that symptomatic cures were almost invariably secured, for in some of the failures enumerated in the list published in the "Transactions of the American Electro-Therapeutic Association," the symptoms were either ameliorated or they were growths whose chief symptoms were their bulk alone. That most troublesome symptom, hemorrhage, was invariably relieved, and more quickly since the use of mercurialized zinc electrodes, possibly due to the same interstitial influence of the cataphoric diffusion of nascent oxychlorid of mercury which I announce in another Section of this meeting as a new specific for cancer.

As to the varieties of fibroid tumors easiest affected by carefully conducted electric treatment, it has already been said that, with some exceptions, it is practically restricted to the intramural and interstitial forms. Since all small tumors are of either of these varieties, it may be said that, in their earlier stages, all fibroids are amenable to electricity, hence the early recognition and electric treatment of small tumors will not only arrest their growth but preserve in its entirety the sexual and other pelvic functions of the patient. Of the larger intramural and interstitial tumors those are most amenable that have multiple foci of growth, the large, smooth, monocentric growths being least amenable.

As to the comparative value of the method over any other treatment in the cases adapted to it, it is hardly necessary for me to say anything, for of the risks and final results in successful cases of its chief alternative, hysterectomy, others are better judges. I may, however, say that no treatment is better that does not result in 90 per cent. of the cases being returned to their families and society as whole women, as these patients have been.

DISCUSSION.

Dr. A. G. BANKER of Columbus, Ind.—In electricity for the treatment of fibroid tumors we have a valuable agent, and if the practitioner has perseverance and can maintain the confidence of his patients he will effect a cure in a large number of cases. He will have no ventral hernias; no subsequent risk of constriction of the bowels from adhesions following operations, and he will satisfy his patients. My experience with this agent in the treatment of these growths has been limited in country practice. I have treated about twenty patients who had fibroid tumors of the uterus. Some of them had previously consulted experienced abdominal surgeons, who had given an unfavorable opinion, but the patients after receiving electric treatment are perfectly well today. In one case the growth was quite rapid. The patient had been previously seen by a noted gynecologist who decided that an operation would mean certain death. She had been in bed for several months. Her feet and legs were greatly swollen. After beginning the electricity, which was kept up for some time, the tumor was materially reduced in size, and menstruation, which had been previously irregular, became normal from the commencement of the treatment. She is now practically well and no one would suspect that she had ever had a fibroid.

Of the twenty cases I have treated, in seven the fibroid tumors were quite large, and in none of them can there be found, at the present time, any evidence of the tumors.

COMPARISON BETWEEN TYPHOID FEVER OF INFANTS AND CHILDREN AND THAT OF ADULTS.

Presented to the Section on Diseases of Children, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, June 1-4, 1897.

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Typhoid fever occurs so rarely in very young infants and children and, as a rule, pursues such a short and

mild course, that many have denied that it is ever seen in infants under two years of age, and have maintained that it seldom occurs in those younger than five years. Systematic observations have altered these views. Pathologic investigations have shown that no time of life is exempt from the disease, although they have strengthened the opinion that it is very rare below the age of two years. The child is subject to every other form of contagion and removed from the sources of this only by reason of special care in diet. This may explain its continued absence from large institutions devoted to the care of children. It argues strongly in favor of prophylactic measures.

The study of the disease as it occurs in the child is of importance, as it appears to throw special light on some of its features and to yield indications for treatment.

The problem presented is, Why should the bacillus of typhoid produce a disturbance of shorter duration and less severity at one period of life than at a more advanced?

In considering this question let us first examine the pathology, then the symptoms and treatment. All writers on this subject agree that there is redness and swelling of Peyer's patches, the solitary follicles and the mesenteric lymph nodes, and accompanying these are the evidences of a catarrhal enteritis. They agree, moreover, in the statement that these lesions found in the intestinal tract are very much milder than in the adult, that ulceration is rare, and that when it does occur it is not extensive or deep and seldom goes on to perforation. The spleen is enlarged. The degeneration in the tissues of the heart, kidneys and liver is less frequent and less marked than in the adult. It would seem from this that there was some cause besides the typhoid fever poison operating in the adult to intensify these lesions, or some element of protection for the very young child against the dangerous processes so often prominent in the adult that they have been named as a part of the natural history of the disease. What is this?

Let us proceed a step farther and inquire into the symptoms, to see if they differ also. The statement is frequently made that typhoid fever begins abruptly in very young children, that it is not characterized by the prodromal symptoms found in the adult. My limited experience does not warrant a denial of this statement, but I am led to believe that they do exist and escape notice. It is a characteristic of small children to hide their minor discomforts from fear of the doctor or of confinement to bed. Careful inquiry will often show sickness of some days' continuance, which the parents pronounce sudden. The little ones will keep at their play until their strength gives out. How often do we see this in some of the other diseases! The prodromes of this disease are often neglected by the adult.

The earlier individual symptoms differ but little from those of the adult. There is a wider range of temperature, the marked exacerbations having given origin to the name remittent. But extended observation has shown that this is a characteristic of all fevers occurring in young children. The abdominal symptoms are usually moderate. There is the splenic enlargement, the loss of flesh and strength. There is the bronchitis also. The nervous symptoms, cerebral in character, as a rule intensified by high temperature, are present. There is indolent ulceration of the mouth as in the adult, at times. The importance of observ-

ing this has been pointed out lately. I have seen and noted it in the adult and child. Attention has been called to it as an index of the progress of the intestinal lesions. The statement has been made by good authority that its progress is in keeping with that of the latter lesions. This seemed to be so in an adult case under my care in April last.

As in the adult, we must look at the picture as a whole to arrive at a diagnosis. The eruption, bowel symptoms, visceral symptoms and fever, when combined form a group found in no other disease. To make our diagnosis logical, we must state the differential. We will exclude remittent fever from the fact that the temperature will not show the same regularity. There will not be the same gastric irritability and there will not be the same remission of symptoms as in remittent fever. There is a constipation in remittent fever which is often difficult to remove, whereas in typhoid the mildest laxatives are often all that are required, and they frequently do more than they are intended to, or in other words, the bowel is liable to be irritable. The eruption offers another point of difference.

We will exclude meningitis by the mild intermittent delirium, the regularity of the pulse and respiration, as compared with the irregular pulse and sighing respiration found in inflammation in the meninges. Then, in the latter disease would be found signs of localized convulsions or paralysis and strabismus. From ileocolitis, at times, there is difficulty in making an exclusion. In a late work by a high authority, this question is dismissed in the following way: That the disease, typhoid, does not often arise in infancy (we want farther light on that subject), and that it is slower in invasion; but unfortunately, the same author remarks in his article on typhoid that a sudden is quite as frequent as an insidious invasion. Surely this does not throw much light on the subject. Again, he names the absence of eruption, but shows also that this symptom is often absent in typhoid. Disinfection of excrement will be in order in severe and protracted cases until the bacteriologist gives us more ready and certain means of diagnosis.

Pleurisy, pneumonia and otitis media may at times simulate this disease. Careful physical examination will solve the problem.

Elsner's preparation of cultures on a proper medium to exclude the coli communis bacillus is complicated and not always successful. Widal's test, the clumping together of the bacilli of a pure culture of the typhoid bacillus in the presence of blood serum drawn from a patient with typhoid, has been shown variable. It served well in a number of cases in which it was used in St. John's Hospital, Brooklyn.

Ehrlich's "diazo-reaction" occurs in the urine in other diseases, and in health at times. It is therefore not positive.

One turns from this question of positive diagnosis with the feeling that the means for arriving at it, at an early period of the disease, are wanting, and is inclined to believe that it eventually, as the diagnosis of diphtheria, must be solved by the bacteriologist.

The duration of the disease in the young child is from eight to fourteen or nineteen days. This is variously stated, but the average duration is shorter than in the adult and the mortality very small. We find therefore, as we proceed, that accompanying lesions are less pronounced and less severe in young

children than in the adult, systemic disturbances are milder and less apt to terminate fatally and of much shorter duration. Is it not reasonable to suppose, in the light of these facts, that the later stages of adult typhoid are due to inflammatory and ulcerative lesions in the bowel, and that the degeneration of heart and kidneys is due to nutrition thus interfered with?

The reason for this difference in the character of the intestinal lesions, the reason for their being less marked and less deep, has been stated by some to be the unirritating diet usually taken by the very young. This looks reasonable. And does not this condition of affairs in the intestinal tract offer an explanation of the shorter duration of the disease and the lower death rate? I have been led to believe, for some years, from an experience in hospital and private practice, that the range of temperature in the third and fourth weeks in adult typhoid was due not so much to the typhoid poison *per se* as to the inflamed and ulcerated condition of the intestine. Modern methods of treatment have been directed to these conditions and by some aimed at the bacillus in the intestine, or in other words, antiseptic methods have been employed, and although they may have missed the bacillus typhosus, careful observers have maintained that they have done much toward alleviating the pathologic conditions found in the form of ulcers and general catarrhal enteritis. The course of adult typhoid seems to have been rendered milder at the same time. I have failed to meet an experienced practitioner in late years who does not allow that the classic cases of this disease with their intense intestinal symptoms are rare. Better methods of administering food and more rational medication offer an explanation.

The use of intestinal antiseptics in typhoid has found its able opponents, although one of them allows that there are few symptoms to be dreaded more than diarrhea, "and that cases which are constipated or in which the bowels are regular rarely die." They have maintained, and correctly I think, that it is impossible to attack a bacillus which, like the typhosus, lies buried deeply, by a remedy applied to the surface of the membrane. They have maintained also that no measures have been devised to render the bowel aseptic, forgetting possibly what regulation of diet alone has done toward that end. I have subscribed to the use of this line of remedies on the ground that it meets the pathologic conditions in the intestine, during the progress of which the greatest danger seems to be met in the latter stage of this disease. It may not render the bowel aseptic, but a long line of testimony gives strong ground for the belief that it renders it less septic, and that is frequently as far as the surgeon goes with his treatment of wounds, and he congratulates himself that he has made an advance. He does not fold his hands and desist in the attempt because bacteriologic examination tells him his work is incomplete. As well might we say to the advocates of the Brand treatment alone that it does not remove the element of temperature entirely, and for that reason is useless.

Methods of treatment which receive the support of some of our best observers deserve trial, or at least careful recognition, especially where they are directed to a lesion which is prominent in the cause of death, and most of all when clinical experience seems to point to their efficacy. There is very general agreement as to its use in cases of ordinary enteritis and

colitis. What should be the objection to it in this disease, where the same condition of affairs is presented arising from a different origin? It would seem that the objection arose from a misconception as to the object aimed at. The necessity would appear to exist to remove or disinfect products of inflammation as in the case of any other mucous membrane, and it would be rational to expect the same amelioration of symptoms of constitutional disturbance as follows the use of these agents in inflammation of membranes generally. It has become a well-recognized fact that where the resistance of the tissues has been lowered bacteria otherwise saprophytic become virulent. Such bacteria are found in the intestine. If they are not removed or rendered innocuous it is reasonable to suppose that they will create disturbance, as they do in other membranes under similar conditions. The obstetrician's investigation with regard to the action of the streptococcus in a healthy woman gives a case in point. He exhibits it to us as saprophyte under ordinary circumstances, and as virulent as any special germ when the vitality of the tissues is lowered. This brings us to the point I wish to emphasize, and it is this: In typhoid fever we have presented to us a complex condition.

The different methods of treatment which have been presented to us from time to time appear to reflect this view. The excursions made by the therapeutic pendulum have been large. We have had treatment aimed at temperature, treatment with elimination as its main point, treatment directed to the destruction of the bacillus and the protection of the intestinal tract. They have all had their advocates, armed with temperature charts and histories which, to say the least, have appeared enticing as far as they go.

It is a well-founded principle, however, that in the treatment of disease experience of a small number of cases will not establish a criterion. Experience has taught reliance upon methods established by long and extensive use only.

Let us try to gather together points of common agreement in this department. The necessity for controlling the temperature is one. Of the means to this end, the application of water of variable temperature to the surface of the body or to the intestine by high enemas, has received most favor. The sponging of the surface, the coil, the wet pack, or the systematic cold bath known as the Brand treatment, are the various methods. Whatever objection we may have to offer to the form in which it is applied, I think we will allow that this general principle is the best. There is an additional reason for its use. It acts as a tonic to the nervous system and through the sympathetic favorably affects the general nutrition. The use of antipyretic drugs has its advocates, but it is always accompanied by the warning to watch the heart, showing that there is danger in it. We may say with safety, I think, that for steady and prolonged use water has the most advocates.

There is a general agreement as to diet, that it should be milk or food in the liquid form. That it should be moderate in quantity. That it should not be given too often, that the introduction of one portion of food into the stomach before it has had time to digest a previous may be avoided. The warning is general, that if we do not obey these directions we will produce disorder of the stomach and intestine and aggravate the lesions in the latter. In other words, while all may not advocate the use of so-called intes-

tinal antiseptics, they take all the means in their power, outside of these agents, to put the digestive organs in a position to use their own antiseptics; or, in other words, they allow that the intestine must be guarded.

Then there has been proposed a line of treatment called the eliminative. Although not generally accepted, it has had the effect of calling attention to the excretory functions, to see that they are properly performed.

Then there is the antiseptic treatment. Various drugs have been employed in this line with two avowed ends in view; one of which is the destruction of the bacillus typhosus, and the other the limitation of the ulcerative and inflammatory changes in the intestine. While there is not evidence to support the first claim, the second is rational and has received the support of too many able observers to be gainsaid. They do not render the bowel aseptic, but they appear to render it less septic and control the symptoms in the latter stages. Calomel, salophen, carbonate of guaiacol and the bismuth salts have found favor with me. Turpentine, the time-honored drug, has surely done much for me in cases marked by intestinal involvement as indicated by tympanites, tenderness, and frequent dark and offensive stools accompanied with marked constitutional symptoms.

I have found no drug equal to opium to control marked nervous disturbances, and that statement is backed by the experience of many.

There seems to be a very general consensus of opinion with regard to the use of strychnin to guard the heart's action, *i. e.*, that it holds the first place.

Alcohol in some form is esteemed by many.

The nose, mouth and pharynx should be cleansed carefully and frequently.

The fact that the specific bacillus is present in the urine as well as feces emphasizes the necessity for scrupulous care and disinfection to avoid contagion.

In adult typhoid fever it has been found that the period of greatest danger is during and toward the end of the third week, and that death rarely occurs before the fourteenth day. It has been found that the mortality among adults in this disease is not small. It has been found that, during and after the third week, the changes in the intestinal tract are prominent factors in the disease.

In the case of children, on the other hand, below five years, it has been found that the disease rarely goes beyond the fourteenth or nineteenth day. It has been found that the mortality is very small, that the changes in the intestine are as a rule mild, and the degeneration in the tissues of the heart and kidneys less, showing better nutrition. Also, in the last few years, testimony points to a milder form of the disease in adults, a shorter duration and smaller mortality, and during this period the intestine has received more careful treatment. It is fair to assume, in the light of these facts, that the treatment and result bear a relation one to the other. It seems fair to suggest that the care of the intestinal lesions should play as prominent a part in our treatment as the holding of the temperature within bounds by either the Brand treatment or a modification of it. While the latter will tend to lessen the lowering of the vitality of the tissues, the former will care for and protect the intestinal tract from new invasions and enable it the better to perform its important work.

Appendicitis, like typhoid, is said to be rare at the

two extremes of life. There is a growing belief that the former, like the latter, is due to the invasion of bacteria. The unirritating diet of early childhood has been offered as an explanation for the milder intestinal involvement in typhoid. May not the same explanation hold in the aged who have learned to be cautious in diet, and may it not hold in the case of appendicitis in both? Both extremes of life are subject to febrile and intestinal disturbances. Is it not fair to suppose that the course of the diseases, appendicitis and typhoid, may expend itself with mild manifestations only and go unrecognized, the intestinal tract, better cared for and therefore in better condition, not offering the opportunity for development of the more serious lesions found in these diseases?

The following table is a record of my personal experience in the treatment of typhoid fever:

	Private.	Hospital.	Total.	Deaths.
Under 15 years of age	13	5	18	0
Over 15 years of age	41	20	61	5
Total	54	25	79	5
Mortality 6.3 per cent.				

Youngest child 14 months; next 23 months; between the ages of 2 and 3 years, 2; between the ages of 4 and 5 years, 6; between the ages of 7 and 15 years, 8; between the ages of 15 and 20 years, 17; between the ages of 20 and 30 years, 32; between the ages of 30 and 40 years, 7; between the ages of 40 and 50 years, 5.

249 McDonough Street.

MENINGITIS A COMPLICATION OF MEASLES.

Presented to the Section on Diseases of Children, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

BY THOMAS W. HARVEY, M.D.

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The relative rareness of this complication is my reason for bringing it to your consideration. I find that very few practitioners have met this condition after measles. The literature of the subject presents few recorded cases and many writers do not mention it as one of the possible complications. Others relegate all forms of meningitis following measles to the tubercular class. There are at least a dozen of the most commonly used authors on general medicine who do not mention this complication of measles (Flint, Aitken, Trousseau, Ringer in Reynolds' System, Bartholow, Watson, Neimeyer, Tanner, Barlow, Wood Struempell, Wood and Fitz).

Of the writers on diseases of children, there are at least twenty who make no mention of such a complication (Conden, Dewees, Ellis, Eustace Smith, Evanson and Maunsell, West, Day, Billard, Stewart, Stevens, Duncan, Donkin, Churchill, Cadet-de-Cassecourt, Bouchut, Ashby and Wright, Tanner, Starr, F. E. Waxham in Keating's Cyclopaedia).

Dr. Potts, in the *Jahrb. f. Kinderheilkunde*, 1880, reports 844 cases of measles and no complication of meningitis.

Dr. Chadburne, in *Journal of Obstetrics*, reports 300 cases, no meningitis.

Dr. Bernardy, in *Annals of Gyn. and Ped.*, 1893, reports 160 cases, no meningitis.

J. E. Atkinson, in "Wood's Reference Handbook," makes no mention of meningitis as a complication, except incidentally that convulsions may occur in measles.

Vogel, "Diseases of Children," translated by Raphael, 1870, says "meningitis occurs so rarely as to make doubtful the connection."

Brothers, *Archives of Pediatrics* (U. S.), 1893, mentions one case of fatal meningitis complicating measles.

J. Lewis Smith says, "there are other complications of measles of less frequent occurrence, among which may be mentioned congestion of the brain, with or without serious effusion."

Loomis says, "secondary meningitis not infrequently occurs as a complication of measles. When it does occur, it is developed during the period in which the eruption is disappearing. It is more likely to occur in this disease than in scarlet fever." This last statement certainly does not agree with the experience of most practitioners, and the first statement is not entirely in accord with other writers on this subject.

Meigs and Pepper mention one case of meningitis observed in a series of 314 cases of measles. The patient had fatal cerebral symptoms, just as the rash was disappearing, due either to congestion of the brain or to uremia. On the fifth day he was dull, heavy, apathetic, soon comatose, with irregular convulsions and arms contracted.

Pepper, in "Text-book of Medicine," says "true meningitis is rare; strabismus, tetanus, contractures, cataleptic states and maniacal attacks have been observed.

Thomas, in *Ziemssen's Cyclopaedia of Practical Medicine*, vol. ii, p. 97, says, "Measles differs from scarlet fever in this, that affections of other organs not essentially complicated in the process of measles, especially inflammation of important internal organs, of serous membranes and joints, are tolerably rare; yet now and then affections of various kinds occur, especially inflammations during the eruptive stage. They are mostly without influence on the exanthem, but effect alterations in the course of the fever and prevent rapid defervescence of the measles. Conspicuous among the affections of the nervous system are meningitis, meningitis with tetanus and cataleptic rigidity of the limbs, spinal meningitis, hyperemia of the brain, menigo-encephalitis and encephalitis."

Henoch, Sydenham's translation, 1887, says, "The least frequent complications are connected with the nervous system." He mentions a case of a child 3 years old, when, in the middle of the second week after eruption, drowsiness set in suddenly, out of which the child could hardly be aroused. There was rigid contracture of the neck, moderate fever and irregular pulse. The treatment was leeches, ice bag, calomel and mercurial inunction. The patient recovered. He thinks that some of the cases collected by Thomas in Ziemssen were coincidences for which the measles was not to blame. On the other hand, a case of diffuse myelitis published by Barlow ("Med. Chirurgical Transactions," Vol. 70, 1887), which ended fatally on the eleventh day of the measles, was certainly directly due to the disease. This case seems to have become a classic, as it is referred to by many of the French and German writers on the subject; it was characterized by the same muscular rigidity and contractures of the limbs that have been noted by so many observers, and which were present in the case I mention hereinafter.

Rilliet and Barthez mention a case complicating measles, where the symptoms of diffuse myelitis were