surgical attention with the same confidence and assurance with which we enter the abdominal cavity, providing we exercise the same care and possess the same cleanliness. In all operations on the skull the entire head should be shaved and thoroughly disinfected before the skull wall is opened. All foreign matter should be thoroughly removed and, where dirt, hair, etc., have become lodged in the line of fracture, where fracture exists, the chisel and hammer must be used to remove them.

The next care of the surgeon is to ascertain, if possible, the nature and extent of the injury. Where fracture with depression is found, removal of a section of bone, either with the trephine or chisel, places the field of injury open to observation and clears up questions that must otherwise remain in doubt. In all cases sufficient bone should be removed to permit of a thorough inspection of the field of operation.

We now, with the injured parts easily within reach, proceed to treat them as we treat injured structures in other parts of the body. All foreign matter and blood-clots are to be removed, hemorrhage controlled either by hot applications, pressure or ligature, and all ragged edges of the wound excised, securing, if possible, smooth coaptating surfaces. The wound in the brain should be closed with catgut sutures, after which the dura mater is carefully drawn over it and closed with the same material and the outer wound closed and dressed in the usual way. When we feel that our work has been clean throughout, drainage is unnecessary, but if we fear subsequent septic trouble drainage should be provided for; the patient should be put at physical and mental rest and his condition carefully watched for at least ten days. Should septic trouble occur the parts must be opened up and a rigid antiseptic treatment instituted. He must ever bear in mind that the scar tissue resulting in wounds that do not heal by first intention is prone to be followed by those dreaded *remote* effects which are often immeasurably worse than death, and we should, therefore, leave nothing undone which may in any way conduce to or further the prospects of an aseptic result. In cases presented to us for treatment we must not carelessly overestimate or underestimate nature's possibilities, but rather by a careful consideration of all the conditions, facts and symptoms present, intelligently weigh the evidence and draw conclusions in accordance with its drift. Time spent by the surgeon in securing facts to strengthen his judgment is usually time gained for the patient and is therefore well spent.

This paper has not been written with the view of instructing, but rather of inviting attention to a field of surgery worthy, we believe, of more consideration than is being given to it and to stimulate a closer and more thorough study of the conditions with which it deals. Placed in positions where we may be called on at any time to assume the responsibilities involved in such cases we should, in doing even ordinary justice to our patients, be prepared to treat them with a fair degree of intelligence, and they should receive at our hands that degree of surgical skill to which in this day they are fairly entitled. The records of Macewen, Starr, Horsley, Fluchrer, Weismann, and others, combined with our present knowledge of surgical cleanliness, place us in positions to do at least reasonably accurate and successful work on the skull and brain, and when we consider the importance of maintaining the security and integrity of nature's great nerve center and its

peculiar liability to injury, time spent in specially fitting ourselves for work in this connection can not be regarded in any other light than that of wise expenditure.

402 Grand Avenue.

TREATMENT OF TYPHOID FEVER.

WITH BACTERICIDAL IN CONNECTION WITH OTHER AGENTS, AND SOME CONSEQUENT DEDUCTIONS.*

J. M. PECK, A.M., M.D.

ARLINGTON, KY.

It would be remarkable indeed for any physician, be he the most humble or the most distinguished—or his work restricted—if he is not called upon to cross swords with the disease designated as typhoid fever. The treatment of a typhoid fever patient, as we shall attempt to describe, is the outgrowth of our acceptance of the now old and universally admitted theory as enunciated by Eberth, and, except in rare instances, the primary and principal site of infection is in the intestinal tract, although there may be undoubted cases in which there is no perceptible inflammatory process in the alimentary canal.

Taking the fact for granted, then, in the great majority of cases that entrance of the bacilli into the system is by means of the ingesta, we would naturally expect the first local manifestation to be somewhere in this tract. This we find to be the actual condition in nearly all cases. In many cases, one of the earliest and most noticeable symptoms is a peculiar diarrhea, which we take to be a well-directed effort of nature to rid herself of the disturbing elements there. Bacteriologists and pathologists of to-day assert that the real disturbing element is not so much the bacilli themselves, but the toxins produced by them. The toxins are the cause of the toxemia, and when this toxicity is extreme, we have a condition of mental and physical inactivity so familiar to us all who have treated or witnessed many typhoid patients treated according to the old expectant way of management. If the Brand or any other treatment has no recommendation above the old, beyond the preservation of the mental faculties, for this alone they would demand our adoption in every possible instance. It seems the Brand method would favorably impress every thinking mind as meeting in a great measure almost every indication possible to be met in an uncomplicated case of typhoid fever except that to be met by means of intestinal antisepsis. But happy is the physician whose clientele is of sufficient wealth that he may carry the Brand treatment into their homes without frequently meeting insurmountable obstacles; or, on whom his grip is so strong that he will not run serious risk of losing desirable patronage and influence. In hospital practice the cold plunge bath stands easily first as a favorite treatment by the leading teachers of the day, but a large majority of the typhoid patients are treated outside of the hospital, and the question arises, what is the most expedient and successful way to treat them? Our very limited experience is to the effect that the nearest approach, in many respects, to the Brand treatment will be attended with the greatest success.

Elimination of the bacilli and also their toxins, in every way possible, not detrimental to the patient, is the very important object to be attained. This is effected

* Presented to the Section on Practice of Medicine, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

chiefly through the bowels and kidneys, and possibly to a certain extent through the skin. Nature usually begins this eliminative process by a diarrhea, as above stated. In accord with this idea, we should assist by as thorough a cleansing of the bowel as possible. The drugs on which we most rely for aid in this therapeutic endeavor are calomel and chlorin. As a germicide and purgative, calomel meets two important indications. It may be given in from 1/10 to 1/2 grain doses every half hour, as conditions may demand, until six or eight doses are taken. As soon as the bowels move because of the calomel, there should be a free washing out of the bowel with sterilized water, the effect of which may be improved by the addition of a dram of salt to a pint of water. This flushing will do much toward assisting nature, as well as contributing to the comfort of the patient. The course of the calomel, in varying doses according to the susceptibility of the patient to the drug, should be repeated every twenty-four to forty-eight hours. The wash should be repeated as often as the emergency demands, in proportion to the meteorism or bowel trouble. The antiseptic or germ-destroying property of chlorin has long been recognized as very powerful, while at the same time experience has amply proved that it is harmless to the animal economy. Then in addition to this cleansing effect of the calomel, and the washing, on the bowel and contents, we may give chlorin in aqueous solution and still nearer approach a condition of asepsis in the bowel and thus render it less inviting to the bacilli. My favorite way of preparing chlorin is that recommended by Dr. Yeo, with the exception of quinin, which I omit. Take potassium chlorate, grains 30, acid hydrochloric, minims 60, and distilled water 12 ounces. Put the potash in a dry bottle of sufficient size, add the acid, cork the bottle and allow it to stand until chemical action ceases, then add 3 or 4 ounces of the water at a time and agitate thoroughly. This is repeated until the preparation is complete. A tablespoonful is given to an adult every two hours until the offensive character, if such exists, of the evacuations is removed, then the interval is lengthened at night but continued in the day until convalescence is established. By this constantly lax condition of the bowels, the repeated washing out from below and the frequent imbibing of the chlorin solution serves to sufficiently free the bowel of the disturbing elements so that meteorism and its accompanying evils are in a great measure prevented. Auto-intoxication from this source is reduced to the minimum. So much then in the way of lessening, as well as the removal of a portion, of the products of infection which occur in the intestines. Professor Osler, at the meeting of THE ASSOCIATION at Baltimore, some five years ago, stated that "the only thing developed by this intestinal antiseptics is that the walls of the bowel could stand considerably more irritation and strain during typhoid fever than had been supposed." As revealed by the light of to-day that statement should be corrected as follows: Intestinal antiseptics, during typhoid fever, tends to protect and strengthen the walls of the bowel and to that extent is a preventive of extensive sloughing, hemorrhage or perforation.

In this connection, we next come to the consideration of hydrotherapy as an additional means of sustaining the vital forces, and promoting elimination of the toxic products through the kidneys and skin. In private practice the ideal hydrotherapy is by the sponge bath, hot and cold. Its practicability at once commends it to your intelligence. Any patient who with the aid of his family or friends is unable to carry

out this modification of the Brand treatment should be sent to the hospital, where water and nurses are abundant. The familiar maxim, "the greater the skill the better the service," is true in this as well as other callings; for the sponge bath very little skill and usually one nurse will suffice. The free use of sterilized water internally should be maintained throughout the attack, and externally, as conditions may require. If the patient can not take it into his stomach, inject 16 to 20 ounces into the bowel at stated intervals and the effect will be almost the same. We might say he should be drenched internally and externally with water. Internally it acts as a solvent and carrier of the waste matter, to a degree, like flushing out the sewers of a city. It facilitates intestinal antiseptics, it feeds and soothes the famished and parched tissues, favors metabolism, and induces sleep, nature's great restorer. If we follow up this effect with the free use of water externally, hot and then cold, the first effect is the shock, the severity of which depends on the temperature of the water and the hyperesthetic condition of the patient. As a result of the reflex action produced on the nervous system, we have expansion of the lungs, increased elimination of carbon-dioxid, increased oxygenation of the blood, increased blood-pressure, and a consequent increased activity of the lymphatics and other glands, especially the kidneys, which means an increase in the excretion of the toxins in the fluids of the body, and for your patient a bright eye and a clear head. The cold pack or sponge bath does not cause so pronounced a reaction as does the cold plunge bath; neither is it so terrifying and hazardous to the patient. At periods during an attack of typhoid fever the temperature in the majority of cases runs high, so much so that the patient is distressed. The nervous tension is too great, causing extreme restlessness, and if the sponge bath does not relieve it we must resort either to the cold plunge bath or give an antipyretic. What shall we do? In many instances it would be impossible to use the cold bath, in others still, it would be more dangerous than the drug. In the hospital you might use the plunge bath, but in private practice I would give acetanilid, and in about thirty minutes the patient is quiet, the skin is bathed in perspiration and the temperature is coming down within reasonable bounds. Often we will have among our patients those who have rigors. One will complain of being cold, or the extremities are cold while his body is hot, and we find the circulation very rapid and a temperature ranging from 104 to 105.5. If you give him 3 or 4 grains of acetanilid and re-apply ice-cold applications to his head, usually in fifteen or twenty minutes he will begin to complain of burning up. Having experienced this ordeal I can state from personal knowledge that the sensation is one of extreme heat over the surface. But to the patient. In five or ten minutes longer you find him perspiring, the extremities warm, and he expresses himself as feeling comfortable. The exact way in which this effect is produced, I am not yet able to demonstrate, but from repeated observation I am sure that through the nervous system the acetanilid causes dilatation of the peripheral blood-vessels and thus allows the hot blood to flow from the congested parts to the surface, the cooling area. The radial pulsation is slower and shows greater volume. This allows rest for the overworked heart.

Much prejudice exists against the coal-tar derivatives as antipyretics. This prejudice exists in the minds of many of our most learned, but in not a few instances it is held by those who have had very little

if any personal experience with them as antipyretics. That they are remedies which should be used with great caution, there can be no question, but that they should be discarded because some have dared to use them recklessly and met with disaster, is not warranted. On the same plea we will strike most every remedy of value from our list.

Along the latter part of the year 1895, I began the treatment of typhoid patients with the view of destroying and removing the bacilli and their toxins in the manner described, believing it to be the rational way of assisting in the correction of the pathological conditions. Since that time seventy-seven typhoid patients have come under our care with the result that all of them recovered. I might say, were permitted to recover, because some advocate the idea that patients so treated, when they do recover do so in spite of the treatment. The youngest of these patients was 4 years of age, and the oldest 63 years. They represent the various callings and conditions in life, from abject poverty to that of plenty. Their nursing and feeding as a rule harmonized with the intelligence and ability of the nurse to carry out the instructions. Diet was restricted to liquids and semi-liquids. Fruit juices were served in liberal amounts if the patients desired them and they could be obtained. If they so desired, they were permitted to masticate and suck the juices of broiled steak. The duration varied from nineteen to sixty-five days, though the average time was only twenty-five and one-tenth days from date of onset to a continued normal temperature. Except when temperature was high they all remained rational. No preparation containing opium was used at any time, save in one case of severe hemorrhage. Hemorrhage occurred in six cases, though very slight in five of those. Ice over the bowels and an enema of cold water containing extract of witch hazel were all that was used to control the hemorrhage in these. In the other case the hemorrhage was so severe and repeated, tincture of opium was added to the injection of witch hazel and water. Aside from this case, no effort was made at any time to check the bowels except by cleansing. When there is diarrhea, a part of the expectant plan is to control that diarrhea by sedatives and astringents, the idea being to preserve the vitality of the patient.

By a comparison of my results with those obtained by others, while employing the expectant plan coupled with the sponge bath, it is found that the results secured by the bath and intestinal antiseptics are the more favorable. The conclusion is that it is a mistake to check a diarrhea in typhoid fever except by the use of a purgative or by a thorough washing with sterilized water. By this, many of the bacilli and their toxins are carried away by the dejecta. Results indicate that the chlorin solution has a very beneficial effect in checking the production of the toxins, or by rendering them less active. That the toxins are largely produced in the glands, lymphatic and others, is not proof positive that the chlorin does not come in contact with them there, to some extent. It is evident that it does, in some way, to a certain degree, destroy or render inert, either in the bowel or elsewhere, a sufficient amount of them to prevent their producing that profound toxicity formerly so common in the disease. It is not held, in the seventy-seven cases reported, that the chlorin was the sole agent in the prevention of the toxemia. The effect of the calomel with the flushing of the bowel, prepared the way or acted as a stepping-stone for the chlorin. The cold bath, through its effect on the nervous and cardiovascular systems, greatly increased the elimination of toxins through the kidneys.

With the united effect of these remedial measures the patient is enabled to recover in a shorter period, and with a saving of vital force. In well-regulated hospitals where the patient is under the care of skilled nurses, and no imprudence in the diet could occur, and every detail as to treatment is faithfully adhered to, relapses would be rare and the course of the disease correspondingly shortened. We have the above statement, notwithstanding the reverse opinion is held by gentlemen of recognized and distinguished ability.

DISCUSSION.

DR. C. BIRNIE, Taneytown, Md.—My opinion is that the majority of cases result from the ingestion of contaminated water and not through breathing air. The patient and his surroundings should be kept clean and the excretions disinfected, so that neither air nor water be contaminated. I believe that typhoid fever is more easily treated where the bowels are loose. In talking with a prominent man, he told me that he prayed for constipation. I have never found that constipation was a thing to be desired in the treatment of this disease. I think that cool bathing is of great importance, but in country districts it is impossible to carry out the Brand method in all its details, and I can not agree with any statements made that we should treat typhoid fever antiseptically; I believe that this is impossible. Typhoid fever is a disease of the whole body and not of the intestinal tract alone. I disagree with the statements made regarding antiseptics; when we consider the canal, from the mouth to the anus, a twisting and turning canal, there is no known means by which we can antisepticize it. I think flushing the colon is useful, and I have known it to give relief to the status; for that it is good. There is a large number of cases that will get well under any reasonable line of treatment. Prescribe for the patient and not for the disease.

DR. A. E. ROUSSEL, Philadelphia—It has been within the last six weeks that I made a post-mortem on a patient of mine at the Howard Hospital, a young woman about 26 years of age, who had hardly any congestion of the intestinal tract; the most minute observations revealed no break of continuity of the tissues, yet the case responded to Widal's reaction and was evidently one of typhoid fever. How frequently do we see cases with marked meningeal symptoms due to the same cause! Therefore I consider the statements regarding the value of intestinal antiseptics as largely exaggerated. There has been a marked reduction in the mortality from the use of the Brand method. Where the entire treatment can not be carried out I believe that portable bath-tubs should be used. In those cases where a trained nurse can not be procured the application of the baths does not require a great range of intelligence; the member of the family acting as nurse should be taught how to take the temperature, and when the tubbing should be applied. I think the difficulties of applying the Brand treatment has been widely exaggerated. We know positively that before this method of treating these cases was in vogue the mortality ranged from 18 to 20 per cent., while now it runs from 5 to 10 or 11 per cent. I can not fully agree with the last speaker's remarks that those cases which show a mild degree of constipation are more severe and show a larger mortality. Dr. Wilson has had applied in the wards of the German Hospital the Woodbridge treatment, and among the 18 or 20 cases the results were far from being satisfactory. I think there were four or five deaths out of the above number of cases. I have tried many drugs and I have tried cold water, and the latter has proved by far the most efficacious. As regards the entrance of the germs into the system, I think it is undoubtedly in the vast majority of cases through the water-supply, so far as it has been demonstrated. But it is fair to assume that the germs may enter the system through one, or more than one channel.

DR. LOUIS FAUGERES BISHOP, New York City—I also wish to state that the antiseptic treatment of typhoid fever has brought nothing but disappointment. I have tried chlorin and other mixtures, and have been disappointed in all. Typhoid

fever is a general disease of the whole system and the intestinal tract is not the road through which we should treat it. The opinion of the whole medical world will support the Brand treatment. We should on every occasion preach and teach it. There is one practical point that is worthy of mention, i. e., that a tub is not necessary. In New York City in private practice we seldom use tubs any more. The nurses have learned how to arrange their patients in a rubber sheet, which answers just as well as a tub. Of course these baths are given by skilled and trained nurses. The tub is safer in unskilled hands. As to the merits of the Brand method, all are agreed that its chief merit lies in the support it gives to the circulation and the restoration of the nervous system, and that any reduction of temperature is a secondary matter, though, of course, important. When the patient gets a cold bath the effect is the same as it is in health; the respirations are deepened, the circulation is increased, the nervous system is wonderfully uplifted. It does not diminish the number of intestinal hemorrhages or perforations, but it certainly does not increase them.

DR. H. M. FUSSELL, Philadelphia—I am glad that I heard it mentioned that a modification of the Brand method can be used in private practice. After protecting the bed and floor with the rubber sheet, the water should be allowed to fall upon the patient from a height of from four to five inches above his body. I may have mistaken Dr. Peck's point in reference to antipyretics and I can not let his remarks go unchecked, because it is so much easier to give drugs than to give the baths. Antipyretics certainly reduce temperatures, but not in the same way as the cold bath does. I do not believe that intestinal antiseptics, given in a general way, do any good, but I have used in conjunction with the Brand treatment salol as a local measure. If there is a severe case of diarrhea, this is checked by this drug. I think we should depend upon cold water.

DR. J. M. PECK, in closing—Evidently some of the gentlemen failed to hear or else misunderstood the ideas expressed in the paper. I did not intimate that typhoid fever is a local disease, but that in typhoid fever we may, and usually do, have in the intestinal tract a local manifestation of the disease. The view taken in the paper is in perfect accord with that of the bacteriologist and pathologist of to-day. The degree of toxemia depends on the amount of toxins, and their amount depends on the multiplicity of the typhoid bacilli; hence our contention that any means by which only a part of the bacilli are carried away or the intestinal tract rendered less inviting to, or less favorable to the production of, the bacilli is so much to the help of the patient. Our experience with cases in which a constantly lax condition of the bowels and free flushing of them with sterilized water and frequent ingestions of chlorin fully justifies our faith in the treatment. This kind of intestinal antiseptics combined with the external application of cold as suggested in the paper will yield better results in private practice than any other yet suggested. If those using the Brand method exclusively will add to it intestinal antiseptics they will improve on their already good results. I do not believe the intestinal tract can be made strictly aseptic, but am thoroughly convinced by clinical experience that the septic products may be so reduced that auto-infection and auto-intoxication are kept in comparatively safe limits. The objection raised that the chlorin is a nauseous dose is purely imaginary, since by the addition of aromatics the most fastidious may be pleased. To be sure, the coal-tar derivatives should be used with caution, and when so used the life of your patient is in no sense endangered thereby, but is actually safe-guarded. The fact that they are potent drugs should not cause us to discard them any more than should strychnia, belladonna and a host of other powerful, but exceedingly valuable remedies be discarded. I repeat that, with judicious use, there is no danger of, or excuse for, killing a patient with acetanilid.

Violation of Quarantine.—An eclectic practitioner of Appleton, Wis., who has achieved a somewhat unsavory notoriety by his recent flagrant violation of accepted health regulations, who escaped from quarantine at Appleton, and passed through Chicago to Terre Haute, Ind., was apprehended in Milwaukee, January 30, and sent to the isolation hospital there.

INFLUENZA, ACCOMPANIED BY FOUR DISTINCT PNEUMONIC ATTACKS.

OTITIS MEDIA PURULENTA AND CEREBRAL HYPEREMIA, COLITIS, INANITION—RECOVERY.

JULIUS ULLMAN, M.D.

Instructor in Clinical Medicine, University of Buffalo; Late Acting Assistant-Surgeon, U. S. A.

BUFFALO, N. Y.

As excuse for recital of this case may be given its very unusual course and happy termination in recovery.

Allen D., aged 23 months, suffered during last summer from a dysenteric diarrhea, for which he spent two months on a farm and ultimately recovered. Twelve days previous to the present illness, I treated this baby for parotitis. On January 12, when I called I found him irritable, with flushed countenance and considerable amount of dry cough; temperature 103.6; pulse 112; respiration 32. The tongue was coated, and there was

First Attack.

anorexia. The examination of the chest revealed by auscultation, subcrepitant râles, especially over both bases of the lung posteriorly. The onset was abrupt and the baby soon showed a marked apathy due to toxemia.

In the further discussion of the case I shall confine myself to the interesting and unusual temperature chart herewith presented.

The first attack of pneumonia, which was of a broncho-pneumonic type scattered with here and there very small areas of consolidation, was associated with a very high temperature-curve, reaching a maximum of 105.6 F. The respirations were as high as 42, and the pulse at one time reached 135. The lines, indicating the abrupt fall of the temperature, show the effect of cold sponges and packs.

* Presented to the Section on Practice of Medicine, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.