the capacity of a young and strong workman from full hard work to light work, or "no ladder work," or some seriously limited occupation, it is obvious that the very best effort should be put forward to procure the most perfect functional result which is possible. In order to ensure this result it is very desirable that the same surgeon should supervise the case from start to finish. He should be entirely responsible for the case whilst in the wards; he should supervise its manipulation and splinting, its early massage, and, on discharge, its progress through the out-patient department and physio-therapeutic department. He should control the entire physio-therapeutic treatment.

Many of our general hospitals now have orthopaedic departments. In these hospitals the fractures naturally go to the wards associated with this department. The work of an orthopaedic surgeon differs in one very important respect from that of the general surgeon in that the former frequently has to undertake much more prolonged after-treatment of his patients. The operative measures employed, though essential and highly important, may be a mere incident in the course of the whole treatment. Weeks or months of patient physio-therapeutic measures, accompanied by the constant supervision and adjustment of mechanical appliances, may be required in order that the value of the operation may not be lost. Similarly in the case of fractures, supervision of the whole of the after-treatment is of the very highest importance. In hospitals which have no special department for orthopaedics, a member of the surgical staff should be selected to take charge of the fractures. He should naturally be one with some leaning towards orthopaedics, who would be able to devote the necessary time to the work, which would, in this case, be in addition to his general surgical duties. He should be allotted a sufficient number of additional beds for fractures. This number will be arrived at from a survey of the in-patient records. It will be found to work out, in the average general hospital, at 6 per cent. of the total surgical beds. In areas which are almost entirely industrial this figure may be a little higher.

Under a system of centralization such as this the surgeon in charge becomes more expert in his methods, the house-surgeon of the unit receives real thorough instruction and practice in his art, the nursing staff becomes extremely skilled in the handling and adjustment of splints and the nursing of patients in fracture apparatus, and the general wards are relieved of cases which are somewhat alien to them. At Salford Royal Hospital, where an orthopaedic department was opened in 1918, the system has worked extremely well and with the greatest advantage to all concerned.

NOTES ON A GIANT.

BY

WILLIAM ROBINSON, M.S., F.R.C.S.ENG.,

SENIOR SURGEON, ROYAL INFIRMARY, SUNDERLAND.

SIMON ORD described "the cretinoid state in adult women," and surgeons showed that complete removal of the thyroid gland brought about myxoedema, the functions of the ductless glands have been constantly investigated. Before that time we knew only that the complete removal of the sexual glands in man, sheep, cattle, horses, and other animals not only prevented reproduction, but made them docile and fat, thus affecting character as well as growth. Afterwards Marie, in 1885, showed that growths and hypertrophy of the pituitary gland caused acromegaly, and since then it has been slowly established by surgeons that the anterior lobe of the pituitary gland presides over the growth of the body. This discovery led Professor D. J. Cunningham to slip his finger through the foramen magnum of the skull of Hunter's costly giant, Byrne, in the Hunterian Museum, and to discover its expanded and shallow pituitary fossa; and Professor Arthur Keith later to cut a window in the cranial vault, and so render the enlarged fossa visible to the eye. (John Hunter is said to have paid the watchers of Byrne's corpse £500 to allow the body to be kidnapped.)

Recently E. Uhlenroth, of the Rockefeller Institute, has produced experimental giantism—that is, growth beyond the normal size of the species—in salamanders by feeding them on the anterior lobe of the pituitary gland. The function of the posterior lobe is unknown, and when given as food not only was growth not stimulated, but actually retarded. It is the intermediate part of the gland that supplies the extracts which excite unstriated muscle, raise blood pressure, and produce diuresis.

The effect produced depends on the developmental stage of the salamander: no effect is produced on the larvae. At the stage when growth ceases or is normally much lessened, cell proliferation can be enforced by the specific substance in the anterior lobe of the hypophysis.*

The giant "F." consulted me six or seven years ago. He was then 20 years of age, his height was 7 ft. 8 in., he was still growing, and he weighed over 22 st. Although so tall he was fairly proportionate, except that his hands, feet, skull, and lower jaw were perhaps unduly large. His hands were long and shapely, and differed from the short, broad, spade-like hands and sausage-like fingers of the acromegalic, the age of onset accounting for the difference. When the disease is congenital or begins during the growing period of youth, gigantism results; if after 25, acromegaly is produced. When "F." stretched out his arm at right angles to his body, the writer (height 5 ft. 11 in.) could walk comfortably under it. "F." knew that giants died young, and his ambition was to live long enough to outgrow the Chinese giant, who, he said, was 8 ft. 4 in. in height. So far he had had no serious illness. His sexual organs were normal. He had no pressure symptoms in his brain, and these were not to be expected, as an x-ray photograph showed a pituitary fossa quite normal in shape. All his bones were overgrown in breadth as well as in length, and the soft structures of the body were similarly affected; nor is this surprising as far as the muscles are concerned, when it is remembered that biologically bone is secondary to muscle and not muscle to bone. Three excellent skiagrams were taken for me by Dr. A. C. Norman, and I append a description of each:

Giant "F." with a man of ordinary height standing beside him.

1. *Skull.*—The sella turcica—like a capital U in shape—admits two-thirds of a shilling in the antero-posterior plane, whilst that of an ordinary skull will admit only a threepenny piece. The greatest length from chin to occiput is 12½ in. From forehead to occiput measures 9½ in. The thickness of the skull in many places measures ½ in., and at the external occipital protuberance ¾ in. The air-containing sinuses are very large, especially the frontal, which measures ¾ in. antero-posteriorly. The lower jaw is huge.

2. *Forearm and Wrist.*—The inferior extremities of the radius and ulna are not yet joined to their respective shafts as they should be at the age of 20. His limbs are, therefore, still growing.

3. *Hand and Wrist.*—From the wrist-joint to the tip of the middle finger measures 11½ in. The greatest breadth of the hand at rest at the head of the first metacarpal bone measures 6 in. The parts of the hand are proportionate. His thumbnail is 1¼ in., and that of his middle finger 1 in. in length. Ossification: (a) The heads of the inner four metacarpals are joined to their respective shafts, and so is the base of the thumb metacarpal to its shaft, as they all should be, at the age of 20. (b) The bases of the first and second rows of the phalanges are not yet united to their shafts as they should be at 20; but those of

* *Lancet*, February 12th, 1921, p. 358.

the third row are as they should be at his age. The fingers and the thumb are evidently still growing.

"F." had an average intelligence and was not ungainly, though most giants are said to have been dull, feeble, ungainly, and short-lived. Magrath, 7 ft. 5 in., died in 1760 at the age of 24. Chang, the Chinese giant, was an exception, and so was the Russian, Machnow, who at 23 measured 9 ft. 3 in., and was well proportioned. He was, perhaps, the biggest of modern giants. Byrne measured 8 ft. 4 in. after his death, which took place at 22. Og, the king of Basan, was handsome (Josephus), and his iron bedstead was 13 ft. 6 in. by 6 ft. Goliath of Gath was 9 ft. 6 in., or according to Josephus 8 ft. 9 in., and his hand was big, for "the staff of his spear was like a weaver's beam." Classical evidence of giants measuring 46 and even 60 cubits is mythical and untrustworthy. The Scriptural evidence of races of giants does not amount to much. The two Hebrew words translated "giants" in the Authorized Version and "nephelim" and "mighty men" in the Revised Version did not apparently apply to giants in our sense of the word.

Even the celebrated naturalists Cuvier and Buffon fell into the popular delusion of there being "giants in those days" by figuring the fossil bones of elephants, rhinoceroses, mastodons, etc., as remains of human giants. Nevertheless human skeletons of extraordinary size have been found in the caves in the "Red Rocks" of Mentone, where they measured 6 ft. 6 in. in length, and showed evidences of powerful muscular development; and in Scotland, where five such skeletons were found together at Logie Pert, Forfarshire. We must therefore admit that giantism may be racial as well as the result of disease. The tallest men now living in the British Isles are said to be the villagers of Balmaclellan, in Galloway, whose average height is 5 ft. 10.46 in. (Dr. Beddoe). The average height of the Tehuelches of Patagonia is only 5 ft. 10 in.

INVOLVEMENT OF THE ORBIT IN DISEASE OF THE NASAL ACCESSORY SINUSES.

BY

ROBERT E. WRIGHT, M.B., MAJOR, I.M.S.,

ACTING SUPERINTENDENT, GOVERNMENT OPHTHALMIC HOSPITAL, MADRAS.

It is not so very long ago that most cases of orbital cellulitis applying for relief at large ophthalmic clinics were regarded as of unknown origin. Even now the most diligent inquiry often fails to explain the mode of onset in certain cases. It should, however, always be remembered that until the ophthalmic surgeon can prove the accessory sinuses of the nose healthy, he is not justified in looking for a more obscure seat of origin elsewhere. The intimate relation between the orbit and the nasal accessory sinuses is familiar to all. To those who dip slightly deeper, and familiarize themselves with illustrations of the work of Onodi or of others who have for a considerable time drawn attention to this important matter, it must appear strange that extension from infected sinuses to the cellular tissues of the orbit is not more frequent. Probably mild degrees of periostitis are much more frequent and much more serious than is commonly thought. If ophthalmologists have been to blame in the past for accepting orbital cellulitis as a clinical entity, this cannot be said of those rhinologists who of recent years have devoted so much time and labour to the nasal accessory sinuses. Owing chiefly to their researches, it is now a recognized fact that cellulitis of the orbit is nearly always due to accessory sinus disease.

In a large out-patient department like that of the Government Ophthalmic Hospital, Madras, a considerable number of such cases report for treatment. More than half of the cases are children, in whom it is often very difficult to locate the sinus trouble; fortunately in adults it is simpler. In either case the nose should be carefully examined by the usual inspection methods; transillumination should be performed, and, if possible, a good x-ray photograph obtained. In children the sinus disease is more often of a primary acute nature, whilst in adults it is more frequent to meet with an exacerbation of a chronic condition. It is remarkable how often orbital cellulitis clears up by mere drainage, but it is to be remembered that a certain number of patients come back later with optic atrophy. This note is intended, however, to record the comparative frequency with which one of these sinuses was responsible for cases of orbital trouble reporting to this hospital during the last quarter of 1920. Six cases in all were met with. This is greatly in excess of the average rate at which orbital complications are met with in frontal sinus disease in Madras. The case notes are as follows:

CASE I.

R. P., Hindu male, aged 27, presented himself on September 19th, 1920, complaining of swelling of the left upper lid of three months' duration. His sight was not affected, but he had been troubled with nasal discharge. There was a small, rounded, firm swelling below the middle of the superior orbital rim and marked ptosis. While examining the cyst-like tumour the patient volunteered the information that he could empty it, and proceeded to do so by squeezing firmly upon it and evacuating the contents (about a drachm of muco-pus) upon the floor. There was tenderness on pressure against the floor of the sinus. The left nasal fossa showed hyperæmia, swelling of the middle turbinate, with polypi and pus in the middle meatus. A frontal sinus probe could not be passed; transillumination was negative. An x-ray photograph showed small symmetrical frontal air sinuses without marked septa. A certain amount of fogginess on the left was the only indication of disease. There was no history of syphilis, and the Wassermann reaction was negative. Both fundi were normal.

Drainage by the intranasal route was adopted. The anterior part of the middle turbinate was removed with scissors and snare, and the ethmoidal cells broken down. A large escape of pus occurred on opening the agger cells. As the ostium of the frontal sinus was cleared and enlarged, pus flowed freely into the middle meatus. Drainage was established by enlarging the fronto-nasal canal and ostium. Irrigation was subsequently carried out for a short time. The patient left hospital on October 28th, 1920, free from swelling, ptosis or tenderness, and without discharge from the frontal sinus.

CASE II.

R., Hindu male, aged 30, came to hospital on September 20th, 1920, complaining of dull vision on the right side and discharge from the upper lid. R. eye, V. = F. at 2½ metres due to old leucoma: fundus normal. L. eye normal. The lid disease commenced three and a half years ago with unilateral headache and offensive nasal discharge. He had interrupted attacks of pain during this time. During one of these, five months ago, a swelling appeared below the brow. He had it opened, and as it would not heal he came to hospital. The sinus led to necrotic bone in the roof of the orbit. Examination of the nose showed polypi, and pus in the middle meatus. A frontal sinus cannula could be passed on the left but not on the right. Transillumination was negative. An x-ray photograph showed very extensive frontal sinuses on either side, divided into loculi by well-marked septa. There were large orbito-ethmoidal cells. The Wassermann reaction was negative, and there was no clinical evidence of syphilis.

The external route was chosen for operation. A Killian incision was made and the frontal sinus opened at its inner end. The mesial septum between the sinuses was eroded, and a probe could be freely passed through to the temporal region on the left. The left ostium communicated freely with the nose, that on the right was effectively blocked. There was erosion of the floor of the right sinus and subperiosteal pus over the os planum and lacrymal bone. The orbito-ethmoidal cell was opened and both it and the frontal sinus were put in free communication with the middle meatus. The necrotic inner wall of the orbit was removed. The wound was partially closed, drainage being established from its inner end through the free opening into the nasal fossa. For some time gauze wicks were renewed daily, then irrigation with a frontal sinus cannula was carried out. Clear fluid returned from both sinuses after about five weeks, and he was discharged almost well on November 11th, 1920. In this case the Killian type of operation was adopted, and the trochlea was saved by leaving a bridge. The lacrymal sac had to be removed. The important points in such cases are to establish good intranasal drainage without doing muscular damage, and avoid deformity due to subsequent contraction of scar tissue.

CASE III.

K. M., Hindu male, aged 40, reported on October 16th, 1920, complaining of swelling and pain of the left eye. R. eye, V. = 6/36, fundi normal. He gave an unreliable history of the swelling starting one and a half months before. He had no nasal discharge. He denied syphilis, but his wife had a suspicious record. The Wassermann reaction was positive. His right eye was much proptosed, there was extensive swelling of the lid, brow, and root of the nose. There was a pulsating swelling about the size of half an eyeball an inch above the inner end of the right brow. On firm pressure this disappeared and a circular loss of bone could be felt. This gave the patient acute pain, and caused the swelling of the lid to increase. The nasal fossa was so swollen and oedematous that nothing could be made out, even after thorough packing with cocaine and adrenalin. There was obvious bony deformity, and exposed