As to the administration of cholesterin, Reicher made use of a 3 per cent. solution in olive oil, of which he administered 100 gms. a day—hence 3 gms. of the substance. In this manner he obtained a much better resorption than with aqueous suspensions. In future I shall follow the same plan; in the past I have made use of cholesterin in capsules. A serious drawback to the extended use of the material is its cost, viz., 50 cents a gram; this makes it doubly important to achieve as extensive a resorption as possible. Regarding its non-toxicity, Reicher's observations are quite in accord with my own; even with 4 and 5 gms. a day no deleterious results whatever were noted.

A theoretical discussion of the rationale of the use of cholesterin in anemias of the pernicious type does not seem necessary at present. The sole object of this communication is to place my results on record. So far as they go they seem to indicate that in advanced cases very little, if anything, is to be hoped for from the use of cholesterin, while in early cases improvement may follow.

1302 Madison Avenue.

THE INTRAVENOUS INJECTION OF MERCURY.

GEORGE P. CRUME, M.D.
MINNEAPOLIS.

The hypodermic method of administering mercury has gained a distinct and deserved place in the therapy of syphilis. Not only has the technic been gradually improved, but preparations less irritating and better suited to our needs have been produced.

For convenience of study this method readily admits of division into subcutaneous, intramuscular and intravenous injections. It is especially to the last that I desire to call attention.

The introduction of mercury (sublimed solution) by means of intravenous injections was first recommended by Bacelli in 1892, though other drugs had been administered in this way several years earlier. Two reasons have prevented this method from gaining more than limited favor with the profession; first, the delicacy of the technic; second, the fact that it is regarded by some, many of whom have never used it, as dangerous.

My experience with this method began about fifteen months ago and since then I have given over 200 intravenous injections, a number somewhat limited but certainly entitling one to a preliminary opinion not only as to the technic but as to the potency of the drug when thus administered.

Any preparation free from insoluble particles may be used. Solutions of bichlorid, biniodid or cyanid in 1 per cent. strength are most frequently given, the dose being from 1 to 3 c.c. repeated daily or every other day. My experience has been almost entirely with the cyanid, a salt which contains 79 per cent. of mercury and is, I believe, less irritating than the sublimate.

TECHNIC.

The technic is simple, but demands care and exactness. Almost any of the superficial veins may be used; the median basilic and cephalic are generally recommended, but I find that those on the back of the hands are most often suitable. A bandage is tightly applied proximal to the site of injection to distend and render

the vein prominent. I then apply to the site for injection chemically pure alcohol on a pledget of cotton without much friction. The needle and syringe, having been prepared, may now be loaded, the needle attached and introduced almost parallel to the vein till in the lumen and in the direction of blood current. Then the bandage should be removed and the injection slowly given. When the needle is withdrawn the blood usually flows rather freely from the small puncture. This should be wiped away and no dressing applied.

Fine platino-iridium needles (2 to 3 cm. in length) should be used, and the Luer all-glass syringe is best adapted to this purpose.

It is not always easy to be certain that the eye of the needle is in the vein, though it is advised to determine this by the lessened resistance and the freedom with which the point can be moved, indications which to me are not reliable when the vein is small or located in loose cellular tissue. Using the Luer syringe, I chanced to discover that whenever the needle is in the lumen of the vein the blood at once comes into the barrel of the syringe, provided the piston is not held. This has proved in my hands a valuable aid indicative of the presence of the needle in the lumen of the vein, but it is an indication which can not be obtained unless the piston fits the cylinder so accurately that the blood pressure is sufficient to press it backward. This guards against undue wounding of the delicate endothelium, which predisposes to an endophlebitis. After the needle is in position the strictest attention is needed to keep it there until the injection is consummated. To this end an assistant is necessary to remove the bandage.

We know that syphilis is caused by a special organism, but our knowledge of the action of mercury on that organism remains purely empirical. We agree that the remedy must be absorbed, must reach the circulation, before it exerts a general effect. Then if the drug is administered by the mouth, by inunctions or intramuscular injections, there is not only the delay, which may be several days, before the circulation is reached by an amount of the drug sufficient to produce the physiologic effect, but also the greater disturbance of the system, and the increased difficulty of maintaining the desired intensity of effect. It seems to me that these disadvantages are best met and overcome by intravenous injections; that this is our best means for meeting the needs of those urgent cases in which great destruction or irreparable damage is imminent, as for example, severe visceral disease, lesions of the eye or of the nervous system. For not only can the physiologic effect be produced, but the patient's tolerance can be discovered in two or three days and with perfect safety by this method. In certain specific conditions not infrequently met this is an advantage of first importance.

OBJECTIONS.

Nevertheless, this method is not without real as well as fancied objections.

1. The technic is somewhat delicate, it being easy to miss the vein or pass the needle entirely through it.

2. Injection outside of the vein causes a cellulitis with induration at site of injection, an acute phlebitis; injection into the wall of the vein or the valves or failure to remove the bandage before injecting causes an acute endophlebitis. None of these accidents is serious, neither do they occasion much pain or inconvenience.

3. Veins are not always sufficiently prominent for the operation, especially in women and obese subjects.

4. A. Fournier asserts that it is imprudent to bring the endocardium in direct and sudden contact with a toxic agent such as mercury. But he produces no evidence and admits never having given an intravenous injection.

5. It is said that the mercury is more rapidly eliminated than by any other method and that recurrences are more frequent.

6. It is further asserted that the therapeutic effects are not very encouraging, not being, in fact, superior to those of other methods.

This last objection is not what, after careful and impartial consideration of the method, would be expected to be true, and it is not believed that experience in well-selected cases will ever establish it. That recurrences happen after treatment by this method is not denied. They occur, and often to our embarrassment, after treatment by every method; that they occur earlier than when other methods are used has not been proved, and, if it were, there would still remain a valued place for intravenous injections in the therapy of those severe conditions above indicated.

ADVANTAGES.

As a routine practice very few advise this method; as a provisory means when it is necessary to act quickly, to surprise the enemy as it were, in cases of rapidly-involving syphilis, it should receive first consideration; also as a therapeutic test; and for this purpose mercury, not the iodids, should be used in the great majority of cases. Other advantages which this method enjoys are: Absence of pain, mathematical dosage, and instantaneous introduction into the circulation.

815 Andrus Building.

ILEOCOLITIS WITH INTOXICATION

PRESENTING SYMPTOMS OF MENINGITIS AND FOLLOWED BY MULTIPLE NEURITIS.

H. D. McCARTY, M.D.

BALTIMORE.

History.—January 5, Fred L., aged 5, had been as well as usual. At his evening meal he partook freely of canned corn, and before going to bed ate three cherry tarts. He awoke at 2 a. m., with violent pains in the abdomen, followed by nausea and vomiting. The child had a very high temperature, and before daybreak appeared somewhat delirious. The bowels were constipated. He appeared more or less stuporous, but it was not until the following Tuesday, January 9, that symptoms resembling those of meningitis developed. The family was much alarmed by the drawing back of the child's head and the occurrence of internal squint. He became even more stuporous; the tongue was thickly coated and the breath offensive, the temperature running 103-104, pulse about 120. For twenty-six days after the onset the temperature varied from 101 to 104, and the pulse was continually high. The attending physician was asked to call in a consultant, which was done, and a diagnosis of meningitis was made.

Examination.—I saw the child on January 31, at which time he presented the following picture: He was a rather large boy, extremely emaciated, with pale mucous membranes, and lemon-colored, flabby, dry skin. The patient assumed the lateral position in bed, the head was drawn back with marked rigidity of the neck and contraction of the abdominal muscles. The lower extremities were flexed on hip and knee, and all the flexors contracted and rigid. Kernig's sign was marked. The hands were clenched, arms flexed at elbow and usually held across the chest, the patient from time to time putting his hands to his mouth. The palpebral apertures were wide

and equal. The pupils were dilated, equal and reacted to light sluggishly and contracted slightly to accommodation. The right eye was slightly turned in. No knee-jerk was obtained, but the contracted condition of the lower extremities made the test uncertain. Stimulation of the plantar surfaces gave plantar response. (Babinski was absent.) There was hyperesthesia of the lower extremities. Any manipulation of them evidently caused great pain. Dermographia was marked. The boy was conscious but stupid; he recognized those about him and was able to call for what he wanted. He was cognizant of pain and discomfort and called constantly for food. The presence of the father seemed to irritate the child. The child passed urine freely. The bowels were obstinately constipated. The pulse was 110 to 120, and irregular. Respirations varied in number and depth. No definite periodicity was noted. The picture was one of meningitis.

Treatment.—Being impressed after several days by the condition which had changed but little since the onset, except for the failing forces, and by the character of the stools, which were foul-smelling, dark brown in color, containing large amounts of thick jelly-like mucous, occasionally streaked with blood, decomposing clots of milk and small undigested particles of shredded wheat biscuit. I was compelled to think that the condition was possibly due to the toxins absorbed from the intestinal tract. Treatment was instituted accordingly. A large dose of castor oil was given and the bowels washed on alternate days with nitrate of silver, 1/4 gr. to the ounce, and salt solution, a long soft catheter being used. For the first week nothing but whey, albumin water, and predigested milk and brandy were given at regular intervals. One dram of bismuth in emulsion was given every twenty-four hours.

Clinical Course.—From the first the improvement was rapid and marked and the boy gained in strength and took on flesh at an astonishing rate. As the symptoms of irritation cleared up it became evident that there was a definite symmetrical paralysis of the legs. The muscles of the legs had become wasted, and there was definite weakness of the flexors of the ankle. The knee-jerk was not obtained until six weeks after improvement was first noted. The patient did not walk until about three months after improvement began. The gait was feeble, unsteady, the legs being lifted high, and the feet slapped on the ground. Examination showed the double foot drop so commonly seen in multiple neuritis. There was never any marked weakness in the arms.

It would seem from the rapid improvement following on treatment directed toward the intestinal tract that one may fairly assume that the meningeal symptoms were due surely in large part to the action of toxins and not to a definite inflammation. The involvement of the legs can be explained by the action of the poison circulating in the blood. In consideration of the admitted difficulty of the diagnosis between meningitis and the results of intestinal toxemia, this case affords great encouragement for thorough research for the primary seat of the infection, even in cases in which the outlook seems anything but favorable.

613 Park Avenue.

Regional Anesthesia by Spinal Technic.—Avramescu believes that the anesthetic injected into the spinal cavity acts on the roots, not on the spinal cord, and that consequently only those roots should be acted on which innervate the field of operation. In his communication on the subject, published in *Spitalul*, and summarized in the *Münch. med. Wchnschr.*, 1908, 2457, he states that the anesthetic should be injected between the fourth and fifth lumbar vertebrae when the operation is to be on the external genitals, perineum or anus, and between the first and second lumbar vertebrae for the inguinal region and legs. The ninth or tenth thoracic vertebrae correspond to the abdomen below the umbilicus, the sixth and seventh to the region above the umbilicus, and the first and third to the thorax. No injection should ever be made above this, on account of the danger of paralyzing the phrenic nerve.