

**DISINFECTION AND DISINFECTANTS:  
THEIR APPLICATION AND USE IN THE  
PREVENTION AND TREATMENT OF  
DISEASE AND IN PUBLIC AND  
PRIVATE SANITATION**

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Disinfection and disinfectants: their application and use in the prevention and treatment of disease and in public and private sanitation by Committee on Disinfectants

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# **COMMITTEE ON DISINFECTANTS**

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DISINFECTION AND DISINFECTANTS:

THEIR APPLICATION AND USE

IN THE

PREVENTION AND TREATMENT OF DISEASE,

AND IN

PUBLIC AND PRIVATE SANITATION.

BY THE

COMMITTEE ON DISINFECTANTS,

APPOINTED BY

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

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UNIV. OF  
CALIFORNIA

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By IRVING A. WATSON, SECRETARY AMERICAN PUBLIC HEALTH ASSOCIATION.

TO THE  
ASSOCIATION

UNIVERSITY OF CALIFORNIA  
DEPARTMENT OF HOME ECONOMICS  
HOUSEHOLD SCIENCE

NOTE.

This volume is the result of the labors of the COMMITTEE ON DISINFECTANTS, appointed by the American Public Health Association in October, 1884. The committee continued its researches, investigations, and experiments for three years, and made its final report in November, 1887.

Only by a careful study of this volume itself will the amount of work this committee performed, and its great value to the interests of health, be appreciated. The ability of the committee, composed of men all eminent in their professions, is a sufficient guaranty of the high character of this work. The original experimental investigations made by the committee are of the greatest importance and value, and render this the most complete and practical volume upon disinfection and disinfectants yet published.

This work was presented in three annual parts: hence the entire discussion of a given subject may not always be found in one place. A copious index has been prepared, by which all the matter pertaining to a specific topic may readily be found.

I. A. W.

418011

REPORT  
OF THE  
COMMITTEE ON DISINFECTANTS.

1885.

COMMITTEES.

GEORGE M. STERNBERG, M. D.,  
Surgeon U. S. A.; Fellow by Courtesy in Johns Hopkins University.

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Commissioner of Health of the city of Brooklyn, N. Y.

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Member New Jersey State Board of Health.

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Baltimore.



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CALIFORNIA

## INTRODUCTORY.

### GENERAL REPORT OF THE SECRETARY.

At the last annual meeting of the American Public Health Association, held in St. Louis, Mo., October 14-17, 1884, the following resolution was offered by Dr. James F. Hibberd, of Indiana, referred to the Executive Committee, and, after a favorable report by that committee, unanimously adopted by the Association :

WHEREAS, It is important, equally for practitioners of medicine, for boards of health, and for the general public, that the highest attainments of science in this department of sanitation should be formulated for easy reference by all who need it for practical application, and especially is this desirable in view of the probable visitation of cholera in the near future;—therefore be it

*Resolved*, by the American Public Health Association, That a committee be appointed to examine the subject of disinfectants, antiseptics, and germicides, in their relations to preventive medicine and sanitation, and that said committee formulate a table of these agents for the information of those interested, the agents to be classified, so far as may be deemed advisable, according to their specific virtues, facility of application, and economy of use.

In accordance with this resolution, the following committee was appointed by the president of the association :

Major George M. Sternberg, Surgeon U. S. Army, Fellow by Courtesy in the Johns Hopkins University, Baltimore ; Dr. Joseph H. Raymond, Professor of Physiology and Sanitary Science in Long Island College Hospital, and health commissioner of the city of Brooklyn ; Dr. Victor C. Vaughan, Professor of Physiological Chemistry in the University of Michigan, and member of the Michigan State Board of Health ; Major Charles Smart, Surgeon U. S. army, and member of the National Board of Health ; Dr. W. H. Watkins, Medical Director of the Auxiliary Sanitary Association of New Orleans ; Dr. Albert R. Leeds, Professor of Chemistry in Stevens Institute of Technology, and member of the New Jersey State Board of Health ; and Dr. George H. Rohé, Professor of Hygiene in the College of Physicians and Surgeons, Baltimore.

The committee met immediately after appointment, and organized by the election of Dr. Sternberg as chairman and Dr. Rohé as secretary.

In order to be enabled to make an extended experimental research, the committee, after consultation, decided to appeal to municipal and state boards of health, and to other sanitary organizations, for financial aid. Responses to this appeal were encouraging ; and a statement of receipts and disbursements on account of this work is appended to this report.

At a meeting held in Baltimore on November 20, 1884, the committee

was divided into two sub-committees,—one, consisting of Drs. Sternberg, Smart, and Rohé, to examine the literature of disinfectants, and abstract and tabulate the results, and to investigate in an exact manner in the laboratory the relative germicidal value of the various substances used as disinfectants. The latter part of the inquiry was exclusively under the direction of Dr. Sternberg, the chairman of the committee, who was granted exceptional facilities for carrying on this work in the biological laboratory of the Johns Hopkins University. The committee would here take occasion to express to the trustees of the university its high appreciation of the courtesy and aid extended by them while these investigations were in progress.

The second sub-committee, consisting of Professors Raymond, Vaughan, and Leeds, and Dr. Watkins, was appointed especially to investigate the practical application of such disinfectants as are found efficient, upon a large scale, their cost, methods of use, chemical relations, effects upon furniture or fabrics, or their possibly poisonous effects upon human beings or animals.

Reports and papers from members of both of these committees will be found under the heading "Experimental Data" in the body of this report.

The therapeutic value of the various substances investigated does not properly come within the purview of the committee, and has consequently received no attention.

At the conference of state boards of health, which was held in Washington, December 11 and 12, 1884, a preliminary statement of the work then accomplished and contemplated was made; and in accordance with authority received from the executive committee of the American Public Health Association, a series of *preliminary reports* has been published during the present year, in a medical journal of wide circulation—the *Medical News*, of Philadelphia. To Messrs. Lea Bros. & Co., the publishers of the journal mentioned, the committee is indebted for substantial aid afforded in rendering the results of the committee's work promptly available to sanitarians and the public.

The compensation received for the papers published in the *Medical News* was kept as a separate fund to cover the cost of printing the report herewith submitted. A considerable deficiency has resulted, responsibility for which has been assumed by individual members of the committee.

GEORGE H. ROHÉ, *Secretary*.

#### FINANCIAL STATEMENT.

##### RECEIPTS.

From American Public Health Association, . . . . .	\$50.00
" H. Lomb, Esq., . . . . .	50.00
" W. G. Little, Esq., . . . . .	50.00
" Connecticut State Board of Health, . . . . .	50.00
" Illinois " " . . . . .	50.00
" Iowa " " . . . . .	50.00
" Louisiana " " . . . . .	25.00
" Massachusetts " " . . . . .	50.00

From Michigan State Board of Health, . . . . .	\$50.00
" New York " " . . . . .	50.00
" South Carolina " " . . . . .	25.00
" Wisconsin " " . . . . .	25.00
" Provincial Board of Health, Canada, . . . . .	25.00
" Boston " " . . . . .	25.00
" Brooklyn " " . . . . .	100.00
" Charleston " " . . . . .	25.00
" Pittsburgh " " . . . . .	25.00
" Sanitary Protection Association, Newport, R. I., . . . . .	10.00
" Members of the committee, . . . . .	12.15
Total, . . . . .	\$747.15

## EXPENDITURES.

Laboratory expenses, . . . . .	\$264.18
Salary of assistants, . . . . .	400.00
Printing, binding, and mailing Preliminary Report, stationery, postage, express charges, and incidental expenses, . . . . .	82.97
Total, . . . . .	\$747.15

## PRELIMINARY REMARKS BY THE CHAIRMAN OF THE COMMITTEE.

A complete investigation of both disinfectants and antiseptics being impracticable in the time and with the resources at command, the committee decided upon so far departing from the letter of the resolution under which it was appointed as to limit its investigations to the subject of disinfectants, properly so called, that is, to *those agents which are capable of destroying the infecting power of infectious material.*

In the experimental investigations made by the writer in the biological laboratory of Johns Hopkins University, the biological test of disinfecting power has been the only one employed. In applying this test a variety of micro-organisms have been subjected to the action of the various agents under trial, and the object in view has been to determine, within sufficiently narrow limits for practical purposes, the percentage in which these agents are capable of destroying the vitality of the test-organisms in a given time. This is determined by a series of experiments in which the agent being tested is used in a greater or less amount, according as it is found to fail, or to be effective. Failure is shown by the fact that the test-organisms grow in a suitable culture medium after having been exposed to the action of the disinfectant; on the other hand, failure to multiply in such a solution is evidence that the test-organisms have been killed. Further details with reference to the method will be found in the paper on "Commercial Disinfectants," and also in my paper published in the *American Journal of Medical Science*, April, 1883, in which I give the results of an extended series of experiments of a similar nature.

Experiments of this kind require a certain amount of technical skill, and a very great expenditure of time. Results which are recorded in a