unbroken vesicles. These gave the cultural characters of *Staphylococcus pyogenes aureus*, but grew rather more abundantly on culture media than a virulent strain with which they were compared. They were not virulent for rabbits. Harman was much impressed by the resistance to heat, to the effects of drying, and to the action of corrosive sublimate possessed by his cultures, but this was not, I think, greater than has been met with in some strains of staphylococci.

The epidemiology of veld sore was carefully studied by Harman, but he could find no indication that the infection spread from one to another among the troops, and barcoo rot affects men living in solitude. Neither disease seems to be associated with particular occupations. It would seem probable that barcoo rot, and possibly veld sore too, is due to the infection of the epidermal structures with staphylococci of low virulence, such as abound upon the skin. In barcoo rot the infection of hair follicles is apparently the common way in which it begins, and the usual manner in which it spreads at the margin of the ulcer.

Harman's view of the pathology of veld sore I take to be that under ordinary nutritive conditions the skin cocci of low virulence are not able to "make good" against the local defences, but that in the case of men too long upon a restricted diet the defence is weakened, and they are able to infect the epidermal structures but not the true skin. He regards it, in fact, as a minor scorbutic manifestation. This may well be, but improper dressing and neglect of the sores also play an important part, for I have seen them heal up rapidly under appropriate dressings when no improvement in diet was possible. The fact recorded by Harman that the African natives did not suffer whereas the Boers did suggests, however, that lack of washing and of simple surgical dressing is alone an inadequate explanation.

Treatment of Barcoo Rot.

In hospital the ulcers generally heal up slowly under any sort of wet antiseptic dressing, but are very difficult to deal with in the field. A wet dressing is unhandy when a man has to go about his business and it is difficult or impossible to change it sufficiently frequently. Moreover, in a hot climate it soon becomes converted into a dry dressing and adheres to the ulcer.

Harman found that if the ulcers were thoroughly cleaned up, powdered with calomel and covered with cotton-wool, the last being affixed by strapping, good results followed. This method is satisfactory for small ulcers, but the cleaning up must be very efficiently performed.

In view of the observations on the pathology of barcoo rot described above, it seemed not unlikely that the infection of the hair follicles was largely responsible for the continuance of the ulcerative process in the centre, and its progress at the margins of the ulcer. An infected hair follicle is like a foreign body, and healing will not occur until it is either sterilized or ulcerated out. Acting upon this idea I removed the hair or hairs traversing the early blebs, and found that these healed straight away. The patients soon realized the efficacy of early removal of the hair follicles in suppressing these secondary infections, and undertook this part of the treatment themselves. Next, working on the principle employed to restrict a bush fire by burning an area in front of it, I attacked the larger ulcers, removing the hairs from their base and around their margins, and was pleased to find that the ulcerative process was stayed, and healing commenced at once.

The extensive ulcers in the floors of which no epithelial structures remain, naturally take a long time to heal, but this period Captain Maclure abbreviated by the transplantation of numerous snippets of skin from the abdomen.

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A SIMPLE DEVICE FOR THE GROWTH OF ANAEROBES ON PLATES.

BY

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MUCH of the confusion that exists in the literature on anaerobes is due to the difficulty of growing these organisms in pure culture. In the case of most aerobic organisms a plating out process is a relatively simple operation, and but little trouble is experienced in getting pure cultures of any organism provided that the medium used be suitable for its growth. The anaerobes, on the other hand, exhibit symbiosis to an extraordinary degree, so that an apparently pure culture of one organism, which gives fixed and regular reactions through a series of sub-cultures, may yet prove in the end to be contaminated. The *B. enteritidis sporogenes* of Klein, for example, was ultimately found to consist of a non-motile sugar-splitting organism together with a motile proteoclast; and there are doubtless other instances of this confusion to be found in the literature on anaerobes.

All the anaerobes we have so far isolated from wounds belong to one or other of two main groups. They are either sugar fermenters or they are protein digesters, and it has been found possible by varying the constituents of a nutrient medium to encourage the development of one or other type of organisms. Thus a mixture containing *B. welchii*, when planted into a medium containing sugar fermentable by this organism, will yield a culture in which *B. welchii* preponderates, and in which the development of other organisms is at first held in abeyance. By a series of replants in such a sugar-containing medium at suitable intervals—a process, that is, of intensive culture—it becomes possible to get a relatively pure growth of *B. welchii*. This result, however, marks but the first stage in isolation, and the subsequent purification of the culture can be effected only by repeatedly picking off isolated colonies from the surface of some solid medium. Slopes in tubes are inconvenient for the purpose, and recourse must be had to plates.

There are two methods in general use for putting up anaerobic plate cultures. In the first the plates are placed in some air-tight receptacle from which oxygen is removed by absorption, by exhaustion, or by combustion with hydrogen. This method has its disadvantages in that the receptacle is as a rule bulky, and takes up much space in an incubator. It is, moreover, difficult to determine the progress of growth without opening up the whole apparatus.

The second method consists in the incubation of each culture plate separately, and the device which embraces this principle, and which is perhaps best known to British workers, is the capsule devised by McLeod. This consists of a glass plate of special design superimposed on a porcelain receptacle containing pyrogallic acid and soda. The apparatus is very efficient, but it has the disadvantage that the amount of available surface space is small, and also that it is not always easy to see the colonies against the white background of porcelain.

The device herein described is a cheap and practical application of the second principle so as to use the material that can be found in any laboratory. Drugs in powder are now exported to France in cardboard cylinders, which are provided with metal tops and bottoms. These can be found in any hospital dispensary. The metal top consists of a circular disc or lid, which when pushed down fits tightly into a supporting flange, the principle being one which is used extensively in trade for tins containing paints, enamels, glaxo, etc. The combination of supporting flange and lid (see diagram) presents a circular groove or trench on both its upper and lower aspects, and so forms a suitable coupling adjustment for the two halves of a Petri dish of suitable size.

The diagram represents the apparatus in cross section, A being the flange and B the lid. The upper surface of the lid B is painted with black enamel, and its centre is occupied by a central aperture, o.

Method of Use.

1. The grooves on both the upper and the lower surfaces of the flange and lid are filled with plasticine. One or two teaspoonfuls of pyrogallic acid in powder are placed in the lower

half of a Petri dish, x, and the metal plate is pressed firmly down on it, so that the edge of the dish is securely embedded in the lower plasticine containing trench. Extra plasticine is added all round up to the level of the dotted line shown in the diagram so as to make an absolutely air-tight lute.

2. The other half of the Petri dish, y, is sterilized in a larger Petri plate in the hot-air oven, filled up with a suitable amount of agar or agar-gelatine, and when cooled is inoculated.

3. Saturated caustic soda solution, 10 c.cm., is poured through the hole o into the plate x, and then as quickly as possible the plate y in an inverted position is pressed firmly down into the upper trench and luted down with extra plasticine all round up to the level of the dotted line shown in the figure.

Organisms thus grow on an agar surface in an air-tight box from which most of the available oxygen is absorbed by sodium pyrogallate. The smearing of the agar surface with alkaline egg-albumen at the time of inoculation greatly facilitates growth. Where difficulty is experienced in getting growth by this method, the organism may be coaxed into giving good surface colonies by a preliminary passage through several subcultures in alkaline meat under paraffin.

The following organisms have been successfully cultured by this method—*B. welchii*, *B. von Hübner IX*, *B. aëro-fetidus*, *B. fallax*, *B. oedematiens*, *B. sporogenes*, *B. histolyticus*, *B. tetani*, *B. paratyphosus coli*, *V. septique*, and others not yet definitely classified.

Advantages of the Method.

1. The procedure is a simple one and requires no special skill.

2. The lid, b, serves a double purpose. It provides a black background against which colonies can be easily discerned, so that the progress of a culture can be watched from day to day. It also prevents soiling of the agar surface with pyrogallate solution.

3. The apparatus takes up very little room in the incubator. A series of cultures can be stacked one on top of the other, and each one can be taken out and examined separately.

4. It is cheap; the tin lids cost but a trifling sum. They are unbreakable, and can be used again and again.

The prepared and blackened metal plates, with or without $\frac{3}{8}$ in. Petri dishes to fit them, may be obtained from Messrs. R. B. Turner and Co., 9-11, Eagle Street, Holborn, London.

I have to thank the Medical Research Committee for placing a supply of these at my disposal.

MELAENA AND HAEMATEMESIS NEONATORUM.

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In this very fatal condition the details of a successful treatment are useful, and for that reason I submit the notes of a case which occurred in my practice:

The mother was a young primipara, and delivered herself of a full term female, weight 8½ lb., length 22 in., after seven hours' labour, on March 16th, at 8 p.m. The family history was good on both paternal and maternal sides.

I saw the child on March 17th, in the morning, and everything was normal. I then left town for twenty-four hours, and did not visit the case again until the following evening. On March 17th, at 5.30 p.m., the baby vomited a little brown fluid. For the next three hours she was very restless. At 9.30 she passed a large tarry motion with streaks of blood through it; at 10.15 she vomited about 3 oz. of red blood. From 10.30 until 11.0 she was very collapsed, with lips and fingers cyanosed. At 11.30 she passed a very large bloody offensive motion. She seemed in pain, and did not sleep more than ten minutes at a time. On the morning of the 18th, as I was away, Dr. Fitzgibbon kindly saw the patient for me. At 9 a.m. she had a very large fluid motion, with blood through it. At midday, horse serum 2 c.cm.

was injected into the loin. Very shortly after this there was a motion containing a large quantity of blood. Some blood was vomited. I saw her at 5.50 p.m., and soon after this there was a large tarry stool. At 10 p.m. horse serum, 4 c.cm., was injected. On this day she had four doses of a mixture containing calcium lactate, gr. 1, and adrenalin chloride 1 in 1,000, one minimi to each dose. She had a restless night, waking every hour.

March 19th. At 3.15 a.m. and 4 p.m., large melaena were passed. She looked better and I decided to wait before giving any more horse serum. However, after the second tarry stool, I injected 5 c.cm. hypodermically. The adrenalin mixture was administered twelve times. She had a good night and slept well.

March 20th. Slight melaena twice—at 3 a.m. and 4 p.m. At 4.45 p.m., 5 c.cm. of horse serum hypodermically; twelve doses of the mixture in the twenty-four hours. She was very restless and evidently in great pain, which was probably due to flatus.

March 21st. In much pain. At 2 a.m. a small rubber catheter was passed per rectum and a large quantity of flatus came away. The chill was taken off the water, which until this day had been given dead cold. There was one small tarry stool.

March 22nd. At 2.20 a.m. the infant was very restless and inclined to cyanosis, and looked as though about to die. Horse serum, 5 c.cm., was given by mouth; this was repeated at 9.30 a.m. She seemed weak through the day, and I decided to give her something stronger than water. I therefore ordered albumin water (one egg to the pint of water) every two hours, which was the first "food" given. This was the sixth day of the illness and the seventh since birth. The mixture was given eight times in the day.

March 23rd. Albumin water 2 oz. every two hours. Mixture eight times. Horse serum, 5 c.cm. twice in the twenty-four hours by mouth. Two motions, improved, but still rather tarry. One pound weight lost in the week.

March 24th. Albumin water during the night. At 8.30 a.m. the first slightly yellow motion. At 11 a.m. rennet whey 2 oz. Serum 5 c.cm. by mouth twice. Two more yellow motions. Rennet whey through the day. The mixture three times.

March 25th. The mother's breasts had been kept pumped in order to continue secretion, and on this day the baby had 2 drachms of breast milk with rennet whey. Serum 5 c.cm. by mouth. Mixture three times in the day. Two motions.

March 26th. Whey and breast milk. Mixture three times daily.

March 27th. Breast feeding only.

After this the baby gradually improved, and is quite healthy to-day.

Many theories have been brought forward to account for intestinal bleeding in the newborn, and I do not intend to enter into a discussion of them here. I believe it possible that one of the unknown toxæmias of pregnancy which circulate in the mother is carried to the child, whether causing a premature gastric secretion as suggested by Dr. Crawford, or in what other way the ulceration is caused, it is impossible with our present knowledge to state. The very large offensive motion which was passed on the first day of the illness was strong evidence for a toxæmic theory. In necropsies on eclamptic patients, hæmorrhages have been found in various intra-abdominal sites. When eclamptic fits occur in infants, when scopalamine can be demonstrated in the urine of the newborn, why should not gastro-intestinal hæmorrhage be caused by a toxæmia carried from the mother to the child while still *in utero*? The starvation treatment which is so successful in cases of maternal toxæmia is extraordinarily successful in a case such as the one described.

STRANGULATION FOLLOWING REDUCTION EN MASSE (LEFT INGUINAL HERNIA): LAPAROTOMY: RECOVERY.

By

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In past years, when taxis was very frequently practised, a case such as the following was not regarded as uncommon. Nowadays it is rarely met with, because earlier operative measures are undertaken. The case is especially noteworthy in that the patient himself apparently performed reduction *en masse*.

C. G., aged 44, was taken ill suddenly on February 5th, 1917, with severe pain in the left iliac fossa and vomiting. The next day he felt better, and no vomiting occurred. The bowels acted properly on February 4th, and by enema on February 6th and 7th. On February 7th he vomited again, and complained