Here we had a boy who had a perfectly typical lobar pneumonia with evidence of abdominal pain most of which subsided within 48 hours upon the appearance of an effusion.

The whole pneumonic picture was complete and we again had our attention called to the abdomen. The state of disintegration in which the appendix was found proves beyond question that the attack of appendicitis was much more than 24 hours old, and we are in no way able to declare that the two conditions did not develop simultaneously.

There was no broadening of the abdomen, and this is probably due to the fact that the appendix was behind the colon and very high up. The sketch shows the location of the appendix and its abscess.

These case reports have been run through rapidly but no words of mine can depict the suffering experienced by a few of these patients who were manifesting "the well known abdominal pain," as an accompaniment of pneumonia.

If we consider pain, fever, headache, vomiting, abdominal rigidity, with its small, running pulse, as evidences of peritonism, we have the same symptoms to consider in cases of "abdominal onset" in pneumonia.

A few points we must bear in mind: 1, History and age of patient aids materially; 2, the onset of fever is more sudden, it goes higher and is more sustained in pneumonia; 3, headache and dry furred tongue more pronounced and occur earlier in pneumonia; 4, vomiting is more frequently repeated in pneumonia; 5, evidence of shock is practically always more marked in the abdominal condition though it may be simulated by pneumonia; 6, tender points may be found along the insertion of the diaphragm in pleuritic conditions; 7, abdominal rigidity occurs with the first evidence of pain in diaphragmatic difficulty but it awaits the occurrence of some peritonitis in the abdominal conditions. Patience in examination will reveal expiratory relaxation of abdomen where diaphragm alone is concerned.

From the standpoint of diagnosis we must reiterate the all but worn out adage "get your history" and let it be complete. History practically holds the key in the gastric or duodenal perforation cases. Having obtained the history, do not permit the apparent urgency of the symptoms to interfere with a painstaking examination. The man who finds a rigid abdomen will hunt for a head zone, he will try the legs for evidence of pain in the right psoas muscle, he will uncover the abdomen, and step to the foot of the bed to get an accurate impression of the respiratory excursion of the abdomen and its contour. But having done these things, he views the thorax from the same position, if at all, and rarely do we see a man uncover the chest and then go to the head of the bed and standing in a position to view both sides of the thorax from the median line thereby see and be able to judge the relative excursion of each side. If then he have a thoracic condition confronting him he will see quickly the limitation of excursion bespeaking a diaphragm arched up, like some lashed colt in a quivering resistance to a second blow. The grunting, catchy respiration with these other signs ought to keep him from going astray in his findings.

Discussion.

Dr. I. W. Terry, San Francisco: I think it is a good thing to draw attention to these errors or possible errors. Personally I have been guilty of opening the abdomen three times in pneumonia or diaphragmatic pleurisies because I could not make the correct diagnosis. In one of them after the removal of a perfectly normal appendix a very careful examination of the lungs failed to show anything abnormal and it was not until 48 hours later that a diaphragmatic pneumonia was manifest. It is very possible that had we observed the excursions Dr. Crosby mentions we might have avoided this. In these examinations in stepping to the head of the bed and looking down, one should have the light coming from the foot or from the head. One can easily mistake the excursion of the diaphragm unless the light is arranged just right. One other point in the diagnosis—it seems to me that ordinarily the leukocyte count is higher in the beginning pneumonias than it is in the appendix or intra-abdominal cases. In one of my cases there was a leukocyte count of 24,000 with very marked rigidity of the abdomen but not enough localized tenderness to account for it and not until a number of hours later could pneumonia be diagnosed. The last case is very interesting from a diagnostic standpoint. Dr. Crosby certainly worked it out very admirably.

ANTITYPHOID VACCINATION.*

By MAJOR BROOKE, U. S. Army.

Before taking up the prophylactic treatment of typhoid fever, I will preface my remarks by referring briefly to the morbidity and mortality of this disease in recent wars and in the United States at the present time.

During our civil war 80,000 cases of typhoid fever were recognized as such amongst the federal forces and probably as many more sick were accounted for under other heads, owing to the imperfect methods of diagnosis present at that period. In the Franco-Prussian war over 70,000 cases were reported in the German army. During the Spanish-American war about 20% of the men in the national encampments came down with the disease, of which 7% died, and it developed in 90% of the volunteer regiments within eight weeks of mobilization. In the South African war the British forces, consisting of 555,000 men, had 57,684 cases, of which 8,225 died. According to Osler about 500,000 people in this country incur enteric fever annually, with a mortality of from 35,000 to 40,000.

Certainly any measure capable of preventing typhoid fever or reducing the mortality of this ubiquitous disease is worthy of careful study and consideration.

Simmons and Frankel, as early as 1886, discovered that it was possible to immunize animals against the typhoid bacillus, by inoculating them with living cultures, but no further progress was made in this line until Brieger and Wassermann found out six years later that it was practicable to protect animals by the use of dead organisms.

* Read before the Forty-Second Annual Meeting of the State Society, Del Monte, April, 1912.

This important discovery made it possible to conduct experiments on human beings and a few years later it was definitely proved that immunity secured by employing vaccines was associated with a marked increase of both agglutinins and bacteriolysins, just as in immunity produced by an attack of fever.

While perhaps not the first to employ killed cultures of typhoid bacilli, or what is now commonly termed antityphoid vaccine, to produce immunity against this microorganism, Sir A. Wright was the first one to urge its use and employ it on a large scale. Although his work was encouraging, it was not satisfactory enough to enthuse others and following the Boer war the employment of antityphoid vaccine fell into disuse. This was due to the imperfect immunity secured, the severe reaction following its administration and the possibility of a negative phase. The last objection Wright himself called attention to, realizing it would render the subject more susceptible to enterica, if exposed to infection immediately after inoculation.

The further use of antityphoid vaccination was largely due to the careful and scientific work of Sir Wm. Leishman and his assistants. Their experiments demonstrated that it was possible to effectually immunize people against typhoid fever, without producing a negative phase and without any general or only a slight general reaction, in the majority of cases. These brilliant results were obtained by making the following changes in the preparation and the administration of the vaccine:

Employment of non-virulent cultures.

Preventing subsequent contamination of the vaccine by preserving it in ¼% lysol.

Accurate standardization of the product.

Employment of divided doses in its administration.

The establishment of the entire subject on a sound scientific basis and the wonderful results obtained in the vaccinated troops sent to India reawakened Major Russell's interest in the matter, in 1907. Since that time, chiefly on account of his work and his advocacy of antityphoid vaccination, our entire army has been inoculated and considerable interest aroused in the medical profession throughout the country.

As used in our army to-day, the antityphoid vaccine is prepared by growing a non-virulent culture of typhoid bacilli on agar for about twenty-four hours, washing these off with salt solution, sterilizing them at 53 degrees C., or a little above this point for an hour, standardizing the product and adding a small amount of liquor cresolis compositus to prevent subsequent contamination. Many modifications of the above method have been used in the preparation of the vaccine, but I will only mention one here. Russell reports that antityphoid vaccine sterilized by formalin remains active longer and seems to give greater protection to rabbits than that sterilized by any other method, hence it is not improbable that the latter method may supersede the former in the preparation of vaccine for human use.

The vaccine is given in three doses, at intervals of ten days each and is usually injected, with an ordinary hypodermic syringe, under the skin, at the insertion of the deltoid muscle. As the vaccine is a suspension in salt solution, the container should be shaken before the emulsion is drawn into the syringe. The administration of the vaccine in divided doses is an important factor in increasing its immunizing action, it also lessens the liability of a negative phase and reduces greatly the local and general reactions.

The initial dose contains 500 million bacilli and the other two one billion each. A local reaction always occurs and consists usually of some redness, heat, tenderness, slight swelling and infrequently pain at the site of inoculation. One or all of these signs of inflammation may continue from two to four days. Occasionally the above symptoms are exaggerated and even enlargement of the axillary lymphatic glands may be noted.

No general reaction occurs in about 60% of those vaccinated and a mild reaction in about 35%; so altogether the general reaction is absent or insignificant in about 95% of all cases. In a few people the reaction is so severe that the subject has to take to bed and he may be quite uncomfortable for several days. I have never seen any permanently harmful action that could be definitely attributed to the vaccine follow its employment. However, I agree with Davis that it should not be given indiscriminately to the weak or infirm.

One case came under my observation, after the second dose, with a temperature of 102.5 degrees F., considerable headache, backache, coated tongue and loss of appetite. On the fourth day moderate enlargement of the spleen was noted and about half a dozen spots suspiciously like rose spots appeared on the abdomen. For a while I feared the man had contracted typhoid fever, just prior to the first inoculation, and had a blood culture made for typhoid bacilli. The next day I was gratified to find the temperature normal, all the symptoms rapidly disappeared and needless to add the blood culture was sterile. The third dose, which in this case, was given on the fourteenth day after the second one, did not cause a general reaction.

Recent experiments by Russell and the English authors show conclusively that a negative phase ordinarily never occurs and that the agglutinins and the protective bodies in the serum are always increased following inoculation. The possible presence of the former must always be recognized in the diagnosis of an inoculated subject suspected of having typhoid fever and usually persists in the blood in sufficient quantity to agglutinate typhoid bacilli in dilutions of from 1-50 to 1-100 for a period varying from one to four years.

How long immunity from typhoid fever, induced by vaccination, lasts is not definitely known. Most authorities agree that 90% of those inoculated will be protected for from two to three years and no doubt a smaller per cent. much longer. As far as I am aware, no data has been published giving any information of how long immunity will con-

tine, reinforced by second and third inoculations at intervals of two to three years. Scarcely enough time has elapsed to determine this period by actual experiment, but I anticipate that each succeeding vaccination will confer protection for a longer period than the preceding one.

The results obtained by the use of antityphoid vaccine to-day are much superior to those produced by Wright in his early work. During the Boer war, Wright inoculated about 100,000 men. Among these, the incidence of the disease was cut down 50% and the mortality among the inoculated who subsequently contracted fever was one-half of what it was among the non-vaccinated.

In 1905, 150 individuals of the 17th Lancers, out of a total of 593, were vaccinated while en route to India from England. Shortly after taking station at Meerut, an epidemic of enteric fever prevailed. Sixty-three cases occurred, of which sixty-one were among the non-inoculated and the other two arose in men who refused the second immunizing dose. Prior to the Gettysburg maneuvers in 1910, ninety-two men out of 118 of Company "A," First Battalion of Engineers, received antityphoid vaccine; two others had had typhoid fever and were considered immune. Of the twenty-four non-protected, six, or 25 per cent., incurred typhoid fever. No cases developed among the ninety-two vaccinated men.

In India among the white troops, which average 70,000 annually, the admission rate and the death rate from typhoid fever have gradually fallen from 15.6 and 3.19 per thousand in 1906, to 4.6 and .63 per thousand in 1910. During this period the percentage of the command vaccinated has increased from six to eighty. No more convincing statistics upon the efficiency of antityphoid vaccination in the prevention and the reduction of the mortality of typhoid fever, upon a large scale and for an extended period of time, have yet been published.

In the maneuver camp at San Antonio last year, although typhoid fever existed in the vicinity, only two cases occurred among the troops—one case in a civilian teamster who had not been vaccinated, the other case in a soldier who had received two of the three inoculations. This is a striking contrast to the 20 per cent. afflicted in the national encampments during the Spanish-American War.

Many more military statistics upon the efficacy of antityphoid vaccination might be quoted, but would be out of place in a short discussion of this kind.

Before completing this part of my paper I do not want to give you the impression that antityphoid vaccination has been the only factor in reducing the morbidity of enterica. Searching out and isolating typhoid carriers, progress in sanitary science and the realization of the necessity of thoroughly carrying out approved measures have had their place, but any one who will make a critical study of the question will, in my opinion, be convinced that antityphoid vaccination has been by far the most potent measure at our disposal.

That antityphoid vaccination can be extended to other fields with beneficial results is shown by the reports upon the inoculation of nurses by Richardson and Spooner of Boston and Davis of Chicago. Richardson states that a hospital nurse in Massachusetts is about eight times as liable to contract typhoid fever as the ordinary citizen. Spooner found for the decade prior to 1909, from two to six nurses developed typhoid fever annually at the Massachusetts General Hospital. In 1909 and 1910, following the employment of antityphoid inoculation, only one nurse incurred this disease and her case ran a mild course. The experience of Davis in Chicago has likewise been encouraging.

Unquestionably the immunization of doctors, nurses and orderlies attending typhoid patients is unqualifiedly called for and should be urged whenever practicable. In mining camps and wherever large bodies of people are crowded together, under imperfect sanitary conditions, a like procedure should be strongly advocated. In towns and communities where an epidemic is prevailing, all unprotected persons should be advised to avail themselves of its use. Whether antityphoid vaccination will ever be as universally employed as vaccination against variola, I cannot say, but I am prepared to recommend its general use in all unprotected healthy individuals under forty years of age.

Reasoning from analogy, one would think that antityphoid vaccination ought to be indicated in ridding typhoid carriers of their infection, but unfortunately its use here has not been very promising. Conversely its employment in the treatment of typhoid fever would appear to be adding more fuel to the flame. Nevertheless Leishman reasoned that if antityphoid serum reduced the mortality of this disease by increasing the opsonins and the phagocytic activity of the leukocytes, the same results might be obtained by the judicious use of antityphoid vaccine. The experience of Smallman, Kennedy, Pollock and other English observers would tend to confirm this view. Personally, I have had no experience in the treatment of enteric fever with antityphoid vaccine and will dwell no longer upon this phase of my paper.

I trust I have not conveyed the idea that we should, for one moment, relax our efforts in carrying out all sanitary precepts known to be efficient in the prevention of typhoid fever. My object has been to emphasize the importance and endeavor to prove to you the utility of a supplementary measure, readily obtainable, easily applied and that promises greater success in reducing the morbidity and mortality of typhoid fever than any procedure heretofore advocated.

Discussion.

Dr. W. V. Brem, Los Angeles: I wish to express my appreciation of a paper of this kind which deals with an ever-present disease—500,000 cases a year in the United States and 40,000 deaths. It seems to be much more desirable to be associated with a movement tending towards the control of a common, everyday disease that has lost some of its interest perhaps because of our familiarity with it, than to gain distinction by the discovery of rare organisms, causes of disease that have but little influence on human life. We want more work on the widespread diseases and we want to hear less

of rare things. I have had a little experience in anti-typhoid vaccination. In Panama there was a small epidemic among the nurses of the hospital and we were unable to discover the origin. Neither the water nor the food supply could be convicted and a search for a typhoid carrier was fruitless. There was quite a little disturbance in the minds of the nurses and we instituted vaccination, making it voluntary. About 20 nurses and physicians were vaccinated and the epidemic ceased. At another time, my own little girl, if you will pardon the personal reference, developed a typhoid-like fever and we isolated from her blood the paratyphoid "B" bacillus. I vaccinated my family and none of the others became ill. Regarding the treatment of the chronic typhoid carriers, we were able to cure a urinary carrier, a little girl of four years, by vaccination with an autogenous vaccine. We gave her nine injections before eradicating the infection. I regard this prophylaxic measure against typhoid (antityphoid vaccination), as one of the great advances that medical science has achieved in these late years that have been so full of far-reaching discoveries. I wish to express again my appreciation of the paper that has just been read.

Dr. Geo. H. Evans, San Francisco: I would like to particularly emphasize one recommendation in this paper and that is the recommendation calling for the vaccination of nurses, doctors and internes. I would go further than that and would seriously recommend that the family physician urge upon his patients the necessity for typhoid vaccination. I have in my service at St. Luke's a nurse seriously ill with typhoid contracted in attendance upon one of my typhoid patients. The nurses in the training school have all been inoculated prophylactically. Regarding the negative phase I will present a personal illustration. I personally went through this inoculation a few months ago and one week after my second inoculation I presented a decidedly negative Widal. Fearing some mistake regarding the typhoid culture it was confirmed by a strain in use at the Presidio. About one month after there was a very strong and definite agglutionation, showing that in some cases there is a temporary negative phase following these inoculations. The question of immunity and the length of time of the immunity cannot, of course, be definitely decided at the present time. The whole question is too new.

Dr. René Bine, San Francisco: Not only is the author of this paper to be congratulated but the Society owes him a debt of gratitude for having brought before it his experiences in this work. The tremendous work of the Army Medical Corps along these lines is not appreciated by many of our members and unfortunately we as individuals cannot enforce such prophylactic measures as can be done in the army. It must be remembered that even in the army, however, no soldier has been, so far as I am informed, vaccinated against his wishes, and in view of the fact that reactions are seldom severe, soldiers are rather glad to get the period of rest necessitated by the routine of vaccination and observation following. My own experience with typhoid vaccination is limited to six cases—all persons exposed to the disease. No severe reactions occurred. The benefits to be obtained with typhoid vaccines in treatment of the disease, as has been stated, are rather uncertain. There is no uniformity in the doses recommended, some advising one million bacilli or less, others hundreds of millions. I have employed them in but two cases; in the first I thought I did some good, whereas in the second I am not sure that the vaccine did not slightly prolong the disease. Everybody has seen cases run such atypical courses as to realize the difficulties in estimating the results with such medication.

Dr. D'Arcy Power, San Francisco: To my mind the greatest value to be derived from Major Brooke's paper would be in getting its facts prominently before the public. In an editorial in the State Journal I attempted to do this some months ago and I believe that there is no field of experimental medicine which would be so readily understood and at the same time so helpful to establishing a right understanding on the part of the public of the value of medical research as a clear statement of what has been achieved and is yet possible by typhoid vaccination.

Dr. A. S. Lobingier, Los Angeles: I presume that typhoid fever is supposed largely to be a condition which interests only internists but any one who has had typhoid will recognize that it is a question of great importance to all. I do not know of any disease of acute character which will leave more evidence of impairment. I think the laity is very erroneous in believing that typhoid will benefit an individual. Typhoid very seriously complicates the gastro-intestinal tract. The fact that 80 or 85 per cent. of the pathological conditions are direct result of typhoid shows that it is a question of mortality.

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THE TUBERCULIDES AS OBSERVED IN SOUTHERN CALIFORNIA.*

By RALPH WILLIAMS, M. D., Los Angeles.

When, at the solicitation of Dr. Anderson, the author agreed to write a paper with the above title, he was under the opinion that it would be very easy to secure all the necessary data, in relation to the prevalence of the various manifestations upon the skin which the tubercle bacillus or its toxins may give rise, to render it of some value to you, and particularly to dermatologists in other portions of the country. However, in seeking this information from various members of the profession whom one would naturally expect to have come in contact with many cases, the author finds that their records have not been sufficiently accurately kept or have been otherwise lost or misplaced, as to render anything like a complete analysis possible. Consequently he will have to draw largely, if not entirely, upon such as have passed under his own observation either in private practice or at the dispensary of the Medical College of the State of California in Los Angeles, at which, either under its present name or its old one (the College of Medicine of Southern California), he has been in active and fairly constant attendance since 1893. The records of this institution also have unfortunately been displaced in part and are not strictly available for the purpose under consideration. You can readily see from the foregoing that most of the paper is an explanation and an apology.

One would naturally suppose that in Southern

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