

plex one. It is no simple matter to correct the morals of the public, to educate the ignorant and to relieve poverty. Much has been and is being done, however, to diminish the infant mortality and the results of this work are already evident in a decreasing death-rate, especially in our large cities. Much more must be done, nevertheless, than is now being done. To do it means the expenditure of much energy and money, especially of money. The money spent will, however, be well invested, because of the increase in the productive power of the community as the result of the number of lives saved. The campaign is too large a one to be properly carried out by private charity. It must, therefore, be undertaken and conducted by the public authorities, national, state and municipal.

## IV.

## THE CONTROL OF TYPHOID FEVER.\*

BY MARK W. RICHARDSON, M.D., BOSTON.

TYPHOID fever is with us because typhoid bacilli get into our food and drink. Typhoid bacilli get into our food and drink because the stools, urines, or sputum of persons harboring typhoid bacilli are inadequately controlled. Not all persons, however, who ingest the typhoid bacilli contract typhoid fever. They are either naturally immune or have, through typhoid infection or through artificial inoculation, acquired specific immunity. The problem resolves itself, therefore, into two parts: First, a more strict control of typhoid excretions; and, secondly, an increase in the resistance of the community through typhoid inoculation.

## TYPHOID INOCULATION.

The value of this procedure has been demonstrated beyond a doubt through military experience and the results obtained in training schools for nurses. The immunity acquired is not absolute in all cases. It persists for three years and probably longer. The inconvenience suffered by the individual is small. The necessary material is furnished free of charge by the State Department of Health. The practice should become universal because it will be long before typhoid excreta can be eliminated from our water and food supplies.

## CONTROL OF WATER SUPPLIES.

The character of the water supplies in Massachusetts has improved enormously in the last forty or fifty years, and to this improvement, no doubt, is due the fact that the typhoid death rate in this state, which in 1870 was approximately 80 per 100,000 of the population, is now but 8 per 100,000. This improvement, however, is confined largely to the urban water supplies.

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The water supplies of the farms, exposed as they are frequently to contamination from defective privies and barnyards, continue to be responsible for much typhoid fever, especially of the vacation type.

There should be undoubtedly much more close supervision over the country well, not only from the point of view of the inhabitants of the rural localities, but also from that of the summer visitor.

## CONTROL OF FOOD-HANDLERS.

Another very important factor in the control of typhoid fever lies in an increasingly strict supervision of food-handlers. The dangers incident to an unclean cook have been well exemplified in the experience of the New York Health Department with Typhoid Mary. It is apparent, however, that efficient control can be obtained only after long years of effort and mainly along educational lines, for it is manifestly impossible to determine, even by frequent bacteriological examinations, all the individuals who may be excreting typhoid bacilli. An important beginning, however, can be made if Health Departments will undertake the examination and education of all typhoid convalescents. Urinary carriers of the convalescent type are practically constant and easily discovered. Fecal carriers are, unfortunately, intermittent and not so easily discovered. In my opinion, however, the urinary carriers are much more dangerous. All typhoid convalescents, and especially those having to do with food products, should be made the subject of special educational effort, for with knowledge and care these individual carriers can reduce their dangerous potentialities to a minimum.

It has been my fortune to examine many cooks, to see many hotel and club kitchens, to see the lavatories used by these cooks, and their methods of furnishing specimens of urine and, to me, the wonder is that we do not have more typhoid than we do.

There is on foot a strong movement looking to the periodic examination of food-handlers in order to further the elimination of communicable disease. Such examinations, if supplemented properly by educational work would undoubtedly have an important effect upon the transfer of infection through food products. The necessity for an adequate inspection of milk, its production and distribution, seems to me to lie largely in the elimination from the industry of those who are sick or have been sick with a communicable disease, through the proper care of excreta of such individuals.

The house fly and his relation to diarrheal diseases has been abundantly exploited. I believe that this exploitation has been somewhat overdone, but would, nevertheless, urge a continued active campaign against this common nuisance.

## THE TYPHOID PATIENT.

All cases of undetermined continued fever should be reported immediately to the local board of health as possible cases of typhoid fever. In no other way can health departments take early and effective steps to control epidemics.

To clear up the diagnosis, the physician must then use all the aids furnished by city and state authorities, such as Widal outfits and bile outfits for the cultivation of the typhoid bacilli from blood, stools, urine, or sputum. All doubtful cases should be subjected to typhoid precautions. Typhoid patients are best treated in hospitals. In any event, those who care for patients should not also be concerned with food supplies.

All excretions should be treated with disinfectants, the best of which is heat as employed in steam-jacketed hoppers used in large hospitals or as generated through the decomposition of calcium oxide in the method of Linenthal and Jones. Chemical disinfection is best carried out by thorough mixing of the excreta with carbolic acid 5%, formalin 10%, milk of lime or chlorinated lime 6%. Disinfection should, furthermore, be extended to bath water, inasmuch as this can easily be contaminated with stools or urine. Internal disinfection through the use of hexamethylamine should be carried out in every case, five or ten grains of the drug being given three times daily throughout the disease. This drug has no effect probably upon the presence of the typhoid bacilli in the stools although it is excreted in the bile. As a urinary disinfectant, however, it is very effective and eliminates undoubtedly many of the urinary carriers. Incidentally, I believe it prevents the occurrence of intercurrent cystitis, orchitis, and epididymitis.

The typhoid bacilli are present but rarely, I believe, in the sputum. I have seen them but once and then during a complicating pneumonia. This undoubted occurrence, though uncommon, necessitates, however, the routine disinfection of all sputum. It requires, furthermore, that each typhoid patient should have his own dishes and other apparatus, and that they should be subjected to rigid supervision. The disinfection of typhoid excreta from a city point of view is required from another standpoint, in that many of our shell fish are grown or fattened in sewage-polluted waters. Such polluted waters, furthermore, are oftentimes used by the public for bathing purposes.

## DISINFECTION OF PREMISES.

After the death or convalescence of a patient, the room or rooms in which the patient has been kept must be the subject of careful treatment. Gaseous disinfection of the premises, however, is neither necessary or advisable. Sufficient will be done if the rooms are treated with a maximum of fresh air and sunshine with the abundant application of soap and water and the maximum utilization of fire, steam, boiling water

and some chemical disinfectant, such as carbolic acid 5%.

Finally, perhaps the most important factor in the whole problem is that of unclean hands. We have seen that the typhoid carrier, through uncleanly habits, infects oftentimes the food supplies. Of similar importance are the unclean habits of the general population, which as a rule takes no care to wash the hands before partaking of food.

When we consider how many typhoid carriers are at large, how frequently they must contaminate objects of common contact, such as door-knobs, hand rails, etc., it cannot but be that the indirect transfer of infectious material to the hands of the general population is frequent.

Indeed, I believe that our most effective slogan for the immediate future must be *wash your hands before handling food, whether it be for yourself or for other people's use.*

## V.

## PREVENTABLE HEART DISEASE.\*

BY ROGER I. LEE, M.D., CAMBRIDGE, MASS.

THE discussion of preventable heart disease is inevitably the discussion of the etiology of heart disease. Dr. Richard C. Cabot<sup>1</sup> in an analysis of six hundred successive and unselected cases of heart disease found that he could group 93% of the 600 cases under four etiological headings. These headings were: (1) Rheumatic, that is, presumably streptococcic, (2) Syphilitic, (3) Arteriosclerotic, (4) Nephritic. The largest group was the rheumatic or streptococcic, which includes 278 cases, or a little over 46%. The next largest group was the nephritic group, 19%; the arteriosclerotic was 15%; the syphilitic 12%. It is evident that the so-called "rheumatic," that is the streptococcic or infectious group, is the important group. It embraces nearly half of the cases. Streptococcic heart disease has its origin in a large majority of cases (in 60% of Cabot's series) before the 22nd year. It begins young; it is essentially a chronic disease and if severe or progressive it handicaps those afflicted during the prime of life, and often kills before maturity. The prognosis of severe chronic endocarditis in childhood is notoriously grave. Surely it would seem that since it is possible by repeated adequate medical inspection to control the health of school children, it ought to be possible to eliminate much of this group and to minimize the after-effects of early slight cardiac lesions. Even on economic grounds a considerable number of people should not start their working years with a handicap which can never be removed, but which tends to increase.

During the past year opportunity presented to examine the entire freshman class of Harvard College. This group represented 662 young

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