

Animal Inhalation Exposure Chambers

Public Health Monograph No. 57

Exposure Chambers for Research in Animal Inhalation. By David A. Fraser, Ronald E. Bales, Morton Lippmann, and Herbert E. Stokinger. Public Health Monograph No. 57 (PHS Pub. No. 662), 54 pages, illustrated. U.S. Government Printing Office, Washington, D.C., 1959, price 40 cents.

The accompanying summary covers the principal contents of Public Health Monograph No. 57, published concurrently with this issue of *Public Health Reports*. The authors are with the Occupational Health Field Headquarters, Occupational Health Branch, Public Health Service.

For readers wishing the data in full, copies are on sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. Official agencies and others directly concerned may obtain single sample copies without charge from the Public Inquiries Branch, Office of Information, Public Health Service. Copies will be found also in the libraries of professional schools and the major universities and in selected public libraries.

The phenomenal increase in the amounts and kinds of chemicals used in industry, in the defense establishments, and in the home, with attendant concern about the potential health effects of community air pollution, has aroused a demand for toxicity information that can be gained only through carefully controlled studies of inhalation toxicology. New investigators entering the field often encounter a bewildering array of sizes and shapes of exposure chambers and accessory equipment, and are faced with the choice of either copying a chamber designed by a previous worker for a different set of conditions or developing their own design through a time-consuming series of trial and error experiments.

To help these investigators avoid some common difficulties and sources of error, the Occupational Health Branch of the Public Health Service has prepared a monograph on exposure chambers for research in animal inhalation, drawing on more than 40 years' experience with animal inhalation studies by investigators in its laboratories, as well as the experience of other research centers and private investigators.

The Occupational Health Field Headquarters laboratory currently uses four types of total-enclosure exposure chambers: large-scale, control, small-scale, and pilot. The features of each type that have proved of value in ease of operation and maintenance, in reliability of performance, and in adaptability are described in detail. Emphasis is placed on the fundamental requirements of the chambers and the reason for each particular design. Design considerations, such as size, shape, construction materials, maintenance, animal complement and placement, airflow requirements, heat balance, and air conditioning, are discussed.

Since the maintenance of a desired test atmosphere is the most important aspect of animal exposure chamber operation, attention is given to the various interdependent factors which influence this atmosphere. All test atmospheres fall into one of three general categories: dispersion of solid particulates in air, mist or dispersion of liquid droplets in air, and gas or vapor forming a single and homogeneous phase with air. These are dealt with in order of decreasing complexity and difficulty of producing and maintaining satisfactory performance in the chamber. Basic equations and formulas affecting particles and chamber dynamics are given and used to predict the performance of specific chambers.

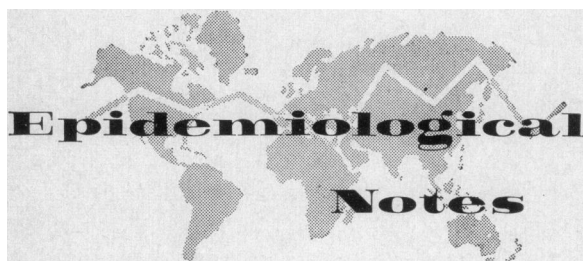
Routine day-to-day operation of the chambers is described with suggestions for safety

precautions and increased precision of operation through the use of automatic accessory equipment. Some of the forms and methods that are used by the laboratory for recording data can serve as a guide for newcomers in the field.

With an understanding of these fundamental concepts, the investigator should be able to modify any of the chambers described to meet

the requirements of his own experiment with a minimum of time and effort and little sacrifice of essential performance characteristics.

The monograph also includes a comprehensive and critical summary of the literature and history of animal inhalation exposure chambers from the first report in 1865 to the present. There are more than 80 references and 30 illustrations and tables.



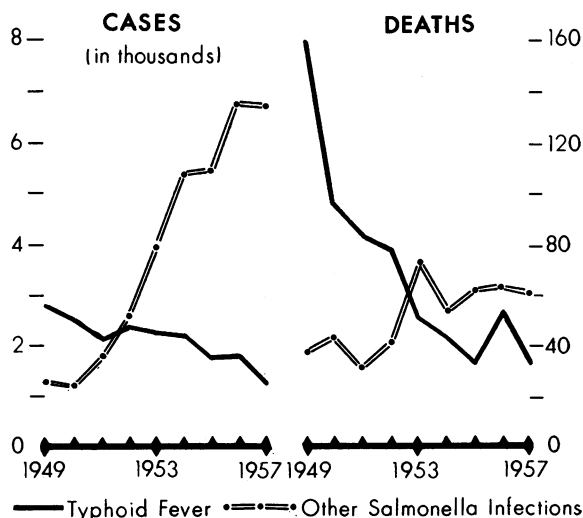
Salmonellosis

During the past decade, while typhoid fever has been reported less frequently and has caused fewer deaths from year to year, other *Salmonella* infections have shown the opposite trend. In 1950 twice as many cases and deaths from typhoid fever were recorded as for other *Salmonella* infections (see chart). In 1957, however, there were five times more cases of the latter than of typhoid fever, and the number of deaths was also in excess of those for typhoid fever. The increase in deaths has been more evident in young children and in persons over the age of 55 years.

The increase in number of reported cases of *Salmonella* infections, exclusive of typhoid fever, probably is due mainly to more complete notification which has followed greater awareness of these infections and an improvement in facilities for laboratory diagnosis. It also seems reasonable to assume that more frequent certification of deaths from these infections is due partly to such factors.

As typhoid fever has only one known reservoir of infection, man, its control is relatively simple. The other *Salmonella* infections are common to many species of animals, as well as man, and the disease can be transmitted not only by contact with infected animals and their excreta but also by consumption of the meat or other products of infected animals. The control of these infections is difficult because they are so widely distributed.—CARL C. DAUER, M.D., *medical adviser, National Office of Vital Statistics, Public Health Service.*

Numbers of cases and deaths from typhoid fever and other *Salmonella* infections, 1949–57



Federal Publications

Working Paper on Financing Migrant Health Services. *The President's Committee on Migratory Labor; June 1959; 67 pages.*

Methods either currently in use or proposed to finance health services for foreign, offshore, and domestic migratory farmworkers in the continental United States are discussed. A resource document based on the study initiated in May 1957, this paper also describes inherent problems of migratory laborers and emphasizes the need to provide them with year-round health insurance coverage.

A limited number of copies are available from the Division of Special Health Services, Public Health Service, or the President's Committee on Migratory Labor, Department of Labor, Washington 25, D.C.

Brucellosis in the U.S.S.R. A review of the literature. *PHS Publication No. 635; 1959; by Julian Hoptman; 77 pages; 30 cents.*

Designed to acquaint medical scientists with research activities and progress within the U.S.S.R., this monograph evaluates the investigations, related developments, and control of brucellosis in the Soviet Union.

Discussions of the history, epidemiology, clinical aspects, pathology and pathogenesis, biochemical studies, diagnosis, resistance and immunity, and therapy provide a description of brucellosis in man and veterinary problems pertaining to it.

Activities of the National Institutes of Health in the Field of Gerontology, January 1959. *PHS Publication No. 695; 1959; 121 pages.*

Intramural and extramural research and training projects on aging conducted by the National Institutes of Health are listed and briefly described.

Identified as being either primarily or secondarily related to

gerontology, the projects are classified according to major discipline. General, major multidisciplinary, and training projects are listed separately.

Names and addresses of the principal investigators are provided.

Mid-American Conference on Migratory Labor. *Council of State Governments and President's Committee on Migratory Labor; 1959; 50 pages.*

This presentation of the conference proceedings includes recommendations, papers by the principal speakers, and general discussion summaries on children and youth, housing and sanitation, public health and public assistance, and employment.

Copies may be obtained from the President's Committee on Migratory Labor, U.S. Department of Labor, Washington 25, D.C.

Directory of State and Territorial Health Authorities, 1959. *PHS Publication No. 75; 1959 revision; 102 pages; 35 cents.*

Revised as of May 1959, this directory lists personnel of each State and Territorial health department. Included also are officials of other State agencies directing grant-in-aid programs of the Public Health Service and of the Children's Bureau grant program for crippled children's services.

Personnel of the Public Health Service in charge of functions closely associated with State health departments are listed in the appendix.

Serologic Tests for Syphilis, 1959 Manual. *PHS Publication No. 411; revised 1959; 142 pages; \$2.50.*

This water- and grease-proof plastic covered manual provides a ready reference to the latest technical procedures for performing each of the serologic tests for syphilis

commonly employed in the United States.

New tests include fluorescent treponemal antibody, rapid plasma reagin, *Treponema pallidum* complement fixation using small volumes, *T. pallidum* immobilization, one-fifth Kolmer with Reiter protein antigen, and the Kahn test with cardioliolipin antigen.

General information and general equipment are included as well as an appendix which describes methods of collecting and preserving sheep blood, preparation of hemolysin, preparation and preservation of complement, and use of merthiolate as a bacteriostat.

Proceedings, 1959 Biennial Conference of the State and Territorial Dental Directors. *PHS Publication No. 698; 1959; 62 pages.*

Principles of human behavior derived from behavioral research and their implications for dental public health practice are the subjects of seven papers. Also included are the address by the president of the Association of State and Territorial Dental Directors, recommendations of the conference, and recommendations of the association.

Sinus Infection (Sinusitis). *PHS Publication No. 172 (Health Information Series No. 34); revised 1959; leaflet; 5 cents, \$2 per 100.* Presents latest information on sinusitis, outlining causes, signs, prevention, and treatment.

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.
