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ANTIPHTHISIN IN TUBERCULAR AFFECTIONS OF CHILDREN.

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The therapeutic application of antiphthisin has thus far been limited to comparatively few practitioners, partly on account of limited production, and partly because the remedy was only furnished to such as gave us assurance that they would restrict its application to cases which were not too far advanced in the disease, and in which we could still hope for its beneficial effects.

The reason for restriction is apparent by the well-known fact that specific medication can only be fully effective, when it is applied to pure uncomplicated cases, to the exclusion of those in which other pathologic processes are also present.

It would certainly be unreasonable to demand that this remedy which has a specific germicidal effect upon the tubercle bacillus only, shall also remove and cause the cure of pathologic changes, which result remotely from the primary cause and, more unreasonable still, that the remedy shall also favorably influence and cure complications, which like infection with other pathogenic germs have no relation to tuberculosis at all, more, than that they may be associated in the same patient.

In all such cases it is necessary to remove the complications by other treatment, either before or in conjunction with the application of the specific remedy; but the final results are determined by the importance and curability of such attending pathologic processes.

We see thus, that the use of a specific germicidal remedy can only be fully effective when the disease is still uncomplicated by secondary degenerations, and is free from complications which, unfortunately are present in most cases of tubercular disease as they come under our notice; there are, however, not a few cases of purely tubercular affections in an early stage in which the results of specific medication are highly satisfactory. In such cases I have every reason to believe, that under proper use of the germicidal products obtainable from the bacillus of tuberculosis, a cure will result almost without exception. For these as in all other therapeutic efforts the only unavoidable condition is that the organism itself shall still have the power to use and appropriate the introduced curative substance; for under no circumstances can we otherwise conceive the cure of disease, than that the living organism must, itself, take an active part in its removal.

Since the living organism can not by any means be compared with dead substances or matter which we can disinfect, regardless of the changes which occur within it, we have little to hope from chemic or physical means in the form of high temperatures, acids, alkalies, etc., and all hopes in this direction have thus far been changed to disappointment; their action having invariably been found a distinctly local one; beyond their direct application, they lose their intended effectiveness in the living organism by their undergoing insoluble or inert chemic combinations, by saturation or by diffusion.

With specific germicidal agents we have become acquainted only within more recent years, and, so far, they all are products of specific germs and not subject to changes such as we have learned do occur in the chemic and physical agents referred to; on the contrary, we observe them to reach the diseased structures directly and uninjured, and to become effective there.

This fact is not explained by assuming with Robert Koch, a peculiar affinity or attraction, the same as was taught by older schools of medicine to be the action of drug remedies, but by the imbibing and transportation of these curative substances through the agency of leucocytes.

For this, speak the penetration of leucocytes into the tubercular tissues and the production there of a substance which behaves peculiarly to certain anilin dyes, and the presence of which can only then be demonstrated when the specific curative substance has been introduced and has inaugurated the cure.¹ With this occurrence we see the tubercle bacilli diminish and disappear, while within the coagulated protoplasm of tubercular cells, the nuclei appear again in their normal coloring properties.

Upon the basis of such experimental observations, we can explain and understand why we are able to favorably influence specific pathologic changes within the living organisms with relatively small quantities of the specific remedy, and this I have shown to be the action of antiphthisin, while the crude tuberculin at the same time produces injurious effects, containing as it does, all the toxic substances produced by the tubercle bacilli in their cultures.

It was necessary to preface this paper by the foregoing remarks in order to show the importance of proper selection of cases, and to also indicate the limitations of the remedy.

Among the favorable uncomplicated tubercular processes are, in the first place,

THE TUBERCULAR AFFECTIONS OF CHILDHOOD.

That the heretofore available therapeutic agents are insufficient for the treatment of scrofulosis is easily demonstrated, and I need only to point to the unsatisfactory results in the tubercular affections of bones and joints of children.

¹ Klebs' Tuberculose, page 214.

The frequently observed cheesy myelitis of the long bones, although subjected to resection, is often followed by renewals of the process, which may finally compel ablation of the entire limb, and even with such radical operation, the life is not infrequently lost through extension of the disease to the pelvis, the spine or to internal organs.

These cases are peculiar in the often observed long duration of the tubercular disease, although extensive destructive processes and extensive involvement of the glandular structures are present, without seriously damaging the general condition of the patient, a fact which makes them especially adapted for the treatment with antiphthisin.

The danger of depending for the ultimate success upon the heretofore customary treatment is, however, shown, by the unexpected occurrence of inflammation and suppuration, by the advent of which the favorable time for specific medication has been lost, while the insufficiency of internal medication is also demonstrated; and we can not emphasize too much the fact, that scrofulous affections are primarily of a tubercular character, which so long as they remain purely tubercular, run their course without inflammatory complication.

It is entirely the same with all other scrofulous and tubercular affections which, so long as inflammation and suppuration have not occurred, are all amenable to the antiphthisin treatment.

What clinical results may be obtained will appear from a short resumé of cases treated by me, the number of which I regret is not as large as I could wish.

In giving my experience, I divide my cases into several natural groups, the first of which I may call

THE LATENT TUBERCULOSIS OF CHILDHOOD.

Of this group we find numerous examples in tubercular families. The, at birth, apparently healthy children, show sooner or later a retardation in growth and that pale appearance, with thick upper lips, which may remind us of myxedema, and which on the whole we call the scrofulous diathesis. In other cases the organism is simply retarded in its development, sometimes altogether, often only in length, the children remaining then short only; in other instances they grow rapidly in length, at the expense of corresponding breadth and fullness. In any case, the absence of glandular swelling may simulate nutritive disturbances due to other causes which the physician hopes to overcome by dietetic and roborant treatment, and although at times successful, failure to correct the evil is by no means an exception, and the truly present latent tuberculosis is attested by the common saying that "such children sooner or later become tuberculous."

Just upon this point I desire to distinguish between the more modern views based upon bacteriologic research and the older theories based upon empirical observations only.

We fortunately know now quite well, that tubercular infection does not necessarily cause stormy or violent symptoms, but that, on the contrary, it may remain latent for many years, and only show its presence by more or less nutritive disturbances which, instead of being predisposing conditions, are in fact the expression of the already present tubercular disease.

If any experienced observer would still doubt this, he can certainly recall cases from his practice, in

which the history shows such nutritive disturbances having been present in childhood, and in which during youth or early manhood a more rapidly developing tuberculosis occurred. Neither will he have missed cases in which such latent tubercular affections have been approximately recovered from during childhood, and who, nevertheless subsequently, perhaps after considerable lapse of time, died of the disease. Such cures when obtained through dietetic and climatic influences are, as a rule, not lasting; they do not assure against a later development; indeed, they may carry with them even a certain degree of danger, and I have repeatedly seen cases of young strong subjects in which suddenly, in connection with unusual or violent exertion, the acutest forms of pulmonary tuberculosis occurred. In such cases we can then show anatomically a small, not previously diagnosed cavity from which dissemination of the tubercle bacilli took place as a consequence of such over-exertion.

The practical physician may reply, that we certainly can not look upon all badly developed or poorly nourished children as tubercular, and this is not the case, neither is it necessary to here consider the other causes for nutritive deficiency in childhood. But I consider it quite certain that by far the greatest number of such cases are subjects of latent tuberculosis, especially when no other good and sufficient cause is apparent. The question is, How are they to be diagnosed, when the physical examination of organs is negative?

The answer is very simple; and it is a matter of surprise that the method of which we avail ourselves for recognition of latent animal tuberculosis has not been taken advantage of for diagnostic purposes in the human subject also.

The greatest credit is due to certain American health authorities and statesmen to have first made practical use of a scientific fact in the systematic application of tuberculin for the recognition of latent tuberculosis in cattle, and history will recognize it equal in importance to the introduction of vaccination for smallpox.

One might well ask why this simple and sure procedure has not found recognition and practice for the diagnosis of latent tubercular affections in the human subject? Whatever the answer may be, whether due to the objection of patients and parents, or to want on the part of the physician of proper insistence for such test, or whether the neglect lies in the newness of the procedure, as contrary to existing modes and habits; the members of the medical profession can not ignore and escape this issue, for the truth of its value is beyond doubt, and the test must be insisted upon in all cases where the diagnosis can not otherwise be sufficiently established.

Among my cases of latent tuberculosis, I will call your attention to but few.

Case 1.—G. B., a delicate girl aged 6 years, has been the subject of cough without any physical evidence on the part of the lungs; she was highly anemic, with deficient development of the osseous and muscular system; there was also slight swelling and tenderness of the cervical glands; râles could be shown in both apices; after the use of 20 cubic centimeters of antiphthisin, the child not only lost her cough entirely with disappearance of the râles, but she improved remarkably in general health and appearance, and has since remained entirely well.

Case 2.—N. B., child 10 years old, tall and slender; the father died of tuberculosis. There were only slight differences in the percussion note. Very careful percussion

showed, however, slight dullness in left apex posterior, on the right side posterior a little more marked relative dullness extended to the spine of the scapula. In this locality inspiratory ronchi were also present and extended further downward; in several places, there was also blowing expiration, especially over right apex.

After the use of 50 cubic centimeters of antiphthisin in thirty-two days, when she was discharged, the child gained two and one-half pounds; coughed only occasionally; no more dullness could be demonstrated, and since then has been entirely well.

Case 3.—O. St., boy 13 years old,² suffered from asthmatic attacks for the last year; is imperfectly developed for his age; lips and nose thickened; has been mentally retarded also. Hydrotherapy, climatic influence and local treatment of the nose have been of no benefit. Weight 107 pounds, low temperatures, between 36.5 and 36.7 C.; frequent coughing paroxysms, especially nights, and with considerable dyspnea. Physical examination showed moderate dullness over left lung, posterior to middle of scapula, and supraclavicular in front; also a small area of dullness at lower angle of right scapula; auscultation over left apex front and back gave blowing expiration and harsh inspiration, with here and there accompanying ronchi, also roughened respiration over the dull area at lower angle of right scapula. At times expectoration, but none obtainable for examination, the expectoration disappearing entirely in the early part of the treatment. After six weeks his weight had increased seven pounds, there was no cough, no asthma, and his general health was so completely restored, and his appearance so improved, that his mother upon her arrival could hardly recognize him to be the same child. Physical examination showed nothing abnormal in his respiration; slight difference on percussion was still present.

Under the influence of specific medication the tubercular intoxication apparently ceased, and the deficient nutrition gave place rapidly to normal conditions. This case is the more interesting since long-continued climatic and hydro-pathic influences, as also the local treatment of the nose, were entirely without benefit.

Since percussion differences were still existing, I did not consider this case as radically cured, but it is fair to presume, from the result obtained, that by timely repetition of the treatment further tubercular development can be prevented.

In a second group of cases, I include:

PURE NON-COMPLICATED SCROFULOUS AFFECTIONS.

Since the term, scrofulosis, is established, I think best to retain it, but I understand it to mean the specific pathologic processes occurring in childhood, produced by the bacillus of tuberculosis. The form and composition of the cheesy deposits in scrofulosis is equally characteristic with those which we find in the so-called "pearl disease" of cattle, and which are at times more or less calcareous, pediculated, or rich in granulation tissue resembling sarcoma.

The scarcity of tubercle bacilli is usually common to both, which made the recognition of their etiologic identity exceedingly difficult. Both are auspicious examples of the variation of pathologic processes produced by the same cause but upon a different soil.

The scrofulous deposits, which I consider as the essentials of the process, are the product of the reaction, to the tubercle bacilli, on the part of the youthful organism, and may therefore be looked upon as a defense against the dissemination of the infecting germs. If the defense is broken through, we see tubercular dissemination occur from the bronchial glands into the lungs or into the blood, from the cheesy nodules or deposits of nerve centers into the meninges, etc., showing that the tubercle bacilli must have been present from the beginning in these deposits. How should they have found their way later into these non-vascular masses? for, indeed, we can no longer accept the theory of spontaneous generation.

If further proof is, however, needed, we can also furnish it therapeutically, for if by any manner of procedure we succeed in destroying the tubercle bacilli, the cheesy deposits disappear. According to the sentence: "*Sublata causa, tollitur effectus*," must we conclude with mathematical certainty, that the tubercle bacilli are the cause of scrofulous new formations.

Not infrequently we witness such a result through the inherent forces of the organism, when they are furthered upon Hippocratical principles, but in many cases such a natural recovery is impossible or only obtainable after irremovable and serious injury has occurred, of which the following case is a striking example:

Case 4.—S. B., girl aged 16,³ was referred to me in Karlsruhe on account of a scrofulous eye affection. Her development was retarded, corresponding to the age of 10 or 12 years; the insufficient development was the more striking on account of a coexisting hunchback, but her mental and sexual development was also retarded. Menstruation had not yet occurred. The eye affection which had long been unsuccessfully cared for by Dr. Mayer, an experienced ophthalmologist, and in a good hospital, consisted in cloudiness of the left cornea. The limbus was covered by a gelatinous swelling; the upper and lower portions of the cornea were infiltrated with dry, yellow masses; and in the center, fibroid degeneration in the form of a leucoma had occurred. The entire conjunctiva was much swollen and reddened, traversed by dilated vessels; three large arteries approached the cornea; near the middle vessel upon the sclerotic was a yellow, round, flat nodule 3 to 4 mm. in diameter, immovable and covered by the movable conjunctiva; a smaller arterial branch terminated at its edge. Beyond the hunchback there was nothing indicative of scrofulosis, elsewhere; especially no enlarged glands. She weighed only fifty-eight and three-fourth pounds and despite the good diet of the hospital, she was thirty pounds short of her normal weight, according to Quetelet's tables.

Specific treatment was applied from October 15 to November 22, beginning with 5 milligrams, and increasing to 1 cubic centimeter; in all 13.7 cubic centimeters. Its effect upon the eye was early observable. The gelatinous swelling disappeared first under contraction of the vessels, then the yellow infiltration upon the upper segment of the cornea began to clear, became smaller and was gone on the twenty-fourth day. The lower yellow spot also had by this time become much smaller, the dilatation of the vessels had disappeared. There was no more lacrymation or pain. On the thirty-first day the episcleral spot had also entirely disappeared.

Her general condition, in the meanwhile, gave place to a striking change for the better; menstruation had occurred; her appearance was much better; she had gained four pounds in weight.

A slight relapse occurred upon the eye the following month, but was quickly controlled by a few more injections. The central fibroid degeneration was so far improved that the patient could count fingers at 5 meters, which she could not do before, at half the distance. The patient was then discharged, but suffered subsequently from two more tuberculous deposits. On March 20, she returned with a diffuse swelling on the lower border of the left lower maxilla, which was incised; but discharged only a small quantity of thin pus; after eighteen injections, some of which were finally made into the swelling, the latter disappeared entirely. A similar swelling occurred at the head of the left fibula, disappearing after three local injections. Finally, on May following, a bush-like dilation of a conjunctival vessel near the lower border, with a small gelatinous infiltration of the edge of the cornea developed, which disappeared after one injection which was made into the subconjunctival tissue. Since that time the girl has remained well.

I have related this case more in detail, because it is rarely that we can observe upon the human subject in so satisfactory a manner, that which I had repeatedly observed to be the action of tuberculin and of antiphthisin in the animal experiment, namely, the entire disappearance of tubercular tissue or deposits without reaction.

² Klebs' Tuberculose, page 332.

³ Klebs' Tuberculose, page 328.

In this case it could not be shown, as I have done in the animal experiment, that the conversion and re-absorption of tubercular tissue is preceded by the degeneration and disappearance of the tubercle bacilli, but there is no good reason to doubt that in both instances the same course obtains, and that, under the use of the remedy the tubercle bacilli are directly injured and their virulence destroyed entirely so, as one can demonstrate it to occur in the test tube.

The following experiments made by me and published in my work on "Tuberculosis,"⁴ may be of interest in this connection. Of five guinea pigs born on the same day, two were infected on July 1, 1892, with tubercle bacilli which had been kept five days in a solution of the remedy, while the other three were infected with bacilli from the same culture, but without exposing them to the effect of the remedy; on the eighth day, the three last animals showed a marked difference in their growth, having only gained 11, 50, and 59 grams respectively, whereas those which were infected with bacilli treated with the remedy, had gained 105, and 110 grams. The three sick animals were killed, two on July 30 and one on August 24, and were far advanced in tuberculosis; whereas, in one of the other two, killed August 4, no tubercular lesion was found. The second animal was killed a year later. It had reached its full growth, weighing 681 grams, and showed only the local changes in the abdominal cavity which Prudden and Hodenpyl have shown to be characteristic after the injection of dead tubercle bacilli.

Case 5.—H. B., age 9 years, (the sister of Case 4) was referred to me by Dr. Ruppert, of the Vicentius Hospital. The pale, poorly nourished child had been treated for some time without result for an affection of the knee joint. Could walk only with crutches; the left knee presented a spindle-form swelling (tumor albus) involving the external soft parts, while the interior of the joint was filled with soft fungoid masses.

The injections were made in part, peri- and in part intra-articular; altogether in the first month 6.72 cubic centimeters were used in twenty-two injections. No increase occurred in the inflammatory processes; on the contrary after the fourth injection, the pain was materially diminished; during the second half of the month the child could walk without crutches, and on the twenty-fourth day the swelling had entirely disappeared, nothing of the fungoid masses could be longer detected, and after the faulty position of the limb had been corrected by the application of an isinglass bandage, the child was discharged. Three months later the child presented herself to me, having the appearance of perfect health. Inasmuch, however, as no other evidence of tuberculosis was present, it might be urged that the affection may not have been of a tubercular character, but I believe that the history of the sister's case, and the result of the treatment would refute such an objection.

The third class of cases are those in which both, the

INVOLVEMENT OF THE LYMPHATIC GLANDS AND OF THE BONES,

bear unmistakable evidence of scrofulosis, cases which, however, differ from the others only quantitatively, as to the extent of the disease. These are cases which at the present time are exclusively referred to the surgeon, inasmuch as every other method of treatment is unavailing. But even for the surgeon, such patients are not the most desirable, because of the extensive tubercular processes and the obstinate relapses which are observed.

I am of opinion that when in such cases multiple deposits exist in the osseous structures, even the operative treatment becomes of doubtful utility because

beside the observable and removable deposits, smaller and not observable ones are frequently present, which, although still latent at operation, are apt to develop rapidly thereafter, and in any operative interference the danger of dissemination is ever present.

The following three cases were treated in the Diakonissen Hospital and referred by its surgeon, Dr. Baer. In only one case was the result entirely satisfactory; of the other two, one indeed improved, but a permanent result was not obtained, for reasons which will become apparent.

Case 6.—S. D., aged 3½ years, a well nourished girl. Resection had been made of right elbow joint, on account of fungoid caries. The child presented numerous scrofulous ulcers communicating partly with the bone, partly with lymphatic glands, many of them fistulous, especially upon the right arm and neck. Patient received forty injections between November 1 and Dec. 17, 1892, in all 7 cubic centimeters. A small abscess was incised on the right wrist joint, and was treated locally with the remedy. Discharged December 17, when all wounds, ulcers and fistulae were entirely closed, and all glandular swellings had disappeared. A year thereafter the child had remained free from relapse and was entirely well.

Case 7.—Isabella T., 5½ years of age, fairly well nourished, but pale; suffered from an enormous number of scrofulous ulcers upon the face, neck and extremities which communicated mostly with glands, but also with bony parts. The right metatarsal bones upon which several operative procedures had failed, presented a cheesy mass, while the leg of the same side presented long cicatrices, but also ulcerations and swellings in connection with the bones and glands. Under the specific injections most of the ulcerations healed, but new swellings occurred constantly, and the condition of the metatarsal bones in spite of again repeated partial resection could not be brought to a cure. In the course of the treatment the child had the measles, which certainly was not favorable to her recovery. In spite of large doses increased to 1 gram per day, and of long-continued treatment, the result was only partial. Since, with a slight exception, no septic complications were present at any time, the failure can not be attributed to sepsis, but must be looked for in the extensive distribution of tuberculosis and in the deficient blood conditions. I therefore advised the employment of salt water baths, and climatic influences for her general improvement. I have not been able to learn the further result. Another hindrance in the treatment was the great number of subcutaneous injections, altogether 130 in number, which became very painful. Unfortunately, I had at that time not yet learned that the rectal injection of the remedy is equally efficacious, which method of administration I now recommend, especially in practice with children.

The last, *Case 8*, of the scrofulous diseases in childhood which came under my care was a boy aged 10, with suppurating tubercular coxitis. In this case a short course of injections was without any benefit, and the failure emphasizes the fact that under complicating suppuration and sepsis, the latter must be removed before resorting to specific treatment.

While the material which I submit to you is not very large, I nevertheless believe it sufficient to show that particularly in the tubercular affections of childhood, antiphthisin offers most favorable prospects; the selection of cases is of the greatest importance, and we can only then expect its fullest benefit when we select cases which present neither septic complications nor conditions of exhaustion and marasmus; and you will doubtless also appreciate that there are cases, which on account of the great extent of the purely tubercular disease may fail to make a recovery.

These limitations, however, suggest that we should employ the remedy in the early periods of the disease, and that we should not lose valuable time in the employment of symptomatic treatment only.

Finally, I wish to point out that, in all tubercular affections, the same as in many other severe and

⁴ Klebs' Tuberculosis.

serious diseases, their treatment in hospitals or special institutions offers great advantages over that of private practice.

In Europe numerous institutions for the treatment of children have been established, and should the profession in this country desire it, the Winyah Sanitarium, at Asheville, N. C., will be glad to establish a special institution for tubercular children upon the most approved and advanced principles, and with every essential for their care.

The excellent climatic conditions of its location would permit their treatment in the open air at all times of the year.

DISCUSSION.

DR. LARRABEE—No one is warranted in making a diagnosis of tubercular meningitis who has not sat at least an hour at the bedside of the child. No practitioner who has sat at the bedside of a child an hour will fail to make a proper diagnosis of tubercular meningitis. If the three symptoms are there together, it is tubercular meningitis; therefore the importance of emphasizing all these symptoms. In the first place there must be some evident deterioration, some disturbance of the mental and physical condition. There must be at the same time the knitting of the eyebrow, or the convulsed lid. There must be the contracted abdomen, and there must be constipation. These three symptoms, and the valuable symptom of projectile vomiting, make a case of tubercular meningitis. The projectile vomiting is valuable in showing the disturbance from the center to the periphery. But that alone must not diagnose the case. There must be the peculiar knitting of the eyebrows, and the constipated bowel and the dilated bowel. If the four run together, you are absolutely certain, although the three symptoms are sufficient for the diagnosis ordinarily. Whoever takes the history of the family, and relies on the statement of the friends in this examination, will often find himself mistaken. Large hospital experience from day to day teaches the truth of the words of the lamented great surgeon, who was crowned both in Europe and America with laurels. When closing his life he said: "Two-thirds of the civilized world have syphilis, either hereditary or acquired."

Whenever I give iodid of potash to a child and cure his bronchitis, I consider it a very fortunate result. I might say I have touched in the dark the diathesis. I say also that when I give these cases of brain trouble iodid of potash, and they get well, I put it down in my category that I have struck a trail, and that I have stumbled upon a recovery in a case where I could not by any questioning or examination find a specific cause. The well-known fatality of these cases, the necessarily fatal results of tubercular meningitis, forbid that we should record cases of recovery, and the Doctor is evidently very correct in that.

As to the difficulty in the diagnosis of pneumonia, I suppose it is unnecessary to repeat all the difficulties of that diagnosis. There is only one way to get out of it, and that is in every case to make an examination of the chest. Make it a routine every time.

We have before us to-day one of the most distinguished gentlemen in either Europe or America, Professor Klebs. (Applause). It is a great misfortune that the investigations and researches of Professor Koch were published when they were. It was premature, and he objected to it, and he was made to say that which he never thought of saying. I was in Berlin at the time and was conversant with the ideas then prevailing, but the London papers got hold of the thing and published it as a cure of consumption which nobody had thought of. That publication produced a feeling that has thrown discredit upon all efforts in the direction of Professor Koch's researches.

The study of tuberculosis in childhood is an especially interesting one, for the reason that it is only in childhood that we have so many diverse manifestations and the only reason of that is because we have so many growing centers. Tuberculosis, like everything else of a morbid character, attacks that part at which the greatest activity is manifested. In the adult we expect to find tuberculosis in the lung, while in a child we may not find it in the lung, but find it everywhere. Where there is the greatest activity and growth, that part in-

vites the tubercular bacillus. My friend Dr. Von Ruck, has admitted the term tuberculosis, but I am sorry he has tied a string to it. It is said that scrofulosis is associated with or is part of the tuberculosis in infant childhood. We do not believe in the transmission of the tubercular bacillus. If a babe be born with tubercular bacillus, it is not going to live long enough to trouble anybody. I recognize in scrofula a disease depending upon a debility, born of debility and born of hygienic surroundings, and attended by increase in fibrous tissue. We have in the scrofulous subject a tendency to the increase of fatty tissue, the thickening of the lips and nose. When the child arrives at the age of 20 or 21, we never hear of scrofula, unless it is engrafted upon the system.

DR. LYON, of Connecticut—I would like to ask Professor Klebs, through Dr. Von Ruck, what distinction he makes in his use of tuberculin and antitoxin—what difference he makes in the use of the two? In the second place, if he would use them both as diagnostic or both as curative, and whether he so instructs the medical profession. I ask these questions to call out answers from him.

DR. UPSON—I ask Professor Klebs whether antiphtthisin is effective when given by the mouth?

DR. PARSONS—In my paper, I did not mean to depreciate in any sense the importance which attaches itself to this tubercular bacillus. My point was illustrated better than I could do it by the remarks of Professor Larrabee, regarding scrofulosis.

DR. GRIFFITH—I want to say one thing in support of the idea that this may have been a case of tubercular meningitis which recovered. I think we find it more manifest daily that there is a vast amount of dogmatism in medicine. I think it possible that perhaps tubercular meningitis may recover. There was a case reported not long ago of a child who did recover, and it was proved before recovery that it was tubercular meningitis, by obtaining fluid from the spinal column in which the bacilli were discovered, and yet the child recovered. What is proved to have happened once, may happen many times, and we are not in a position to say that every case is tubercular meningitis that dies, and every case that gets well is not tubercular meningitis. We can not state that.

In regard to the diagnosis of pneumonia, I think Dr. Larrabee misunderstood me, if he understood me to say that we must not examine the lungs very carefully. I say not only that, but that in spite of the examination of the lungs we fail many time in making a true diagnosis. The pain in the abdomen is not a symptom in itself of anything important, but when combined with other things is a very important matter.

PROFESSOR KLEBS spoke in German.—At the conclusion of his remarks, several gentlemen in the Section requested the Chairman to ask Dr. Von Ruck if he would translate into English the substance of Professor Klebs' statements, that those not understanding German might have the benefit of his discourse.

DR. VON RUCK made the following statement: there is practically no difference between tuberculosis and scrofulosis. Scrofulosis represents a tubercular infection in a state of latency at times, but becomes more manifest when glandular, and other manifestations, such as retarded growth and development show themselves. The clinician only sees the manifestation in the form of nutritive disturbance, and the tubercular tissue is hidden from his observation. This nutritive disturbance, as for instance the thickened upper lip and nose, and the otherwise arrested development of the child, are produced by intoxications with substances representing the products of the tubercular bacilli at the point of their localization. If any proof is necessary that these scrofulosis manifestations are of a tubercular character, it is apparent from the distinctly tubercular manifestations which result when the cheesy glands break down and when their products are absorbed into the circulation, either through the lymphatics, or when the tubercular process has perforated a vein, in which case miliary tuberculosis or localization of new tubercular eruptions in distant organs become manifest.

If scrofulosis were not primarily tuberculosis, how could we explain the appearance of such distinctly tubercular manifestations following immediately upon the softening and breaking down of the specific scrofulosis new formations? These scrofulous deposits must contain the tubercular bacillus, for it is only through their absorption that the more acutely tubercular infection becomes manifest, and it could not be conceived that in these non-bacillar deposits the tubercular bacillus should have found entrance after their generation, unless we would again return to the theory of

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