six times the municipal need. We have accepted this practice in the West as a way of life but perhaps have given it scant notice as it has grown in the humid East. Since little if any water so used returns to the streams, it poses a future threat to our city supplies in some localities. In general, the challenge here is to learn and practice improved techniques for the storage, transport, and use of water for irrigation so as to reduce loss and waste. An interesting approach to water conservation has been made in California, where the legislature has before it a proposal to prohibit the use of water for crops which would create or add to marketing problems (*5*).

Water is of course essential to industry, and staggering quantities are used in the production of many items. The growing national economy could automatically add pressures for proportionately greater uses. Industries, however, appear to be able to regulate their needs within wide limits depending on how much water can be had, notwithstanding the general assumptions of shortages to come. There is reason to believe that plant economies and the re-use of water within the plants may reduce future problems (*2*). Prof. Gilbert White, of the University of Chicago, conceded the "water supply clearly is of growing importance in the economic life of market economies," but concluded that "Its part in limiting present or future economic growth in most areas is doubtful" (*6*). A very small part of the water used by industry is consumed. Most of it is returned to the bodies from whence it came, seldom, however, unimpaired in quality.

Steam-operated electric generating plants form the largest remaining category of water users. Here again great quantities are used, only about 1 percent of which is consumed. In some situations even this can be significant. It is estimated that by the year 2000 about 500 million gallons per day will be lost through evaporation resulting from steam generation of electric power in the Potomac River Basin. This is five-sixths of the recorded minimum flow of this river at Washington.

While nearly 500 billion gallons of water will be used daily for all purposes in 1980, consumption will be in the neighborhood of 180 billion gallons daily, of which 148 billion gallons daily will be lost through irrigation. For strictly consumptive purposes therefore, our national supply would appear to be adequate for some time. However, since many of our great population centers are developing without regard for future water availability in their localities, many intense problems will arise. If no significant redistribution of people and industries occurs, our ingenuity will be greatly taxed to make it possible for them to remain where they prefer to be.

About two-thirds of our streamflow occurs during one-third of the year, so much of our water is lost unless stored and released when needed. An additional 100 billion gallons daily can be added to our dependable minimum national supply by flow regulation. It is estimated for example, that the unregulated flow of the Potomac would in a drought fall below the daily municipal water requirements of the Washington Metropolitan Area soon after the year 1970. The challenge, obviously, is to anticipate the shortage and plan now what dams and other structures must be built and where.

Comprehensive development and use of the

water potential of almost all regions will ultimately be essential. Comprehensive development has been defined by Dr. Edward A. Ackerman as ". . . the application of integrated multiple-purpose design, planning, and management which include joint consideration of ground and surface waters, conservational and other measures for 'engineering' of demand, and the treatment, and management of water having substandard quality" (*7*).

Among several of the less obvious of the many considerations which planning for such development entails are:

- Our waters are predominantly interstate, so coordination between the jurisdictions and interests involved becomes an initial challenge. Arrangements between and among the States by compact hold great promise for achievement of this end.
- Basic data as to streamflow and the effects thereon of urban encroachment, as well as various forms of land and forest care and conservation practices, are inadequate for precise forecasting of future stream behavior.
- The extent and availability of ground waters have not been determined to a sufficient degree to reveal their full potential for satisfying future needs. Conversely, the recharge of aquifers, amounting to storing water underground for future use, while a tool of possibly limited application, has had little investigation and use.
- Enormous evaporation losses, especially during storage, pose a problem for which a solution is sought and badly needed. In the west and southwest where losses represent an appreciable part of available water, the problem is quite serious. For example, the annual evaporation from Lake Mead averages 900,000 acre-feet per year, about 16 percent of the water made available by the reservoir (*8*).
- The protection or reservation of sites for future dams and reservoirs before they are preempted by other forms of costly development requires early public action.
- Supplementary or complementary benefits may be hoped for if efforts in weather modification and saline water conversion are successful and applicable on a large scale.

Planning for comprehensive development in its fullest sense must be accelerated during the sixties if we would meet the challenge of future water sufficiency in time (*9*).

Water Quality

Except for irrigation, all water uses competing with municipal supply, and including municipal supply, produce wastes for the disposal of which the waters themselves are necessary. In fact, the capacity of our natural waters to assimilate and transport wastes satisfies one of the greatest of man's needs under present conditions. This constitutes perhaps the most important water use next to domestic supply. Obviously, the presence of contaminants in and the degradation of the waters so used adversely affect their suitability for all other purposes.

Simple dilution, except under some circumstances, can no longer suffice as an acceptable waste-disposal practice. Accordingly, there has been widespread construction of municipal and industrial treatment facilities during this century. Depending on the local conditions, the degrees of treatment provided have been progressively upward. Even so, if no more than the current rate of improvement is maintained, the prospects for our streams are poor indeed. Based on the oxygen-consuming residuals after treatment, it is estimated that the loads reaching our waters from municipal systems in 1980 will be equivalent to the raw sewage from 87 million persons. Industrial waste sources could raise this figure to 174 million (*10*). Against this an assimilative capacity for a population equivalent of only 36 million is available under present conditions of minimum streamflow.

The elevation of water temperatures by industrial use, with power generation being the greatest single category, produces an effect equivalent to organic pollution because dissolved oxygen is lost. Heat in conjunction with otherwise tolerable oxygen-demanding discharges can thus create serious conditions.

Only recently have we become aware of new and comparatively insidious contaminants and organisms for which we are totally unprepared. Their general resistance to current sewage- and water-treatment methods now prompts anxiety. The most conspicuous of these is the synthetic detergent. The synthetic organic chemicals

used as weed, pest, and insect killers, some 500 million pounds of which were produced in a recent year, also find their way into the waters.

These and other so-called exotics, as well as radioactive materials, are appearing in greater amounts. When it is considered that the allowable arsenic content of water is 100 million times greater than the allowable strontium 90 content, it is apparent that even minute quantities of some materials are not insignificant.

The general safety of public water supplies is unquestioned, and the virtual elimination of waterborne pathogenic bacteria during the past 40 years has been spectacular. Had the 1908 death rate from typhoid fever prevailed in 1958, 42,000 people would have died. Instead only 20 died, and I would suppose none of these contracted the disease from well-operated public water systems (*11*). Viruses, however, are now claiming attention, as well as parasitic worms and certain free-living cysts. Current treatment of sewage does not eliminate them and some individuals of the species studied have consistently penetrated the water purification process (*12*). Incidentally, some 70 virus types have been recovered from human feces and sewage.

None of the conventional tests for the control of sewage- or water-treatment processes, nor the considerations in determining stream water quality take any account of these exotics and organisms. The public health significance of these new substances is as yet undetermined. Mark Hollis, Assistant Surgeon General, Public Health Service, has stated: "Even though it is embarrassing, workers in the field simply do not understand the behavior of most of these substances in streams and on water-treatment methods. And even less understood are the health-effect potentials, especially for long-term exposure to low concentrations" (*13*). Obviously, we are here confronted with important challenges which must be met first through research and later through application of the findings. Moreover, if it is determined that the health effects are detrimental, our water and stream standards must be revised and our methods of water-quality assessment improved so as to reveal the true conditions.

Involved with this is the further challenge for the development of water- and sewage-treatment methods which will effectively remove the substances and organisms inimical to health. Here it should be noted that there has been no new basic development in sewage treatment since 1916 when the biologically activated sludge process evolved. Since some mineral and organic substances remain in sewage even after "complete" treatment, the prospect of increasing concentrations of these in streams of our more heavily populated and industrialized areas already justify concern (*13*). At periods of low flow especially, the water in some of our streams and rivers is already re-used several times. A sixfold re-use has been considered as a reasonable future possibility (*14*).

Considering the complexities, solutions are not to be expected overnight. For this reason, we are challenged immediately to make more extensive use of the tools at hand. The degree of sewage treatment by municipalities and industries should be raised as much as necessary to maintain the biological health and aesthetic quality of our streams. And our streamflow should be regulated where necessary to coordinate with such treatment as it is now possible to provide. This combination can do much to forestall early difficulties and might suffice in some situations for many years. All of which brings us back once again to the need for comprehensive water resource planning and development.

Our success through more intensive use of present techniques may suffer, however, from several surprising influences. Our sewage plant effluents are high in nutrients, and our cropland through heavy use of chemical fertilizers is a source of similar materials reaching our waters. Under this stimulation, we may expect to see a heavy increase in algal growth, especially where the streams have been warmed by industrial use. While siltation can smother many of the organisms essential for the biological balance of a stream, the removal of silt with an increase in algal growth induced by the clarified water may add to the problems in some situations (*15*). Tastes and odors in water supplies will increase, and with the death of algae otherwise available dissolved oxygen may be lowered or lost altogether. A future challenge may be to establish control of nutrients in effluents.

It is obvious that each form of water use can, and usually does, have an effect on each other use, and that all uses from both the quantitative and qualitative standpoints must be looked at as a whole. Any such examination, however, must also be made with regard to the regimen of the particular river basin within which it occurs.

Land

The great growth of urban populations has finally been recognized as a breeder of highly complex land-use problems. In one way or another the solutions provided will be of public health significance.

Residents of congested central cities have placed much dependence on the availability of open spaces in the surrounding undeveloped areas. Such spaces are rapidly disappearing. In the Washington area, for instance, new building is consuming 8,000 acres each year. The challenge is to regulate building development so as to insure adequate and accessible recreational opportunities and to procure the necessary lands before they are preempted by other uses.

The shorter workweek, earlier retirement, increased longevity, and generally improved economic status are stimulating pressures for more recreational outlets. Even extensive provisions for recreation within the urban areas will not reduce the need for other substantial acquisitions and developments. In Maryland the number of days, or nights, of camping in State facilities increased from 1,000 in 1950 to 167,000 in 1959 (*16*). Attendance at recreational areas of water resource projects of the U.S. Army Corps of Engineers in 1959 was 106,500,000, a growth of more than 90 million since 1950 (*17*).

Maurice K. Goddard, secretary, Pennsylvania Department of Forests and Waters, stated that we must design recreation facilities close to our population centers. "In building such facilities, however, we face several difficulties. First, very few natural sites exist. Second, since large reservoirs and land areas are involved, there is serious competition between uses . . . uses for highways, airports, shopping centers, housing developments . . . and for each good reservoir site there are a dozen water uses—flood control, water supply, pollution abatement, and so on. This all points to one thing—multiple-purpose reservoirs and multiple use of recreational areas based on these reservoirs" (*18*). All of which brings us right back to our basic challenge to plan for full water resource development, recognizing recreational use as a high-priority consideration in any such system.

One other land problem will be mentioned, one which has received little recognition and attention. Our urban expansion is taking place with no adequate provision for refuse disposal landfills. About 1 acre per year is required for each 10,000 people. As available sites are used and converted to other purposes, more and more remote disposal points must be sought. With each increment of distance comes an increment in cost which adds further to the premium man pays for congested living. The challenge is obvious; the solution is much less clear.

Air

Until relatively recently the air of our cities has received little notice and only the most perfunctory protection, if any, from governmental authorities. The conventional municipal smoke regulations, even if enforced, are generally inadequate and outdated since they seek to control only a few of the sources of air pollution, and to these apply criteria which recognize only a portion of their damage potentials.

Even the nature, extent, and full significance of the various forms of air pollution are largely unknown. The most comprehensive information relates to particulate matter which appears to be in a downward trend, not from controls, but from a change in the sources during the past 30 years (*19*). Gaseous pollution has been studied in comparatively few cities. In general, it would appear to grow in intensity as the cities increase in size.

In addition to the usual industrial sources, the automobile is under some circumstances now recognized as a prime offender. Photochemical reaction between sunlight and volatile organic compounds released through automobile exhausts have resulted in a type of smog in Los Angeles that reduces visibility and has eye-irritating and crop-damaging properties (*20*). It has also been claimed that there is an associa-

tion between the Los Angeles smog and respiratory and cardiac deaths (*21*). Dr. Moyer D. Thomas, senior scientist, department of biological science, Stanford Research Institute, has stated: "Of great concern at this time is the question whether sublethal concentrations of any pollutant in prolonged exposures can cause chronic effects on health or bodily function" (*20*). The challenge here unfolded is for more support of research, both as to the effects of pollutants and the control of their sources.

Just as water problems almost always involve several political jurisdictions, so do those of air pollution. Thus, it is that both investigation and control of air conditions can be adequate only on a regional basis. While this has been recognized in some localities, future success in this field will depend on a high level of interjurisdictional cooperation and coordination. The development of new agencies for this purpose or the addition of new responsibilities to those of existing agencies would justify consideration. This part of the air challenge clearly falls within the political sphere.

With higher concentrations of highway and air traffic, noise is intruding on our urban environment. Of particular concern is the jet age airport both for the workers therein and those who must live nearby. Exposure at close range to jet noise can produce permanent hearing damage (*22*). Of more general importance, however, is the almost incessant, if less intense, sound of aircraft in flight, which frays the nerves, distracts the mind, lowers the efficiency, and tries the disposition. Obviously, the production of noise-making machines has outstripped both our ability and inclination to control them. Within the decade this problem will force its way to a higher position in the public and official consciousness.

Conclusion

The time has passed when we can take our land, water, and air for granted. The time has also passed when we can migrate to new situations where the land, water, and air are unaffected by man's activities. We are now face to face with the consequences of a swelling population whose continued growth and health will be greatly influenced by our ability to insure suitable surroundings. The decade of the sixties will be the time during which many basic decisions must be made and on these will depend our future well-being.

In the fields of public health and sanitary engineering, we are challenged by nearly all aspects of our physical environment, both present and future.

Observation and interpretation as we operate, research and application as we investigate, planning and guidance as we anticipate—all must be used to the full in our response to the "summons to fight."

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WHO Assembly Adopts New Resolutions

A budget of $23,607,180 for 1962 was adopted by the 14th World Health Assembly at its meeting in New Delhi, India, February 7–24, 1961. Included in this amount is the $20,852,000 originally proposed by the Director-General, plus additional amounts approved by the Assembly. Two million dollars will be used to finance field activities of the worldwide malaria eradication program and $797,347 for its administrative and operational services costs; $110,033 for assistance to the Republic of the Congo (Leopoldville); and $21,400 for the use of Russian as a working language in the European region.

The new budget reflects attempts to preserve the continuity of WHO's evolution in recent years with particular reference to medical research, the continuing need to concentrate on worldwide eradication of malaria, and the strengthening of basic public health services.

Welcoming the attainment of independence by new states and their entry into the World Health Organization, and stressing the important part WHO has in promoting the right of colonial peoples to freedom and independence through assistance in raising levels of physical and mental health, the Assembly unanimously adopted a resolution appealing to member states of WHO to introduce into or develop in their health education programs the teaching of principles of racial equality and nondiscrimination with a view toward promoting good mental health and in recognition of the fundamental right of every human being to health. The Assembly also adopted a resolution voicing satisfaction with the speedy assistance to the Congo by WHO and requesting similar assistance to all newly independent states who became members of the organization.

In malaria eradication, the cost of field operations in the worldwide campaign will be transferred over a 3-year period from WHO's special voluntary fund to its regular budget. However, voluntary contributions from governments and private sources will continue to be solicited. Beginning in 1961, the cost of administrative and operational services of this program will be financed from WHO's regular budget. These measures will insure that technical achievements in malaria eradication will not be hampered by lack of funds, the Assembly noted.

The Assembly's resolution regarding radiation noted that present scientific knowledge provides data on the harmful biological and genetic effects of massive doses of ionizing radiation. It also recognized the anxiety of member states concerning this hazard and approved the United Nations General Assembly action relating to immediate cessation of nuclear test explosions.

Most countries in which smallpox still occurs have undertaken programs to eradicate it. Progress was reported in worldwide efforts to wipe out smallpox. However the disease remains an important hazard in international travel.

CDC Training Program, 1961–62

Training courses offered by the Communicable Disease Center, Public Health Service, from July 1961 through June 1962 are listed below. This list represents the complete schedule for the period. Courses listed under "Organization and Orientation" are especially developed for people from other countries. Additional information and application forms may be obtained from either the Chief, Communicable Disease Center, Atlanta 22, Ga., or the appropriate regional office of the Department of Health, Education, and Welfare. Applications should be submitted at least 6 weeks before the beginning of each course.

Epidemiology

Principles of epidemiology (101). Jan. 15–19; Atlanta.

Applied and field epidemiology (103). July 6–Aug. 4; Atlanta.

Applied epidemiology (112). Oct. 30–Nov. 3; May 7–11; Atlanta.

Epidemiology for nurses (121). Spring; Atlanta.

Principles of epidemiology for nurses (122). To be arranged; by arrangement with schools of nursing in universities and colleges.

Epidemiology for veterinarians (140). Feb. 19–23; Atlanta.

Vector Control

Epidemiology and control of vector-borne diseases (201). Feb. 12–16; Atlanta; other dates and locations by arrangement.

Insect control, operational (202). By arrangement; Atlanta.

Insect control, advanced (203). Sept. 11–22; Atlanta.

Rodent control, advanced (211). Sept. 25–Oct. 6; Atlanta.

Rodent control, operational (212). By arrangement; Atlanta.

Insect and rodent control (221). June 4–15; Atlanta.

Mosquito control (231). Nov. 6–10; Atlanta.

Identification and biology of arthropods (241). Jan. 8–19; Atlanta.

Environmental Control

Epidemiology for professional sanitarians (308). May 14–18; Atlanta.

Epidemiology and control of foodborne diseases (311). Nov. 13–17; Region VII. June 4–8; Region IX.

Applied procedures for control of foodborne diseases (312). Sept. 18–22; Region VII. Oct. 2–6; Region V. Dec. 4–8; Regions I & II. Feb. 26–Mar. 2; Region IX. Mar. 5–9; Region IX. Apr. 2–6; Region VI.

Venereal Disease Control

Nursing work conferences on the control of venereal disease (421). Dates to be announced; location to be determined.

Nursing in venereal disease control (422). Monthly, September through June; New York City Department of Health, Bedford Health District, John F. Mahoney Training Center, Brooklyn.

Venereal disease contact interview and investigation (431). July 10–21; Aug. 14–25; Sept. 11–22; Oct. 9–20; Oct. 30–Nov. 10; Jan. 8–19; Feb. 5–16; Mar. 12–23; Apr. 9–20; May 14–25; Venereal Disease Training School, Fulton County Health Department, Atlanta. July 10–21; Sept. 11–22; Nov. 27–Dec. 8; Jan. 29–Feb. 9; Mar. 26–Apr. 6; May 21–June 1; Venereal Disease Training School, Detroit City Health Department. Aug. 14–25; Oct. 30–Nov. 10; Feb. 5–16; May 7–18; Venereal Disease Training School, Los Angeles Department of Health.

(For courses given in Detroit and Los Angeles, the first week is for all trainees, and the second week is for experienced personnel only.)

Current laboratory methods in the serology of syphilis (454). Sept. 11–29; Nov. 27–Dec. 15; Mar. 26–Apr. 13; Chamblee.

Management and control of syphilis serology by the central laboratory (455). Apr. 30–May 11; Chamblee.

The *Treponema pallidum* immobilization (TPI) test (456). By arrangement; Chamblee.

Introduction to fluorescent antibody methods (457). Oct. 30–Nov. 3; Jan. 8–12; Feb. 26–Mar. 2; Chamblee.

Fluorescent antibody methods in the diagnosis of the venereal diseases (458). Nov. 5–17; Jan. 15–26; Mar. 5–16; Chamblee.

Darkfield microscopy for the detection and identification of the *T. pallidum* (459). Oct. 9–11; Oct 11–13; Oct. 16–18; Oct. 18–20; Feb. 5–7; Feb. 7–9; Feb. 12–14; Feb. 14–16; Chamblee.

Health Mobilization

Medical program of health mobilization (501). By arrangement; State departments of health.

Health mobilization continua (511). By arrangement; State departments of health.

Training Methods and Aids

Training methods (601). Sept. 11–15; Atlanta.

The preparation and use of training aids (611). Sept. 18–22; Atlanta.

Organization and Orientation

Principles, organization, and practice of communicable disease control (701). Summer 1962; Atlanta.

Applied epidemiology in communicable disease control (712). June 19–July 14; June 18–July 13 (tentative); Atlanta.

Nursing aspects of communicable disease control (720). June 25–29 (tentative); Atlanta.

Environmental aspects of communicable disease control (730). June 12–July 7; June 11–July 6 (tentative); Atlanta.

Laboratory Methods

Laboratory methods in medical parasitology (800). Sept. 11–Oct. 6; Atlanta.

Laboratory methods in medical parasitology (801). Oct. 9–27; Atlanta.

Laboratory methods in the diagnosis of malaria (805). By arrangement; Atlanta.

Laboratory methods in medical mycology (815). Jan. 8–Feb. 2; Atlanta.

Laboratory methods in the study of pulmonary mycoses (817). Feb. 12–23; Atlanta.

Laboratory diagnostic methods in veterinary mycology (940). Mar. 5–9; Atlanta.

Fundamentals of virology (819). Sept. 18–29; Feb. 12–23; Atlanta.

Laboratory methods in the diagnosis of viral and rickettsial diseases (820). Oct. 30–Nov. 17; Mar. 12–30; Atlanta.

Special training in virus techniques (821). By arrangement.

Laboratory methods in the diagnosis of rabies (826). Nov. 27–Dec. 1; Apr. 9–13; Atlanta.

Laboratory methods in medical bacteriology (838). Feb. 26–Mar. 16; Atlanta.

Special problems in medical bacteriology (839). Mar. 19–23; Atlanta.

Typing of *Corynebacterium diphtheriae* (842). By arrangement; Atlanta.

Fluorescent antibody techniques in the public health laboratory (845). Oct. 23–Nov. 3; Atlanta.

Laboratory methods in enteric bacteriology (850). Mar. 26–Apr. 6; Atlanta.

Special problems in enteric bacteriology (851). By arrangement; Atlanta.

Phage typing of *Salmonella typhosa* (852). By arrangement; Atlanta.

Laboratory methods in the diagnosis of leptospirosis (853). By arrangement; Atlanta.

Serologic differentiation of streptococci (854). By arrangement; Atlanta.

Laboratory methods in the diagnosis of tuberculosis (855). Jan. 15–26; Jan. 29–Feb. 9; Atlanta.

Bacteriophage typing of staphylococci (856). Dec. 4–8; Atlanta.

Fluorescent antibody techniques in streptococcus grouping (860). Oct. 2–13; Atlanta.

Serologic methods in microbiology (941). Jan. 29–Feb. 9; Atlanta.

Special problems in microbiology (942). By arrangement; Atlanta.

Clinical Research

The long and close association between the Tulane University School of Medicine and the Public Health Service Hospital at New Orleans is described by Dr. John L. Wilson, recently retired director of the hospital, in the May 1961 *Bulletin of the Tulane University Medical Faculty.*

The hospital and the medical school have exchanged professional services for more than 120 years. At present, 12 of the hospital staff hold faculty appointments at Tulane, and 30 of the Tulane faculty serve as consultants to the hospital.

In recent years, the staffs have worked together in clinical investigations and specialized training programs. The May Bulletin is composed almost entirely of reports on research conducted jointly by the medical school and the hospital.

Federal Publications

Health Statistics From the U.S. National Health Survey.

ACUTE CONDITIONS, seasonal variations, United States, July 1957–June 1960. *PHS Publication No. 584–B24; 1960; 47 pages; 35 cents.*

HERNIAS REPORTED in INTERVIEWS, United States, July 1957–June 1959. *PHS Publication No. 584–B25; 22 pages; 25 cents.*

HEALTH INSURANCE, interim report, United States, July–December 1959. *PHS Publication No. 584–B26; 1960; 67 pages; 45 cents.*

SELECTED HEALTH CHARACTERISTICS, by area, geographic regions, and urban-rural residence, United States, July 1957–June 1959. *PHS Publication No. 584–C5; 1961; 40 pages; 35 cents.*

SELECTED HEALTH CHARACTERISTICS, by area, geographic divisions, and large metropolitan areas, United States, July 1957–June 1959. *PHS Publication No. 584–C6; 1961; 44 pages; 35 cents.*

HOSPITAL UTILIZATION in the last year of life. *PHS Publication No. 584–D3; 1961; 30 pages; 30 cents.*

REPORTING HOSPITALIZATION in the health interview survey. *PHS Publication No. 584–D4; 1961; 71 pages; 50 cents.*

Cancer Services, Facilities, and Programs in the United States, 1960. *PHS Publication No. 14; revised 1960; 166 pages; 70 cents.*

In a new format, this edition of two previous publications lists for each State important advisory and coordinating groups and summarizes legislation pertaining to cancer. It presents for the first time a list of schools of cytotechnology and regional and Statewide registers, as well as approved cancer hospitals and cancer consultation and treatment services.

A summary of each State's program provides information on available funds, public and professional education, detection, diagnosis, and treatment, control of environmental hazards, and special studies.

This booklet replaces "State Cancer Control Programs as Planned for Fiscal Years 1954 and 1955" (PHS Pub. No. 404) and "Cancer Services and Facilities in the United States, 1954" (PHS Pub. No. 14, revised 1954).

Proceedings, The National Conference on Water Pollution. *PHS Publication No. 819; 1960; 607 pages; $2.25*

The complete record of the opening and closing plenary session addresses, banquet speeches, special reports, and panel discussions are included in this report. The panel themes were water pollution and our changing times, meeting the growing competition for water, keeping water clean, and research and training.

More than 30 recommendations resulting from these sessions are also reported.

Radiological Health Handbook. *Order No. PB 121 748R; 1961; 468 pages; $3.75.*

Intended as a basic reference for radiobiology, radiochemistry, and radiophysics students, trainees, technicians, and professional workers whose duties require a knowledge of radiation physics, this handbook is designed to close the gap between the person with little knowledge of radiation physics and the individual who understands and appreciates its complexities.

This revision, which is current to September 1960, supersedes the handbook published in 1957; however, it is similar in scope.

The handbook provides much of the information required in health protection practice. Sections are included on physical, chemical, and mathematical data; radioisotope, decay, and radioassay data; and radiation protection data.

Much of the material has been updated, especially the table of isotopes and the glossary, which has been made consistent with the American Standards Association's Glossary of Terms in Nuclear Science and Technology. Also revised is the chart of nuclides.

The handbook was prepared by the Division of Radiological Health, Public Health Service, U.S. Department of Health, Education, and Welfare. It may be purchased only from the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. Order by number. Free sample copies are not available.

Salmonella; Salmonella Infections. Bibliography of literature, 1955–April 1960. *PHS Publication No. 803 (Bibliography Series No. 33); 1961; by Dorothy Bocker; 40 pages.*

Seven hundred and fifty-five references are arranged under the headings: laboratory, animal infections, human infections, and epidemiology. Articles and monographs in English, French, German, Italian, and Spanish are cited, and a few of the entries are briefly annotated. An author index is included.

Russian Drug Index. *PHS Publication No. 814; 1961; 102 pages; 60 cents.*

Drugs developed from 1950 through 1960 in the Soviet Union and those developed elsewhere but carrying new Russian designations are listed.

Six hundred and fifty entries, arranged by subject, include transliteration of the drug name, synonyms, chemical formula, brief description of properties, the Russian bibliographic source, and an American bibliographic source if one was available.

An alphabetical index of drug names including 2,500 synonyms is appended.

University Curricula in Radiological Health. Symposium held at Princeton, N.J., August 2–4, 1960. *PHS Publication (unnumbered); 1961; 132 pages.*

Steps to reduce the national shortage of trained radiological health specialists and support technicians to serve in radiation protection and control programs are highlighted.

Proceedings of a symposium attended by more than 100 representatives of universities, professional societies, governmental health agencies, and others with a principal interest in radiological health are reported.

Qualification standards and educational requirements for specialists in radiological health were the main topics discussed, since the activities and the planning of nearly all schools are still in a comparatively early state.

An inventory lists radiological health courses at 30 universities.

Nursing Home Standards Guide. *PHS Publication No. 827; 1961; 63 pages; 45 cents.*

Developed to assist State and local licensing agencies and other groups interested in instituting or improving nursing home laws, regulations, and ordinances, this publication synthesizes the best features of existing and suggested standards. Major subject areas covered include: development and function of standards, definitions, physical facilities, plant safety, and maintenance and operation of nursing homes.

The guide, written from a national viewpoint, is not intended as a model for adoption without modification. Each State or local jurisdiction must develop its own laws and regulations to meet specific needs and capabilities.

School Health Program. An outline for school and community. *PHS Publication No. 834; 1961; fourfold pamphlet; 5 cents.*

This pamphlet presents in outline form the various aspects and questions which should be considered by community groups and workers interested in improving school health programs. It provides guidelines on how these programs should be measured and strengthened according to present-day resources and requirements. Separate sections deal with health education for pupils, staff, and parents, the school environment related to mental and physical health and safety, and health services within the school and community.

Responsibilities of State departments of health and education are discussed, and the sources of consultation and cooperative assistance are listed. Also included is a selected bibliography on school health policies.

This publication is jointly sponsored by the Public Health Service (Division of Community Practice), the Children's Bureau, and the Office of Education.

Hospital Electrical Facilities. *PHS Publication No. 818; 1961; 35 pages.*

This manual, directed to engineers involved in planning and building hospitals as well as administrators and maintenance personnel, discusses electrical power supply systems, essential equipment, and special installations in hospitals.

Sections are devoted to electrical codes, services, and communication and signal systems. A table on currently recommended lighting in hospitals, illustrations for electrical systems, and a reference list related to electrical power systems are included.

Proceedings: Conference on Physiological Aspects of Water Quality. *Edited by Harry A. Faber and Lena J. Bryson; 244 pages.*

Detailed reports on water quality, minerals, and trace elements in water are made available for the first time. Included also are reviews of the effects of insecticides, pesticides, and other organic substances.

The publication contains contributions from medical specialists, physiologists, toxicologists, biochemists, and biologists.

Single copies are available on request from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C.

Register of Air Pollution Analyses, January 1, 1956–June 30, 1959. *PHS Publication No. 610, volume 2; by H. D. Townsend and E. R. Hendrickson; 247 pages; $1.25.*

More than 100 different air sample categories are reported from 400 cities from all 50 States in this listing which supplements the previous volume of the register. Information is tabulated concerning how, where, and when measurements have been made and where results are available.

The register is useful in studies of pollution levels, in epidemiologic studies of the effect of air pollution on health, for comparison of pollution levels in various communities, for determining which sampling and analytical techniques have been used, and for compilation of results of air quality surveys.

Proceedings 1960 Annual Conference of the Surgeon General, Public Health Service, and the Chief, Children's Bureau, With State and Territorial Health Officers. *PHS Publication No. 830; 1961; 60 pages.*

In this official record of the conference appear summaries of discussions on water supply and control, medical care administration, radiological and environmental health, poliomyelitis control, research proposals, metropolitan health planning, and 1960 activities of the Children's Bureau. Recommendations and resolutions of each of the standing and special committees are also included.

Officers and executive committee members of the Association of State and Territorial Health Officers are listed for the past and current years.

This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, 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. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C.

The Public Health Service does not supply publications other than its own.
