togen in half-minim doses of the liq. arsenici hydrochloricus, with the same result as in previous trials, a rapid aggravation of the symptoms. The subsequent progress of the case may be gathered from the blood state as shown in the table—namely, a steady decline in spite of all treatment. Transfusion of blood was offered, but declined by the patient and friends. She died on August 31st, and unfortunately no *post-mortem* examination was permitted.

REMARKS.

Reference to the table shows the importance of making repeated examinations of the blood, for during certain stages of the disease it would have been impossible to have diagnosed the condition from one examination, with the result that a too hopeful prognosis might have been given.

The following points of interest may be noted in the table:

1. The low percentage to which the hæmoglobin fell before death; 8 per cent. is the lowest reading I have recorded among many hundreds of examinations.

2. The high-colour index, which in itself would give rise to suspicion as to the nature of the disease. The colour index depends, of course, on the adjustment between the two instruments used for estimating hæmoglobin and corpuscles respectively. The scale of Oliver's hæmoglobinometer is based on the mean of a large number of counts made equally with the Gowers and Thoma-Zeiss cytometers, which differ slightly in their readings. The colour index, as here given, may be taken as very near the truth. It was maintained throughout (with one exception) at a level considerably above the normal (1.0), rising on two occasions to 2.4, until shortly before death, when it fell to 0.84.

3. The preponderance of megaloblasts over normoblasts among the nucleated red cells: This is regarded by many observers as characteristic of pernicious anæmia; for, though nucleated red corpuscles are found frequently in all grave anæmias, practically in no other condition do the megaloblasts so constantly outweigh numerically the normoblasts. Cabot,¹ in a recent valuable paper, the outcome of the study of 110 cases of pernicious anæmia, regards this as a distinctive feature of the disease, and a point of differential diagnosis from secondary anæmia. In the table of nucleated elements I have not classified separately the microblasts, nor the free nuclei, which were of fairly frequent occurrence; nor is mention made of myelocytes, which occurred not rarely. On two occasions coarsely granular basophile cells were met with. The relative diminution in the number of nucleated cells towards the end has been noted by other observers. Coles,² in one of two cases in which repeated counts were made, noted the same fact. It may, perhaps, be regarded as an indication of exhaustion of the regenerative power of the hæmogenetic tissues.

4. The leucocytes: Taking the average number of leucocytes present in health as from 8,000 to 9,000 per c.mm., it will be seen that the number present in this case was usually below normal. The lymphocytes were relatively somewhat in excess and the polymorphonucleated leucocytes somewhat under their normal proportion. Other observers (Hayem, Stengel, etc.) have noted the same facts, and Cabot³ contrasts the diminution in polymorphonuclear neutrophiles in pernicious anæmia with their frequent though not invariable increase in secondary anæmia. The large hyaline cells and the eosinophiles were present in normal numbers.

Causation.—Passing in review the definite history of long-continued repeated loss of blood in small quantities from the nose, giving rise to a state of anæmia lasting, with intermissions, for a long period of years, the case might be considered as one of pure secondary anæmia. If this be so then the condition in the later stages is clinically indistinguishable from the true pernicious form. Moreover, the prevention of further hæmorrhage failed to arrest the progress of the disease. The case must be regarded as originally a secondary anæmia, gradually merging into true pernicious anæmia, and must be classified with those described by Coupland⁴ as "symptomatic or secondary pernicious anæmia," differing only from the primary or idiopathic form in the fact that in the latter no obvious cause is to be found. Cabot, in the paper above referred to, states that he has no experience leading him to believe that there is any such condition as "secondary pernicious anæmia."

The case under consideration appears to me to clearly show the possibility of chronic secondary anæmia passing into the pernicious form, and tends to bear out the well-known

views of Stockman as to the pathology of the disease; that all cases of "idiopathic" pernicious anæmia are really forms of secondary anæmia, initially brought about by various causes, and subsequently perpetuated and rendered "pernicious" by repeated minute hæmorrhages into the tissues as a result of the anæmic state. In the idiopathic cases the hæmorrhages are internal and clinically invisible; in the obviously secondary cases the hæmorrhage is primarily external and visible, with the subsequent development, in the later stages, of the former condition.

The possibility, however, must not be lost sight of that the case may bear on Hunter's⁵ recently published hypothesis that the disease is due to blood destruction resulting from an infective process set up in the gastric or intestinal mucous membrane by the swallowing of repeated small doses of pus derived from some suppurating focus, usually alveolar supuration from carious teeth; for in addition to the blood continually swallowed there was a slight admixture of purulent discharge from the nose which passed down into the stomach, and may there have set up infection. The small size of the ulcerated surface and the slight amount of discharge render this supposition somewhat improbable.

REFERENCES.

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THE TREATMENT OF TWO CASES OF NERVE LEPROSY IN WHICH RECOVERY TOOK PLACE.

By GEORGE THIN, M.D.

In the comparatively small number of cases of leprosy that recover—although in nerve leprosy the chances are considerably more favourable than in tubercular leprosy—it is often difficult to estimate how much the favourable result is due to general hygienic measures and how much to the action of medicinal remedies. I wish, therefore, to put on record the outlines of two cases of nerve leprosy in which the credit of the cure must, I believe, be chiefly attributed to the action of drugs.

A boy, aged 11 years, was brought to me suffering from fully-developed and severe nerve leprosy. He had been born in the West Indies, was brought to England when he was 4 years of age, and a few months afterwards it was noticed that there was something wrong with his skin. After the skin affection had lasted for several years it was recognised by Erasmus Wilson as leprosy. I found his legs and thighs discoloured and completely anæsthetic over a large extent of surface. The affected area of skin terminated behind on the gluteal region on both sides, and was marked by a strictly delineated, slightly raised, scaly border. A considerable part of the affected area on the thigh was of a faint bluish-violet colour. The fingers of both hands were "clawed" and some mutilation had taken place, but I have no notes of the exact condition of each finger. There was anæsthesia about the arms and wrists and also on the face, which was partially discoloured. The eyes were watery and bleared, and the eyebrows were defective. The boy had the physique of a lad of 7 or 8 instead of 11, the limbs being small and shrunken, and his appearance that of an atrophied and wasted creature.

The main line of treatment I prescribed was the use of chaulmoogra oil, which was applied externally and given internally. When I saw him again three months afterwards his general condition was improved, the erythema was less pronounced, and the doses of chaulmoogra oil had been increased until he was taking 21 drops daily without discomfort.

His third visit to me was eight months after I had first seen him, and my notes state that on the front of the right wrist there was a large bulla continuing down to the thumb. There were bullæ on the dorsum of the distal ends of the little and ring fingers, and he had a sensation of pain in these places. The right groin was erythematous and the seat of small papules. There were minute red papules on the abdomen, and

some brown papules on the ulna and on the legs, and it was a question with me whether these papules may have been due to the chaulmoogra oil. The skin of the legs had become paler and had assumed a more natural appearance. Boric ointment was prescribed for the raw surfaces on the hands, and four days afterwards, when he saw me again, I made a note that the skin on the wrist was clean and beginning to granulate, and that the backs of the fingers were better.

From that date the patient disappeared from my observation, but after thirteen years had passed, a tall, lithe, active-looking young man presented himself one morning in my consulting room, identifying himself with the leper boy I had seen before. He told me that he had been in perfect health for a number of years, and that the remedies I had prescribed had cured him. When I asked him why he had never come back to see me, he simply replied, "It was very ungrateful of me." The object of his visit was to consult me about the advisability of his proceeding to one of our Colonies where, on account of the strict laws against leprosy, it had been suggested to him that the mutilation of his fingers might give rise to inconvenient questions.

I examined him carefully, and learned from him and from his mother, whom I sent for, that after I first saw him he took chaulmoogra oil for more than two years, perhaps nearly three years, and that six months after he began to take it his parents noticed that there was an improvement. During the latter part of this period he did not take it constantly, intermitting its use from time to time. Externally the chaulmoogra was used in an ointment.

On examination I found that his trunk and limbs showed hard, muscular development, without much fat. There was no anæsthesia in the skin of the face, the muscular development of which was perfect; his eyes looked healthy, and he had normal eyebrows. The only evidence of his having had leprosy was found in the mutilation of the hands and feet, and in the incomplete restoration of sensation on some parts of the limbs. The following is a copy of the notes I made of his condition:

RIGHT HAND.

Thumb.—Distal phalanx shortened and bent; bit of bone wanting.
Fore and Middle Fingers.—Normal.
Ring Finger.—The last phalanx and half of middle phalanx gone.
Little Finger.—Second and third phalanx gone.

LEFT HAND.

Little Finger.—Second and third phalanx gone.
Other fingers entire, but all contracted. He could not open them.

LEFT FOOT.

The three central toes contracted; no loss of bone.

RIGHT FOOT.

Toes twisted laterally, but not contracted; no loss of bone.
Sensation perfect in the left foot; defective in the right heel.

THE LEGS.

Sensation perfect in most parts, but some areas duller than others. The skin over both patellæ is insensitive, dull in front of the left leg above the patella.

Genital development perfect. Voice good. The upper part of the trunk and chest is normal and well developed; good muscular development of the arms. Sensation to touch is normal in the arms above the elbows, dull on the extensor surface of both forearms, absent on the back of the left hand.

The eyes at one time had streamed with water, but this had not occurred for the last five years. They had never been much inflamed. His vision was perfect, and his eyebrows well developed. He suffered from no pain. His skin was everywhere normal in consistence and colour, and he had a fine fresh complexion.

I was so struck with the remarkable result of the treatment that I asked his mother (an intelligent, careful woman) to tell me how she had carried it out. The following is an extract from a letter she sent me: "We followed your instructions carefully for a year. He began by taking chaulmoogra oil, increasing the doses gradually from three to seven drops. You afterwards advised capsules, as being more easily taken. Chaulmoogra oil was also well rubbed all over his body every night. In the morning he had a tepid bath in which boracic acid was dissolved. He was much in the open air, and slept with his window open both summer and winter, and took good nourishing food. After about a year his system became so impregnated with the chaulmoogra that his linen, even after being washed, smelt of it, as did his skin and hair. He had used the oil for two or three months before the smell became

perceptible to those around him. It at last became so distasteful and repugnant to him that he refused to take any more of it, and we did not insist on his doing so, seeing that he was so much better in every way, and that it had begun to have a nauseating effect upon him.

"From that time to now he has been steadily improving in health and strength. He twice began the oil again, but did not continue it for any length of time."

I attribute the recovery of this boy to the chaulmoogra oil, because before he began to take it he had been steadily deteriorating from the time the disease appeared, and, although hygienic measures may have contributed to his recovery, it must be borne in mind that he had always been well cared for, and that his family (English people of the professional class) were in comfortable circumstances.

I shall now give a brief sketch of some points in a case in which nerve leprosy was detected at a very early stage in a youth who had been some years abroad, and in which complete recovery took place.

I put this case on record chiefly because I was witness to the remarkable effects of locally applied pyrogallallic acid, which had been recommended in the treatment of leprosy by Dr. Unna shortly before the patient was brought to me. The treatment of the case consisted in the long-continued application of pyrogallallic acid ointment to the affected part, and the regular exhibition of gurjun oil internally, arsenic being given intermittently. The lesion which presented itself to me when I first saw the patient was a round, slightly-discoloured patch on the face, which had existed for at least six months previously. The appearance was characteristic of nerve leprosy in the early stage. The border of the patch was raised. Its centre was completely anæsthetic, but the anæsthesia was only partial at the periphery, where slight sensibility could still be elicited. On carefully examining the rest of the body, a similar patch, scarcely larger than a threepenny piece, was found over the spine between the shoulders. This patch was a little redder than the surrounding skin, and was desquamating slightly. It was slightly anæsthetic, the anæsthesia extending beyond the border, where, however, it was not so marked as in the centre.

The treatment prescribed was 5 per cent. pyrogallallic acid ointment to be rubbed into both places twice daily; a drachm dose of gurjun oil to be taken twice a day; and 2 minims of Fowler's solution twice daily. In a week the strength of the pyrogallallic acid ointment was increased to 7½ per cent., and this was the strength which was afterwards continued. The small patch between the shoulders disappeared entirely in less than a month, and perfect sensation was restored. The patch on the face became gradually less anæsthetic from month to month, the improvement, although not so great at first, being always progressive.

About a year after I had been first consulted several small anæsthetic spots appeared on one of the thighs, the largest of the spots not exceeding that of a split-pea. These spots were somewhat pale in colour. At the same time two small round brownish patches, anæsthetic in the centre, appeared on the calf of the same leg. Under the pyrogallallic acid ointment these patches and spots completely cleared up and normal sensation returned.

I have only a few notes of the case, but I find that two years after I first saw the patient I was still prescribing pyrogallallic acid ointment and gurjun oil in capsules. As there was an idiosyncrasy against the arsenic, it could only be given occasionally and in small doses.

The patient passed out of my observation for some time, but I had an opportunity of carefully examining him three or four years after the treatment was first commenced, when I found that the patch on the face had disappeared, and that sensation in the part had completely returned. The treatment by gurjun oil was continued for some time after no trace of the disease was visible.

How much of the favourable result in this case can be attributed to the gurjun oil I cannot say. The patient was a healthy adolescent, and of a naturally good constitution—facts that certainly contributed to the recovery. But as regards the pyrogallallic acid ointment I was convinced that in this instance it had eradicated small recent patches of anæsthetic leprosy. It is to this action of the pyrogallallic acid ointment, for the use of which we have to

thank Dr. Unna, that I wish to call attention. The case otherwise points very strongly to the possibility of a localisation of the disease in the skin. The complete restoration of sensation to patches in which the sensibility had been destroyed indicates that, when the disease has not lasted long, a regeneration of nerve fibres may take place within a comparatively short time after the bacilli have been destroyed. The theory of the action of pyrogallic acid in cases like this is probably that it kills the bacilli of leprosy, and the complete cessation of any other manifestation of the disease would indicate that, so far, the bacilli had only obtained hold of the superficial parts of the skin.

The patient was afterwards carefully examined on several occasions, and at considerable intervals, after every appearance of the disease had ceased, and no recurrence was found. Recovery was complete. For a number of years the patient has led an active useful life, enjoying excellent health.

ON OPERATING ON THE SUBJECTS OF EXOPHTHALMIC GOITRE.

By J. DELPRATT HARRIS, M.R.C.S.,
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Not a great deal seems to have been written on this particular subject. One turns to works on medicine, and finds the disease carefully described, and attention drawn to many curious nerve manifestations, and the treatment found beneficial in certain milder forms, ending with physical and mental rest, good food, and the avoidance of all stimulants, such as alcohol and coffee. The case now brought forward serves to show what may happen if all these points are obliged to be set aside.

In many surgical works no notice seems to have been bestowed on the subject apart from operating on the enlarged thyroid gland itself. In this last instance a recent work states that such operations not infrequently end fatally in forty-eight hours, the patient becoming delirious and restless; this has been attributed to the autotoxic action of the thyroid gland, the patient suffering in a manner similar to that when too large a quantity of thyroid extract is given.

CASE.

A woman, married, aged 46, of well-nourished appearance, and not particularly anæmic came to the Royal Devon and Exeter Hospital for pain in her left breast of about a fortnight's duration. She was the subject also of exophthalmic goitre. Twenty-three years ago she was confined of twins who were not suckled as she had no true nipples. A fortnight prior to admission she noticed pain of a stabbing character in the left breast, which at the same time she thought began to swell. Her goitrous condition seems to have caused her no special symptoms, as she can only remember suffering from indigestion and "bile" of late years. Handling the breast caused no pain; a lobulated mass was to be felt in the upper part. It slipped to some extent under the fingers, and was close to the nipple. It seemed about 2½ inches in diameter; the mammary gland itself seemed swollen, and some general mastitis was present.

The pulse, seldom below 150, was irregular but forcible. There were distinct tremors, and Graefe's symptom was well marked. The date of the onset of the goitrous symptoms was unknown, but she had been told that her pulse was very quick for at least twenty years. She was kept under treatment at the hospital for quite one month, taking potassium iodide with ammonia, and using extract of belladonna in compound mercury ointment locally. Under this treatment the mastitis certainly diminished, but this only served to bring the hard lobulated masses into greater prominence. As she lived a long distance in the country and could not come up to be seen easily, after much consideration its removal was decided on, and this was carried out on March 6th by Halsted's method. The anæsthetic was ether, which was taken with some difficulty, principally from pulmonary causes.

After the operation the notes run as follows:

March 9th.—Patient has been very sick several times. Dressing required packing. Had sips of hot water. Pulse 126. Temperature normal. During the night was restless and slept but little. March 10th. Pulse 160. Temperature 99.4°F. Sickness stopped. Pulse weakening and quickening: in the evening 170. Hypodermic injections of strychnine gr. ¼ every four hours. Complained of faintness. No further packing of dressing required. During the night condition of patient remained about the same. Slept four hours in all. Complained of cold feet. March 11th. Patient very weak and restless. Pulse 180. Temperature 97.8°F. Profuse perspiration, but hands and feet cold. Hypodermic injections stopped. Brandy mixture given. Brandy 5ij per diem. March 12th. Patient has not slept, has taken fifteen ounces of milk. Hypodermic injection given at 4.30 A.M. At 7.35 A.M. the patient died, the pulse for some hours previously being quite uncountable. She survived the operation 68 hours.

This, then, depicts the condition of a patient suffering from well-marked Graves's disease, who from circumstances is obliged to undergo an operation of a formidable character with

all its mental disturbance, other than such on the thyroid gland itself.

It would seem that the condition of the heart is from the first the great difficulty; beating irregularly at great speed, which possibly indicates thin and dilated ventricles, the anæsthetic at once converts chronic compensation into acute embarrassment, whilst the unavoidable loss of blood causes temporary quickening of the already too quick pulsations, causing general weakness and exhaustion, which, owing to the anæsthetic sickness, cannot at first be remedied by food, and thus before compensation can again be restored our patient sinks. Therefore in advanced cases of exophthalmic goitre every effort should be made to avert a serious operation; but, if it is absolutely imperative, a course of treatment with remedies of the digitalis class should precede. Should the heart not respond to this treatment, the operation should be reconsidered, for undoubtedly the risk in such cases is of the gravest possible character.

The operation was conducted under the modern aseptic treatment, biniodide solution being the principal antiseptic used. The loss of blood was very moderate after as well as at the operation, so that the pulse and temperature noted would seem to be that of unavoidable conditions when operating on goitrous patients who have well-marked Graves's disease.

It may be added that the constant mental worry of having a tumour of the breast—which, if not truly malignant at the time, might degenerate at any time and form an opening loth to heal—had great weight in deciding it best on the whole to operate.

The tumour proved cystic, of the dilated duct type, with apparently no intracystic growths and but little solid material outside the cysts, which seemed surrounded by inflamed gland substance.

A CASE OF DESCENDING LANDRY'S PARALYSIS IN A CHILD.

By LEONARD A. ROWDEN, M.B., C.M.,
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THE following case is especially interesting on account of its rarity:

History.

N. C., a lad, aged 10, came under my care in June, 1897, when passing through a severe attack of whooping-cough. In April, 1898, he was attacked by chorea, which lasted about six months, and affected chiefly the muscles of the face, and only to a slight extent those of the upper and lower limbs. Since October, 1898, he has been in good health, and has appeared to be a very active and bright lad, the only thing noticeable being an occasional slight twitching of one side of his face, which I considered a habit imitated from his father, who is affected in the same way.

On September 17th, 1900, I was sent for, and obtained the following history. On September 14th he slipped about 5 feet into an excavation for a sewer that was being filled in, and then another 5 or 6 feet to the bottom. He jumped out feeling none the worse for his accident, except for a slight bruise of the left knee. He played about as usual during the day, and in the evening was very active in a game of cricket. He had a good night. On the following day, September 15th, he did not feel very well, but got up and played about for some hours and took his food as usual. There was no vomiting and no pain or stiffness anywhere, but towards evening he held his head as though he had a slight stiff neck, and vomited once after having some light food. He was rather restless during the night. On September 16th he was up most of the day, but complained of slight headache and pain in the neck. He was more restless during the night, and appeared to be feverish.

Condition on Examination.

On September 17th I saw him about 12 o'clock. His temperature was nearly 103°F., his pulse 100 and good, and respiration normal. He did not appear to be at all ill, having no headache and no pain anywhere. On examination I found that he could not turn his head to either side, but could move it backwards and forwards. Passive movement of the head was easy and free from pain. There was also inability to raise either arm at the shoulder-joint. He had a fair grasp with both hands, and could flex and extend the forearms readily at the elbow-joints, and could kick his legs about briskly. There was no bruising or any sign of injury or dislocation at any point of the spine, and no tenderness on pressure of the vertebrae. There seemed to be very slight swelling about the lumbar muscles, but it was not at all distinct, and pressure here seemed to cause a little pain. I considered his condition as probably arising from the shake of his fall, and perhaps from chill. As there was scarlet fever next door I examined him carefully for symptoms of this disease, but could find none, nor were there any signs of diphtheria.

Progress of Case.

I saw him again next day, September 18th, about noon, and was told that he had had a very restless night, but did not complain of any particular pain. On examination I was surprised to find complete motor