amount of meningo-myelitis, these changes being most marked in the lower parts of the cord.

[Fig. 4.—Section through the dorsal region. A. Anterior median fissure. B. Posterior median fissure. C. Column of Goll, much atrophied. Fasciculus of Burdach partly sclerosed. E. Antero-lateral column showing commencing sclerosis as yet limited to the crossed pyramidal and direct cerebellar tracts.

Fig. 5.—Section through the lumbar region. A. and B. Same as before. C. and D. Columns of Goll and Burdach, much atrophied. E. Sclerosis of lateral columns. G. Posterior roots, atrophied.

The lesion in Friedreich's ataxia is, therefore, a combined sclerosis of certain tracts in the posterior and lateral columns of the cord, together with the vesicular columns of Clarke in the grey matter and the posterior nerve roots.

Now, though in advanced cases, such an extensive development of the sclerosis may be met with, the primary lesion is a sclerosis of the posterior columns and vesicular column of Clarke, as has been proved by Déjerine and Letulle, who have also shown that all the other parts affected, namely, the direct cerebellar tract, the crossed pyramidal tract (?), Gowers's tract, the mixed ascending tract, the column of Turk, and the posterior nerve roots, are only involved in the later stages of the disease, and due to the meningo-myelitis, more marked in the lower part of the cord, and differing in the character of the sclerosis from that of the posterior columns.

According to Déjerine and Letulle the sclerosis of the posterior columns in Friedreich's ataxia is essentially different from that of locomotor ataxia, and, indeed, from every other sclerotic lesion. "It is a pure neuroglial sclerosis" (see Fig. 6). In it one sees fibres crossing one another in different directions, forming true whorls, and that the processes of the pia mater passing into the cord are perfectly normal. The whorls are composed of fine long fibres, running for the most part horizontally or obliquely at very acute angles, and in the midst of these whorls are seen some remaining nerve fibres, lying horizontally and obliquely, not cut trans-

versely, as is the case in all other sclerosis, where the degenerate nerve fibres are cut transversely, and the new development of fibrous tissue is in the course of the blood vessels or pia matal processes or nerve tubes. This proves the lesion to be associated with the earliest development of the cord, and not a lesion following on the fully developed cord.

Fig. 6.—Transverse section through the posterior columns at level of lumbar enlargement, after preparation by Dr. Byrom Bramwell. A. Posterior median fissure with blood vessel cut transversely. B. Whorls of fibres cut longitudinally. C. Fibres cut transversely.

It is only in the posterior columns of the cord that this particular form of sclerosis is met with. In the other parts affected, the sclerosis is the same as is found in other diseases, such as locomotor ataxia, cerebro-spinal sclerosis, etc.

It is still questionable whether the crossed pyramidal tracts are not primarily involved, as some of the earliest symptoms of the disease, such as the foot deformity, which is presumably due to the affection of the crossed pyramidal tract, seems to point to this part being primarily affected.

But for a full account of the disease and the points still unsettled, I would refer you to Dr. Byrom Bramwell's *Atlas of Clinical Medicine*, from which I have derived much of the above account of the pathology of the disease.

SERUMTHERAPY IN PUERPERAL SEPTICÆMIA.

WITH A TABLE OF CASES.

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As the number of recorded cases of puerperal septicæmia which have been treated with antistreptococcic serum is still small, it is highly desirable that all such cases should be published, in order that a true estimate of the value of this treatment may be made, and rules laid down for guidance as to the dose, time, and frequency of administration, and the selection of cases in which it will be of most benefit. To the following abstract of the notes of 3 cases in which I have used the antistreptococcic serum, I have appended a table of 23 cases so treated, collected from various publications, showing the date of onset of the malady, the date of the first injection, the number of injections, with the quantity injected and the result.

In no case can it be said with certainty that the treatment was followed by ill-effect which could directly be attributed to it. Gaulard thought that the fatal result of his second case was due to an overdose of serum, but as Dr. J. D. Williams¹ pointed out, this was most probably a mistaken view, and it may be seen from the table that in several cases more than twice the quantity Gaulard gave has been administered without harm. In fact, in Kennedy's case, the quantity given as the initial dose equalled the quantity given by Gaulard in four injections. In Dr. Williams's second case the patient

Reporter.	Date of Onset.	Date of First Injection.	Number of Injections and Quantity injected.	Other Treatment and Results.
Leask. BRIT. MED. JOURN., vol. i, 1896.	7th day.	11 days after confinement	1 injection, 4 c.cm.	Intrauterine douches. Recovery
Gaulard, (1) <i>Presse Méd.</i> , November 30th, 1895. Two cases.	7th day	13 " "	2 injections { 1st, 10 c.cm. 2nd, 2 c.cm.	Uterus curetted, and packed with iodoform gauze. Recovery.
Vinay, (2) <i>Lyon Méd.</i> , 1896. Four cases.	2nd day	4 " "	4 injections, 10 c.cm. each.	Uterus swabbed with creasoted glycerine. Death.
Jacquot, (1) <i>Presse Méd.</i> , May, 1895.	Not stated	2 cases { 22nd day 25th day 2 cases, not stated	Not stated.	General condition improved and temperature lowered. Death.
T. C., BRIT. MED. JOURN., July, 1896.	3 days	7 days from confinement	1 injection, 10 c.cm.	Intrauterine injections and quinine. Recovery. Relapse thought to be due to fresh infection from a case of erysipelas
McKerron, (1) BRIT. MED. JOURN., October, 1896. Three cases.	9 days	15 " "	3 injections, 10 c.cm. each	Iodine douches and flushing curette used before injection. Death.
	2 days (2)	8 " "	4 " 10 c.cm. "	Sublimate douches and quinine. Recovery.
	4 days (3)	8 " "	3 " 10 c.cm. "	Intrauterine douches. Death.
Kennedy, <i>Lancet</i> , vol. ii, 1895.	4th day	19th day	2 injections { 1st, 40 c.cm. 2nd, 45 c.cm.	Vaginal douches previously. Intrauterine douche after injection. Recovery
Williams, (1) BRIT. MED. JOURN., vol. ii, 1896. Six cases.	7th day	11th day from confinement	2 injections { 1st, 10 c.cm. 2nd, 20 c.cm.	Recovery
	Between 2nd and 5th days (2)	8th " "	2 injections { 1st, 30 c.cm. 2nd, 30 c.cm.	Perchloride douches. Recovery
	8th day (3)	14th " "	1 injection, 35 c.cm.	Perchloride douches. Recovery
	2nd day (4)	5th " "	2 injections { 1st, 30 c.cm. 2nd, 30 c.cm.	Recovery
	3rd day (5)	7th " "	1 injection, 28 c.cm.	Recovery
	Early (6)	10th day	3 injections { 1st, 20 c.cm. 2nd, 20 c.cm. 3rd, 20 c.cm.	Death
Adam, BRIT. MED. JOURN., vol. ii, 1896.	Before 7th day	11th day from confinement	11 injections { 1st, 5 c.cm. 2nd, 4 c.cm. 3rd, 10 c.cm. 4th, 10 c.cm. 5th, 13 c.cm. 6th, 17 c.cm. 7th, 10 c.cm. 8th, 8 c.cm. 9th, 10 c.cm. each 10th, 10 c.cm. " 11th, 10 c.cm. " 107 c.cm. altogether	Antiseptic douches. Complicated by enteric fever, following on 28th day. Recovery
Sheen, BRIT. MED. JOURN., vol. ii, 1896.	Immediately	7th " "	injections { 1st, 10 c.cm. 2nd, 10 c.cm. 3rd, 20 c.cm.	Curetting and intrauterine douches. Death from pneumonia, which had set in prior to the serum treatment
Butin, (1) <i>Journ. de la Soc. Méd. de Lille</i> , 35, 1896. Two cases.	Not stated	7th " "	5 injections amounting to 9 c.cm.	Sublimate douches and iodoform crayons introduced into uterine cavity. Recovery
	Not stated (2)	At once	Not stated	Recovery. Disease cut short

developed a patchy pneumonia on the seventeenth day, which the medical man in attendance thought might be due to the serum; and Dr. Williams suggested two explanations: First, that possibly the serum was imperfectly filtered, and living streptococci were injected; if this were so one would rather have expected an abscess at the site of the injection, but no mention is made of this having occurred; secondly, that an efficiently-filtered serum might give rise to the pneumonia. I can find no record of this having occurred in the other cases, in several of which a larger quantity of serum was used.

Those cases in which the serum was injected soon after the onset of symptoms and in a fairly large initial dose, appear to have done best. When the treatment has been delayed, convalescence has been more protracted.

The table shows that the earlier the onset of the disease after parturition the more severe the symptoms. In all the fatal cases the symptoms began early. It would probably be

best in such cases to give a large initial dose (30 c.cm. or more) as soon as the diagnosis is established. Of the total number of 26 cases, 16 recovered, 10 died; these 10 deaths, however, include Vinay's four cases in which the treatment was not adopted till very late, and although he states that benefit was derived from the serum, organic lesions were already established which caused death. Excluding Vinay's cases, there were 6 deaths to 16 recoveries—a mortality of 18.18 per cent.

The antistreptococcal serum being only of value in streptococcal infection, a bacteriological examination of the uterine discharges should, when possible, be made in order to determine the presence or absence of the streptococcus. The use of the serum in no way dispenses with the necessity for local treatment (curetting, douching, etc.), as probably in all cases of puerperal septicæmia there is a mixed infection and other organisms besides the streptococcus pyogenes are present in the uterus and capable of causing a fatal toxæmia if their growth is not prevented.

CASE I.—Mrs. B., aged 34, 11 para, has had bad health during the whole of pregnancy, with considerable leucorrhœa. She was attended in her confinement by a qualified midwife from the Plaistow Maternity Charity. Confined October 11th, 1896. Breech presentation, which presented no difficulty. In the evening of the day of her confinement her temperature was 103°. I saw her on October 13th, and found the temperature 103°, pulse 120, skin hot and dry, tongue moist with white fur; abdomen distended; uterus on a level with the umbilicus and tender on pressure; lochia normal in quantity and not offensive. Ordered perchloride douches and quinine. October 14th. Morning temperature 102.8°; pulse 120 and of good quality; general condition the same. Gave injection of 10 c.cm. antistreptococcic serum. In the evening the temperature had risen to 103°, the abdomen was more distended; another injection of 20 c.cm. serum was given. October 15th. Morning temperature 103.8°. Uterus smaller and not so tender, abdomen softer, general condition the same; 10 c.cm. serum injected; evening temperature 104°, pulse 130; 10 c.cm. serum injected. October 16th. Morning temperature 103°, evening 104°; general condition worse. No more injections given. Died same evening. No bacteriological examination made.

CASE II.—Mrs. B., aged 30, a thin, anæmic woman, who has been in a bad state of health lately. Confined October 29th, 1896; placenta prævia, from which there had been considerable hæmorrhage before I was summoned. All went well till November 1st, when she had a slight rigor and her temperature rose to 103°. With intrauterine douches of mercuric chloride she did well till November 5th, when, owing to illness, I did not see her till November 9th. During my absence the douches were omitted for thirty-six hours, and the lochia became offensive, the temperature rising to 105°. November 9th. Morning temperature 101°, pulse 112. Gave 20 c.cm. antistreptococcic serum. A cover-glass preparation of the lochia taken direct from the uterus by means of a speculum showed long chains of streptococci. Evening temperature 102.6°. November 10th. Morning temperature 99.4°, pulse 108. Patient's general condition good and takes food well. Another 20 c.cm. serum injected. Evening temperature 102.6°. Douches continued. November 11th. Morning temperature 101.4°; 10 c.cm. serum injected; has slight diarrhœa. November 12th. Morning temperature 100.2°, pulse 108. General condition improving; the douches to be discontinued. Evening temperature 101°. November 13th. Morning temperature 99.8°, evening 100°. Diarrhœa ceased and patient doing well. From this date the patient's recovery was steady and uninterrupted.

CASE III.—Mrs. K., aged 35, miscarried February 2nd, 1897, at the third month. Had no assistance at the time, and has had considerable hæmorrhage since according to her own account. February 9th. Patient sent to the Maternity Charity for help as she was feeling very ill. She was seen by Dr. Geddes, the resident medical officer, who found her with an offensive vaginal discharge and a temperature of 102°. Some fragments of decidua which protruded from the os uteri were removed and an iodine douche given. In the evening the temperature rose to 105°, and I saw her with Dr. Geddes. I found that the patient had a retroflexed uterus, and that the fundus contained a quantity of decomposing fragments of decidua, which were removed with the curette and a perchloride intrauterine douche given. February 10th. Morning temperature 101°. Patient comfortable; uterus smaller and os closing; very little discharge. In the evening the temperature rose to 102°, and, as an examination of the lochia revealed the presence of streptococci, 10 c.cm. of antistreptococcic serum were given. February 11th. Morning temperature 100°; evening normal. Recovery uneventful from this date.

REFERENCE.

1 BRITISH MEDICAL JOURNAL, 1896, ii, p. 1285.

CASES OF ABDOMINAL SURGERY.

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THE following cases of abdominal surgery which have occurred in my practice appear to me to be worth recording:

CASE I. *Polypus Uteri: Ovarian Abscess*.—E. B., aged 36, a thin, dark woman of medium height, cook. Anæmic, came to hospital first October 11th, 1894.

Menstrual History.—Commenced at 12 years; has returned every 14 days since commencement. Always much premenstrual pain, passing off as period develops; amount always free. At 16 years of age lost blood for six months constantly.

Married at 18 years; first child at 24½ years; 3 children. One miscarriage; always flooded before and after confinements. First confinement easy—got up well. Twelve months later had abortion; missed five weeks, in bed three weeks with inflammation. Got up for two days, and had to go to bed again for sixteen weeks. Second child at 26 years; child 8 months—nearly flooded to death. Placenta came away of itself 15 hours later. Third child at 28 years; full time. Regular menstruation during first three months of pregnancy. Tedious labour. Membranes ruptured three days before birth; was in bed one month with "windy spasms." Flooding more or less every fortnight for six months. Has occasionally "dribbled" since then for five or six weeks at a time. Fourteen days before coming to hospital had severe shivering attack. Two months ago flooded for fourteen days.

October 28th. Has lost no blood since coming to hospital until last week. Period lasted three to four days—one napkin per day. Uterus retroflexed, small polypus with narrow stalk protruding from os. Fundus somewhat fixed; muco-purulent discharge from os. Iodine tampons, later changed for pure glycerine.

November 4th. Menstruation; lasted three days.

November 11th. Menstruation; three to four napkins per day—lasted six days.

November 22nd. Under chloroform. Uterus dilated. Polypus which springs from cervix half an inch above os, twisted off. No further abnormality found. Uterus normal size; appendages apparently healthy.

November 25th. Has had slight coloured discharge since; looks and feels better.

December 7th. Period, which lasted a week with free loss, some pain; tenderness over posterior uterine surface.

December 12th. Left hospital much improved. Returned August 25th, 1896. Has been well until about August, 1895, since which time she has had metrorrhagia at intervals.

September 5th. Uterus curetted. Small amount of granulation tissue removed.

September 27th. Under chloroform; examination shows normal uterus, but a firm elastic mass on the left side, apparently size of little finger.

October 2nd. In the Trendelenburg position, laparotomy was performed. On the left side, a tense tumour, the size of a small orange, composed of Fallopian tube and ovary, was found very adherent to the posterior surface of the broad ligament. The ovary was converted into a pus sac, with—in places—very thin walls. One of these ruptured during removal, and pus escaped, but was caught by sponges packed below. The tube was closed at both ends, and was greatly distended by serous-looking fluid. After removal, the peritoneum was united over the raw surfaces, and abdomen closed by triple suture. No drainage. The temperature, which was 102.6° on the morning of the operation, fell to 97.4° after operation, with a pulse of 88 and respiration 24. At 6 P.M. it was normal; pulse 92, respiration 14. During the next eight days it never rose beyond 99°. Pulse usually 80 to 90, and respiration 16 to 20. She passed flatus by the rectum tube the next night, but was much troubled by flatulent distension until October 5th. As the bowels did not act, one-grain doses of calomel were given every hour for six hours, followed by tartrate of soda, and simple enema, which was followed by an action.

On October 5th menstruation (?) commenced, and continued with considerable loss until the 13th without pain. Was treated at first by plugging, but as it persisted, and the patient began to thin rapidly, a tupelo tent was introduced on the 12th, and the uterus curetted on the 13th, bringing away some deciduous-looking material from the right cornu. The uterus, as a whole, was somewhat fixed towards the left side, and could not be drawn down. The uterine interior was lightly plugged, as was also the vagina.

October 17th. There has been no more bleeding since curettement.

October 23rd. Some little bleeding occurred on the 21st and 22nd. October 29th. No further bleeding. Has put on flesh considerably, and is always hungry. Discharged.

CASE II.—*Extrauterine Pregnancy: Incomplete Removal owing to Collapse: Recovery*.—A. L., aged 23, sent by Dr. Carruthers, Openshaw.—Restaurant waitress. Medium height, blond, well-developed. Admitted December 22nd, 1896. Mother died, 55 years, uterine cancer; father died, 45 years, cerebral tumour. Has always been healthy except for rheumatic fever four years ago. Has had one child twelve months since. Confinement normal, but placenta torn; in bed ten days. Present illness dates from confinement; has been short of breath and troubled by flatulence. After confinement went back to work for four months. Periods returned, and were regular until one month ago, when she began to have continuous discharge of blood. There was pain in front, with a pressing sensation downwards in both inguinal regions. After coitus there was discharge and pain, with discharge of a dirty-watery character during the next day. Three weeks since, she stood for some time in the market with wet feet, caught a severe cold; the discharge of blood stopped for three days, during which time she was in bed. She got up again; the discharge returned, but after being about for a week she was obliged to return to bed again on account of great pain.

December 29th. Under chloroform; the uterus was dilated, and the interior found apparently normal. Behind and to the right is a large, tense, hard mass, apparently inseparable from the uterus.

January 5th. Operation. In the lithotomy position, the bladder was separated from the uterus, and the uterine arteries tied. The patient being placed in the Trendelenburg position—easily done on a Stockholm table—the abdomen was opened in the median line. A large mass was found in the right broad ligament, bulging into Douglas's pouch, and entirely superitoneal. To its upper surface omentum and one loop of small intestine were firmly adherent. The peritoneum being divided and the uterus freed on the left side, it was attempted to shell out the mass with the uterus to which it was fixed. Its wall was too friable to permit of this being done without yielding, and about two pints of brownish-red fluid escaped; no fetal structures found. This did not, however, touch the peritoneum, which was protected by sponges. When empty, the cavity was felt to extend downwards in the recto-vaginal septum. When the mass was nearly all loosened, the collapse of the patient became so great that it was rapidly determined to draw the whole mass through the vagina, leaving it attached by its posterior portion, close the peritoneum as quickly as possible, with the abdominal wound, leaving the intestinal loop still adherent. As much as possible of the tissues so delivered, including the uterus, was tied off and removed, but for a long time sloughs continued to come away. A gauze drain was also placed in the vagina.

January 6th. Patient rallied well, temperature being normal at 6 P.M. It rose on the 6th to 101°, and on the 9th to 101.8°, after which there was a long period of high and irregular temperatures lasting nearly seven weeks. Some chloroform sickness, but began to take food after twenty-four hours.

January 8th. No sign of peritonitis. Drain removed; some offensive smell. Bowels moved after enema; urine passed naturally.

January 9th. Some sloughs removed. Has been irrigated with perchloride five times daily. Bowels moved thrice; pulse soft and regular; abdomen supple. Slept well; temperature 102.6°.

January 14th. Large slough removed. Small amounts have been removed daily since last note. Smell very offensive; sloughs black. Remaining surface looks healthy. Patient very restless and difficult, disturbing everyone in ward; temperature 102.4°. Bowels rather constipated; urine passes easily. No frequency.

January 17th. Some pus. Still a small slough in left upper extremity of vagina. Smell much less; face flushed, no rigors, appetite fair.

January 22nd. Small amounts of slough washed out still. Vagina is somewhat excoriated above. Finger enters small cavity, which would