TYPHOID AND HOW IT IS SPREAD

(Woods Hutchinson, M. D., in Saturday Evening Post.)

Nowhere can the natural history of disease be more clearly seen or more advantageously studied than in the case of typhoid fever.

The cause of typhoid is simplicity itself, merely drinking the excreta of some one else—"eating dirt," in the popular phrase—simple but of a deadly effectiveness, and disgracefully common2. The demon may be exercised by an incantation of one sentence: "Keep human excreta out of the drinking water." That sounds simple, but it isn't. Eternal vigilance is the price of health as well as liberty.

We can, however, make our pedigree of typhoid a little more precise. It is not merely a dirt of human origin which is injurious, but dirt of a particular type—namely, discharges from a previous case of the disease. Just as in the fight against malaria, we have not the enormous problem of the extermination of all and every variety of mosquito, but only one particular genus, and only the infected specimens of that, so in typhoid, the contamination of water or food which we have to guard against is that from previous cases. From one point of view, this leaves the problem as wide as ever, for, obviously, the only way to insure against poisoning of water by typhoid discharges is to shut out absolutely all sewage contamination. On the other hand, it is of immense advantage in this regard—it enables us to fight the enemy at both ends of the line—to turn his flank as well as crush his centre.

While we are protecting our water supplies against sewage we can, in the main, render that sewage comparatively harmless by thoroughly disinfecting and sterilizing all discharges from every known case of the disease. A similar method is used in the fight against yellow fever and malaria. Not only are the breeding place of the two mosquito criminals broken up, but each known case of the disease is carefully screened, so as to prevent the insects from becoming infected and thus able to transmit the disease to other human victims.

It cannot be too emphatically insisted upon that every case of typhoid, like every case of yellow fever and of malaria, comes from a previous case. It is neither healthy nor exhilerating to drink a clear solution of sewage, no matter how dilute; but, as a matter of fact, it is astonishing how long communities may drink sewage-laden water with comparative impunity, so long as the sewage contains no typhoid discharges. One case of typhoid imported into a watershed will set a city in a blaze.

The malevolent Deus in the sewage machina is, of course, a germ—the bacillus typhosus of Eberth. The astonishing recentness of much of our important knowledge is nowhere better illustrated than in the case of typhoid.

However, when it comes to the number of deaths from the diseace there is a striking and gratifying diminution for twenty years past, which is increasing in ratio instead of diminishing. That we are really getting control of typhoid is shown by the, at first sight, singular and decidedly unexpected fact that it is no longer a disease of cities, but of the country. The death rate per thousand living in the cities of the United States is lower than in the rural districts. For instance, the mortality in the State of Maryland, outside of Baltimore, is two and one-half times as great as that in the city itself. Our period of greatest outbreak in the large cities is now the month of September, when city dwellers have just returned from their vacations in the pure and healthful country, bringing the bacilli in their systems.

The moral is obvious. Great cities are developing a sanitary conscience. Bad as our city water often is, and defective as our systems of sewage, they cannot for a moment compare in deadliness with that most unheavenly pair of twins, the shallow well and the vault privy. A more ingenious combination for the dissemination of typhoid than this precious couple could hardly have been devised. The innocent householder sallies forth, and, at an appropriate distance from his home, he digs two holes, one about thirty feet deep, the other about four. Into the shallower one he throws his excreta, while upon the surface of the ground he flings abroad household waste from the back stoop. The gentle rain from heaven washes the various products down into the soil and percolates gradually into the deeper hole. When the interesting solution has accumulated to a sufficient depth it is drawn up by the old oaken bucket or modern pump and drunk. Is it any wonder that in the United States three hundred and fifty thousand cases of typhoid occur every year, with a death penalty of 10 per cent.? Counting half of these as workers, and the period of illness as two months, which would be very moderate estimates, gives a loss of productive working time equivalent to thirty thousand years. Talk of "cheap as dirt!" It is the most expensive thing there is.

Given the bacillus, how does it get into the human system? Here the evidence is so abundant and overwhelming that we may content ourselves with bald statements of fact. The three great routes of this pestilence are water, milk and flies. Of the three, the first is far the most common and important. While only a rough statement is possible, probably 85 per cent. of all cases from water, 5 per cent. through other channels would fairly represent the percentage.

That it is conveyed through water is as certain as that the sun rises and sets. The only embarrassment in proving it lies in selecting from the swarm of instances. There is the classic case of the Swiss villages on opposite sides of the same mountain chain, the second of which drew its water supply from a spring that came through the mountain from a brooklet running by the first village. Typhoid fever broke out in the first village, and, twenty days later, it appeared in the second village, twenty miles away on the other side of the mountain. Colored particles thrown into the brook on one side promptly appeared in the spring upon the other. Then there was the gruesome modern instance of Plymouth, Pennsylvania, in 1885, a single case of imported typhoid occurring on the watershed of a reservoir was followed, thirty days later, by an epidemic of eleven hundred cases in a population of eight thousand.

An equally vivid instance came under my own observation. A school and a penitentiary drew their water supply from the same power flume, carrying a superb volume of purest water from a mountain stream. Early in the autumn a single case of Typhoid appeared in a small town near the head of the flume. The discharges were thrown into the swiftly-running water. Two weeks later an epidemic of typhoid broke out in the school, and three weeks later in the penitentiary. An unexpected freak, however, was the appearance of fifteen or twenty cases in another State institution farther down on the same stream, which did not draw its water supply from the flume, but from deep wells of tested purity. This was a puzzle, until it was found that, owing to a fall in the wells, the water from the flume had been used for sprinkling and washing purposes in the institution, being allowed to run through the water pipes only at night, while the well water was used in the daytime. This was enough to contaminate the pipes, and a small epidemic began, which promptly stopped as soon as the cause was suspected and the flume water no longer used.

This last instance is peculiarly interesting, as illustrating how typhoid infection gets into milk, the second—though at long intervals—most frequent means of its spread. It does not come from the cow, for, fortunately, none of the domestic animals, with the possible exception of the cat, is subject to typhoid. Nor is it possible that cattle, drinking foul, and even infected water, can transmit the bacillus in their milk. That superstition was exploded long ago. Every epidemic of typhoid spread by milk—and there are scores of them now on record—can be traced to the handling of the milk by persons suffering from mild forms of typhoid, or engaged in waiting upon members of the family who are ill of the disease, or the dilution of milk with infected water, or even, almost incredible as it may seem, to such slight contamination as washing the can with infected water.

Health officers now watch like hawks for the appearance of any case of typhoid among or in the families of dairymen. The New York City Board of Health, for instance, requires the weekly filing of a certificate from the family physician of all dairymen that no such cases exist. And the more intelligent dairymen keep a vigilant eye upon any appearance of illness accompanied by fever among their employees, some that I have known even keeping a fever thermometer in the barn for the purpose of testing every suspicious case. How effective such precautions can be made can be illustrated by the fact that, in the past five years, there has not been a single epidemic of typhoid traceable to milk in Greater New York, even with its adequate corps of ten inspectors, and the six States they have to cover. The moment a single case of typhoid appears, the dairy or milkman supplying that customer is given a most rigid special inspection, and, if any source of infection can be discovered, the milk is shut out of New York city until the department is satisfied that all danger has been removed. One or two lessons of this sort are enough for a whole county of dairymen. The danger of transmission of typhoid through milk has been enormously exaggerated, and, like all other milk-born diseases, is entirely due to filthy handling, and may be prevented by intelligent sanitary policing. Even with our present exceedingly imperfect sysetems, probably not more than between 5 and 10 per cent. of typhoid is transmitted in this way; and, if the water supply were kept clean, this would entirely disappear.

Typhoid may not only be transmitted from "the earth beneath," and "the waters under the earth," but also from "the heavens above," through the medium of flies and dust. The first method is bulking larger every day, especially in country districts and in camps. The modus operandi is simplicity itself. The fly lives and moves and has its being in dirt. It breeds in dirt, and it feeds on food, and, as it never wipes its feet, the interesting results can be imagined. Just to dispel any possible doubt, plates of gelatine have been exposed where flies could walk on them, then placed in an incubator, and within forty-eight hours there was a clearly-recorded track of the footprints of the flies written in clumps of bacilli sown by their filthy feet. More definitely, flies have been caught in the houses of typhoid patients, put under the microscope, and their feet, stomachs, and specks found swarming with typhoid bacilli. A single fly-speck may contain three thousand. Fortunately, we have a simple and effective remedy. We cannot disinfect the fly, or make him wipe his feet, but we can exterminate him utterly! This sounds difficult, but it isn't. Like the mosquito, the fly can only breed in one particular kind of place, and that place is a heap of dirt—preferably horse manure, but, at a pinch, dust-bins, garbage-cans, sweepings under porches, or behind furniture, vaults—anywhere that dirt is allowed to remain undisturbed for more than a week at a stretch. Abolish, screen or poison these dirt accumulations, and flies will disappear, and with them not merely risks from typhoid, but half a dozen other diseases, as well as all sorts of filth, and much discomfort and inconvenience. It was largely through flies that the disgraceful epidemic of typhoid which ravaged our camps on our own soil during the Spanish-American war, was spread.

The last method of transmission is by direct contact with the sick. This is a rare means of spread, so much so that it is generally stated that typhoid it not contagious; but it is a real source of danger and one against which precautions should by all means be taken. The only method is, of course, by the soiling of the hands of the nurse or other attendant, and then eating or touching food, or putting the fingers into the mouth before thoroughly cleansing. If the hands be washed with a strong antiseptic solution after waiting upon the patient, and the cheerful habit sometimes indulged in of putting fruit or other delicacies into the sick room for a day or so, in the hope that they may tempt the appetite of the patient, and then taking them out, and letting the children eat them as a treat, be abolished, and the nurse be not allowed to officiate in the kitchen, risk from this source will be done away with. Even with the utmost recklessness it would probably not cover more than one or two per cent. of all cases.

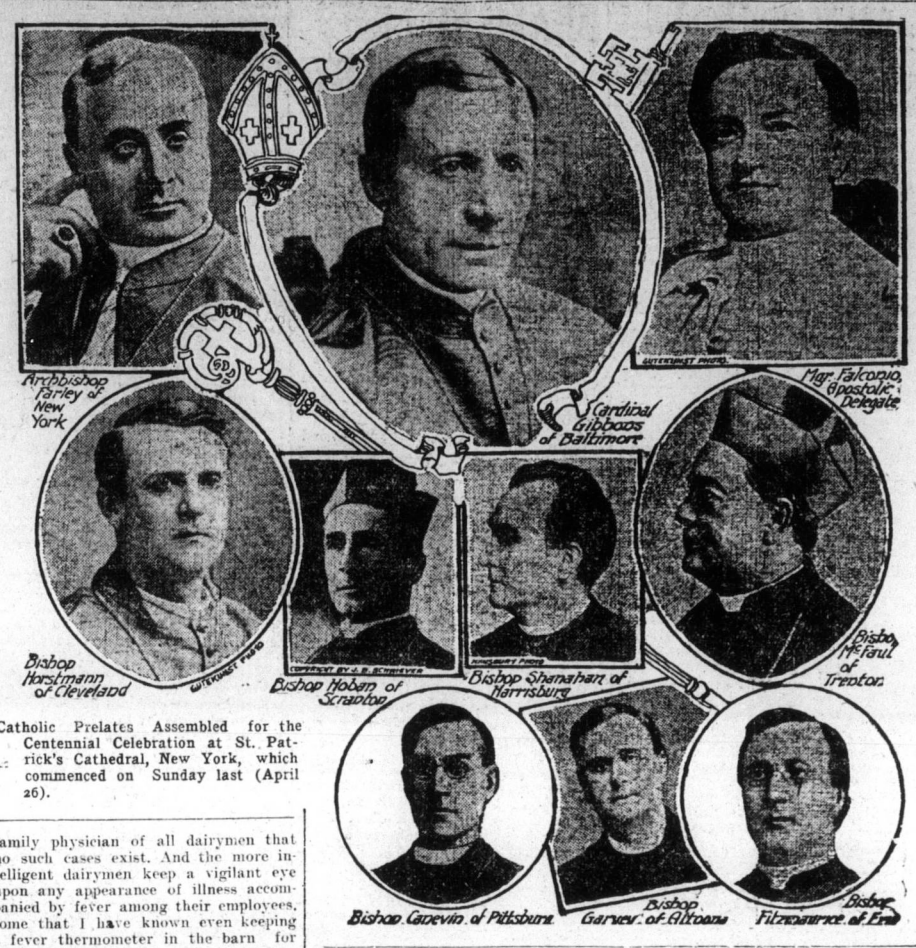
By just what avenue the infecting bacilli go from the stomach into the general system we do not know. Metschnikoff suggests that they can only penetrate the intestinal wall through wounds or abrasions of the mucous membrane, made by intestinal worms or other parasites. Certain it is that the average stomach has a considerable degree of resisting power against them, for in no known civil epidemic has the number of those who caught the disease exceeded 10 per cent. of the total number drinking the infected water or milk. In one or two camps in time of war the percentage has risen as high as 19 or 20 per cent. of those exposed, but this is exceptional. However, now that we know that intestinal symptoms do not constitute the entire disease, and may even be entirely abcases of slight depression with feversent, we strongly suspect that many ishness, loss of appetite, and diturbances of the digestion, which occur during an epidemic, may really have been very mild cases of the disease. One of the singular features of the disease is that, unlike many other infections, we are entirely unable to say what conditions or influences seem either to protest against it or to predispose toward it.

As to treatment, it may be broadly stated that all authorities and schools are for once practically agreed. First, that we have no known specific drug for the cure of the disease. Second, that we are content to take a leaf out of Nature's book, and follow—so to speak—her instinctive methods: first of all, by putting the patient to bed the moment that a reasonable suspicion of the disease is formed; this conserves his strength, and greatly diminishes the danger of serious complications; cases of "walking typhoid" have among the highest death rates; second, by meeting the great instinctive symptom of fever-patients since the world began, third—encouraging the patient to drink large quantities of water, taking care, of course, that the water is pure and stirile. The days when we kept fever patients wrapped up to their necks in woollen blankets in hot, stuffy rooms, and rigorously limited the amount of water that they drank—in other words, fought against Nature in the treatment of disease—have passed. A typhoid-fever patient now is not only given all he wants to drink, but encouraged to take more, and some authorities recommend an intake of at least three or four quarts, and better, six and eight quarts a day. This internal bath helps both to allay the temperature, to make good the enormous loss by perspiration from the fevered skin, and to flush the toxins out of the body.

Third, by liberal and regular feeding with preferably some liquid or semi-liquid food, of which milk is the commonest form. The old attitude of mind represented by the proverb, "Feed a cold and starve a fever," has completely disappeared. One of the fathers of modern medicine asked on his deathbed, thirty years ago, that his epitaph should be: "He fed fevers."

Fourth. We respond to the other great thirst of fever patients, for coolness, by sponge baths and tub baths, whenever the temperature rises above a certain degree.

Simple as these methods sound, they are extremely troublesome to put into execution, and require the greatest skill and judgment in their carrying out. But intelligent persistence in the careful elaboration of these methods sousd, they are extremely troublesome to put into execution, and require the greatest skill and judgment in their carrying out. But intelligent persistence in the careful elaboration of these methods of Nature has resulted in already cutting the death-rate in two—from fifteen or twenty per cent. to less than ten per cent.—and where the full rigor of the tub bath is carried out it has been brought down to as low as five per cent.



Catholic Prelates Assembled for the Centennial Celebration at St. Patrick's Cathedral, New York, which commenced on Sunday last (April 26).

Valuable Mixture to Be Prepared at Home

GOOD SPRING MEDICINE

For a good spring tonic, get from your druggist:
One ounce Fluid Extract Dandelion.
One ounce Compound Salatone.
Four ounces Compound Syrup Sarsaparilla.
Mix, shake well, and take in teaspoonful doses, after meals and at bedtime.

The formula is given by a prominent physician, and is said to have remarkable results in ridding the blood of the uric acid and poisonous waste matter with which the blood is likely to be charged at this season of the year, particularly of persons afflicted with rheumatism or kidney diseases. It strengthens and assists the kidneys to filter these poisons from the blood, restoring the healthy, normal action, so necessary to perfect health.

If you feel that you need a tonic, prepare a bottle and try it anyway, for being so highly recommended it can bring nothing but good results.

SYNOPSIS OF CANADIAN NORTH-WEST HOMESTEAD REGULATIONS.

ANY EVEN-NUMBERED SECTION OF Dominion Lands in Manitoba, Saskatchewan and Alberta, excepting 8 and 26, not reserved, may be homesteaded by any person who is sole head of a family, or any male over 18 years of age, to the extent of one-quarter section of 160 acres, more or less.

Application for entry must be made in person by the applicant at a Dominion Lands Agency or Sub-agency for the district in which the land is situate. Entry by proxy may, however, be made at any agency on certain conditions by the father, mother, son, daughter, brother or sister of an intending homesteader.

DUTIES—(1) At least six months' residence upon and cultivation of the land in each year for three years.

(2) A homesteader may, if he so desires, perform the required residence duties by living on farming land owned solely by him, not less than eighty (80) acres in extent, in the vicinity of his homestead. He may also do so by living with father or mother, on certain conditions. Joint ownership in land will not meet with this requirement.

(3) A homesteader intending to perform his residence duties in accordance with the above while living with parents or on farming land owned by himself must notify the agent for the district of such intention.

W. W. COREY,
Deputy of the Minister of the Interior.

N.B.—Unauthorized publication of this advertisement will not be paid for.

THE WATCH HOUSE

You will find all the latest in SPRING JEWELRY including

Belt Buckles and Pins
Hat Pins
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Fobs, etc., at

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Issuers of Marriage Licenses.

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Tenders for Bending Machine, Sorel.

TENDERS addressed to the undersigned at Ottawa, and endorsed on the envelope "Tender for Bending Machine, Sorel," will be received at the Department of Marine and Fisheries, Ottawa, up to noon of the

EIGHTEENTH DAY OF MAY, 1908.

for the furnishing of one machine for bending steel boiler plates, to be delivered at the Government shipyard at Sorel, P. Q.

Specifications and detailed information can be obtained from the Department of Marine and Fisheries, Ottawa, from the Director of the Government Shipyard at Sorel, and from the Agent of the Department of Marine and Fisheries, Montreal, P. Q.

Each tender must be accompanied by an accepted cheque on a chartered Canadian bank, for the sum of $300.00 to the order of the Minister of Marine and Fisheries. This cheque will be forfeited if the party whose tender is accepted declines to enter into a contract to deliver the bending machine, or fails to carry out the contract. If the tender is not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

F. GOURDEAU,
Deputy Minister of Marine and Fisheries.
Department of Marine and Fisheries,
Ottawa, Canada, 21st April, 1908.

TENDERS

TENDERS addressed to the undersigned at Ottawa, in sealed envelopes and marked on the envelopes "Tender for New Cruiser for British Columbia," will be received up to the

FIRST DAY OF MAY NEXT

for the construction of a twin screw steel Cruiser for Fisheries Protection Service in British Columbia waters, of the following leading dimensions, namely, length over all 250 feeet, breadth of beam mouided 32 feet and depth from top of keel plate to top of beams at side 17 feet, and to be delivered at Victoria, B. C.

Plans and specifications of this steamer can be seen at the Department of Marine and Fisheries, Ottawa, at the offices of the Collectors of Customs at Toronto, Hamilton, Collingwood, Midland, Vancouver and Sydney, N. S., and at the agencies of the Department of Marine and Fisheries at Montreal, Quebec, St. John, N. B., Halifax, N. S., and Charlottetown, P. E. I.

The same plans and specifications can be procured by application from the Department of Marine and Fisheries up to the first day of May next and at the agency of the Department of Marine and Fisheries, Victoria, B. C.

Each tender must be accompanied by an accepted cheque equal to 10% of the whole amount of the tender, which cheque will be forfeited if the person sending the accepted tender declines to enter into a contract with the Department or fails to complete the steamer. Tenders on letter paper will be considered.

The department does not bind itself to accept the lowest or any tender.

Newspapers copying this advertisement without authority from the Department will not be paid.

F. GOURDEAU,
Deputy Minister of Marine and Fisheries.
Ottawa, Canada, 14th March, 1908.

Auction Sale of Timber Berths
Dokis Indian Reserve

THERE will be offered for sale by public auction, at an upset price, in the Russell House, in the city of Ottawa, on Wednesday, the 24th day of June, 1908, at the hour of ten o'clock in the forenoon, timber berths numbered 1 to 8, inclusive, covering the pine timber of nine inches in diameter and over at the stump and, no other, on the whole of the Dokis Indian Reserve situate on the French River in the Province of Ontario.

Each limit will be offered separately at a bonus, ten per cent. of which to be paid in cash on day of sale and notes to be given for the remainder, payable in three, six and nine months, at the Bank of Montreal, in the City of Ottawa, with interest at six per cent., in addition to Crown dues at the rate of $2.00 per M. feet B.M., and $50.00 per M. feet C.M., an annual ground rent of $24.00 and a license fee of $4.00, the cash payment to be forfeited upon failure to pay the balance of bonus within the time above mentioned.

The licenses will be issued in due course after payment of notes above specified, and will be renewable yearly upon compliance with all conditions thereof for a period of ten years and no longer, and will be subject to Manufacturing Conditions in accordance with the provisions of Order of His Excellency in Council of the 19th day of April, 1901.

Dues at the rate above specified to be paid on sworn returns, as required by the Timber Regulations of the Department.

Information regarding the timber berths in question may be laid upon application to the undersigned.

The unauthorized insertion of this advertisement will not be paid for.

J. D. McLEAN,
Secretary.

Department of Indian Affairs,
Ottawa, April 8, 1908.

NOTICE
Tenders for Chain for Marine and Fisheries Dept.
TENDERS

THE time for receiving tenders for Chain Shackles and Swivels required by the Marine and Fisheries Department for which tenders have been invited to be received up to the first of May, will be extended up to the 15th of May next. Revised specifications can be seen at the offices of the agents of the Marine Department at Halifax, N. S., St. John, N. B., Charlottetown, P. E. I., Montreal, P. Q., and Quebec, P. Q., and at the Department, Ottawa.

F. GOURDEAU,
Deputy Minister.

Ottawa, April 23rd, 1908.

2629

Telephone for prompt attention to repairs and installations of Electric and Gas Work of all kinds, from 8 a. m. till 10 p. m.

PORTER & BROAD

Every Woman is interested and should know about the wonderful MARVEL Whirling Spray. The new Vaginal Syringe. Best—Most convenient. It cleanses instantly.

Ask your druggist for it. If he cannot supply the MARVEL, accept no other, but send stamp for illustrated book—sealed. It gives full particulars and directions invaluable to ladies.
WINDSOR SUPPLY CO., Windsor, Ont.
General Agents for Canada.

COLLEGES THAT WILL FORM NEW IRISH UNIVERSITIES.

The bill introduced in the House of Commons by Mr. Birrell, Chief Secretary for Ireland, creates a Roman Catholic University in Dublin and a Presbyterian one in Belfast. The former is composed of a new university in Dublin, for which the old exhibition buildings will be utilized at a cost of £150,000, and in which will be incorporated the existing Queen's College at Cork and Queen's College, Galway (both founded 1845), Queen's College, Belfast (founded 1845), becomes a Presbyterian university. The Anglicans already have a university in Trinity College, Dublin, which is unaffected by the bill.