as an increase in production of red blood cells. Normal blood has no such effect.

An injection of malarial blood is a direct stimulus for the red bone marrow towards increased activity. This stimulus might be applied for therapeutical purposes (forms of anaemia, especially chlorosis). The outbreak of fever can always be prevented by an injection of neosalvarsan as soon as the increase in red cells is well established. The whole process could then be repeated.

We wish to thank the public health authorities of Natal for assisting us in obtaining the strain of malaria; Dr. Griffin of Verulam for his very kind and courteous co-operation in this matter; Dr. J. T. Dunston, Commissioner for Mental Hygiene of the Union of South Africa, for giving us every assistance whilst making these investigations; and Dr. Swift, Acting Commissioner for Mental Hygiene, for his kind permission to publish this note.*

REFERENCE.

* Ronald Ross, BRITISH MEDICAL JOURNAL, January 19th, 1924.

SMALL-POX: AN UNRECOGNIZED OUTBREAK.

BY

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THE following history illustrates the behaviour of unrecognized small-pox in a community where the only control was the previous partial vaccination of the contacts and the fact that it occurred in institutions under discipline and observation. The facts are related as they came to my knowledge in order better to convey the method by which the outbreak was discovered.

On Saturday, February 16th, I was asked by the medical attendant to see a girl, resident in an institution for female adolescents which is supported partly by voluntary contributions and partly by laundry work. I gave it as my opinion that the patient was suffering from chicken-pox, and very much relieved the administration by offering to remove the case to the Preston Isolation Hospital. This offer was accepted, and the patient was removed to an isolation ward in the diphtheria block at the isolation hospital.

During the week-end I became suspicious of my original diagnosis, and asked Dr. Fisher of the Lancashire County Council staff to see the case. He diagnosed the case as one of small-pox, the points being:

1. The rash was preceded by a definite illness on February 8th—headache, pains in the back, and sickness.
2. The rash first appeared on the face and forehead on February 13th.
3. When the rash was fully developed (February 18th) it tended to affect the extremities rather than the centre of the body, and the exposed rather than protected surfaces. Thus the back of the hand and the arm, the front of the leg, and the forehead were affected, whereas the abdomen, the groin, and the front of the neck were free.
4. The rash appeared in one crop upon the face and appeared successively at different sites lower down the body, affecting the feet last; thus the rash on the face was much older than that upon the feet, and all the spots upon the feet were of the same age.
5. The spots were circular and deeply seated in the skin.
6. The vaccinal condition was definitely negative.
7. Revaccination was not successful.

The diagnosis was agreed to by my assistant and the original medical attendant of the case and by the medical officer of the small-pox hospital to which the patient was removed on that day. She made a good recovery, but was somewhat scarred. There were no subsequent cases.

The usual inquiries as to the source of infection revealed the fact that the laundry was regularly receiving parcels of laundry work from an adjoining institution for boys. This home is managed by a religious brotherhood and receives fifty resident boys on behalf of the Home Office. At this home on December 25th there occurred an illness in one of the boys. A rash appeared on December 29th. I saw the case on December 31st in consultation with the medical officer and diagnosed the illness as chicken-pox. Bearing this case in mind I at once inquired as to the subsequent history, and

found that fourteen additional cases had occurred, as shown in the table.

Case No.	Date of Onset.	Vaccinal Condition.	Case No.	Date of Onset.	Vaccinal Condition.
1	Dec. 25th	Nil	9	Jan. 12th	4 scars
2	Jan. 8th	4 scars	10	" "	4 scars
3	" "	4 scars	11	Jan. 13th	Nil
4	Jan. 11th	Nil	12	" "	Nil
5	" "	1 scar	13	Jan. 14th	Nil
6	" "	Nil	14	Jan. 18th	Nil
7	" "	1 scar	15	" "	Nil
8	Jan. 12th	3 scars			

These lads all suffered from an illness similar to that of the first boy. There was, I am assured, a prodromal illness, nausea, and backache, and in one or two instances sickness. The rash appeared first on the face. As the cases occurred they were removed to an empty dormitory and looked after by the resident nurse. At the date of my visit (February 19th) all the boys were well and mixing freely with the other lads. They presented scars on the shins, knees, and feet, and the boys affected later in the outbreak showed characteristic "seeds" in the soles of the feet. Individual scars were also indicative.

An examination of the remaining boys showed that with one exception all had been vaccinated either in infancy or subsequently. Also that on February 1st and February 15th the medical officer of the institution had arranged for the vaccination of the eight among the above who had not been previously vaccinated. In seven of the eight the attempt to vaccinate was unsuccessful both on February 1st and February 15th. In one case, which in its attack had only a single spot and no scars, vaccination was successful. The seven of the fifteen cases in the table were unsuccessfully revaccinated on February 20th.

In view of the fact that the usual experience of public vaccination, using Government lymph, is 99 per cent. case success and a slightly lower figure for insertion success, the unsuccessful attempt to vaccinate these unvaccinated boys was the subject of correspondence between the public vaccinator and the Government lymph establishment, to which my attention was called by the Ministry of Health early in March.

Summarizing, I found that an epidemic illness resembling small-pox had occurred, and that it had (1) infected all but one of those eight boys not protected by previous vaccination; (2) infected seven boys protected by previous vaccination; (3) failed to infect forty-nine boys and staff protected by previous vaccination; (4) rendered those infected immune to vaccination.

On January 28th the nurse who had attended to the sick boys took her uniform to the laundry at the girls' institution. The case in the latter home occurred on February 8th—eleven days later.

Several interesting points arise. The attack rate was as follows:

Institution.	Period of Exposure.	Previously Vaccinated.	No. of Cases.	Percentage.	Unvaccinated.	No. of Cases.	Percentage.
Boys' Home...	Unlimited	56	7	12.5	9	8	88.8
Girls' Home...	8 days	14	—	—	6	1	16.6
Isolation Hospital	2½ days	48	—	—	9	—	—

The total contacts at the three institutions numbered 126, of whom 111 had been previously vaccinated, and 15 were unvaccinated. All, with 10 exceptions (recent army vaccinations 8, refusals 2), were submitted to vaccination in connexion with the small-pox outbreak.

The case success in those previously vaccinated was 102 : 22, or 21.5 per cent.

In the 14 who had never been vaccinated it succeeded in all but one case.

* Detailed charts sent with this paper have been omitted owing to want of space.

An examination of the dates of attack in the boys' home shows that Case 1 infected the remaining cases, and that the removal of the subsequent cases to a separate dormitory without any special precautions was sufficient to check any further spread of the disease. Although the unprotected were with one exception attacked, yet they were not, as one might expect, attacked first. Cases 7, 8, 9, and 10, who were previously vaccinated, became infected before Cases 11, 12, 13, 14, and 15, who were not. All the cases were of the mild type, and there was no practical difference in severity between the cases arising among the protected and the unprotected. In the girls' home secondary cases were looked for with some assurance. Their immunity was perhaps due to the fact that each girl had a separate bedroom. The boys' home is planned on the dormitory system.

THE LIFE-HISTORY OF A CASE OF MYXOEDEMA.

BY
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THIS case of myxoedema was reported in the JOURNALS of January 6th, 1894, and July 31st, 1897, by my father, and is, I think, an unusually long record of a patient continually under observation.

Mrs. S. was born in May, 1829, therefore when she died in January, 1924, she was over 94 years of age. The

FIG. 1.—Original condition, aged 41.

FIG. 2.—After five weeks' treatment

symptoms of myxoedema began in about 1870, and were untreated for twenty years, by which time she was bed-ridden and imbecile, and her appearance is to be seen in photograph 1. After five weeks' treatment with thyroid

FIG. 3.—After fifteen months' treatment.

FIG. 4.—At age 94, after over thirty years' treatment.

tablets her mental condition had much improved, and the condition of the skin generally was clearing up (photograph 2). After fifteen months' treatment she was practically normal again (photograph 3); the regrowth of the

hair is to be noted. Within a year or two she was well enough to nurse her daughter through an attack of typhoid, and lived to a ripe old age—happy, healthy, and mentally active.

It was noted during the early years after her recovery that she appeared mentally younger than a woman of her age, and it was suggested that the twenty years of myxoedema had given her twenty years of rest, from which she benefited in the long run.

As far as my information tells me, she had five grains of extract of thyroid twice a week at the commencement of the treatment, and after recovery she had one grain twice a day for the rest of her life. I have little doubt that during all these years the thyroid was not always taken regularly, but there was never any recurrence of the symptoms. The thyroid gland remained impalpable.

The fourth photograph shows her shortly before her death, which was caused by bronchitis.

ABSCESS OF FRONTAL LOBE: OPERATION: RECOVERY.

BY
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AND
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THE following case appears to be of interest on account of the unusual path of infection—namely, from the frontal sinus—and as confirming certain mental symptoms in lesions of the frontal lobe.

G. R., aged 23, dock fireman, was first seen by A. H. R. on October 27th, 1923. He complained of pain in the lower jaw on the left side and headache which had lasted for six days. Two days previously he had vomited once.

There were found oedema of the left upper and lower eyelids, and tenderness over the left maxillary region. There was also an area of extreme hyperaesthesia of 1 inch radius situated 2 inches to the left of the mid-line, and 2½ inches above the orbital ridge. The pupils were equal and reacted to light. The fundi appeared normal on ophthalmoscopic examination. Transillumination tests showed dullness in the left antrum of Highmore, and the left frontal sinus also appeared relatively dull. The temperature was 103° F. and the pulse 50.

In the course of a few days these symptoms abated, but on November 7th the oedema of the eyelids returned and the headache increased. The temperature varied from 99.5° to 101° F., and the pulse from 66 to 90.

Operations.

On November 9th he was removed to the Grimsby Union Infirmary, and the "wash-out" test having given a positive result on the left side, the left antrum of Highmore was drained through the canine fossa, a large quantity of fluid pus being liberated. On the following day (November 10th) the left frontal sinus was opened by the direct route. It was found to contain glairy inspissated pus. No backward track could be detected. Both operations were performed by S. W. S.

The temperature again became normal and the patient felt much better generally, so that it at first seemed that the whole condition might have been due to the sinus disease only. During this period the temperature never rose above 99° F., and the pulse varied from 62 to 100.

Mental Disturbance: Third Operation.

On November 19th the headache once again became severe, the left eyelids oedematous, and the left pupil slightly dilated. The patient refused to allow his dressings to be touched, or his mouth to be cleansed. Though up to this point his behaviour had been exemplary, he now refused all food and became violent and abusive towards his nurses. It was difficult to obtain answers to questions, and these were given slowly, after an interval of a few seconds. He became very weak, and nutrient saines were commenced.

On November 27th the fundi were again examined and found normal. Both handgrips were very weak, but that of the right hand weaker than the left. In spite of his now semi-comatose condition pressure on the scalp in the region defined above caused the patient to wince. On this date the pulse was 48.

On November 28th a third operation was performed by A. H. R. A vertical incision was made ¾ inch to the left of the middle line, extending for 2½ inches upwards from the orbital ridge. The skull was trephined above and to the left of the frontal sinus. The trephine used was 1 inch in diameter. The dura mater bulged into the opening and there was no pulsation. At a point corresponding to the upper limit of the left frontal sinus there was a marked granulated area. This was believed to represent the track of the causal organisms. The membranes and cortex were incised and pus was found at a depth of ¾ inch. Five ounces of pus were collected, the patient being turned face downwards to facilitate