

be considered that a cure was effected or that there was a permanent disappearance of crust formation.

DR. HENRY LEWIS WAGNER, San Francisco: I would like to ask whether the infarcts had been found in other parts of the body, and where, if other animals had been utilized outside of rabbits? The first man who made a bacteriologic examination of ozena, did so in a laboratory under my supervision in the University of Witzbach, and he then discovered the polymorphous condition of the germ; but in those days—it is now practically twenty-seven years ago—the condition now recognized was not understood, and I am very much interested and have followed it, although I personally have remained rather skeptical. There were a woman and two children, boys I think, in our clinic, but I recall that one boy only showed the characteristic sign of malodor; the mother as well as the other boy showed no sign whatever of the so-called ozena odor, and I think certainly there is no question that the mother as well as one boy should not be included. I have seen these children, and certainly there is no question that all three of them have been benefited.

DR. H. W. LOEB, St. Louis: It seems to me that while work is being done at present, we are still up against the same proposition, whether or not the organism discovered is saprophytic or pathogenic. I should like to ask Dr. Horn if he discovered crusts in the rabbit's nose, and also if he has been able to isolate the Perez bacillus from the nasal discharge. Looking over the various developments in the treatment of ozena in the past twenty years, it seems to me that after all we have achieved more by relieving the nose of the discharge and of the consequent saprophytic changes than by any other plan of treatment. I feel, however, that while we must remain somewhat skeptical, we should be thankful that Dr. Horn was able to make a positive reaction in the mucous membrane of the rabbits.

DR. HENRY HORN, San Francisco: I think that the discussion has brought out the point which I made, that the value of the treatment will be determined by our personal experience. Any one who has read the last article of Hofer in the *Archives of Laryngology* would say that it was exceedingly optimistic. This is the general impression concerning his work, and his enthusiasm during our stay in his laboratory was pronounced. Dr. Willcutt was in Vienna during preliminary stages of this work and he knows that Hofer had just as many obstacles to overcome as we have. In reply to Dr. Loeb's question, I can say that in all the rabbits injected with the original Hofer cultures we recovered the Perez bacillus in the nose. We also recovered it in the heart's blood by the Rosenau method. Regarding the pus in the nose, I have seen a large collection of pus pockets, but no crusts have been seen. I have never noticed odor in the nose of a rabbit, and I do not think that Hofer claims this; but he does claim crusting and atrophy. The point that Dr. Loeb made, that the removal of the saprophytes is a long step toward a cure, is undoubtedly true, and is exactly the point I made. As far as I can see, in the twelve cases I have handled, I have seen as good results with stock nasal vaccine as from the Perez vaccine. As regards the infarcts, I have seen none. Hofer claims there are no changes at necropsy other than the local change in the nose.

Leaders in Rural Sanitation.—It is conceded that among rural people leadership is notably lacking; there is no organization which can be relied on and no idea of social responsibility. Who then can lead in a movement for betterment? The county health officer and the doctor. It is within the authority of the health official to demand certain requirements in the interest of public health and for the protection of the individual. Health work touches intimately the family life in every phase; and it is so personal in many aspects that one with authority like the health officer, or with influence such as the physician has, can teach acceptably and by practical application just what the farmer, his wife and children need to know.—Oscar Dowling. *The American Journal of Public Health*, May, 1915.

A NEW METHOD FOR THE PROPHYLACTIC APPLICATION OF TETANUS ANTITOXIN *

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It has become a fact well established by both clinical and experimental observations that, in the large majority of cases, administration of tetanus antitoxin at the time of, or shortly after, infection by tetanus spores will prevent the development of tetanus. The almost uniformly successful results obtained for a number of years in cases of Fourth of July injuries in the United States have proved conclusively the value of the prophylactic use of tetanus antitoxin.

The present European war has, however, emphasized another phase of the tetanus problem which demands consideration. The routine administration of antitetanic serum to all wounded soldiers is now a fairly general practice both in Germany and in France. In spite of this, owing to the conditions governing the care of the wounded in war, cases of tetanus continue to occur (1) in those soldiers in whom the prophylactic injection has been accidentally omitted, and (2) in those in whom the injection of antitoxin has been delayed until one, two or even more days have elapsed after injury. The occurrence of isolated cases of tetanus in these two groups has tended, in the minds of many European physicians, to cause doubt as to the efficacy of prophylaxis against this disease.

To overcome the delay in administration, it was evident early that some more simple method of application of antitoxin was desirable. The subcutaneous injection of liquid antitoxin, immediately following an injury, manifestly is not a procedure that can always be carried out.

Methods previously proposed to meet this objection, the powdered antitoxin of Calmette, the local applications of liquid antitoxin advocated by Suter, and the rubbing into the wound of antitoxin salve as recommended by Bockenheimer, for reasons which will be discussed in a later article, did not appear to be satisfactory.

Accordingly, after experiments with various methods of local application, the following was found to fulfil best the requirements: Liquid antitoxin was poured on pads of sterile absorbent cotton in such amounts as to render the cotton uniformly moist but not wet enough to drip. These pads were then dried for twenty-four hours in a moderate heat (from 40 to 45 C., 104 to 113 F.). A previously sterilized evaporating dish or earthenware mortar, covered with a double layer of filter paper, was found satisfactory for this purpose. Drying in vacuum did not appear to give any advantage. The dried antitoxin cotton became a stiffened mass, resembling dried paper pulp. This was weighed and then divided into pieces which by weight would represent definite quantities of antitoxin; for example, if the entire mass contained twenty units of dried antitoxin, one twentieth by weight would represent about one unit.

The experimental proof of the efficacy of this method will be described more in detail in a later communication. It is sufficient here to note that when the prepared cotton was bound on freshly made

* From the pathologic-anatomic institute, University of Freiburg in Breisgau (director, Prof. Dr. L. Aschoff).

wounds of mice, rats or guinea-pigs, protection was given against the later injection of many times the minimum fatal dose of tetanus toxin or against the simultaneous inoculation of a garden earth, which had been proved by numerous tests to produce tetanus in 100 per cent. of cases for unprotected mice, rats or guinea-pigs.

If the dry antitoxin pad was bound on a wound in which no fresh blood or serum was present, the absorption of antitoxin was greatly reduced and the protection therefore incomplete. If immediately previous to the application of the pad, it was moistened in sterile saline, distilled water, sterile bouillon or any clean fluid, absorption was rapid and protection entirely adequate.

Pieces of this dried antitoxin cotton were used which were over six weeks old and were found to be perfectly efficient in the usual dosage. Amounts representing the dried product of from one to two and a half units (German standard) were employed, and rats weighing up to 200 grams were given full protection.

In a conference over this method, Hoechst Farbwerke stated that their antitoxin (which was kindly supplied by them for the purposes of these experiments) was combined with a certain percentage of glycerin, which might interfere with both its drying and preservation. They indicated further that a special preparation could be made to meet a demand for such a product.

In conclusion, it must be understood that this method is not offered as a substitute for the subcutaneous injection of fluid antitoxin, which, when it can be properly and early enough administered, is at the present time the best and surest means of producing temporary protection against tetanus. There are occasions, however, especially in times of war, but also in times of peace, such as absence of the proper antitoxin supply, or syringes, too great distance from the doctor, etc., when it would be an advantage to have dry tetanus antitoxin dressings which might be carried in the first-aid dressing kit, which could be applied by a layman as easily as by a physician, and which, in the presence of a dirt-infected wound, only need to be moistened and bound on with the first dressing. In this manner, what might prove to be a dangerous loss of time in obtaining serum could be avoided and the absorption of tetanus antitoxin secured before the elaboration and absorption of tetanus toxin.

A further point in favor of the method is the ease of preservation. As yet no tests have been made with the prepared cotton which has been kept longer than six weeks, but there is no reason to believe that the dried product will not retain its efficacy for much longer periods of time. The difficulties confronting the practicing physician or even druggists in keeping on hand fresh supplies of various antitoxic serums are well known.

Simplicity of preparation and preservation, ease of application, and adaptability to the sudden demands which surround the most complicated injuries when immediate application of serum is indicated, are points which render this method worthy of a thorough trial.

Early Diagnosis.—In the entire realm of preventive medicine, there is no factor more potent than early diagnosis, first, because disease is far more amenable to treatment in the early stages, and second, because early diagnosis affords greater advantages in preventing the spread of infection to others.—*Illinois State Board of Health.*

REPORT OF A CASE OF CESAREAN SECTION AFTER DEATH OF THE MOTHER

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Mrs. D., aged 36, quadripara, with negative family and personal history, had always been in the best of health. Three children, aged 10, 7, and 3, had had normal deliveries, and the patient made an uneventful recovery in each confinement. During the third pregnancy the patient developed varicose veins, especially in the lower left extremity, which caused her so much pain that it was necessary for her to wear an elastic stocking or bandage extending from the foot to the thigh. During her fourth pregnancy her condition was normal, and she had no trouble of any character with the exception of the varicosis, and again it was necessary for her to wear the elastic stocking or rubber bandage.

I saw the patient from time to time and examined the urine several times with a negative result. The expected time of confinement was Oct. 11, 1914. About 7 o'clock on the morning of October 4, the patient's husband telephoned me that his wife had fainted and to call immediately. About fifteen minutes later when I arrived at the house I found that the patient had died. Believing that not more than three to five minutes had passed since she died, I advised the immediate opening of the abdomen and uterus and the removing of the child. Her husband quickly consented, and without wasting any time trying to find the fetal heart beat or other signs of fetal life, and knowing positively that the patient was dead and without wasting any time with anti-septic preparations or for control of hemorrhage, with a small lance I opened the abdomen and uterus, and quickly removing the child, clamped the cord and divided it. Much to my dismay the child showed no sign of life, and had passed through the livid stage and was very pallid. With my stethoscope I listened for heart sounds and found none. To all appearances the child was dead.

In hopes that there might be some life in spite of the fact of apparent hopelessness, I began artificial respiration, at the same time dipping the child in a pan of hot water and then cold water and also using the B. S. Schultze method for reviving asphyxiated babes. I continued the artificial respiration and the dipping in the hot and cold baths for forty minutes, and at no time during the forty minutes was there the slightest indication of life, not a single gasp, and the several examinations for heart sounds failed to reveal the least trace of a heart beat. Then it occurred to me to inject hypodermically epinephrin solution, 1:1,000. After I had filled my hypodermic I was puzzled as to where to inject it to do any good. Before this I had tied the cord, leaving a stump of about three-fourths inch. I injected the epinephrin into the cord, carrying the point of the needle well through the abdominal wall. In about two minutes I noticed the cord begin to pulsate. I also noticed a pulsation of the heart through the chest wall. I could palpate the heart beat. With my stethoscope I could hear it very plainly. I continued the artificial respiration, and hot and cold applications, and at the end of fifty minutes from the time the child was delivered it was breathing well and crying lustily.

The babe has not had a sick day, and is a robust healthy child in every respect. May 4, when it was 7 months old, it weighed 19 pounds.

The cause of the patient's death was pulmonary embolism. The offending body was undoubtedly detached, and its starting point was the thrombus from the femoral, the uterine or the ovarian veins. One of the chief trunks of the pulmonary artery was suddenly obstructed, causing violent dyspnea, cyanosis and almost immediate death. In the more fortunate cases of pulmonary embolism, only a small branch is obstructed, when dyspnea and cyanosis are more moderate, and recovery is possible.

My object in presenting this paper is to urge all physicians to do their whole duty if such an opportunity presents.