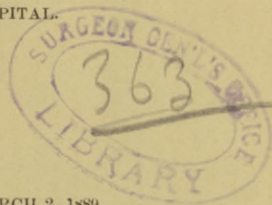


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VIEWS
ON THE
PREVENTION AND TREATMENT
OF
TYPHOID FEVER.

BY
STEPHEN SMITH BURT, M. D.,

PROFESSOR OF CLINICAL MEDICINE AND PHYSICAL DIAGNOSIS, NEW YORK
POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.



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VIEWS ON THE PREVENTION AND TREATMENT OF TYPHOID FEVER.*

By STEPHEN SMITH BURT, M. D.,

PROFESSOR OF CLINICAL MEDICINE AND PHYSICAL DIAGNOSIS IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL.

During the last three months of the year just passed there were 413 cases of enteric fever reported in the city of New York, including 122 deaths; and in Providence, R. I., there were 329 cases and 70 deaths recorded within the same period.

In recounting these statistics I do not so much seek to point a moral in regard to the percentage of deaths as to draw your attention to the many instances of this fever that have been noted in the short space of three months in two of our large Eastern cities, where the intelligence of the inhabitants is certainly not below the average of such places.

From our knowledge of human nature we are justified in concluding that all the cases that occurred during this period were not reported, while, at the same time, it is reasonable to suppose that most of the fatal results were ultimately put on record. And, if these inferences

* Read before the Medical Society of the State of New York, February 5, 1889.



be true, we can easily see how there would be considerable room for error in calculating the ratio of deaths from such reports. But, on the other hand, it is fair to presume, after due allowance for mistakes in diagnosis, that the actual number of cases was in excess of what appears in the statistics.

Now, this evident persistence of typhoid fever in enlightened communities where it should not prevail, to say nothing of the apparently high rate of mortality, which is possibly somewhat fallacious, has led me to consider the facts in regard to the spread, prevention, and treatment of this affection.

Although the topic that I have selected is certainly of great general interest, yet my treatment of it may seem rather trite to many of you because of a contingent lack of novelty. Still, I hold that a thing is but half known which is not generally acted upon, and if we would learn what men believe we must observe what they do.

Typhoid or enteric fever is a preventable disease and quite a needless affliction to the human race. Nevertheless, each year we are called upon to grapple with this malady, and the idea of its extinction is regarded by many as fanciful instead of reasonably feasible. The fault must lie partly with ourselves and not wholly with the rest of the community. Moreover, it is not so much ignorance that we have to plead as a lack of sufficient will to live up to what we know.

If the germ theory of disease is a correct one, and it would seem to be, we ought to follow the example of the surgeons and endeavor to keep out the bacteria. Our task, to be sure, is a much more difficult one than theirs, for these little enemies of the human race come clothed in the garb of peace, and steal into our citadels by the natural paths. The brain of man, however,

nurtured by experience, each day finds itself better able to solve this problem.

Enteric fever is not contagious in the strict sense of the word, but rather infectious, if such a distinction is allowable. That is to say, it is indirectly conveyed by means of excrementitious matter, but not communicated directly from person to person. A rod-shaped vegetable parasite, discoverable only by the microscope, of the genus bacterium and species bacillus, is the disease germ of this malady. From the evacuations of a patient, after a few hours, these germs multiply, spread, and, what is more, retain their virulent activity for a great length of time and under the most varying circumstances. Yet because of a considerable interval between the passing of a stool and its final putrefaction, at which time the poisonous ptomaine is evolved, immediate contact with the patient is rarely if ever a means of infection.

In such a number of instances of careful search by painstaking and trusty observers has an eruption of typhoid fever been traced to a source that plainly owed its infection to a previous outbreak of the same disease, that this deduction regarding its origin has been verified and the sequence of cause and effect established. Unpolluted by man, the earth is free from the germs of enteric fever; but, criminally careless or ignorantly neglectful, he scatters the seeds that generate misery and entail suffering upon his fellows.

So far as contagious and infectious diseases are concerned, the public weal might be fitly compared to the strength of a chain, which is no greater than that of its weakest link. Hence the importance of boards of health, of inspection, and of quarantine, to enforce the law upon the few for the safety of the many. But short of flagrant disobedience to sanitary rules, there

are many minor infringements that work no little injury, for, after all known precautions have been observed, one may be subjected to the mercy of a thoughtless or selfish neighbor. Consequently, until it is not only granted, but, furthermore, acted upon, that the welfare of our fellow-men is also our own, unnecessary disease and premature death will be the lot of mankind.

The poison of enteric fever is undoubtedly due to living germs that are voided by the patient, which multiply with great facility under favorable circumstances, and which are preserved, it is believed, for years in a congenial atmosphere. Thus, wherever these germs are scattered they form colonies of great potency for evil. Little fine particles, too small to be seen by the naked eye, they are borne by the wind, diffused by gases, or conveyed by means of fluids in various directions. And the victim of their noxious power, predisposed in some way not well understood, takes them into his system through the air he breathes, the fluid he drinks, or the food he eats.

In certain portions of the world the struggle for existence between man and vegetable and animal parasites is so great as to render these regions almost uninhabitable. Indeed, at all times and in all places the price of life is continual watchfulness. And the person who relaxes his vigilance is daily in danger of being carried off by the enemy that lurks among us in microscopic tenuity.

It is pretty well established that the gaseous emanations from sewers, or the water that may be polluted by human excrement, however pernicious, will not produce enteric fever when taken into the system unless they contain the germs or toxic principle peculiar to this malady.

Perhaps of all means of propagating enteric fever

our drinking-water is the most common, because the most likely to reach large numbers of persons. Bright, sparkling, and clear, it may still be the vehicle of endless infection. Ice, too, harbors the bacilli characteristic of this affection. These same germs of disease when cast into a public sewer find suitable pabulum for growth and multiplication, whence they spread to the houses by means of the constant diffusion of gases. By the overflow of vaults or the leakage of pipes they saturate the earth and ebb and flow in the tide-water of the subsoil, from which they find their way into adjacent wells and poison the water, or into neighboring cellars and vitiate the atmosphere. Even the milk we drink is liable to pollution from its strong affinity for water in the laboratory of unscrupulous purveyors. Therefore, while the surgeon, armed with antiseptic weapons of defense, stands guard over his wound, we have literally to scour the country in search of the foe.

As a means of stamping out this infectious disease, first of all comes the absolute need of destroying in every instance the excreta, or the germs therein, as they are expelled from the patient. This is not only a moral obligation, but it should be made a legal necessity. Then, when as much attention is given to the plumbing, draining, and ventilation of a home as, in many instances, is bestowed upon decoration, the dreadful scourge ought gradually to disappear.

In the selection of a house in town or country, the water-supply and the drainage should be made the objects of the most careful investigation, for these are the two sources most liable to become vehicles of infection. Stationary basins should be excluded from all sleeping-rooms, and the waste-pipes in every case should be exposed to view and not buried in the walls

or floors. It would be better if the bath-rooms and closets were in a detached portion of the house. Filtered rain-water is the safest for drinking purposes, and the ice employed to cool it should not come into immediate contact with the fluid. Wherever there is the slightest danger of pollution the only safe means for the prevention of infection is to boil the water. Simple filtration will not destroy disease germs, but, if raised to the boiling point, water is freed from all bacteria, however tenacious of life. In like manner meats and food in general should not be kept in direct contact with ice, nor even in the same compartment. And the outlet of a refrigerator must not communicate with a sewer. All this we know, you say, but do we act upon our knowledge? Do we take pains to see that our patients are as well informed, and that they make proper use of their information? The periodical outbreaks of enteric fever would seem to answer this pertinent question.

Unless these simple precautions are taken in every instance, we have to thank ourselves for the weeks of illness, and perhaps years of sorrow and regret that we bring upon ourselves by our own negligence.

Finally, after all has been done that our present knowledge enables us to perform in the way of prevention, there may come a lapse of caution, a blind, foolish trust that things will take care of themselves, or some stupid member of the community, far removed from our supervision, may subject us unknown to the poison of enteric fever, and we fall victims to the malady. Hence, in the present state of imperfection in which we exist, we are obliged to consider the treatment of this disease, which, as I have already ventured to claim, ought not to prevail and would not be the scourge it is but for our own improvidence.

It would be hazardous to predict in view of the apparent revolution in medicine that the germ theory seems destined to bring about, that some material may not be discovered which, introduced into the system, will counteract the poisonous effects of these germs. But at present the indications point to the much more natural, not to say rational, method of exclusion; and, although this involves an amount of care and watchfulness that is often irksome, nevertheless it would appear to be the course that is generally required in life, for without labor nothing is given to man.

I am wholly in accord with those who believe that the pyrexia of typhoid fever is, in a degree, a conservative process.

Fever may be defined as an exaggeration of the normal physiological heat production and heat dissipation, but with the heat-regulating mechanism thrown out of gear. The neurotic hypothesis of pyrexia seems to have been verified by the demonstration that heat production is controlled by the nervous system. Chemical changes that take place in the glands and muscles, which give rise to heat, are directly dependent upon innervation. An injury to certain limited portions of the brain, known as heat centers, will produce fever; and in like manner the injection of pyrogenic substances into the circulation is supposed to have a similar influence upon the central nervous system. Thus the typhoid poison taken into the blood provokes an elevation of temperature by its effect upon the heat areas, unless the central nervous system should be so overwhelmed by the toxic products of the bacilli as to become paralyzed.

When fever is produced it slowly causes oxidation of the foreign substance, but, like many another energy, it is potent for evil as well as good, and must be kept

within bounds. On the other hand, without fever the malady may still be a malignant case of typhoid poisoning. Hence pyrexia is not all of enteric fever. It is rather the combination of pyrexia with the poisonous element than the elevation of temperature alone that is harmful; for it has been demonstrated that a gradual rise of bodily heat not septic in origin can progress to a very considerable height without much permanent damage to the tissues. Consequently the question occurs whether too much attention is not being given to the dangers of what is supposed to be hyperpyrexia, and not enough to the other factors of the malady.

This fever is undoubtedly one of the manifestations of Nature's struggle to rid the system of the unwelcome poison, and in the milder cases of infection the human economy proves itself equal to the occasion, yet in many instances the toxæmia is so profound that the patient sinks under its baneful influence. But between these extremes there lie many stricken with this affection whose fate hangs upon threads that may be rudely torn by blundering hands or gently gathered up by the spirit of enlightenment.

We have no specific with which to combat this disease, and the indications for treatment are to supplement Nature in her endeavor to accomplish this end. I do not wish to appear as an advocate of expectancy to the exclusion of all else; nevertheless, it is very desirable to have the moral courage not to produce an unwarrantable disturbance in the system, with the vain hope of hastening a process about which Nature requires her own time. Therefore, I would earnestly testify in favor of the simpler therapeutic measures, and simplicity, after all, is an evidence of the highest evolution of our art. The peculiar intestinal lesions of this malady demand absolute recumbency, even though the general prostra-

tion is not sufficient to enforce it. Fresh air in abundance, without draughts, is a prime factor in its management. It is my conviction, however, that, except for the most urgent and dangerous complications, any medicine that disturbs the stomach had better never be administered. Pure milk is the best food. Solid material should not find entrance into the body until the fever has subsided, and, what is more, until the intestinal ulcers have healed, which is further on. This should be impressed upon the attendants and the reasons given, and, futhermore, the warning should be repeated in those dangerous days of convalescence. Predigested milk is the most suitable form in which to feed the patient, but it is important to remember that milk is food and not adequate to quench thirst.

Alcohol is one of our powerful allies in the treatment of almost all diseases upon occasion, yet it may in many instances be withheld with benefit. It is the condition of each individual and not the disease that must determine its employment. The rapidity of the pulse in enteric fever is supposed to be directly due to the pyrexia; still, with low tension, and possibly dicrotism, we are feeling the effects of the typhoid poison. Auscultation of the heart, to learn the quality of the first sound, should be daily practiced, as herein lies our best guide for the use of stimulation. Weakness of the first sound calls for aid.

As an instance of deference to the indications of nature I would cite the employment of opium in cases of intestinal hæmorrhage, which insures absolute quietude of the intestines while coagula have time to form in the bleeding vessels.

The importance of guarding against bed-sores by the early use of a water-mattress is great, for it is easier to prevent these ulcers than to heal them. Moreover, a

frequent change of decubitus to avoid hypostatic congestion of the lungs should not be overlooked.

In the choice of means to reduce the temperature of the body a very difficult and delicate problem is presented to the thoughtful observer. I would strongly recommend the medical attendant to weigh well the question whether it is not better to allow the fever considerable latitude than to reduce it at the risk of destroying the patient's inherent power of resisting the chemical poison, which is at the bottom of the whole matter.

If quinine has an antipyretic effect in typhoid fever, it seems to me the amount required to accomplish this end is often harmful.

Antipyrine, while it may reduce the temperature, is productive of so much cardiac weakness that it is a serious problem whether it had better ever be administered in enteric fever.

The application of cold water in the form of a tub-bath, even when carried out with the utmost caution, by the gradual lowering of the temperature of the water is very liable to induce prostration if not collapse; and the final return, in some instances, of the same or a higher bodily heat would seem to show that, although the surface is cooled, and even more than the surface, heat-dissipation is checked for some time afterward, while heat-production continues undisturbed in the deeper structures. At all events, whether this supposition be true or not, my experience with tubbing in typhoid fever leads me to exercise a great deal of caution in the selection of cases for its employment. But, on the other hand, the milder expedient of sponging with tepid water appears to be almost always followed by an improvement in the general condition of the patient, and never by any of the ill effects that are so prone to succeed a tub-bath.

Before closing I would like to mention the 307 cases of enteric fever of Dr. Cotting, of Boston, spoken of in Flint's "Practice of Medicine," that were treated without drugs of anykind, wherein there was a mortality of but 10 per cent ; and likewise the celebrated exploit of Alonzo Clark, in the treatment of 250 cases of typhus fever, at Bellevue Hospital, with a moderate amount of stimulation, and naught else but food and drink and fresh air in great abundance. They all ended in recovery.

Such facts as these ought always to be remembered when, in the enthusiasm of the moment, we are quick to ascribe some special virtue to our latest therapeutical venture.

Finally, the main points that I would emphasize in this necessarily brief survey of my subject are that, as a race, we are responsible for the existence of enteric fever, that its extinction lies in our own hands, and that in the treatment of the disease we should be ever mindful of our limitations.

