James, the eldest, aged 16, affected as shown in the first illustration.

Alice, aged 14, entirely unaffected.

Tom, aged 11, shown in the second illustration.

Annie, aged 7, slightly affected.

Kate, aged 7, affected rather more than Annie.

Joseph, aged 4, has not yet shown any symptoms.

All the affected members of this family are accustomed to

Tom R., aged 11.

describe the subjective symptoms of their complaint as "stiffness." It was first noticed in each of the elder boys when they were 4 years of age. Annie had never complained of any subjective symptoms, and was apparently unaffected when examined at 6 years old. Now, though still free from

Tom R.

any obvious weakness she presents well-marked enlargement of the muscles of the calves and the thighs. The arms are

perhaps slightly affected. Kate began to be "stiff" when she was a year old, but improved afterwards, and has now hardly any subjective symptoms; but there is very marked enlargement of the muscles of the calves and thighs and the gluteal regions. The muscles of the back and shoulders and the pectorals are also obviously enlarged. Lordosis is well marked in both these girls, but more in the younger.

But both the subjective symptoms and the objective signs of the disease are more marked in the two elder boys than in either of the girls. When the boys were first brought to me (now about six years ago) the ordinary symptoms were well marked. They could not go upstairs without great difficulty, helping the weakened muscles of the legs by their hands on their knees; and they could only get up from the ground very slowly, "climbing up themselves" with a very characteristic action. The enlargement of the muscles of the calves and thighs and back was quite as well developed as now, and that of the shoulders more so. Especially in the elder boy, the enlargement of the pectoral muscles was so great that when they were contracted the appearance resembled that of a half-grown mammary gland. This may be still recognised, although it is much less marked now than some years ago. Compare, in the figure of the elder boy, the pectoral muscles on the two sides, relaxed and extended. The characteristic lordosis was well-marked when the cases were first seen, and continues to be so, as the figures show.

Since these boys have been under treatment a very remarkable improvement has been observed in the symptoms. Neither of them finds now any difficulty in going upstairs in the erect position. They play football, and can even jump a fair height. At times they both find a variable amount of "stiffness" in the legs.

The treatment has consisted simply in the continuous administration of dilute nitric acid, with tincture of nuxvomica in small doses, and friction with lin. camphoræ was used more or less.

All the members of this family are somewhat undergrown and look younger than they are. I noted that the height of the eldest when he was aged 14 years and 2 months was only 4 feet 5 inches. He has grown a little since that. They all appear to have intelligence quite up to the average, and are very bright and cheerful.

There are several points in connection with these cases which are of special interest. The occurrence of several cases in one family is not very unusual. But when this happens the girls are commonly spared. In the largest number of recorded cases the calf muscles, or the muscles of the calves and thighs, only have been affected. Hypertrophy of the muscles of the back and still more of those of the shoulder and of the pectorals, is somewhat exceptional. It is remarkable that this occurred in all my cases, except that enlargement of the pectorals could not be detected in the girl who was on the whole least affected. But perhaps the most remarkable circumstance of all is the great improvement which has taken place in the symptoms of the two boys. Whether this is due to the treatment adopted is of course open to question.

RIGHT BRACHIAL MONOPLÉGIA AND PERVERTED SENSATIONS DUE TO TRAUMATIC ABLATION OF THE ARM-AREA IN THE LEFT CORTEX CEREBRI: RECOVERY.

By J. LYNN THOMAS, F.R.C.S. Eng.,
Cardiff.

THIS case was shown at a meeting of the South Wales and Monmouthshire Branch of the British Medical Association held at Newport on November 2nd, 1893. It came under my care whilst house-surgeon at the Cardiff Infirmary, and I am much indebted to Dr. Thomas Wallace for allowing me to treat and to record this interesting case.

History of Injury and Treatment.—G. G., aged 44, an engine driver on the Taff Vale Railway, was admitted on May 28th, 1891, on account of a compound comminuted fracture of the skull due to his being knocked down by a train whilst he was attending to his own engine. He was stunned

for two or three minutes, regained consciousness, and walked down the platform in Cardiff Station.

On admission the patient was pale, complained of much pain in the right shoulder, was under the impression that it was badly contused, but there was no evidence of injury on his clothes and skin, had absolute paralysis of the right upper limb, including scapular movements; had a bleeding, lacerated scalp wound on the left side, and several pieces of brain substance entangled in the hair. The man had a hypodermic injection of a fifth of a grain of morphine, was narcotised with chloroform, the aperture in the skull was plugged whilst the head was being shaved and ascepticised, the scalp wound enlarged, and the whole extent of the fractured bone was fully exposed. The fracture of the bone was about 2 inches long. Its shape and situation are shown in the diagram. The fragments of bone were completely detached and driven into the brain at the anterior end, whilst the posterior extremity of the fracture was of the "gutter" type, and was elevated. My forefinger was easily admitted into the cerebrum, where several pieces of bone were lodged and removed. The brain wound was irrigated with carbolic lotion (1 in 50), and iodoform was swabbed into it with my finger. The edges of the dura mater and the scalp were trimmed, replaced, and sutured, and an aperture left in the posterior angle of the wound for drainage, was dressed with salicylic wool, and bandaged firmly.

The external dressing was changed the following day, and again in a fortnight when the stitches were removed, and the parts were quite healed and the brain pulsation was very marked. The recovery until firm closure of the gap in the skull was uneventful, there being no rise of temperature, no sugar in the urine, no disturbance of vision nor of hearing. The recovery of volition over muscular movements of the upper limb took place slowly but in a very definite order from above downwards, starting with elevation and forward movements of the scapula and abduction of the humerus, and terminating with the coarser movements of the fingers.

For six days there was complete paralysis of the limb, and patches of blunted sensibility but not of complete anæsthesia were noticed along the extensor surface of the forearm and hand. On June 4th he could slightly shrug his shoulder and abduct the arm. Three days later the shoulder movements were stronger and he could use his biceps and triceps. On June 10th circumduction of the shoulder could be performed, and there was improvement of flexion and extension of the elbow; the supinator longus acted prominently; no wrist movements.

On June 14th he had slight control over the extensors of the thumb and fingers but no power over the flexors. On the next day the extensors of the fingers were stronger; he complained of cramp in the ring and mid fingers. On June 17th, in the morning, he regained partial control over the flexors of the thumb and fingers quite suddenly after a fit of sneezing. From this date his improvement was slow but evident, and he left the infirmary on July 23rd, 1891.

I saw the patient again on April 23rd, 1893, and made this note: "Relative strength of hand grasp tested by dynamometer: left, 95; right, 65. Has no power of abduction and adduction of fingers—in other words, has no direct control over his interossei and abductor minimi digiti muscles; has a patch of marked blunted tactile sensation in the upper third of the right forearm in the course of the external cutaneous nerve."

CONDITION TWO AND A-HALF YEARS AFTER INJURY.

During November, 1893, G., who is a very intelligent man and a close observer, allowed me time to investigate his condition and drew my attention to facts in connection with his right upper limb which are of particular interest in connection with the physiology of the psycho-motor areas in man.

He now follows his occupation, and states that his "arm feels as if loaded with lead, and consequently he has to exert himself a little more than he normally should in executing movements." When he touches different objects out of sight he cannot realise their exact shape, nor those qualities usually displayed by the sense of touch such as take place when moving one's hand from the wooden frame of a chair to the leather part; he has to call in the aid of his sense of sight to interpret for his right hand what would at once be perceived by his left without this additional sense; he is now trying to train his hand to know what things are, but it is a very difficult task as progress is extremely slow.

He has a depressed scar in the region indicated in the diagram on the left side of the skull. It is $2\frac{1}{4}$ inches long, so placed that its anterior upper end is $2\frac{1}{2}$ inches from the mid-line of vertex; its posterior upper end is $1\frac{1}{2}$ inch from mid-line, and the scar direction continued backwards would touch theinion.

The width of the scar in the line of the fissure of Rolando is 1 inch, and occupies on the tape the space between the 2 and the 3, starting above; the total length of the line indicating the site of the fissure of Rolando being $5\frac{1}{2}$ inches; so the scar overlaps the mathematical centre of this line. It extends $\frac{2}{3}$ of an inch in front of the line for the sulcus of Rolando, and nearly 1 inch behind the vertical line from the posterior border of the mastoid process.

He cannot fully flex the terminal phalanges when the metacarpo-phalangeal joints are extended; he has fair control at present over his interossei and abductor minimi digiti; he can write, but more slowly and clumsily than formerly. I

The shaded area indicates position of scar in relation to the line of fissure of Rolando. The figures 1 to 5 represent the inches on the surface line for the above fissure.

append a specimen of his handwriting done slowly and at the usual pace.

1. Geo. Greenblade
2. Geo. Greenblade

Specimen of hand writing; 1, written in 30 seconds; 2, in 15 seconds

In the acquired movements of the hand which he has re-acquired, he is up to the present time much slower in executing, and has literally to keep his eye on his hand when at work; he cannot, for example, take hold of a penholder in a proper way without the aid of his left hand. The sense of touch is blunted in the forearm and hand. The sense of pain is blunted in the same region. Sense of heat and cold is keener than in the left hand, and he made this interesting statement: "I am afraid to put my right hand in places on the engine where things are hot for fear of burning my hand." This fear is due to experience, not to pain, for he has more than once blistered his right hand without knowing it. It seems to me that, although his sense to heat and cold is keener within the limits that a normal hand will tolerate, the mechanism for apprising consciousness of thermal danger is utterly absent in this case, and hence the sense of pain (which is blunted in this case) is stimulated in a normal condition the moment thermal degrees become dangerous to the integrity of the organism.

He drew my attention to the fact that his nails on the right hand are more brittle and more striated longitudinally than they were before the accident. He also states that his right forearm is more hairy than formerly; it now certainly is more hairy than the left one. The ulnar side of the hand, including the middle, ring, and little fingers, suffers from hyperidrosis; when he places both hands in his trousers pockets this area alone becomes quite wet in a short time, and during the time he was writing for me a specimen of his handwriting it got quite wet. My hand cannot detect any difference in the temperature of the two limbs; the thermometer was never tried.

Shaded area indicates the extent of local hyperidrosis.

REMARKS.

The original destruction of brain tissue was more particularly confined to the anterior two-thirds of the scar region, and I do not think the injury extended much deeper than the grey matter. It is very difficult to account for the great

Areas for muscular movements of opposite upper limb.

" " " " " lower "

Fig. 610 (after Ecker), from Landois and Stirling's *Human Physiology*.—c, Sulcus of Rolando. (1) Advance of the opposite hind limb; (2), (3), (4), complex movements of the opposite leg and arm, and of the trunk as in swimming; (12) eyes open widely, pupils dilate, and the head and eyes turned towards the opposite side; (13), (13'), the eyes move towards the opposite side and upwards and downwards centre-of vision.

pain in the right shoulder complained of on admission and subsequently, except on the hypothesis that it was referred pain due to the cortical lesion.

Figure 610 from Landois and Stirling's *Physiology* was copied to serve as a key-reminder to the physiology of the region involved in this case, and the numbers on the outer surface of the brain are those well-known ones transferred by Ferrier from the motor areas in the monkey's brain to corresponding convolutions in man. The area marked (5)—I mean, of course, that on the left side—could not have been injured in this case, but it is just possible that its motor path was; if that be so, we must grant that the injury selected the No. (5) path and left undisturbed the paths of Nos. (12), (7), (2), (3), (4), which would be most improbable. In other words, I think this is an instance against the existence of No. (5) in man for the same purpose as it serves in the monkey.

Immediate and permanent disturbance to a part of the "sensory areas" for the right upper limb followed the injury, namely, those for common sensation, tactile sensation, heat and cold, and trophic changes. Nor is he conscious of the exact locality of his hand when searching for objects without his sense of sight. There could not be any injury to the gyrus fornicatus and hippocampal region, for the reason that such an injury would to a certainty cause some paralysis in the lower limb, and besides, the extreme improbability of such injury selecting only the "sensory areas" for the limb that was motorially paralysed.

The man is still conscious of his right arm feeling heavy when at work. This peculiarity may be due to the extra task thrust upon the motor areas which have so successfully taken up the function of the destroyed cortex.

The evidence of this case, taken altogether, is, I think, strongly in favour of Gowers's, Munk's, and Starr's contention that the "motor areas" are not exclusively motorial in their functions.

Cases of grave destructive lesions of the brain, unaccompanied by serious concussion and septic troubles, are of such paramount importance to the elucidation of the physiology of localised areas in man, and are also of such infrequent occurrence that I ventured to give as fully as possible details of the patient's consciousness of his injury, as well as those of my own observation.

THE MILROY LECTURES

ON

DARWINISM AND RACE PROGRESS.

Delivered before the Royal College of Physicians.

By JOHN BERRY HAYCRAFT, M.D., D.Sc., F.R.S.E.,
Professor of Physiology, University College, Cardiff.

[ABSTRACT.]

LECTURE II.—DISEASE AND NATURAL SELECTION.

WE have as the result of the actions upon mankind of such diseases as measles or small-pox a constitutional disturbance which leaves behind as its sole relic individual and race immunity. It was at one time held that this race immunity was the result of hereditary transmission, that the parents were rendered immune, and that they transmitted this immunity to their children. It is conceivable that this may be so, for the blood is affected in these diseases, and therefore the germinal cell may be affected too. There is, however, no reason to believe that this is the case, for a community will, in several generations, undergo at the hands of the microbe a process of selection, and only those strains will be found alive who are able in some measure to resist its inroads.

There are other microbes which, in addition to the production of blood changes, have a profound and lasting effect upon many of the tissues of the body; such are the microbes of leprosy and syphilis. Strange to say, the germ cells seem not to be reached in leprosy, and this loathsome disease is not transmitted from parent to child. Hideous as are its aspects, it must be looked upon as a friend to humanity, for while the microbe of typhoid will attack a man who is healthy, the microbe of leprosy feeds upon those who are debilitated, and from conditions under which healthy and strong racial development is impossible. It is a depopulator

Report of Leprosy Commission in India, 1890-91.