end of the first week and a cure may be anticipated in two weeks.

The advantages of this method are: It is extremely simple and applicable in all cases. It does not confine the patient to the bed or to the house. In many cases an anesthetic is not required. The dangers of hemorrhage and sepsis are reduced to a minimum. A cure can be anticipated with almost absolute certainty.

133 Lincoln Avenue.

THE BEST METHOD OF STERILIZING CATGUT.

BY I. S. STONE, M.D.
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The following method of preparing catgut has none of the disadvantages which have heretofore prevented the general use of this valuable suture material.

It is unnecessary to wash the gut in ether. The gut (Nos. 0 and 1) is cut in pieces eighteen to twenty-four inches in length, loosely coiled and placed in water for twelve hours at ordinary room temperature, to "swell it." This suggestion of my friend Dr. Kinyoun is a good one, for the obvious reason that the formalin solution will penetrate the more readily into the interior of the gut. I formerly wound the material on glass spools, but soon abandoned the idea, because it became so tightly and firmly contracted around the spool as to render it possible that the formalin solution could not penetrate to the deeper layers of the gut.

The gut is taken from the water and placed in a 5 per cent. solution of the ordinary 40 per cent. solution of formalin found in the shops, where it may remain twenty-four to thirty-six hours. It is then thrown into a jar containing absolute alcohol, where it may remain indefinitely.

The writer can positively confirm Dr. Senn's recent notice of formalin catgut, and can certify that it will be strong and reliable in every way after boiling for ten minutes in water. This simple method leaves nothing to be desired. Anyone can use it, and there is positively no longer any reason to rely upon such material as we find in the shops. Every surgeon can easily prepare his own material, and do so without loss of time. Catgut prepared in this way will be found to meet every requirement in surgery where absorbable material is required. There is rarely any need for catgut in abdominal operations until we are ready to close the abdomen, then the small size 0 or 00 for everything but the fascia. The No. 1 is best for that. In the skin the smaller size will become soft in ten days or two weeks. In the cervix and vagina the material thus prepared will be found eminently satisfactory. The small number is the proper one for most operations. In hernia the No. 1 is better and should be allowed to remain rather longer in the formalin solution. I have seen Dr. Edebohl's catgut made strong and sterile after his well known formula, but there is very much less trouble by the later method, and the formalin solution does away entirely with the necessity for bichromate of potash or chromic acid hardening. It is not absolutely necessary to boil the gut, as it gives perfect results without this precaution.

1449 Rhode Island Avenue N. W.

Let us have a Department of Public Health!

THE SERUM REACTION IN HOG CHOLERA.

BY JOHN E. CASHIN, M.D.

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The success which has been obtained in the serum diagnosis of typhoid fever led me to try an experiment with this method as an aid to the diagnosis of hog cholera, an affection due to a motile bacillus, the lesions of which, in the chronic form of the disease, resemble somewhat typhoid fever of the human subject.

Dawson (New York *Medical Journal*, Feb., 7, 1897) reports having obtained the reaction with the blood of a rabbit after inoculation with a bullion culture of the hog cholera bacillus, the reaction appearing promptly after injection.

An opportunity presenting itself a few weeks ago, I isolated the bacillus from an acute case of hog cholera and tested the agglutinating power of the blood serum of different animals upon it with the following result: Human blood serum from the placenta and dried blood from the finger tip, no effect; horse serum, no effect; rabbit serum, no effect; ox serum agglutinated strongly. A trace of ox serum added to an actively motile culture of the hog cholera bacillus caused immobility before the microscope could be brought into focus. Clumping was noted in from one-half to three minutes.

The normal serum of the hog was found to be without effect. The reaction appeared in the blood of two pigs forty-eight hours after the subcutaneous injection of $\frac{3}{4}$ c.c. of a forty-eight hour old virulent bullion culture of the hog cholera bacillus. No signs of illness have appeared in these pigs, except in one case a small abscess at the site of the needle puncture. Nearly a month has elapsed since the inoculation and the reaction in their blood is as well marked as ever. It is still present in a pig which had a severe attack of cholera four months ago. As to the length of time the reaction persists after experimental infection or after an attack of cholera, I have not yet determined; but inasmuch as pigs are usually killed when ten or twelve months old, it would seem reasonable to suppose from what has been observed that it remains during the brief period of existence allowed to most pigs.

The technique in making the diagnosis of hog cholera does not differ from that used in other infectious diseases to which the method has been applied. An incision is made in the skin of the ear of the pig and a few drops of blood collected upon a glass slide or a piece of smooth stiff paper. The blood, if it has been allowed to dry, is moistened with a drop of water and some of it transferred to a cover glass on which has been placed the hog cholera bacillus, either from an agar tube or a bullion culture about forty-eight hours old. The liquids are mixed and the cover glass inverted over a hollow slide and examined with a magnification of 450 or 500 diameters. Fresh, virulent, highly motile cultures exhibit the reaction as well as more attenuated ones, and it appears to me better, when ox serum was used.

It seems this method will be a valuable one to veterinarians and others, enabling them to make a speedy and correct differentiation between cholera and swine plague, anthrax and other diseases of swine during the life of the animal; and that it will be of service in the study and differentiation of the various bacte-

ria which have been described in swine diseases in this country and abroad. One might be able in this way to determine quickly that a specimen of meat, if fresh, came from an animal with cholera.

The following cases illustrate some practical applications of the reaction which I have made in conjunction with Dr. F. T. Eisenman, V.S. A sick pig, belonging to a herd in which there had been two deaths from what was supposed to be cholera, was donated for study. The reaction was not present. Two days later the pig died. At the postmortem examination a fibrinous pericarditis was found, but no lesions of hog cholera. Cultures from the heart, pericardium and spleen showed the staphylococcus pyogenes albus alone. In another case which we examined, and in which the reaction was not found, diarrhea was the most prominent symptom. The pig recovered. This was probably an intestinal disorder brought about by improper feeding.

In four cases examined I have obtained the reaction during life and verified the existence of cholera by postmortem examination.

The clinical symptoms of hog cholera and other swine diseases are very uncertain, and as by early diagnosis often much can be done to prevent loss, this method should commend itself to veterinary practitioners, should further trial show it to be reliable.

ANTITOXIN—SOME MEDICO-LEGAL ASPECTS OF ITS USE.

BY JAMES L. TAYLOR, A.M., M.D.

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In the issue of the JOURNAL of February 27, Dr. Chas. T. McClintock of Detroit discusses, in an admirable scientific paper, one of the most intensely interesting questions now before the medical profession, viz.: the cause of death in hypodermic serum medication. The doctor shows conclusively that the injection of air along with the serum is not an adequate explanation of the reported accidents. He also points out that carbolic acid or trikresol used as a preservative of the serum is still less likely to be causative of these mishaps, and that experiments seem to show that the serum *per se* is not responsible. What the true cause may be, the doctor believes to be at present unanswerable, and prefers to give definite form to our ignorance by calling it "shock."

The profession will certainly not remain satisfied with thus merely giving a name to our ignorance. The phenomena heretofore reported when accidents have occurred, and which so far as we know are liable to be repeated in any injection hereafter made, are too fearfully significant in their effects on both practitioner and patient, to be thus lightly put away.

No other agent now employed by the profession stands in the same category as antitoxin. It holds the unique distinction of occasionally causing sudden death, or an alarming condition of prolonged collapse, when administered to persons in perfect health. The anesthetics do not belong to this category, for they are not employed as therapeutic agents proper. They simply paralyze temporarily the centers of the nerves of sensation, and it is not strange that this paralyzing action should occasionally extend to other centers than those of sensation. The condition of anesthesia is recognized as one of profound danger and its effects are procured with a due sense of the risks involved. But antitoxin which is an alleged

remedy *per se* stands upon an entirely different footing. The recognized function of an anesthetic is to annul pain, which it invariably does, while the alleged function of the serum is to overcome disease, and its action in this role is in any case more or less problematical. The fact that its effects are not uniform is what gives us pause. When we can not be sure whether it will elevate the temperature of a patient or depress it, retard or accelerate the heart's action, develop albuminuria or erythema, or pustular inflammation at the site of the injection, or perhaps cause symptoms of temporary paralysis, and occasionally an alarming condition bordering on collapse and sometimes instant death, it is far from satisfactory to be told that the statistics of mortality tables are favorable to its use.

Moreover the physician is always believed by the laity to know what he is using, and what the effects of his treatment will be. He is employed and enjoys the confidence of his patrons because of his supposed expert knowledge. And when he employs an alleged remedy which may kill instead of curing without knowing why, can it be said that the confidence reposed in his expert knowledge is justified? Will it serve as an answer, if, in a given case, an accident should occur, to say that the general results of the remedy and the indorsement of the profession warrant its use? The fact being established that the use of the remedy is sometimes followed by unexpected consequences and even death, would such an answer exculpate the practitioner in case legal proceedings were instituted against him? Not long ago the daily papers reported the arrest of two physicians by a husband for causing the death of his wife by the administration of chloroform. Under proper precautions death in such cases is sometimes unavoidable, and in a sense therefore thought to be legitimate. Could an accident following the use of antitoxin be defended on the same grounds as a death from anesthetics? The medico-legal aspects of the question are of profound interest to every practitioner, and in the present state of our knowledge, no one who makes use of the antidiphtheritic serum can know that he will not be confronted with its unexpected and untoward consequences.

From a scientific standpoint it is greatly to be regretted that where accidents have occurred, a portion of the serum used in that particular injection had not been subjected to a careful examination. A resulting accident is the only experimental proof that can be had of its toxicity in the human subject, and unfortunately, from obvious prudential motives, an examination in such cases is not likely to be made. Hence it is difficult to determine experimentally whether a given specimen of the serum possesses toxic properties or not. Obviously the general practitioner can not make tests of each specimen used for himself. He must rely on the guaranties of purity furnished by the manufacturer, and it is from the use of these guaranteed specimens that all the reported accidents have resulted.

Unfortunate results have been ascribed by some to a supposed idiosyncrasy on the part of the subject. This explanation is manifestly inadequate. As the term idiosyncrasy is ordinarily used and understood, it may account for variable physiologic manifestations, but another term is employed where the unexpected phenomena are associated with sudden death. Idiosyncrasy may be properly used to designate such minor constitutional