itself; the vessels which looked like cords appeared now like tags of wet tissue paper, and the size of the organ had dwindled to two-thirds; four days later it had further diminished to half its breadth and length.

After-History.

The patient recovered rapidly from shock. Three days after it was noticed that her appearance had much improved; the face had lost its waxy appearance, the cheeks were less pale, the lips had some colour, and the pulse had improved. On the tenth day the temperature, which had been normal, rose to 100°, and we found that one stitch had suppurated. On the fifteenth day there appeared some pigmentation on the brows, forehead, and round the mouth; 6 min. of adrenalin solution three times a day was given with apparent good results, for the stain lessened in depth.

An examination of the blood analysis twelve days after the operation, by Dr. de Korte, gave the following results: Red corpuscles, 4,400,000 per c.mm.; white, 11,200 per c.mm.; haemoglobin, 83 per cent. Percentage composition of white corpuscles: Polynuclear leucocytes, 83 per cent.; lymphocytes (chiefly transitional), 15.5 per cent.; eosinophile leucocytes, 1.5 per cent.

Dr. de Korte's observations on these results were as follows: The relative increase of polynuclear leucocytes is most probably due to the presence of some stitch abscess. It is as well to remember that the increase of red cells may also be more apparent than real, for a diminution in the serous plethora would account for the increase.

Careful examination showed no sign of micro-organism infection.

I desire to express my gratitude to Mr. W. D. Severn for his beautiful pathological illustrations, and to Dr. de Korte for his report on the condition of the blood.

REPORT ON TWO HUNDRED CASES OF RINGWORM TREATED BY X RAYS.

By F. EMRYS-JONES, B.A.CANTAB., L.M.S.S.A.,

RADIOGRAPHER (CONJOINT) TO THE GENERAL HOSPITAL, BIRMINGHAM;
LATE X-RAY SPECIALIST TO THE COVENTRY BOARD SCHOOL
POLYCLINIC FOR TREATMENT OF RINGWORM.

DURING the past five or six years cases of ringworm have been treated at the General Hospital, Birmingham, by means of the x rays under the control or supervision of Dr. Hall-Edwards or myself, but it is only during the last three years that the single-dose method has been used. The apparatus used consists of a 12 in. coil with a dipper brake and tachimeter for regulating the number of interruptions. This is in circuit, with an automatic cut-out switch. By this means a definite number of interruptions can be given. There are also arrangements for measuring accurately the voltage and ampèreage passing through the primary, the milliampèreage through the tube, alternative spark gap, and a Sabouraud pastille, which is bleached in the sun and used four or five times, is used for each application.

With this apparatus the average time for treatment of a single patch varies between five and eight minutes. The advantage of the automatic switch is that one can leave the apparatus for a time knowing that there is no danger of an over-exposure. The patients are treated inside a cubicle, the operator being outside. The cubicle is made of two thicknesses of wood, sheet lead $\frac{1}{8}$ in. thick being interposed. The operator can watch the patient through a lead-glass window. As regards tubes, small light anode tubes are used, being contained in a stand fitted with a lead-glass shield, which is movable in any direction.

The statistics of the last two years (August 4th, 1911, to August 4th, 1913) are as follows: The number of patients treated was 200. Of this number 93 were infected over the whole scalp; in the remainder the scalp was only partially infected, and required from one to four applications. I have been careful to find out the number of patients who had to be re-exposed to the rays, the reason for second applications being: (1) Nervousness on the part of the patients, and their inability to keep still; (2) lack of suitable tubes owing to an excess of patients; this, unfortunately, in hospital work is no uncommon thing; (3) small infected areas which have not become epilated owing either to movement on the part of the patient or to the tube not being quite central in the holder, as tubes vary in size, and some do not fit the holder.

From all these causes 26 had to be treated a second time, this being the number out of a total of 630 applications. The majority required one more application to a small area, which was given through a small lead-glass

adaptor. In the 93 cases infected over the whole scalp Keinbock's method was almost entirely used, five applications being given—one to the top of the head, one to the vertex, one to the back of the head, and one to each side. The usual practice was to give two or three applications each morning, and the remainder in about a week. The average time in which epilation took place was two weeks and five days. The usual time for the hair to recommence to grow was about seven weeks. In one case the hair was not fully grown for six months. In another, owing to two patients having identical names, one side of one patient's head received practically a double pastille dose. It is interesting to note that the hair returned quite healthy, although a considerable time afterwards.

To the best of my knowledge there has not been a single case of x-ray burn or of permanent alopecia, and one must conclude that parents would naturally report to us if such had not been the case.

By far the greater number of patients had been having treatment with ointments and lotions, some even for years. I consider the treatment with x rays quite the best, and certainly the quickest, especially for well-established and extensive cases. With proper apparatus, and in expert hands, it is perfectly safe. It is encouraging to note that several school clinics are supplied with x-ray apparatus, which is reported to be doing good work.

It is very difficult to work out the exact cost for each patient, but it is not excessive when a large number of patients are dealt with, and, even if it is in excess of ordinary treatment, the great saving in time fully justifies it.

PRELIMINARY NOTE ON BED-BUGS AND LEPROSY.

By DAVID THOMSON, M.B., CH.B. EDIN.,

CLINICAL AND PATHOLOGICAL RESEARCH ASSISTANT, SCHOOL OF TROPICAL MEDICINE, LIVERPOOL.

Two articles appeared simultaneously, one by Sandes and the other by Long, in the BRITISH MEDICAL JOURNAL, 1911, vol. ii, pp. 469 and 470, in which it was stated that a considerable percentage of the bed-bugs experimentally fed on lepers were found to contain the leprosy bacilli. Furthermore, a large percentage of the bed-bugs caught within the dwellings of lepers contained acid-fast bacilli, presumably the bacilli of leprosy, while those caught in the dwellings of healthy people contained none. The presumption was that bed-bugs might play an important part in the transmission of this disease. Since these announcements nothing further, so far as I can ascertain, has been published on this subject. In 1911 I attempted to confirm these observations by feeding a number of bed-bugs on two cases of leprosy in the Royal Southern Hospital, Liverpool, in Sir Ronald Ross's clinic. One was a case of the maculo-anaesthetic type, the other was of the nodular variety. Seventeen bugs were fed directly on the nodules of the latter case, and four on the patches of the former. They were killed and examined from two to ten days afterwards for acid-fast bacilli, but none could be found; numerous control bugs were examined, with similar negative results. I was unable to make any further investigations on the subject until 1912. I spent the last three months of that year in Panama, and had ample material at hand for continuing the work. In the leper asylum at Palo-seco I fed 84 bed-bugs on various cases of leprosy, acute and chronic, but was unable to find any trace of acid-fast bacilli in these insects afterwards. Seventeen bed-bugs were caught in the beds of the patients at Palo-seco, and I obtained eighteen more caught on the mattresses of the beds in the leper asylum at Trinidad. All of these likewise showed no trace of acid-fast bacilli. A total of 105 bugs fed on lepers and 35 caught in the beds of lepers, therefore, gave no evidence that these insects harbour or transmit the disease. A further total of 107 bed-bugs were examined as controls; 21 of these were caught in dwellings in Liverpool, the remainder were caught in the Spanish wards in Ancon Hospital in Panama. The controls also gave negative results. The Ziehl-Neelsen stain was used throughout. Full details of this investigation, in addition to other researches on the transmission of disease by bed-bugs, will be published later in the *Annals of Tropical Medicine and Parasitology*.