its power of agglutinating all three micro-organisms at a dilution exceeding 1 in 100.

TABLE IV.—*Test with Anti-paratyphoid B Serum from Lister Institute (C 51; stated titre 1 in 8,000).*

Dilution.	Aertrycke.	"H."	Paratyphoid B.
1 in 100 ...	?	?	+++
1 in 500 ...	0	0	+++
1 in 1,000 ...	0	0	+++
1 in 5,000 ...	0	0	++

V. As will be seen, even in very low dilutions (1 in 100), this serum (Table IV) yielded only slight, doubtful traces of clumping with *Aertrycke* and "H," whilst as against its own strain it went to 5,000 and beyond. It is therefore highly specific. "H" is thus shown to be identical with *Aertrycke* and absorption tests are not needed.

TABLE V.—*Test with Anti-paratyphoid B Serum from Lister Institute (C 89; stated titre 1 in 8,000).*

Dilution.	Aertrycke.	"H."	Paratyphoid B.
1 in 250 ...	+	0	+++
1 in 500 ...	+	0	+++
1 in 1,000 ...	+	0	+++
1 in 5,000 ...	0	0	+++
1 in 10,000 ...	0	0	++
1 in 50,000 ...	0	0	0

VI. Here again there is no need for absorption. This serum is highly differential, and gives the required information by means of agglutination alone.

VII. I also tried an anti-paratyphoid B serum prepared here by immunizing a rabbit against strain "R."

TABLE VI.—*Anti-paratyphoid B Serum, Strain "R."*

Unabsorbed.				Absorbed with Aertrycke.			
Dilution.	Aertrycke.	"H."	Paratyphoid B.	Aertrycke.	"H."	Paratyphoid B.	
1 in 100 ...	+++	+	+++	0	0	+++	
1 in 500 ...	++	+	+++	0	0	+++	
1 in 1,000 ...	0	0	+++	0	0	+++	
1 in 5,000 ...	0	0	+++	0	0	++	
1 in 10,000 ...	0	0	+++	0	0	++	

I combine in the one table (VI) the results obtained with this serum in the unabsorbed and absorbed condition. It will be seen that the serum is highly specific, and might serve to at once distinguish between paratyphoid B and *Aertrycke*. Absorption removes the very last trace of the non-specific agglutinins, while the specific ones persist in well-nigh full force. The diagnosis of strain "H" as an *Aertrycke* or *suipestifer* is thus placed beyond all doubt.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, 1915, vol. ii, p. 782. ² *Journal of Hygiene*, vol. xi, 1911, p. 24. ³ *Ibid.*, vol. vi, 1906, p. 40. ⁴ *Ibid.*, vol. xi, 1911, p. 68. ⁵ *Kolle and Wassermann's Handbook*, second edition, vol. iii, p. 1005, et seq.

PERCHLORIDE OF MERCURY POISONING BY ABSORPTION FROM THE VAGINA.

BY

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THE unusual mode of administration of the poison makes the following case of interest.

An unmarried woman, aged 27, who had been in the habit of using mercury perchloride tablets dissolved in water as a vaginal douche, inserted one tablet (hydrarg. perchlor. gr. 8.75 in each) into the vagina, apparently under the impression that it would serve the same purpose as when dissolved and used

as a douche. This was done at bedtime. I first saw her when she called at my consulting-room at 10 o'clock the following morning, complaining of pain and swelling of the vulva and giving a frank statement of what she had done.

I ordered immediate free douching with warm water. I saw her again at 1 p.m., and found that severe cramping pains in the abdomen had set in, accompanied by diarrhoea, followed later by severe and persistent vomiting. It is interesting to note that on examination I found the vaginal mucous membrane practically unaffected, though the external genitals were congested and oedematous.

At 7 p.m. I saw the patient again, when the symptoms were worse. The diarrhoea, pain, and vomiting continued; nothing would remain in the stomach; egg water was given without success. Hypodermic doses of morphine, gr. $\frac{1}{2}$, from time to time had little effect.

The following day a considerable quantity of blood was being passed in the motions, together with small flakes in the vomit. The patient complained of thirst, and was very somnolent. There was suppression of urine. On the third day the gums were swollen, inflamed and spongy, and of a dark colour, while the breath was fetid. Diarrhoea, pain, and vomiting continued persistently.

By the fourth day the pulse, which had up till then continued strong, began to waver. The salivary glands were swollen, and there was considerable salivation. The symptoms continued during the fifth day, and on the sixth day the patient showed signs of collapse, and died in the evening.

Post-mortem Examination.

The case was reported to the authorities, and Professor Harvey Littlejohn performed a post-mortem examination. The following conditions were found:

Skin.—Generally slightly jaundiced.

Heart.—Muscle pale and flabby. Both ventricles dilated, with resulting valvular incompetence.

Lungs.—Oedematous and deeply congested.

Stomach.—Mucous membrane showed slight signs of irritation and a few small hæmorrhages.

Intestines.—The upper part of the small intestine showed swelling of the mucous membrane, injection, and a general catarrhal condition. The whole of the ileum was deeply livid in colour externally, while internally the mucous membrane was of a uniform brownish-green colour, swollen, and in a necrotic condition. Here and there there were tumefied areas, with extensive blood suffusions under the mucous membrane, which were undergoing gangrenous ulceration. The necrosis was more marked in the lower part of the ileum and caecum. The contents of the small intestine consisted of a dark-brown fluid, apparently altered blood and mucus. The large intestine presented similar appearances, with marked infiltration of the submucosa.

Liver.—Some cloudy swelling, but otherwise appeared normal.

Spleen.—Engorged and somewhat enlarged.

Kidneys.—Enlarged and soft in consistence. Cortex pale and swollen. The capsule stripped easily. The medulla showed areas of congestion.

Pancreas.—No obvious changes.

Uterus.—There was no enlargement. There was no peritonitis.

Microscopic Examination of Tissues.

Microscopic examination of the intestine, kidney, and liver was carried out at the Pathological Department of the University of Edinburgh by Mr. R. Muir. The following is his report:

Large and Small Intestine.—Sections show extreme and extensive necrosis of the mucosa. Large numbers of intestinal bacteria have found this necrotic surface a suitable medium for their growth, large masses of these being found. The sub-mucosa is swollen and extensively infiltrated by fibrinous exudate, especially in the small intestine, with some areas of leucocytic infiltration. This coat also shows marked necrosis, recognized by the complete loss of the nuclear staining reaction. The muscular coats also show necrosis, the fibres showing a hyaline degeneration with loss of nuclei. There is some cellular infiltration of the peritoneal coat, but this is not a marked feature. There are also present throughout these coats deposits of pigment, probably derived from blood. These have no special relation to any particular tissue, and may be post-mortem. The whole condition is intensely necrotic with fibrinous infiltration.

Kidney shows extensive necrosis and catarrh of the renal epithelium of all the secreting tubules, especially in the convoluted series, many of these degenerated epithelial cells showing very marked granular degeneration going on to calcification. This calcification is very irregular in distribution among the tubules; the granules vary in size and have a strong affinity for the basic stains. The collecting tubules do not show so much necrotic change, but they contain granular and hyaline casts. The connective tissue of the renal substance is not much altered and the capillaries in the tuft show some slight thickening of their walls, but no necrotic change. The condition of the kidney is mainly that of intense parenchymatous degeneration going on to calcification.

Liver on the whole shows no gross changes, in fact it is extremely well preserved tissue. There is some degree of congestion and also some slight pigmentary deposit in the hepatic cells which at parts show some slight fatty degeneration. A striking feature is the well-preserved appearance of the liver cells, with numbers of nuclei undergoing mitosis. It suggests

to me that the poison has only acted as a mild stimulant to the liver tissue and has had no toxic effect.

Although many cases of poisoning have occurred from the use of mercury perchloride as a vaginal douche, I am not aware of an instance in which the circumstances were similar to the present case. It is interesting also to note the typical nature of the symptoms produced and the manner in which mercury picks out the lower end of the small intestine, the caecum, and the ascending colon as its selective site. The suppression of urine and the evident changes found in the kidney tissue show the marked action of mercury on this organ. The medico-legal aspect of the case is also of importance.

I am greatly indebted to Professor Harvey Littlejohn for his assistance in compiling the notes of the case.

CASE OF PUERPERAL SEPTICAEMIA TREATED BY AUTOGENOUS VACCINE, WITH RECOVERY.

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THE following case presents features of both clinical and bacteriological interest:

Mrs. M., aged 28, was delivered of twins on February 3rd, 1916. Two years ago I had delivered her with forceps of her first child, and fully a year ago I curetted her for an incomplete abortion.

There was nothing very unusual about the labour, the first presentation being a footling ending in a breach, and the second a vertex. The children weighed 5½ lb. and 5 lb. respectively. There was a slight tear of the perineum. The patient continued well until the afternoon of the eighth day, when she felt hot and flushed. On the following morning she complained of rheumatic pains behind the left shoulder. She felt sick, and vomited freely. The temperature was 101° F., and the pulse 100. The lochia was not fetid. The uterus was firm and well involuted. There was no abdominal tenderness. The milk secretion was free. She had a superficial inflammation of the gums associated with a few carious teeth. Quinine salicylate, combined with Dover's powder, was prescribed. In the evening the temperature was 102° F., and during the following two days it ranged between 101.5° F. and 103° F. Rheumatic pains in the left shoulder and in the bursa over the left elbow were prominent symptoms. On the fourth morning of her illness she was given a vaginal douche. In the evening her temperature had fallen to 100° F., and she felt decidedly better. For two days thereafter there was no pyrexia. On the morning of the seventh day of her illness, however, the temperature had risen to 104° F., and the pulse-rate 120 to 130. There was now severe pain and tenderness associated with some swelling over the left suprapatellar synovial pouch. The milk secretion had practically ceased. Quinine sulphate was prescribed freely. During the next six days the temperature ranged between 103.5° F. and 105° F., and the pulse-rate from 120 to 140. She had five severe rigors, occurring chiefly at night. There was also pain in the right groin. The inguinal glands were slightly enlarged and were associated with a pustular eruption on the pubis. Quinism developing, the administration of the drug was stopped. On the ninth and eleventh days of her illness 20 c.cm. and 25 c.cm. of antistreptococcal serum were given and on the thirteenth day 25 million of streptococcal vaccine (from a fatal case of puerperal septicaemia) were injected.

Meanwhile, an autogenous vaccine was prepared from her own blood, the culture being a pure growth of a short chained diplo-streptococcus. Of this 25 million organisms were injected on the sixteenth day of her illness, and on the eighteenth day 50 million. Every third day thereafter she was given 50 million until near the end of her illness, when she had 75 million. The course of the temperature during the remainder of her illness is indicated in the chart. A curious feature in the case is the rise of temperature (marked X) on the morning of the

twenty-fourth day of her illness to 102.8° F. This was associated with a well-marked, fine, but discrete papular rash of scarlatiniform type, appearing first on the face, chest, and upper extremities, and on the following day, but less pronounced, on the lower part of the body and lower extremities. There was no erythema, urticaria, or itching, as frequently found in serum rashes. Desquamation occurred after the rash had gone. Shortly afterwards there was a fall in temperature, with a subsequent rise associated with abscess formation in the bursa over the right shoulder. After this was opened the temperature gradually fell to normal. She also had a dry, angry-looking herpetic eruption at the left angle of the mouth, which was not of the vesicular type as met with in most febrile diseases. She made an excellent convalescence, and is now in good health.

The source of infection is somewhat obscure, but clinically I am inclined to regard the case as one of scarlet fever which had developed during the puerperium. The organism has microscopic and cultural characteristics more in common with the organism described by W. Mair in the *Journal of Pathology and Bacteriology* (vol. xix, No. 3), in his article on "Experimental scarlet fever in the monkey," than with the ordinary *Streptococcus brevis* of the mouth. A similar organism I have since isolated from cervical and axillary glandular abscesses occurring in scarlet fever patients treated by the Milne method in their own homes.

The patient was treated in a house of one apartment, in which there also lived and slept her husband, mother, the twins, and for a time, her first child. There was no previous history of the patient having suffered from scarlet fever.

I am much indebted to Nurse Allan (the maternity nurse of the burgh), who attended the patient from the second day of the puerperium and throughout the illness, and also to Dr. John Anderson (bacteriologist to the Victoria Infirmary) for his services as clinical bacteriologist in the case.

A NEW SOLID MEDIUM FOR THE ISOLATION OF THE CHOLERA VIBRIO.

By CAPTAIN H. GREME GIBSON, R.A.M.C.

BASED on the fact that the cholera vibrio alone of all the intestinal organisms acidifies starch, the following alkaline medium has been devised for its rapid isolation.

Owing to the medium possessing differentiating properties it should be especially useful in the detection of "cholera carriers," as the faeces emulsified in broth can be plated directly on to it. In the case of water examination, after enrichment in peptone water for a few hours, if a drop or two of the peptone water is plated a tentative diagnosis can be arrived at in eighteen hours owing to the allied vibrios taking a longer time than the true cholera vibrio to bring about acid production.

Preparation of Medium.

The formula is: Agar 30 grams, peptone 10 grams, starch 10 grams, sodium bicarbonate 1.5 grams, litmus (sufficient to colour medium), and water 1,000 c.cm.

Weigh out 30 grams of powdered agar and emulsify with 250 c.cm. of cold water. Then weigh out 10 grams of peptone (Chapoteaut) and 1.5 grams of sodium bicarbonate. Mix together and emulsify in another 250 c.cm. of cold water. The two emulsions are then mixed in a two-litre flask and another 500 c.cm. of water added. The solution is complete in the steamer. When dissolved the medium is clarified with white of egg and filtered in the steamer.

Weigh out 10 grams of potato starch, emulsify it with some of the filtered agar, and add the emulsion to the remainder of the medium.

The whole is sterilized by the fractional method, after which enough sterile watery solution of litmus is added to bring about a blue colour of the medium.

The final reaction of the medium will be found to be -2 to phenolphthalein. I tried several degrees of alkalinity and found that 0.15 per cent. sodium bicarbonate gave quite the best results.

If the plates are examined eighteen hours after inoculation, by looking obliquely through them with a dark background behind, the plate being held parallel to the window, the cholera colonies will be seen to have acquired a faint pink colour, while the colonies of the other intestinal organisms are blue or of a whitish colour. The examination is facilitated by the use of a hand lens. At this time the allied vibrios also produce blue colonies, but at the end of about thirty-six hours they also acidify the medium, though to a less extent than cholera.