require stimulation. A 10 per cent. aqueous solution is painted over the burn before the application of the paraffin. There is very distinct evidence that convalescence is greatly accelerated by the use of this powerful stimulus to the formation of epithelium; 1 and 10 per cent. have been tried, and in most cases the 1 per cent. has proved sufficient.

Mustard gas burns heal readily by the ordinary application of No. 7 paraffin.

The treatment giving the most satisfactory results, obviating pain, sepsis, and other complications, and which we have found generally applicable, is the preliminary painting of the surface of the burn with aqueous flavine solution 1 in 1,000, followed by the application of No. 7 paraffin. In cases of long duration scarlet-red 1 per cent. is substituted for the flavine solution. We have found rapidity of healing and minimized scarring to be greatly favoured by this treatment.

FORMULAE.

No. 7.

Resublimed beta-naphthol	...	...	0.25 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Vaseline	...	...	25 "
Paraffinum durum	...	...	67.75 "

No. 10. Red.

Scarlet-red	...	...	0.2 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Adeps lanae hydrosus	...	...	4 "
Paraffinum molle	...	...	21 "
Paraffinum durum	...	...	67.8 "

No. 11.

Scarlet-red 0.2 per cent. at expense of paraffin molle. It is difficult to get a good wax which will melt and retain most of the scarlet-red.

No. 12.

Brilliant green	...	...	0.05 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Adeps lanae hydrosus	...	...	4 "
Paraffinum molle	...	...	21 "
Paraffinum durum	...	...	67.95 "

No. 13. Flavine Wax.

Flavine	...	...	0.2 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Adeps lanae hydrosus	...	...	4 "
Paraffinum molle	...	...	21 "
Paraffinum durum	...	...	67.8 "

No. 14.

Dichloramine-T	...	...	0.2 per cent.
Eucalyptus oil	...	...	2 "
Olive oil	...	...	5 "
Paraffinum molle	...	...	25 "
Paraffinum durum	...	...	67.8 "

To make a Kilogram of Paraffin.

Take $\frac{1}{2}$ gram of brilliant green or 2 grams of scarlet-red or flavine, and 40 grams of lanoline, rub up the coloured material with the adeps lanae hydrosus until a highly-coloured smooth paste is obtained which contains no undisintegrated particles of the dye; using about half an ounce of water assists the solution of the dyes. Melt the paraffinum durum (678 grams), and add 210 grams of paraffinum molle and 50 c.cm. of olive oil. Let the temperature of the resulting mixture sink to at least 65° C., then stir in the previously prepared lanoline paste, stirring until thoroughly mixed. At about 55° C. add 20 c.cm. of eucalyptus oil, stir and allow to solidify.

The adeps lanae hydrosus is used as a suspending and diffusing agent. Smaller quantities do not satisfactorily take up the dyes. Larger quantities are undesirable, as they make the resultant wax less satisfactory to paint on. If the above directions are carefully followed, little of the dye falls out of suspension, although reheating the wax for use tends to make this occur. Unless small quantities of wax are melted at a time, it is advisable to stir the liquid before using. The scarlet-red forms the least satisfactory suspension, and requires stirring while using, but its therapeutic value has caused it to be persevered with.

To prepare dichloramine-T paraffin, dissolve the dichloramine-T in eucalyptus oil and add to the other ingredients at 55° C.

The dichloramine-T wax has proved an unsatisfactory wax from a practical point of view owing to the tendency to be brittle and adhere to the raw surface of the burn, instead of being easily removed in one piece, as is the case with the other preparations.

A CASE OF FULMINANT CEREBRO-SPINAL FEVER WITHOUT MENINGITIS.

BY

WILLIAM STCLAIR SYMMERS,

PROFESSOR OF PATHOLOGY, QUEEN'S UNIVERSITY, BELFAST.

THE case here reported is one of meningococcal infection, the course of which was so rapid (twenty hours) that the meningeal symptoms and signs remained undeveloped, whereas the outstanding symptoms (witness the laparotomy) pointed to some abdominal lesion, these symptoms being intense pain in the abdomen, rigidity of the recti, repeated vomiting, and diarrhoea. The absence of headache is to be remarked; the pain in the back was not associated with any naked-eye sign of spinal meningitis.

On September 16th, 1916, a boy aged 16, apparently in good health, went to his work as usual in one of the Belfast shipyards. Shortly after commencing work, about 7 a.m., he was seized with violent pain in the abdomen and back; he lay on the ground and vomited freely. He was sent to the Royal Victoria Hospital, arriving almost in collapse, cyanosed, and vomiting. There was now marked diarrhoea, some rigidity of the abdominal muscles, but no trace of headache; the temperature was 96° F., and the pulse 98. By evening the temperature was 100.2 F., and the pulse 130. There was still no headache, but increasing weakness and considerable cyanosis of face. He died twenty hours after the appearance of the first symptoms. Some hours after admission to hospital laparotomy had been performed by Mr. Holmes, without, however, throwing any light on the case.

At the post-mortem examination the points noted were as follows: numerous petechiae on the posterior aspect of the heart, an enlarged and much reddened thymus, enlarged mesenteric glands, some of which showed minute haemorrhages, marked enlargement of the solitary follicles in the lower ileum and colon, the bowel being hyperaemic; Peyer's patches were unchanged. The liver showed superficial yellowish patches scattered over the upper surface near the anterior border. The remaining thoracic and abdominal organs were normal.

The above appearances¹ were identical with those I have invariably seen at the autopsies in cases of cerebro-spinal fever in Belfast during the past seven years, and therefore, at this stage of the autopsy, this disease was suspected.

The brain and cord, however, on being removed, were found normal to the naked eye; there was not the slightest appearance of meningitis, unless some exceedingly faint turbidity of the scanty ventricular fluid could be so interpreted. This cerebro-spinal fluid was small in amount, the brain and cord being somewhat drier than is normally the case. The few drops of fluid collected showed microscopically some finely granular debris, to which its faint turbidity was due; there were a few polymorphonuclear cells, but no inclusion of bacteria.

This fluid, when planted out on ascitic agar,² however, furnished very numerous colonies of the meningococcus in pure culture, the agar tubes being covered by scores of the typical colonies, consisting of the well-known Gram-negative cocci, which acted upon the various sugars in the manner characteristic of this organism—namely, acid production in maltose and dextrose, absence of acid on the others, including galactose.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, February 16th, 1907, p. 391; *Lancet*, February 23rd, 1907, p. 508. ² BRITISH MEDICAL JOURNAL, June 22nd, 1907, pp. 1477-79.

CHLORINE WATER IN THE TREATMENT OF INFANTILE DIARRHOEA.

BY

S. ROSEBERY, M.B., CH.B. EDIN.,

SENIOR MEDICAL OFFICER, SHOREDITCH INFIRMARY, LONDON.

THE use of chlorine water in the treatment of typhoid fever was advocated by Burney Yeo, and it occurred to me that it might be usefully applied to diarrhoeal conditions in children. The death-rate in these is high everywhere, and in Shoreditch and Hoxton the dangers are increased by the very unfavourable conditions under which most of these children are reared, and many of them were admitted to the Shoreditch Infirmary in a critical condition.

During recent months fifty-three cases have come under observation, varying to a considerable degree in severity.

In each case chlorine water in the following mixture was administered:

R.	Aqua chlori	...	...	...	m iv
	Quin. sulph.	...	...	...	gr. ½
	Salol	...	...	...	gr. iv
	Mucilag. tragacanth.	...	...	...	q.s.
	Aqua chloroformi	...	...	ad	3j

Dose: 3 ss to a child under six months, and proportionate doses in elder children.

This was given every six hours for the first twenty-four to thirty six hours, and then thrice a day until the stools were normal. In addition, 10 to 20 m, according to age, of the following mixture was administered twice a day:

Ol. ricini	...	...	...	3j
Ol. olivae	...	...	...	3j
Tinct. opii	...	...	...	m ij

The opium, however small the dose, has a soothing effect upon the bowels, and helps to induce a much-needed rest, which is an important factor in treatment. Lavage of the bowel with normal saline was resorted to in many cases.

In the very severe cases, where the child was admitted in a collapsed state, with depression of the fontanelle, cold and dry skin, blue extremities, sunken and heavy eyes, and general flabby condition, a mustard bath was first ordered, to be followed immediately by injection of pituitrin $\frac{1}{4}$ c.cm., repeated two or three times at intervals of four hours. Then an injection of warm olive oil was given to diminish loss of heat from the skin. Lavage of the bowel was practised two hours after the mustard bath. The diet in these cases varied according to the severity of the attack. In the milder cases albumin water and barley water were sufficient. In the more severe cases sherry whey was given first until the vomiting ceased.

The majority of cases recovered in four to five days, the very severe in ten to twelve days. In the latter it was often necessary to administer brandy in 10 to 20 m doses every two to four hours, as an additional check to collapse, and in such cases also during convalescence I have found thyroid, grain $\frac{1}{2}$ twice a day, useful in helping to accelerate recovery and increase weight, as recommended by Dr. J. Simpson of Edinburgh.

The essential difference between the treatment adopted and that which is in common use was the administration of chlorine water; and a comparison of the cases which received this with those treated without it has strongly disposed me in its favour. Time and facilities did not permit systematic bacteriological investigations, and no explanation of the action of chlorine is attempted, but clinical results were so striking as to justify a recommendation of this treatment.

Out of the fifty-three cases so treated there was one relapse and only one death, upon which unfortunately an autopsy was not allowed. As soon as the vomiting and diarrhoea had ceased, and the children considered well enough, they were placed on a milk mixture adapted to their age and condition, gradually increased in quantity and strength, and their weight regularly recorded. Before discharging the patients one or other of the infantile proprietary foods was given, suitable to their digestion, so that they became accustomed to an article of diet they were likely to receive at home.

A CASE OF CAESAREAN SECTION COMPLICATED BY RUPTURE OF THE UTERUS.

BY

MAJOR G. W. KILNER CROSLAND, D.S.O.,
HONORARY SURGEON, HUDDERSFIELD ROYAL INFIRMARY.

A SHORT account of an unusual complication in a case in which Caesarean section was twice done may be of interest.

Caesarean section was performed on Mrs. B., aged 26, by me in April, 1913, owing to contracted pelvis; she was delivered of a dead child, weighing 10½ lb.

She again became pregnant, and I saw her in consultation with Dr. Brown in June, 1917. I advised waiting until labour commenced and her admission then to the Royal Infirmary for a similar operation. Labour began on August 8th at 4.30 a.m. The pains were not severe; she was admitted to the infirmary at 3.30 p.m. She says that immediately after her admission she had three fairly strong pains, and that they then entirely ceased.

On admission the abdomen was rather tender, but the patient was not in pain; no uterine contractions could be felt; the

temperature was normal and the pulse 90. There were no signs of collapse, and she was quite cheerful. On vaginal examination the head was presenting, but had not entered the pelvis; the os was patulous, not much dilated, nor was the cervix drawn up.

The abdomen was prepared with iodine, and laparotomy was done at 7.30. On opening the peritoneum the uterus presented, the upper part being normal in appearance, but across the lower third there was a very large subperitoneal haematoma, which extended into both broad ligaments. It was difficult at first to make out the exact cause of this unusual complication, but on opening the uterus towards the fundus (where the wall was normal), as soon as the knife reached the edge of the haematoma it entered a large circular rent or gap in the middle line of the organ, about three inches in diameter, obviously a subperitoneal rupture of the uterus through the lower part of the scar left by the former operation. The living child and placenta were easily delivered.

The question of the best way of dealing with the condition then arose. Owing to the edges of the rent being very friable and much infiltrated with blood, it seemed to be impossible to close it in a satisfactory manner, and hysterectomy was considered. However, on account of the very large haematoma filling the pelvis, this was not thought feasible, and I decided to suture the incision in the uterus as best I could. This, of course, was easily done in the upper part, but when the rupture was reached great difficulty was experienced, and it was closed apparently not very effectively, owing to the infiltrated and lacerated edges. A large rubber tube was passed through the cervix and left there until morning to obviate any distension of the uterus with blood; an injection of pituitrin was given, and the patient, who had stood the operation well, removed to the ward.

After operation she never gave any cause for uneasiness, and made an uneventful convalescence.

An interesting point about the case is the freedom from signs of shock and collapse after such an injury to the uterus, with the subsequent effusion of so much blood. The pains also were never really very severe, nor was the os much dilated even at the time of operation. I was not at all satisfied that the closure of the uterine wound was effectual, and felt that if it had been possible hysterectomy would have been the better operation.

NOTE ON THE FATE OF HALAZONE IN THE ANIMAL BODY AND ON THE STABILITY OF TABLETS CONTAINING IT.

BY

E. K. DUNHAM, M.D.,

AND

H. D. DAKIN, D.Sc., F.R.S.

(Report to the Medical Research Committee.)

In a recent paper in this JOURNAL,¹ an account was given of the use of "halazone," *p*-sulphonichloraminobenzoic acid, for the sterilization of small quantities of infected water. As was previously stated, one of the great difficulties encountered in securing tablets of high germicidal potency for the sterilization of water has been occasioned by the lack of stability of the substances employed, when present in the small quantities required for tablets. Halazone appeared to offer distinct advantages in this respect over other substances hitherto made use of. Since our original communication we have had the opportunity of further testing the stability of our product and we have also determined its fate in the body when ingested.

The Fate of Halazone in the Animal Body.

Halazone even in large doses appears to be practically devoid of toxicity. We have fed rabbits for many weeks with doses of 100 to 200 mg. per day, without observable symptoms, and repeated doses of 500 mg. were also without effect. As the quantity needed for the sterilization of a quart of water is only 4 mg., the substance may be regarded as perfectly innocuous. The urine of rabbits which had received "halazone" given by stomach tube was collected and examined. As was to be expected, no unchanged substance was present and all active chlorine had disappeared. On acidifying the urine and extracting with ether, a crystalline acid was separated, which was purified by dissolving it in sodium carbonate and reprecipitating with hydrochloric acid. The substance decomposed at 280° C. and had all the properties of *p*-sulphonamidobenzoic acid. On analysis, the substance was found to contain 6.94 per cent. of nitrogen compared with a theoretical value of 6.96. The yield of pure acid recovered from the