

spontaneous generation. These are all facts that have been demonstrated anatomically and pathologically over and over again, and stronger proof than has been adduced in that direction, it would be impossible to furnish. But whatever the practitioner wishes to maintain, I can only recommend to you that he subject those cases of latent or more manifest scrofulosis affections to the test of specific medication, which I can assure you is perfectly safe and harmless, and under which, if the process is a truly tubercular one, these manifestations will quickly disappear, furnishing such results of still further evidence of the truly tubercular character of scrofulosis.

As to the diagnostic value of tuberculin, the same has never failed us in the experiments with the lower animals, and will be found equally satisfactory in its application to the human being. I must, however, warn against the employment of tuberculin as a diagnostic in cases where extensive tuberculosis is already present, and in which from the clinical history and course of the disease there should be no reasonable doubt as to the nature of the malady. On the contrary, I would advise the use of such a test only when a disease is entirely latent and only manifest by the nutritive disturbance heretofore mentioned, in which case the test is made rather for exclusion of the tuberculosis than for the confirmation of its presence. If any of the gentlemen who desire to do so, use tuberculin in the adult, I would advise the hypodermic injection of 5 milligrams, say about 9 o'clock in the morning, after having previously made a complete record of temperature preceding the test for one or two days. If, now, a distinct rise of temperature occurs, say within about twenty-four hours, then the evidence is conclusive that the tubercular process is present in the individual. The test failing, the experiment should be repeated in the course of three or four days. This time, however, with a larger dose of 10 milligrams, with the same observation of temperature before and after its application. No temperature reaction occurring to those doses, we can safely conclude that in the individual experimented upon, no active tubercular tissue is present.

In children, the first dose for trial could be much less, and the temperature reaction would probably take place from the administration of from .5 to 1 milligram. A second dose can be made with 2.5 or 3 milligrams, and a final one with 5 milligrams, with the same precautions as spoken of for the adult.

For some time past, however, I have not applied tuberculin for diagnostic purposes in the human subject, but have used the toxalbumins precipitate in the manufacture of antiphthisin. A definite amount of the organic substance being present, we can apply this substance with much greater precision, inasmuch as tuberculin varies considerably in the amount of organic substance contained in different specimens.

The process of manufacture of antitoxin is as follows: we take the ripe culture of the tubercular bacillus and reduce it to one-tenth of the original amount by evaporation in a vacuum. This really is the tuberculin as prepared by Professor Koch. With this substance we now apply an acid solution of soda iodid of bismuth, and obtain a precipitate which is filtered out. This precipitate represents the toxic properties of tuberculin as proved by me both in the animal experiment and in its application to the human being for diagnostic purposes. It produces the characteristic general reactions manifest in chill, malaise, aching, depression with rise of temperature and subsequent defervescence, just as we see in the beginning of all infectious diseases. It also exerts slight curative properties in the lower animals, but larger doses prove fatal, and entirely so, as does tuberculin. Taking now the filtrate. After the toxic albumins are filtered out, we can precipitate further by the addition of absolute alcohol and an organic substance resembling in its chemic reaction a peptone, and this organic substance redissolved in distilled water, so that the organic substance present is antitoxin.

In the animal experiment we find that this alcoholic precipitate does not produce fever or toxic symptoms of any kind. This is so in the human subject as well, but the animal infected with tuberculosis can be cured therewith just the same as we can do with tuberculin, and that in the human subject the tubercular tissue is re-absorbed without the production of any concomitant symptoms of an undesirable character.

DR. LARRABEE—How about tubercular meningitis after a supposed diagnosis of the case?

DR. VON RUCK—I have not treated any cases myself of tubercular meningitis.

SCORBUS IN INFANCY.

Read in the Section on Diseases of Children, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY I. N. LOVE, M.D.

VICE-PRESIDENT, AMERICAN MEDICAL ASSOCIATION, 1894.
ST. LOUIS, MO.

Prior to 1891, when the report of eleven cases of scorbutus in infancy was made by Dr. Northrup to the American Pediatric Society, I had never observed a case; at least I had never recognized it. Going back over an experience of sixteen years, the first five of which were spent in the eleemosynary institutions of St. Louis, including one year's service at the General Dispensary under the control of the Health Department, which was the receiving station for the distribution of all patients to the various hospitals of the city and where a very large number of outdoor patients were constantly treated, ranging from one hundred to one hundred and fifty cases a day (the medical colleges of St. Louis not having at that time established their private clinics), a number of cases come to mind with their various symptoms suggesting scorbutus, but such cases were invariably found in family practice rather than in public institutions. There can be no question as to the importance of the disease.

Since the appearance of Northrup's paper in 1891, five cases have come under observation, and they uniformly occurred in the families of the well-to-do. One case had been fed for ten months with sterilized milk too largely diluted with barley-water, and investigation elicited the fact that equal parts of sterilized milk and a strong solution of barley-water had been the food given.

Another case, one of a pair of twins, eight months old, who had been fed with boiled cow's milk largely diluted with plain water and lime-water. Both were almost typical specimens of marasmus. There had been a very evident failure of assimilation from the beginning, and marked gastro-intestinal irritation. The parents and the attendants had been deceived by the fact that the children being very small at birth and delicate were disposed to sleep almost constantly, and this, they thought, gave evidence of their being satisfied and getting a sufficient amount of food. Insufficient food and the consequent hunger usually results in a considerable amount of fretting and crying. My being summoned was dependent upon the fact that a few days before, one of the children who had been so uniformly amiable and sleepy, had suddenly developed marked disposition to fret and gave evidence of the presence of pain when handled. I observed, upon examination, a swelling around the right femur in its lower third, with great tenderness, the child crying lustily when the part was handled. Examination of the mouth revealed the fact that the gums were spongy and bled readily. No teeth had as yet appeared. The swelling of the thigh increased and by the second day purpuric spots appeared at various points upon the surface of the child. It died of exhaustion within three days from the time of my first visit. An interesting feature in this case was, that of two children surrounded by exactly the same conditions, one should develop scurvy and the other should not, both, of course, preceded by a history of marasmus. The surviving child was given liberally of beef juice, orange juice, and fresh cow's milk, given, when possible, directly from the cow. It was surprising to see how rapidly the child

began to thrive, and it soon became well nourished.

A case came under observation, nine months old, which had been treated from birth; it had been poorly nourished and it was found to have a few spots of pemphigus blebs about the nates shortly after birth. A diagnosis of congenital syphilis was made and the child treated accordingly. The mother was delicate and very evidently her milk had been poor in quality and quantity. The child did not thrive and though further local expressions of syphilis did not appear, it was supposed to be a case of syphilitic marasmus. Acute symptoms of great distress and swelling of both thighs developed; on being called into the case, after careful examination, finding puffy bleeding gums and pronounced extravasation of blood in tissues about both femurs, I made a diagnosis of scorbutus. This child had been nursed by its mother, who had been kept constantly under mercury almost to the point of salivation. The child had also been given mercurials most of the time during its life, and this together with evident insufficiency of food as regards quantity and quality, evidenced that the condition of the child was due to mercury more than syphilis; indeed, I was of opinion that it did not have syphilis at all. I stopped all mercurials and administered raw beef juice to the child and occasionally a teaspoonful of orange juice with water. Analysis having demonstrated that the mother's milk was in every way deficient and the general condition of the mother being very unfavorable, I at once ordered the child to be weaned and carefully substituted good fresh cow's milk, diluted with a small quantity of water, and added thereto a teaspoonful of Mellin's Food.

By careful, systematic feeding, watching the secretions, the child began to improve within a few days and ere many months had passed was finely developed.

It is well to emphasize the thought that this disease is most frequently mistaken for rheumatism, stomatitis, rickets, sarcoma arthritis and infantile paralysis. As in the majority of diseases which confront us, the important thing is the making of the diagnosis promptly and the removal of the cause, the latter being uniformly dietetic. We can not too thoroughly emphasize the thought that scurvy in infants, as well as in adults, is uniformly produced by the lack of certain nutritive elements, certain organic acids, such as citric, tartaric acid, and in combination with potash. These special elements are known to be contained abundantly in fresh vegetables and fruit juices, in raw meat and raw milk, and the evidence is certainly accumulating from many directions and my own experience corroborates it, that the modern craze for the sterilization, the complete desiccation of milk tends toward scurvy. Of course, it goes without saying, that unsanitary conditions, the lack of sunshine and fresh air increase the tendency to this disease.

The reading of the existing literature upon the subject and the careful weighing of the evidence furnished by my own experience and observation, justify the following conclusions:

1. That we must impress upon the mothers of the children under our care that, in artificial feeding, something additional is needed beside a food that will stay with the child or apparently agree with it; in other words, that an absence of marked evidence of indigestion does not necessarily mean assimilation.

2. More stress on the part of the family physician should be laid upon the tissue-building powers of the food presented. The primitive mothers who permitted their children early to have some of the food from the table in small quantities were not far wrong, for there can be no doubt that the general nutrition of the child was more completely subserved.

In artificial feeding we have a divided duty; regard for the stomach and a general disturbed alimentary canal will often necessitate the temporary use of a food which should not long be continued. Many of the commercial foods often meet a temporary emergency and are valuable to that extent. Certain it is that the modifying material which can be combined with fresh cow's milk in such a manner as to facilitate digestion by the breaking up of the curd, which is the disturbing element in cow's milk, and at the same time furnish additional elements of nutrition and not interfere with or destroy the elements presented in the milk, which are anti-scorbutic, is a desideratum, and such we have in Mellin's Food.

My experience agrees with that of Dr. Davis at the Philadelphia Hospital reported in the *American Journal of Medical Sciences*, June, 1891, to the effect that, although sterilized milk often cured and prevented gastro-enteric disturbance, the nourishment of the child is insufficient and unless guarded they will pass into a condition of marasmus. For the meeting of emergencies, the correction of a gastro-intestinal disturbance, for temporary use in such cases, they are very valuable.

Certainly the evidence is overwhelming that children brought up on dried foods without any modification of conditions, soon become pale, flabby and deficient in vitality and even present symptoms of rickets. There can be no doubt that the fresh secretion from the mammary glands of the cow, ass or goat, the same as with the human mother, furnish the fresh animal element necessary to proper nutrition.

The earliest records of infantile scorbutus appeared in Germany from 1859 to 1873, made by Moller, Bohn, Hirschsprung, Senator and Ingilve, the first appearing in England being made by Mr. T. Smith in 1876, but not recognized as scorbutic. Borrough and Cheadle, of England, were the first liberal contributors to the subject. Up to a recent date there was no record of infantile scurvy having been met with in America. Since the first able presentment of the subject by Northrup in 1891 there have been a number of contributions upon the subject, notably those of Crandall, Fruitnight, Winters, Booker, Jacobi, Holt, Carr, Louis Starr, Rotch, Henry Ling Taylor, and more recently Egan, Blackader, and Hollopeter, so that the evidence is accumulating that infantile scurvy is a definite entity and general practitioners should be on the alert for it. Indeed, we may safely say that the literature regarding this subject is one of the most important and valuable contributions to the fund of general medicine made by pediatric workers.

DISCUSSION.

DR. ATKINSON, of Baltimore—I am very far from denying the occurrence of scurvy in infants. It is, however, a condition that must be extremely rare. Upon the subject of artificial food for children, there are many conditions lacking in artificially prepared food. Nobody doubts that. The lack of proper nutrition is more accountable for ill effects than the insufficiency of the properties in the food. Condensed

milk, properly condensed, is just as perfect food as cow's milk not condensed. Not so good as mother's milk, but condensed milk with 75 per cent. of its water drawn off by evaporation is just as good as simple cow's milk. It keeps longer. Condensed milk is simply preserved milk. Condensed milk is as much of a preserve as a can of preserved strawberries. Each pound of condensed milk contains a quarter of a pound of cane sugar. But this is a question, however, that has led me away from the one at issue, which is scurvy in infants. We have hemorrhagica occurring in active children as in adults; it might be mistaken for scurvy, and if it lasts long enough will run into conditions that make it hard to distinguish from scurvy—conditions that assimilate scurvy very closely. I do not think the cause of which the Doctor speaks was the saving condition, but I think it was the correction of the error in the nourishment of the child that brought about the improvement. As I said before, I do not state that there is no such thing as scurvy in children, but do say that if there is scurvy as a condition in nursing children, it is a thing of rare occurrence. That it may occur, I do not deny, but in nearly every case where there are conditions that assimilate scurvy, it is simply assimilating scurvy and nothing more. It is marasmus, or purpura hemorrhagica and allied conditions that bring the vitality of the child to a low ebb.

DR. BISHOP, of Maryland—There is a percentage of children who die who can undoubtedly have their lives spared by the proper treatment of the mother. The proper condition of the mother will result in a live child, and a child whose health may be prolonged for a greater or less length of time. It seems to me that one question hinges on the other in these various papers. The question of heredity is one of the things involved. A child who has a hereditary fault in its physical condition requires different care from that of a perfectly healthy child. I think there is a mistake made by some of you gentlemen who have the care of infants in large cities. I listened with a great deal of interest to the care of children as described by Dr. Cotton. But I think instead of their taking such care of these weak children, it would be a much more humane thing to let them die. There are quite a large number of children who go to hospitals, as well as in private practice, who ought to be allowed to die. It is not a humane thing to let a child that is a victim of the disease of its parent, live as a child and die as an adult. Such a child ought to be eliminated from society, because of the evil effect it produces in after life. People who have such constitutions are more apt to reproduce in a hurry than those who have perfect physical systems. Persons who are predisposed to consumption are much more likely to marry, and, being married, much more likely to have children, than persons of perfect physical formation and conditions. I have noticed it as well in the vegetable kingdom. The diseased peach tree will produce twice the fruit—certain classes of diseased trees—that a healthy tree will produce. It seems to me there ought to be a certain amount of care taken not to permit these diseased children to grow up. Let their parents nurse them. There is another thing that we are in fault in, so far as regards feeding the child on artificial food. Instead of taking good care of the cow that it may produce good artificial food for the child, it would be better to take good care of the mother that she may produce good natural food for the child. These artificially prepared foods are good as a rule, but occasionally children are killed by them.

DR. LOVE—The prenatal feeding of the child is an important thing. Indeed, I think the physician should keep in mind the wellbeing of the child prior to its conception even. The proper and healthful condition of the mother, and all that concerns the child should be considered. That opens up a broad field. The question of matrimony, the question of who should marry and who should not, enter into it. No one knows better than a doctor that the main questions in the matter of matrimony are recklessly disregarded. I see my friend Dr. Hutchinson, of Des Moines, Iowa. He has been a very able writer on this subject of whether marriage is a failure, and all that goes with that particular problem, and I should be glad if the subject could be opened up along those lines.

The statement of the last speaker, suggesting that there are some children that ought to be permitted to die, is certainly one that we can not entertain at all. Where is there a mother on earth who would consent that her particular infant should be permitted to die? Where is the father, worthy of the name of father, who would consent that his child should be permitted to die? and another thing the physician has no right to entertain, is the matter of life and death. The desire to save, has developed new means of salvation. Not a baby that can be conceived is so insignificant as not to be worthy of our most profound consideration. We may have there the germ of a Garfield or Lincoln or Marion Sims, or Shakespeare, and so on. The proposition laid down by our friend can not be entertained at all.

The point thrown out by Dr. Atkinson, suggesting that he feels that most of these cases come under the head of bad nutrition, etc., is important; but when there is presented to us a baby with such profound symptoms, a baby who has been poorly nourished, and there should suddenly appear great distress, a suggestion of rheumatism of the leg, and marked evidence of extravasation of blood, and there is no question about the pathologic condition, and examination reveals the gums bleeding, almost suggestive of a fungous condition, you then have the same conditions exactly that you find in scurvy in the adult. There can be no doubt of scurvy in infants. The evidence presented in our meetings by its workers is worthy of profound consideration. These workers come from a country whose practice covers a thousand hills, and their testimony is valuable. Then we have the testimony of Dr. Cotton, our Chairman, who is located in a large city, having to do with all kinds and conditions of children. He sees more sick children, I have no doubt, one hundred to one, with special conditions, than he saw twenty years ago when he practiced up in the interior of Illinois, although he was a busy country practitioner. The evidence of Dr. Cotton along these lines is important. In reading the evidence presented to us by Dr. Booker and others, we should weigh it thoroughly. When a man located in a large city gives his observations, and in addition those as a specialist, in observing the children in the world to-day, and places before us his views as an expert, such evidence is very important. The words and views of Dr. Atkinson on this subject of scurvy in infants are important.

The earliest records of infantile scurvy appeared in Germany from 1859 to 1873, made by Müller and others. The first records that appeared in the English language were by Dr. Smith in 1876, but then it was not recognized as scurvy. Burrow and Schiedel of England, were the first contributors to the subject. Since the presentation by Northrup in 1891, there have been a number of contributions on the subject, and I have enumerated the same in my paper. I do not mean to say that scurvy in infants is frequently found. My cases of scurvy have been found in the houses of the well-to-do, and not among the poor. I believe the general practitioner should be on the alert for scurvy in infants, and I think the literature on the subject is most valuable.

DR. VALENTINE, of New York—The remarks of my friend Dr. Love, suggest a point that I have wished for an opportunity to bring before this meeting. He says that a healthy mother is required to bring forth a healthy child. This is manifestly a self-evident proposition. Is it not a fact that it is within the experience of every one of us, although not engaged in the special work to which this Section is devoted, that a healthy vigorous young girl will marry a man in apparently exceedingly good health, and that shortly thereafter she will complain of pains, rather vague in character, and the girl shows all manner of symptoms which give her friends cause for congratulation. The error is soon manifest. The girl sinks. Perhaps a tumor is found in the abdomen. The tumor grows on that one side, and the other symptoms of abdominal irritation suggest the presence of a foreign body in the pelvis, which entails the necessity of an operation to save this woman's life. A microscopic examination of the majority of tumors, be they of the ovaries or the tubes, shows the presence of gonococci. I am not engaged in children's diseases, but mainly with the fathers of these children, and principally before they are married. I have frequently had occasion to observe manifestations of latent gonorrhea, so-called by courtesy. It is because of defective examination that we do not discover the gonococci. Why not? Because of the difficulties entailed by the examination. Those who favored me by listening to my paper on modern urethroscopy will agree with me that it is criminal for a man to marry who has had gonorrhea, unless it be proved that he is free from the power of infection. Only by destroying the ostii where the gonococci are assembled, where

they are latent, can we extirpate the germ. It is only by destroying these that we can utterly destroy this disease. A week after destroying them it is my habit to make an injection with nitrate of silver. I think I can then with a clear conscience consent to that man's marriage.

Why should this be in the hands of a specialist? Are not the lives of women and children of sufficient importance to the general practitioner? I hold that the time has come when we should have the temerity to put ourselves on record as advocating the enactment of a law requiring, as a condition necessary to marriage, the certificate of a physician that this man who proposes to get married can not infect his wife with gonorrhea.

DR. HUTCHINSON, of Iowa—I think Dr. Valentine's remarks ought to be emphasized by this Section. The number of deaths caused by the gonococci is something to which the profession is just waking up. I happened to have a most painful case of some trouble of this nature brought to my notice a short time ago. We ought to insist upon sounding a danger signal with reference to this infection that is impairing the fruitfulness of the finest women in our country. We should advocate some sentiment on the subject. It would be a difficult law to enforce, and I do not think we can get at the evil through legislation. I should regret the taking of any action that would prohibit marriage on the part of any portion of humanity, because I believe that it might result in something worse. I think, however, it would be well to call the attention of the public to the danger to which women and children are exposed by this disease.

THE ETIOLOGY OF INFANTILE DIARRHEA.

Read in the Section on Diseases of Children, at the Forty-sixth Annual Meeting of the American Medical Association
Baltimore, Md., May 7-10, 1895.

BY ROSA ENGELMAN, M.D.

CHICAGO.

In order to arrive at any just conception of the subject, attention must be directed to the entire alimentary canal, as well as to milk, the staple food of infancy and childhood. A straight almost indifferentiated tube swarms from mouth to arms, with facultative, obligate, saprophytic and pathogenic germs. Milk, particularly during the heated term, is fertile soil for various fermentations, microbial contamination, and the exogenous as well as endogenous development of toxins. An unclean mouth, a slight error in diet, constitutional taint, immature sensitive cellular metabolism invite these germs to unusual lodgment and activity.

Their great number and variety exclude a specific relation to the particular disease manifestations under consideration. The question resolves itself into a discussion of the toxemic, septicemic or pyemic genesis of the several morbid gastro-intestinal disturbances, in which not one or a few, but many and various microorganisms play a part.

Escherich long since proved that there is a great simplicity and uniformity of bacterial vegetation, and that increase and variety was due to changes in diet.

He demonstrated the constant harmless presence of the bacterium *lactis aerogenes* and bacterium *coli commune* in the upper and lower bowel, respectively, and their relationship to normal digestion. The assumption of pathogenic attributes by these germs was likewise disclosed.

The rise and evolution of the biologic field revealed the shortcomings of a purely pathologico-anatomic classification of infantile diarrhea. This disorder was in turn ascribed to: 1, disordered structure and function inherent to an undeveloped organism; 2, atmospheric and telluric influences; 3, the chemic constituents, metamorphoses and amount of food ingested; 4, the omnipresent germ. The far-sighted Hueppe foresaw the dangers of biased opinions. He says:

"For a time, under the influence of Darwinism, bacteriology ran into absolute generalizations, and differentiating signs were not sufficiently valued. Then the opposite mistake was made, in that differences were overrated and a one-sided conception of microbial species, specific effects and special products was adduced. Toxemia of intestinal origin is foreshadowed by him in his statement that the specific microorganism is not alone the cause of the disease. The significance and evolutionary phase of the above cited factors were for a time swamped in the omnipotent germ theory. The effort to discover specific microorganisms as the causative agents of the different degrees and forms of diarrhea proved futile, but led to the revelations of Escherich, Baginsky, Stadlhaugen, Hueppe, Huebner, Booker, Jeffries, Abelsons, Sevestre, Vaughan, Czerny, Moser, and many others. They established the non-specificity of the various gastro-intestinal diseases, and gave to us a wide knowledge of the untold microbial hordes, regular, accidental or pathogenic occupants of the alimentary tract.

These scientists likewise confirmed the interdependence of bio-chemic operations and the relations of these germs to the several diarrheal disorders and give to us a reasonable basis for the following postulate: indigestion, slight to severe gastro-intestinal catarrh, and even a foudroyant attack of cholera infantum may be primarily ascribed to an intoxication; this intoxication being caused by an absorption (little or much, slow or rapid) of toxic, tissue and bacterial products, elaborated without or within the body. Intestinal lesions ensuing, the microbial horde, led by such germs as the bacterium *coli commune*, bacterium *lactis aerogenes*, staphylococcus *pyogenes*, streptococcus *pyogenes*, pneumococcus and others, invade the blood and give rise to general systemic or localized infection, a fulminate or insidious septicemia. Thus also can we secondarily account for pneumonia, meningitis, encephalitis, nephritis, etc., of intestinal genesis.

An accumulation in the food, and concentration in the gut of saprophytes and their toxins explain the inception of a gastro-enteritis, the continuance of which maintains the irritation of an exceedingly susceptible mucous membrane and its nervous director, the colic plexus.

The unstable abdominal brain that presides over an enormous circulatory territory succumbs to the saprogenic poison. Consequently neither specific nor pathogenic intermediary need be concerned in an attack of cholera infantum. From the fact, however, that the latter includes a number of morbid entities, it might at another time be the result of an overwhelming septicemia instead of toxemia. On the other hand, chronic enterocolitis and pedatrophs might arise from sluggishly acting germs associated with slow, prolonged, poisonous absorption. It has recently been shown that acute enterocolitis results from the invasion of the blood by numerous germs that have been hitherto considered specific only to certain other processes.

A. Rodet and G. Roux in 1892, differentiated between the infectious and poisonous properties of the bacterium *coli commune*. It and the bacterium *lactis aerogenes* had been acknowledged harmless intestinal tenants. The former's pathogenic and pyogenic attributes were now recognized as well as its areas of invasion, viz., serous surfaces, skin, glands, respira-