Short Notes and Clinical Cases.

A CASE ILLUSTRATING THE ETIOLOGY OF THE ARGYLL ROBERTSON PUPIL.

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IN the issue of this Journal for May, 1921, Kinnier Wilson discusses fully the various views which have been held as to the etiology of the Argyll Robertson pupil. From the clinical and pathological evidence available he concludes that the phenomenon occurs in many conditions apart from syphilis, and may result from any lesion which interrupts the colliculo-nuclear fibres passing from the superior colliculi to the oculomotor nuclei and skirting the central grey matter of the aqueduct. He also points out the recognized association of lesions of the superior colliculi with defective conjugate movements of the eyeballs in the vertical plane.

The case here described appears to afford valuable evidence of the correctness of this view. It is that of a soldier in whom a fragment of shrapnel, entering the skull through the posterior part of the right parietal bone, can be shown by *x*-ray photographs to have traversed the upper part of the mid-brain. Among other effects this injury has produced classical reflex iridoplegia in both eyes.

History.—The patient is twenty-nine years of age, and his pre-war occupation was a coal-hewer. He was wounded by a shell on January 27, 1916, in the head and the left buttock. The left sciatic nerve was severed, and was sutured in 1919 with a good result, considerable voluntary power having returned.

He states that after the wound he was unconscious for eleven weeks. On regaining consciousness he was paralysed in the right side of the face (lower half only), right arm and right leg, both limbs lying useless. He also saw everything double for the first three or four weeks, and he still sees double when reading, unless he closes one eye. One month after regaining consciousness shaking commenced in the right arm; the movements affected the whole limb from the beginning, and rapidly became very severe. Six weeks later similar movements began in the right leg, and about the same time in the lower half of the right side of the face. Since this time the movements have continued without

cessation, except during sleep, when they cease entirely. There has been no appreciable improvement up to the present date. The movements are aggravated by any excitement.

He had some loss of bladder control for the first month after regaining consciousness, but now control is perfect. The bowels have always been quite normal.

Present Condition.—The general condition is good, and intelligence above the average; he eats and sleeps well, and the involuntary movements appear to cause remarkably little mental distress.

The entrance wound in the skull is situated 1 in. to the right of

FIG. 1.—Antero-posterior view.

the mid-line and $\frac{1}{2}$ to 1 in. above the level of the superior angle of the occipital bone (cf. *Fig. 3*). There is a defect in the bone at this point, which is now covered with sound skin; no pulsation can be felt. There is no exit wound.

The right upper and lower limbs are the seat of constant coarse, almost violent, tremor, and the right side of the mouth is continually twitching; there is no trace of involuntary movement in the upper part of the face or in the left limbs. The right upper limb is carried in the position of adduction at the shoulder and flexion at the elbow, wrist and finger joints; the right lower limb is kept extended at the knee, with the ankle plantar-flexed and the toes flexed. With the

exception, however, of the toes, which cannot be moved owing to muscular rigidity, all parts of both limbs can be moved both voluntarily and passively without difficulty, and the power of grip in the right hand, though diminished, is quite good. The tremor affects in the upper limb chiefly the biceps, brachialis, flexors of wrists, and to a less extent flexors of fingers; in the lower limb both flexors and extensors of the knee, calf muscles and flexors of toes. The excursions of the tremor are wide and powerful, and their rate about four per second.

Cranial Nerves.—There is a slight stammer, which the patient has always had. Vision about 6/60 in right eye, 6/36 in left eye. No

FIG. 2.—Lateral view.

squint at rest. The lateral and downward movements and convergence of the eyes are normal, but there is distinct defect of upward movement of both eyes, more marked in the right eye, so that on deviation in this direction a slight strabismus is produced. There is a slight rotatory nystagmus on deviation to the left, and a slow horizontal nystagmus on deviation to the right. The pupils are of medium size, the left very slightly larger than the right, and the outline of both is quite regular. The direct reflex contraction to light is completely absent in both eyes, while both pupils contract briskly and fully on convergence-accommodation. The consensual light reflex is also absent in both eyes. These observations have been repeatedly verified.

There is no hemianopia, and the optic discs are of good colour and show no swelling. There is distinct weakness of the right lower face. No abnormality can be found in the remaining cranial nerves.

Reflexes.—The tendon reflexes in the left upper limb are normal. Owing to the tremor it is impossible to test them in the right upper or lower limb, while in the left lower limb both knee and ankle jerks are abolished as the direct result of the wound in the buttock, the quadriceps being much wasted as well as the muscles of sciatic nerve supply.

FIG. 3.—The dotted line indicates the course of the fragment of shrapnel.

The abdominal reflexes are normal. The left plantar reflex is flexor, while it is impossible to obtain the right owing to the rigid flexion of the toes.

Sensation.—Sensibility to pain, touch, heat and cold is everywhere normal except in the left lower limb as the result of the sciatic nerve lesion. There is no astereognosis on either side.

The Wassermann Reaction of the blood is completely negative.

X-ray photographs of the skull were obtained with considerable difficulty, owing to the tremor which shook the whole body, and I am much indebted to Dr. H. E. Gamlen for his skill and patience in this

respect. Reference to *Figs. 1* and *2* will show that the shrapnel fragment is situated near the upper surface of the base of the skull. Viewed antero-posteriorly the fragment is seen to be just to the left of the middle line; while the lateral view shows that it has probably been arrested by the tip of the left posterior clinoid process.

To demonstrate the relation of the nervous structures to this part of the skull a photograph (*Fig. 3*) was taken for me by Dr. H. B. Leaster Dixon of a specimen in the Anatomical Department of the University of Durham College of Medicine (by kind permission of Professor Howden). It appears to be certain from this photograph that the shrapnel must have traversed the mid-brain, and if its course was direct from the point of entry to its present situation it must have pierced the upper pair of quadrigeminal bodies, as suggested by the line drawn in the figure. Its slightly lateral direction from right to left makes it probable that both of these bodies would be injured.

The area damaged, therefore, corresponds exactly with the site considered by Wilson to be concerned in the production of the Argyll Robertson phenomenon.

The tremor is clearly associated with injury to extra-pyramidal motor paths in the left side of the mid-brain or possibly to the left red nucleus itself. Damage to the pyramidal fibres must necessarily have been incomplete to permit of the occurrence of the tremor.

SUMMARY.

1. A case is described of gunshot wound of the head in which a fragment of shrapnel is shown to have traversed the upper part of the mesencephalon.
2. The injury has resulted in bilateral Argyll Robertson pupil and defect in conjugate upward movement of the eyes. In addition it has produced right hemitremor, involving face, arm and leg.
3. The Wassermann reaction of the blood is negative, and there is no further evidence of nervous syphilis.

REFERENCE.

- S. A. KINNIER WILSON, "Some Problems in Neurology: 1. The Argyll Robertson Pupil," *Jour. of Neur. and Psychopath.*, 1921, ii.