the slowing down of physiological action; while the evidence obtained by the authors in sterilizing lice outwardly by immersion in lysol solution in connexion with trench fever research also points in the same direction.

In order to obtain further evidence on this question, which is of great importance from the point of view of the treatment of verminous heads, the following experiment was made:

EXPERIMENT V.—Effect of Immersion in Kerosene.

Kerosene as supplied at retail shops was used at a temperature of 20°C. (68°F.), the period of immersion being 5 minutes. Most of the lice made active movements while immersed, and one or two made slight movements immediately after removal.

METHOD.

Active Lice.

Active lice were placed on slips of flannel shirt material on which nits had been laid by a number of females during a period of one week.

First Batch (16 adults, 6 nymphs, 3 larvae).—After immersion the slip of flannel was laid for 10 minutes on filter paper to drain, then put into a cardboard box and kept in incubator at 80°F. No recovery.

Second Batch (10 adults, 6 nymphs, 9 larvae).—After immersion the lice were removed to filter paper, dried off and placed on a fresh slip of flannel in a cardboard box and kept in incubator at 80°F. When examined 18 hours later 6 were living (2 feeble and 4 nearly dead), 19 dead. The survivors died without recovering full activity.

Third Batch (7 adults, 5 nymphs, 9 larvae).—After immersion the lice were placed in soapy water at 82°F. then transferred to clean water at the same temperature and drained off on filter paper, transferred to a fresh slip of flannel in a cardboard box and kept in incubator at 80°F. On examination 18 hours later 2 (nymphs) were active, 2 were feeble, 8 very feeble, and 9 dead. The survivors died within 48 hours, but as no attempt at feeding was made it cannot be concluded that the nymphs which recovered their activity died from the after-effects of their immersion, though this is probable.

Nits.

These received similar treatment to the active lice, save that in the case of the second batch a number of the eggs were removed from the flannel to which they were attached, and incubated apart from the remainder, which were left attached to it. The results were as follows:

First Batch (170 nits).—None hatched.

Second Batch (191 nits).—101 nits were removed from the flannel; of these 82 hatched; 90 nits were left on the flannel, which was drained of oil so far as possible by gentle pressure between filter paper; only 2 hatched.

Third Batch (182 nits).—At least 3 of these eggs developed, but the young lice died during the process of emergence from the egg. None of the remainder hatched.

Conclusions.

That fatality to active lice following immersion in kerosene is due rather to the oil on the surface of the insect or the object to which it clings obtaining entrance to its body after removal from the fluid than during the short period of immersion.

As regards nits, penetration by kerosene is too slow for its entrance into the egg to occur within the few minutes of immersion, but subsequent to their removal the fluid or its vapour inhibits development. In the case of Batch 3, the subsequent washing produced some modification in the egg or its membranes, which prevents normal hatching on the part of the young louse.

In view of this experiment it seems clear that the explanation as set forth above in regard to the closing of the spiracles against the entrance of fluids must be correct, and that provided the insects are not rendered too sluggish to react owing to cold or prevented by their need for oxygen, they can resist the entrance of fluids into their bodies. Probably the action is not volitional, but a necessary reflex (similar to winking) evolved to guard against the dangers arising owing to sudden submersion in sweat.

In the case of nits, where the question of penetration seems likely to be largely a matter of surface tension due to the nature and temperature of the fluid, possibly conditioned by the stage of development which the eggs have attained, it seems possible that eggs that are wetted by the fluid but not entirely immersed, may be more readily penetrated than those completely immersed, while the possibility must be considered of death resulting from the vapour rather than the fluid itself finding entrance into the egg.

REFERENCE.

¹ Bacet and Lloyd: Destruction of Nits of the Clothes Louse by Solutions of Cresol Soap Emulsion and Lysol, BRITISH MEDICAL JOURNAL, April 27th, 1918.

A Bulletin of the Air Medical Service will shortly be issued by the United States. It will be under the authority of the Director of the Air Service, and will make public the results of studies and experiments made by medical research laboratories.

RADIUM IN THE TREATMENT OF TUBERCULOUS ADENITIS.

BY

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THE therapeutic properties of radium have always been a fascinating subject, both to the medical profession and the laity, and the medical profession have by no means, I think, reached the limits of the subject yet.

During 1913-14 I thought I would see what could be done for tuberculous glands by radium. As a result I am convinced that the day of radical operation will soon be past, that it will no longer be necessary to send children thus affected for prolonged periods to the seaside, and that the unsightly scars which disfigure the necks of so many girls can now be avoided. Radium is, if properly used, a safe, and as far as I can see a certain, cure, whether for an early or an advanced case of tuberculous glands. Within the period named I treated between twenty and thirty cases of every grade with radium. In every case the swellings and even old sinuses faded away. Unless there were already sinuses present, no scars were left. The skin was in some a little red for a few weeks from the action of the radium, but this always disappeared.

In no case was any ulceration caused. It is unnecessary to describe all the initial experiments and the doses used. As a result I find as follows:

Fifteen milligrams of radium bromide, spread out on a flat circular applicator $1\frac{1}{4}$ in. in diameter, and mixed with a special varnish to keep it even and prevent loss, is sufficient for this kind of treatment. The applicator has a screen of silver 1 mm. thick, and a piece of thin gutta-percha tissue tied over the whole to prevent soiling of the radium. The applicator is strapped on over the tuberculous glands. I have found ten hours a suitable time for each application of the above strength—that is, 150 milligram hours. The applicator is applied when the patient goes to bed and taken off in the morning. A different gland or group of glands can be attacked at each sitting till all have been covered, and the course then started again.

The patients usually have had two applications a week. Nothing was noticed for from a week to ten days, but from that time a gradual shrinkage of the glands was observed till nothing could be felt except a few fibrous nodules. I continue the treatment till all signs of trouble have disappeared. In very bad cases I usually gave in addition a few applications three months later, but doubt whether this is really necessary if the first treatment is properly carried out.

Since my demobilization from the R.A.M.C. I have had an opportunity of inspecting many of the patients I treated in 1913-14. In none of them can I find a trace of any further trouble, nor have I heard of any I have not actually seen having any signs of recurrence. Evidently, therefore, the cure is usually a lasting one. Should a case recur, I have no doubt that a further course of treatment would restore the patient to health again.

I will briefly quote three typical cases to illustrate the different degrees of the disease treated.

CASE I.

A boy aged 4. Early tuberculous glands of the left tonsillar and carotid region; no obvious signs of softening.

He had five applications of 15 mg. of radium, ten hours each application, at intervals of seven days. At the end of this time all signs of the disease had disappeared.

CASE II.

A woman, aged about 30, had had a swelling on the right side of the neck for a year. It had been treated by iodex, tonics, change of air, and all the usual remedies. When I first saw her the mass of glands was nearly the size of an orange, and there were marked signs of caseation; I was, in fact, afraid lest they would break down and suppurate through the skin before the action of the radium could have much effect. Her general health had suffered considerably.

I treated her twice a week with 15 mg. of radium, ten hours each time for ten sittings. There was an interval of a month, while she was paying a visit, in the middle of the treatment. At the end of that time the neck was perfectly normal. Fortunately the radium began its work before surface suppuration had occurred; I saw her three months later, and she was

thoroughly restored to health and there were no signs of there ever having been any trouble in the neck. To take no risks I gave her three more similar applications.

CASE III.

A boy, aged 4, one of a large family, nearly all of whom had suffered from tuberculosis; several had died. His mother and one or two uncles and aunts had died of phthisis. When I first saw him he had extensive tuberculous adenitis on both sides of the neck. The glands had suppurated, and sinuses secondarily infected were present.

I gave him ten applications of from eight to twelve hours each, twice a week. On several of these occasions, after four hours the applicator was moved to cover another group of glands, and so on. The same strength, 15 mg., of radium was employed. At the end of this treatment all the sinuses had healed, and the masses of glands had shrunk till only a few fibrous nodules could be felt. The boy had also improved much in health, and when I saw him a few months later one would hardly recognize him.

Carious teeth or unhealthy tonsils and adenoids, if present, must be dealt with at the beginning of the treatment, as it would be folly to cure the existing glands and leave a future source of infection behind.

FATAL CEREBRAL HAEMORRHAGE AT 34.

BY

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THE following report may be of interest owing to the difficulties of diagnosis the case presented and to the comparative rarity, as far as I am aware, of the condition:

A single woman, aged 34, of healthy parentage, whose previous health had been good, and who had had no serious illnesses, was in her usual health till September 8th.

On that day, while straining to reach up to a high shelf, she had a sudden sensation "as though someone had struck her on the back of the head," followed by a "fainting attack" (though she did not lose consciousness) and severe occipital headache, which prevented her sleeping that night.

On September 9th she came to my surgery complaining of occipital headache. The temperature and pulse were normal; she was given aspirin and told to report again in the morning. She then said that she had had a good night and that the headache had practically disappeared. She was given a tonic and told to report again if necessary. The "attack" was attributed to the sun, the weather being very hot at the time.

She remained quite well except for slight occasional stiffness of the neck until the afternoon of September 14th, when she had a sudden seizure; without any warning she fell suddenly unconscious. I saw her ten minutes after the onset of the attack. She was then deeply unconscious, the conjunctival reflex was absent, and the complexion ashen grey; there was very marked Cheyne-Stokes respiration and very feeble pulse (100). The reflexes were variable during the attack, which at first was characterized by slight spasmodic contractions of the arms and chewing movements of the jaws, alternating with periods of complete relaxation. There was no definite paralysis of any part. After about an hour she was suddenly seized with violent convulsions with most extreme opisthotonos, which lasted on and off nearly another hour, when she vomited and began to come round. She passed water and sweated during the fit.

On partial return to consciousness she screamed out with agonizing pains in the occipital region, rolling her head backwards and forwards apparently in extreme distress. There was no retraction. Kernig's sign was doubtful, as were the plantar reflexes. The knee-jerks were equal and variable.

She was given morphine gr. $\frac{1}{2}$, which eased the pain, though she had no sleep; she vomited frequently during the night.

On September 15th she was completely conscious and mentally clear. She complained of very severe occipital headache and vomited occasionally. The temperature was 98°, and the pulse 100; systolic pressure 150. The skin was moist. She was passing water freely. Urine, specific gravity 1025, acid, very faint cloud of albumin; partially reduced Fehling's solution; microscopically a few blood casts and red cells. Ophthalmoscopic examination showed clear discs and the fundus normal on both sides. During the day the vomiting ceased and the headache improved.

On September 16th the headache was more severe and there was definite retraction and well marked Kernig sign. The temperature began to rise (99.2°); the pulse fell from 100 to 60. Lumbar puncture was performed in the afternoon. The fluid was under great pressure, spurting out on withdrawing the trocar; about 1 c.cm. was withdrawn. The bacteriological examination was difficult, as the specimen was contaminated with blood. The report stated that the fluid was sterile and polymorph leucocytosis absent.

From September 16th to 25th there was steady improvement, the chief difficulties being the headache (which gradually

became frontal as well as occipital, though less severe) and a persistent insomnia. The albuminuria disappeared after the first forty-eight hours. The glycosuria became more pronounced, but was less than 1 per cent.; there was no acetoneuria. A most marked feature, considering the severity of the symptoms, was the general good spirits of the patient in spite of the headache, and the mental clearness. There was no further vomiting; the optic discs remained clear.

On September 25th, after a good night, and while appearing better than usual, she had a seizure similar to that of the 14th, which was fatal in about two minutes.

Post-mortem Examination.—Brain: There was a large clot of blood between the dura and the brain; the bleeding point was apparently in the frontal region, in the neighbourhood of the crest of the ethmoid. The clot extended between the frontal lobes and on the outer surface of the right frontal lobe as far back as the motor area. In places the brain substance was torn. There was no evidence of disease of bone nor any sign of cerebral tumour or abscess. There was no evidence of any inflammatory condition at the base or elsewhere. The other organs were healthy.

Presumably the first seizure was caused by a minute haemorrhage, which was not discovered *post mortem*. The haemorrhage seen at the *post-mortem* examination was presumably the one which caused the fatal seizure.

The interesting features from the point of view of diagnosis were: The basal symptoms accompanied by evident raised pressure in the spinal canal, the marked mental clearness all through, and the absence of vomiting and optic neuritis.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

CAESAREAN SECTION FOR PLACENTA PRAEVIA WITH CONCEALED HAEMORRHAGE.

ALTHOUGH the case reported below had a fatal termination, most probably from pulmonary apoplexy, I consider the treatment by Caesarean section was correct and satisfactory. I cannot remember reading of a case of placenta praevia with concealed haemorrhage so profuse as to fill the uterus, distending it and causing tonic contraction; and, although some authorities on the subject agree that Caesarean section is correct in certain cases of placenta praevia, I have not yet seen the operation recorded in any such cases.

On November 6th, at 5 p.m., I was called to a woman aged 39, primipara, eight months pregnant. She was in agonizing pain, and on examination of the abdomen the uterus was very distended, and in a state of tonic contraction, so that nothing but the shape of it could be made out. Examining per vagina, I found the os dilated to the size of half a crown, rigid, and a soft mass presenting with no landmarks; the vagina was very narrow and rigid. The pulse was about 120, and the patient very restless; on inquiry I found she had been in this condition since 2 o'clock. I came to the conclusion that she must be delivered as soon as possible; I therefore decided to call in Dr. W. S. McDougall to see if he agreed as to removal to hospital and Caesarean section. During the interval before he arrived the presenting part gave way, and a large haemorrhage occurred, blanching the patient. On arrival Dr. McDougall made an examination and found the placenta at the os, and nothing else presenting; the patient was bleeding. He agreed with me, and the patient was removed to the Carshalton, Beddington, and Wallington District Hospital.

At 9.30 p.m. the patient was put on the table; Dr. McDougall gave the anaesthetic, and Dr. W. H. Passmore assisted me. Operating by the abdominal route, I opened the uterus with a median longitudinal incision, and found the uterus full of clots. I extracted the child already dead, and cleared the uterus, and sewed up with five or six catgut sutures through-and-through, missing the mucosa. Having completed the toilet of the peritoneum, the uterus was returned, and the abdomen closed with three layers of sutures; during the later stages of the operation ergotinine and pituitary extract were injected. The operation was completed in fifteen and a half minutes, a pint of saline was given on the table, and later she was given a continuous saline.

The next morning the patient's condition was satisfactory, except that she vomited when she took feeds, chiefly of Valentine's juice. On November 8th the abdomen was much distended, and the vomit becoming offensive and enemas giving very little relief, it was apparent that the bowel was paralysed. Towards evening I made an opening in the ileum, which relieved the situation; the sickness stopped, the distension disappeared, and in twenty-four hours the bowels acted in the ordinary way. On November 9th the condition was good, the patient taking some food. Next day the condition was still