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

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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

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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

urine was approximately 60 per cent. of the halazone fed, and as no other compound could be isolated, it is probable that halazone is quantitatively converted into *p*-sulphon-anidobenzoic acid in the animal body, with the loss of two atoms of chlorine:

The Stability of Halazone Tablets.

In our first communication we emphasized the necessity of making tablets containing halazone with perfectly dry materials, using either dry sodium carbonate or borax with common salt. Our later experience has only served to confirm this conclusion, and also to indicate the superior keeping properties of the tablets containing dry borax or soda as compared with those containing sodium bicarbonate or salts containing water of crystallization. The difference is particularly marked at temperatures above 30° C.

The results of an extended series of experiments with halazone itself, and tablets containing it mixed with various salts, are now available. The tablets were made by ourselves from carefully dried material, and preserved in amber-coloured bottles. Their stability was estimated at three temperatures: (a) room temperature varying from 15° to 32° C., (b) 40° ± 2, (c) 50° ± 2. The amount of decomposition of the halazone was estimated by heating known quantities of the mixtures or tablets with potassium iodide in 50 per cent. acetic acid and titrating the liberated iodine with decinormal sodium thiosulphate. The deductions drawn from the experiments are as follows:

1. Halazone itself appears to be indefinitely stable at room temperature, while at 50° not more than 1 per cent. decomposition was noted in sixty days.

2. Halazone (5 per cent.) mixed with either dry borax or dry sodium chloride (95 per cent.) is stable at room temperature, but at 50° suffers about 20 per cent. decomposition in sixty days.

3. Tablets containing halazone (0.004 gram), dry borax (0.008 gram), and sodium chloride (0.088 gram) usually showed less than 2 per cent. and never more than 7 per cent. decomposition in 150 days at room temperature (15°–32°), and equally good results were obtained with similar tablets containing dry sodium carbonate (0.004 gram) in place of borax, while tablets containing sodium bicarbonate (0.004 gram) showed 7 per cent. decomposition. For practical purposes they may be regarded as stable at these temperatures.

At higher temperatures the rate of decomposition was most rapid with the bicarbonate tablets—namely, 76 per cent. decomposition in 115 days at 40°. The tablets with borax showed 35 to 48 per cent. decomposition in 115 days at 40° and 33 to 34 per cent. decomposition in 60 days at 50°. The tablets with sodium carbonate showed 48 per cent. decomposition in 95 days at 40° C.

The practical conclusions drawn from these results are as follows: Halazone tablets prepared from thoroughly dry materials, using sodium chloride with either borax or sodium carbonate and preserved in amber bottles, will maintain their germicidal efficiency at temperatures up to 52° almost unchanged for five months, and should be serviceable for considerably more than a year. Prolonged exposure to temperatures constantly maintained as high as 40° to 50° C. will reduce their efficiency by about one-half in three months.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, May 26th, 1917, p. 683.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

PRELIMINARY NOTE ON X-RAY DETECTION OF THE PRESENCE OF CLOTH IN WOUNDS.

The result of some experiments which I have just made appear to me to justify the appearance of this note in advance of a detailed paper which I propose to write when I have finished the set. I am not aware that anything of the kind has hitherto been published.

Many wounds do not heal because of the presence in them of foreign bodies that are as pervious to x rays as, or more so than, the tissues in which they are embedded; it may be that others may wish to avail themselves of a

proceeding likely, as it seems to me, to prove simple and effective in demonstrating their presence.

Having been lately asked to radiograph a leg for the purpose of detecting a piece of reed that was believed to have been in it for eighteen months, I failed, as I expected from my previous efforts in like work. With the aid, however, of bismuth emulsion injected into the sinus I was surprised and pleased to see in a stereo-radiogram—what was quite distinguishable *in situ*—a piece of reed about two inches long and one-eighth of an inch in diameter, and related to a sinus which branched.

This result immediately suggested the possibility of similarly demonstrating the presence of pieces of cloth in fresh wounds or old ones that refused to heal. I find that the texture of pieces of khaki cloth thrust into the interior of a lump of ox liver and similarly treated can be clearly distinguished.

It seems hardly credible that every radiographer who has injected refractory sinuses—there must be few that have not done so—has failed like myself hitherto to stumble on so simple a solution of this question.

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Reports of Societies.

DISCUSSION ON SCOPOLAMINE-MORPHINE NARCOSIS IN CHILDBIRTH (PAINLESS CHILDBIRTH).

A MEETING of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine was held on December 6th, the President, Captain G. F. BLACKER, being in the chair. The discussion was opened by the reading of the papers forming the report of a committee appointed to investigate the effects of scopolamine-morphine narcosis. The Committee consisted of Dr. Fairbairn, Dr. T. G. Stevens, Dr. C. Hubert Roberts, Dr. Herbert Williamson, and Dr. Eardley Holland, but the last named was unable to take part owing to his absence on active service. The observations were carried out independently. A standard solution of scopolamine was employed, the initial dose being morphine gr. $\frac{1}{4}$, and scopolamine gr. $\frac{1}{15}$; subsequent doses consisted of scopolamine gr. $\frac{1}{15}$. The patient was isolated during labour, and, as far as possible, precautions were taken to avoid sensory impulses. The cases were selected by the officer in charge of the ward, and the patients were preferably to be primiparae in whom no complications were anticipated. Two charts were drawn up for use in the labour room, and at each injection observations were recorded, the results of which appear in the papers.

Report from St. Bartholomew's Hospital.

This report (read by Captain HERBERT WILLIAMSON) was on 20 cases only. Careful precautions were taken to avoid any disturbance to the patient.

Dosage.—The initial dose of morphine gr. $\frac{1}{4}$ and scopolamine gr. $\frac{1}{15}$, was given when the cervix was dilated sufficiently to admit a finger and, as a rule, when the pains were recurring regularly at intervals of not less than a quarter of an hour. One hour after the administration of the initial dose, $\frac{1}{15}$ gr. of scopolamine was given, and twenty minutes later an object with which the patient was not familiar was shown to her. From this point onwards the memory test alone was employed; it was considered a safe, but not an absolutely reliable guide, for there were instances in which apperception was present throughout, but amnesia was complete. It was the best guide to dosage, but demanded considerable experience and powers of close observation in the administrator. Its value was diminished by the necessity of arousing the patient each time it was applied. Two alternative tests had been suggested—Babinski's reflex and the pupillary pain reflex. These were tried in all cases, but were found of little value.

Effect on Uterine Contractions.—If the pains of the first stage were good before the administration was commenced little effect was produced; if they were weak, injection of the drugs sometimes led to their entire cessation. Experience at St. Bartholomew's Hospital confirmed that reached by Gauss—that in uterine inertia, scopolamine morphine narcosis should be avoided, for