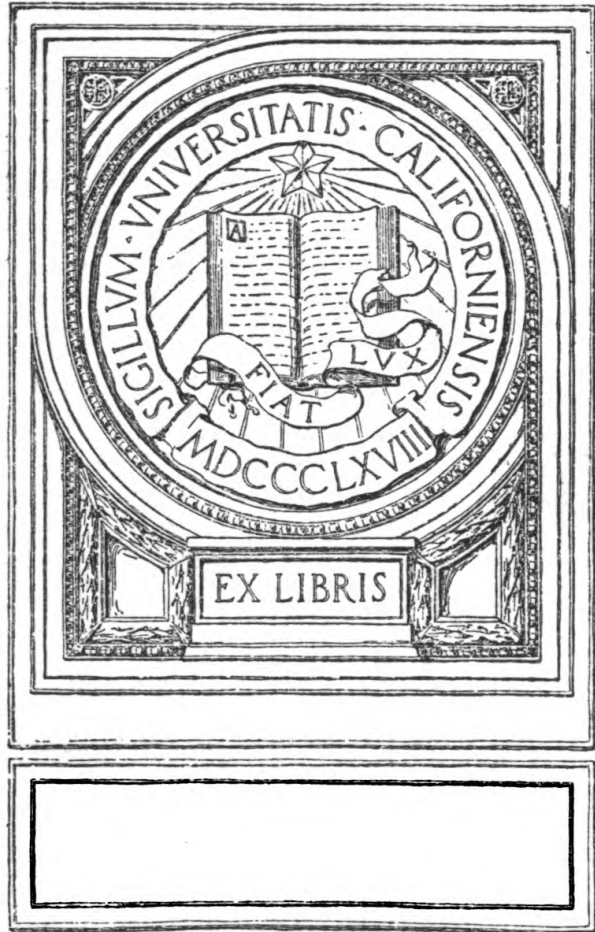
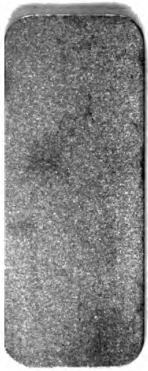


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Review
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(Founded by the late Dr Alexander Bruce)

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Review
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Neurology and Psychiatry

Original Articles

ON ALLOCHEIRIA—AN EXAMPLE OF DEFINITE
ERROR IN THE LOCALISATION OF STIMULI.

By T. GRAHAM-BROWN and R. M. STEWART.

I. INTRODUCTION.

THERE has been some difference of opinion about the occurrence of *definite* error in the localisation of touch, pressure-touch, and painful stimuli in certain cases of cerebral lesion. Victor Horsley was of the opinion that in such cases a stimulus applied to the affected area of the skin on the body of a patient is localised by the patient in a definitely wrong direction. Indeed, Horsley thought that the subject always localised the stimulus in a proximal direction nearer to the trunk than the point actually stimulated, when the defective part of the body was a limb. Henry Head and Holmes, as a result of their observations on cases of cerebral lesion, controvert this opinion, and explain Horsley's results as due to his method of examination, in which the defective kinæsthetic sense is an important factor. For Horsley made his patients indicate the apparent location of the stimulus upon their own bodies, without looking at the spot to which they were pointing. But we ourselves are unable fully to accept the opinion of Head and Holmes in as far as they deny the occurrence of error of localisation in definite wrong direction, although their criticism of Horsley's methods seems to be perfectly justified. Using (as we think) more exact methods of

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examination in cerebral cases, we have found some evidence of the occurrence of definite error in localisation—what we may term “positive” error. The occurrence of this kind of error in cases of the more gross cerebral lesions is not the point at issue in this paper. Were the question of the occurrence or non-occurrence of this phenomenon one so nearly balanced as to be incapable of proper decision from the data before us in such cases, the phenomenon presented by the condition known as *allocheiria* would probably be sufficient to enable us to say that error of localisation in a definite wrong direction does occur.

II. ALLOCHEIRIA.

Allocheiria (or *allæsthesia*) is the name given to a rare condition in which a subject is unable to state upon which side of the body a cutaneous stimulus has been applied, or in which the subject constantly and incorrectly localises the site of a stimulus upon a spot upon the other side of the body diametrically opposite to the spot to which it was really applied. In either case the subject appears fully to recognise the stimulus itself. It is only in the localisation of it that he errs. This condition has been found in cases of tabes, in cases of paraplegia, and in cases of cerebral lesion. But above all—rare as the phenomenon is—it is not often found in the so-called “functional” or “hysterical” states. An analogous condition has been described by Mott in monkeys after lesion of the spinal cord. In the “functional” disorders the condition of *allocheiria* appears usually to be of short duration, rarely lasting more than a few days. As a rule the subject refers the stimulus to the spot which anatomically corresponds on the opposite side of the body to that actually stimulated. Rarely (Purves Stewart, Oppenheim) a stimulus applied to a spot on one side of a limb may be localised on the other side of the same limb. So far as we know the condition has hitherto only been described for touch and pressure-touch stimuli applied to the skin.

As a result of our investigation of the phenomena in certain cases of cerebral lesion we came to the conclusion that there are three factors in the act of localisation of a touch stimulus experienced by a subject.

In the first place the stimulus must be recognised as different

in some manner from all other stimuli applied to other spots on the skin—the factor of “*character*.” In the second place the stimulus must be recognised as in some manner similar to all other stimuli which, in the past, had been applied to the same spot of the skin—the factor of “*individuality*.” In the third place the stimulus (thus characterised and individualised) must be referred to a definite place in the subject’s “scheme” of his cutaneous field—the factor of “*position*.” In allocheiria the subject simply inverts the localisation. The localisation, as he makes it, is the “mirror image” of what would be the correct one. It is clear that here the factors of “character” and “individuality” are unimpaired, that of “position” merely is at fault. In other words, each time a certain cutaneous spot is stimulated the subject localises the stimulus in a certain definite wrong direction which is always the same. This phenomenon itself is sufficient to demonstrate the occurrence of “positive” error in localisation in cases which exhibit cerebral defect—to use that expression in its widest sense. In this paper we describe a case which exhibited allocheiria with the object of showing the great constancy of the error in localisation, and in order to emphasise this point. So rare is the condition that the description of the case might almost be justified for its own sake, but the condition which we encountered displayed such unusual forms—forms not hitherto described—that we think no further justification necessary.

III. BRIEF DESCRIPTION OF THE CASE.

Before describing in greater detail the forms of allocheiria which this case exhibited, we shall review here briefly the course which the case took whilst under our observation.

The patient (No. 70,517, Pte. J. G., R.A.M.C.) was under treatment by one of us for dysentery, and was lying convalescent in a British hospital attached to the Royal Serbian Army. At a few minutes before seven o’clock on the evening of 9th September 1916 (and when a thunderstorm had been for some time in progress) a stroke of lightning hit the ground immediately outside the tent in which he lay. The flash was extremely vivid. The thunderclap appeared to accompany it, and actually to be inside the tent. At this moment the patient was lying in his bed upon his right side and talking to his neighbour. He gave a

startled exclamation and cried, "Oh, my arm." His neighbours observed that he rubbed his left upper limb with his right hand, and then continued to rub higher and higher up his left arm. At the same time they saw him make energetic movements at the different joints of his left upper limb "as if to throw off a cramp." The patient says that he at this point experienced a curious numb sensation in his left upper limb. This gradually spread along it from the hand upwards, and about half a minute after its first appearance had reached the shoulder and crossed over to the left mammary region. Immediately his left upper limb—which up to this moment he had been moving energetically—fell flaccid to the bed. He stated that he thought he had been struck by lightning, and he appeared to be in an emotional state. When seen by one of us less than one hour after the flash it was found that he was suffering from left hemiplegia and left hemianæsthesia and hemianalgesia.

On the following day (the second day of the condition) we made a careful examination of the patient's state. On the third to the twenty-first day of the condition we made careful examinations of the various forms of allocheiria which we encountered, and attempted to treat the hemiplegia by a system of training.

On the twenty-second day of the condition we made another careful general examination of the patient. On the twenty-fifth day, the functional hemiplegia having improved, but not so rapidly as we had hoped, we applied the treatment of chloroform narcosis. On the twenty-sixth to the thirty-second days of the condition we again made careful special examinations of the forms of allocheiria. On the thirty-third day we made a final general examination of the patient, and on the thirty-fifth day he passed out of our care, having to be sent to another hospital for administrative reasons.

IV. THE GENERAL STATE OF THE PATIENT ON DIFFERENT DAYS THROUGHOUT THE PERIOD OF OBSERVATION.

A. *Examination on Second Day of the Condition.*

1. *Clinical History.*—J. G., 20 $\frac{1}{2}$, in civil life a miner.
2. *Family History.*—No events of importance to note; patient is the eldest in a family of five.
3. *Previous Illnesses.*—Measles in infancy and ptomaine

poisoning when 18. When 13 he sustained an injury to the left wrist and was off work for two months. When 15 he sprained an ankle. When 15½ was buried by a fall of coal, and was unconscious for one hour; this was followed by intractable lumbar pains. For several years he has been subject to recurring epistaxis. Bacillary dysentery, August 1916.

4. *State when Examined on 10/9/16 (the day following the Shock).*—His alimentary, hæmopœitic, and circulatory systems show the customary deviations from the normal which one expects to find in a convalescent dysentery patient. There is, however, a moderate degree of cardiac hypertrophy. His urine contains no abnormal constituents.

5. *Nervous System.*—The patient is of average intelligence; he shows no disturbance of memory, attention, or perception; his emotional tone is normal; speech is normal. He is a right-handed man.

(a) *Cranial Nerves.*—Loss of the sense of smell exists on the left side; on the right it is normal. Visual acuity is much reduced in the left eye; he has difficulty in seeing objects and complains of dimness of vision. He cannot read large print with the left eye alone. The apparent size of an object is the same when looked at with either eye singly. Vision in the right eye is unimpaired. The visual field on the left side (tested by the ordinary clinical method) is concentrically contracted. Ophthalmoscopic examination reveals no evidence of morbid change. The pupils are regular, equal, moderately dilated, and react normally to light and on accommodation. Ocular movements are normal; the visual axes are parallel. The muscles innervated by the fifth cranial nerve are normal; anæsthesia exists in the distribution of its sensory branches: this is described below. Hearing: auditory acuity (aerial and bone conduction) is diminished on the left side. Hyperacusis for loud sounds exists on the left side. Taste: the sense of taste (sweet, sour, bitter) is lost on the whole of the left side of the tongue.

(b) *Sensory Functions.*—The patient complains of severe pain on the left side of the head (frontal region). He also experiences a severe pain on the anæsthetic side of the body, which is referred by him to a point on the thoracic wall three inches below the clavicle and in the groove between the pectoralis major and deltoid muscles; it is aggravated by passive movements of the

left upper limb. Touch, pain, and deep pressure stimuli are not felt by the patient in this area.

Pressure in the right inguinal region elicits a sensation of pain; on the left side it cannot be elicited. On rising from the bed the patient feels giddy. Hemianæsthesia and hemianalgesia, including the accessible mucous membranes of the nose, mouth, and pharynx, exist on the left side. Cotton-wool touches are not

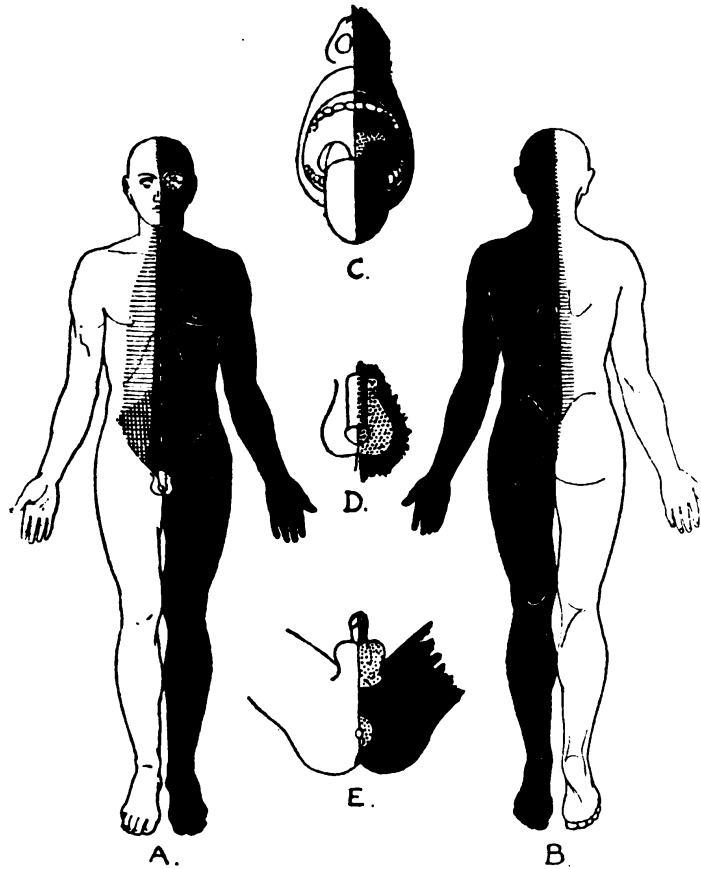


FIG. 1.—Diagram showing the areas of anæsthesia, analgesia, blunted sensibility, and allocheiria.

Black = Area of complete loss of all forms of sensibility.
Horizontal Shading = Area of partial loss ("blunted" sensibility).
Vertical Shading (in right lower quadrant abdomen) = Late intension on abdomen of area of complete loss.
Stippled Shading = Areas in which allocheiria was present (for touch, pressure-touch, pain, heat, cold).

The different parts of this diagram are :—

- A. Anterior surface body.
- B. Posterior surface body.
- C. Tongue, lips, buccal mucosa, hard and soft palates, pharynx and nares.
- D. Anterior aspect, penis, glans penis, and scrotum.
- E. Perineum showing posterior aspect penis, glans penis, and scrotum, and the area of allocheiria round the left side of the anus.

felt over a territory which includes the whole of the left side of the body (skin and accessible mucous membranes) and extends accurately to the middle line; the left side of the scrotum, the left conjunctiva and cornea, and an area of skin round the left eye retain sensibility. But this is blunted, and the stimuli are referred to the opposite side of the body (in the case of the scrotum we noticed this allocheiria for the first time on the following day) (see Fig. 1).

Hemianalgesia (pinprick), with few exceptions, is present over the whole of the left side of the body (skin and accessible mucous

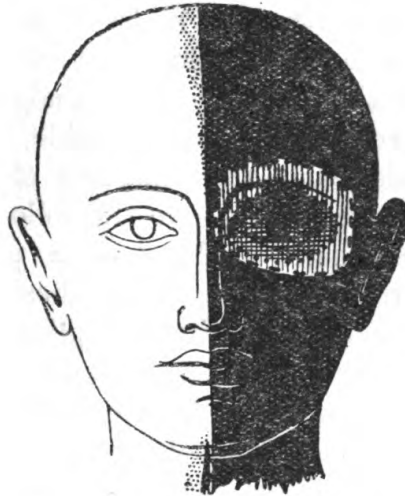


FIG. 2.—Diagram showing areas of anæsthesia, analgesia, blunted sensibility, and allocheiria on face, forehead, and neck.

Black = Area of complete loss of all forms of sensibility.

Stippled Shading = Area of blunted sensibility extending over mid line on to right side of body.

Vertical Shading (enclosed in broken line) = Circumorbital area of allocheiria as first observed.

Cross Shading (enclosed in dotted line) = Extent to which the circumorbital area of allocheiria was later reduced.

membranes), and encroaches on the right half of the body across the mid line. On the head, face, tongue, and accessible mucous membranes of the mouth the analgesia is absolute on the left side accurately to the mid line—on the scalp and forehead an area of blunted sensibility about 1 cm. in breadth lies to the right of the mid line of the body. On the anterior surface of the neck, the right lateral margin of the area of complete analgesia lies slightly to the right of the mid line, and the blunted area

tends for another 2 to 3 cm. to the right of this. As the right lateral margin of the area of complete analgesia is followed in a caudal direction on the anterior surface of the trunk, it is found to extend further and further to the right of the mid line—lying about 4 or 5 cm. to the right of the mid line in the lower part of the abdomen. At the same time the blunted area also expands to the right, and on the thorax its right margin appears to coincide with the right mammary line. On the back of the encroachment on the right side of the body it appears to be about 2 cm. to the right of the mid line for complete analgesia, with an area of blunting about 3 or 4 cm. to the right of this. Both the left limbs are completely analgesic. The left conjunctiva and an area of skin round the left eye are not included in the region of hemianalgesia (Fig. 2). The left side of the scrotum and the left side of the glans penis are also not included, but the sensation of pain seems to be dulled in these regions. (*Note.*—On the following day we found that the left lateral half of the dorsum penis was also not included either in the area of hemianæsthesia or hemianalgesia. We found that touch and pain stimuli applied to this area as well as to the left side of the glans penis and the left side of the scrotum were localised by the patient upon the right side.) Traction of the hairs over the whole of the left side of the body fails to evoke pain, except in the case of the left eyebrow and eyelashes. Pressure pain is absent on the left side of the body. Testicular sensation is present in the left testicle, but is referred to the right (this was noticed on the following day). It is weaker than that in the right testicle. Kinæsthetic sensations are absent on the left side of the body. The patient has no sensation of movement or of its direction when either of the left limbs is moved passively at any of its joints (including hip and shoulder). When told to touch a prominent part of either left limb with the corresponding right limb (right heel or right forefinger) the localisation is grossly defective. When the left fingers are moved passively there is a sensation of pins and needles referred to the area near the groove between the left deltoid and pectoralis major muscles. This does not occur when the wrist is moved passively.

On passive movement at the left elbow the patient experiences pain in the left upper arm. Sensibility to heat and cold is lost on the left side of the body. The patient can recognise two simul-

taneous stimuli (compass test) in the blunted area to the right of the mid line in the pectoral region when they are separated by a distance of not less than 3 cm. The localisation of touches in this area is of normal accuracy.

(c) *Motor Functions*.—There is no motor weakness in the face. Loss of power in the left limbs is nearly complete, and is more evident in the upper limb than in the lower; the distal segments of the limbs are more paralysed than the proximal.

Movements of the left fingers are very weak; feeble flexion and extension are present, but the patient is unable to separate or adduct the fingers. Slight adduction of the thumb is possible, but no other movements. Very feeble extension and flexion can be carried out at the wrist, the movements being "jerky" in character. Pronation and supination are very feeble. Very slight flexion may be performed at the elbow, but no extension, and the patient cannot flex the elbow against gravity. The voluntary movements at the left shoulder are stronger than those at the other joints, but voluntary adduction is very feeble. The left latissimus dorsi contracts very feebly, if at all, when the patient coughs, but the right latissimus contracts strongly. Gait is impossible. The patient does not use the left leg in standing. Voluntary movements of the left toes, and at the left ankle and knee joints, are absent; slight voluntary movements can be performed at the left hip.

Although the *phasic* voluntary movements are so much paralysed, the patient can yet "voluntarily" maintain for a time against gravity either left limb in any posture into which it is passively placed by the observer. The left upper limb, the patient being supine in bed, lies adducted and slightly flexed at all joints. The lower limb lies extended, and slightly rotated outwards at the hip. Muscular tonus is increased in the left limb.

(d) *Reflexes*.—The corneal reflexes are present and equal on both sides. The ciliospinal reflex is normal on the right; absent or much diminished on the left. The palatal reflex is absent on both sides; the pharyngeal reflex is absent on the left side, present on the right. The abdominal and epigastric reflexes equal and active. The left plantar reflex is feebly flexion in type, the right normal. The bulbocavernosus reflex is normal. The arm jerks (biceps, triceps, supinator longus) are absent on both sides. Knee

jerks diminished but equal; Achilles jerks normal. Organic reflexes normal.

We had no means of testing the electrical reaction of the muscles.

Trophic functions. Tache cerebrale is marked on both sides of the abdomen. On the right side the limbs are moist from an active secretion of sweat. The left limbs are quite dry. The anæsthetic limbs do not bleed when pricked.

B. Third Day of Condition.—On this day we noticed the phenomena of allocheiria to which we have already referred, and also discovered, for the first time, a phenomenon of allocheiria in the subject's localisation of visual stimuli applied to the left retina. We describe these phenomena elsewhere.

The following additional notes of the patient's condition were made :—

C. Fifth Day of Condition.—Hearing carefully investigated for the possible occurrence of "allocheiria" in the left ear. This is found not to be present.

The anal region investigated with touch and pain stimuli. It is found that these are recognised when applied to an area of skin round the left side of the anus, but are localised by the subject within the corresponding area on the right side. Stimuli applied to the right side of the body in this region evoke normal sensations.

D. Sixth Day.—We noticed that the reaction time to light seemed to be delayed upon the left side, but we had no means for the accurate measurement of it. When he uses his left eye alone, his judgment of the distance of an object from it is fairly accurate.

E. Eighth Day.—We showed him some common optical illusions (Müller-Lyer illusion, &c.), and found that they have the same effect when viewed with the left eye alone as they have when viewed with the right.

F. Twenty-Second Day.—The full clinical examination of the patient was repeated. We give here only the changes which we observed. The left-sided hyperacusis to loud sounds noted on the second day was no longer present. The ticking of a watch held almost against the left ear was only just heard. The area of left hemianæsthesia and hemianalgesia showed no change, save that the area of blunted sensibility which lay to the right of it was less than before. This area measured about 2 cm. transversely

on the superior aspect of the thorax, and 4 cm. on the abdomen (lower quadrants). The left circumorbital area within which touch and pain stimuli were recognised by the subject, but referred to the corresponding area on the other side of the body, was more restricted than before. Pressure-touch and painful stimuli applied to the left side of the soft palate were recognised by the subject, but referred by him to the right side (Fig. 1).

On the left side of the face pinpricks now caused bleeding; on other anæsthetic areas (as before) this did not occur. Passive flexion of the left thigh on the abdomen is recognised by the subject—apparently by pressure upon, or movement of, the abdominal muscles.

Voluntary movements at the various joints of the left upper limbs were improved, but were still very weak. The latissimus dorsi now contracted equally well on both sides when the patient coughed. The return of motor power in the left lower limb was more marked; he could walk fairly rapidly without support—exhibiting a so-called “functional gait.” In this, his left arm remained closely applied to his side. Increased tonus of the muscles of the left upper limb and spasticity of the lower limb were noted.

The epigastric and abdominal reflexes were now present; they were feeble, and disappeared after several stimulations. The ciliospinal reflexes were now normal on both sides.

G. Twenty-Fifth Day of Condition.—The patient was treated under chloroform narcosis. At all depths of narcosis at which the patient could give coherent replies to questions put to him, the left hemianalgesia persisted, but at a depth of narcosis at which his replies were only just coherent, he was able to move his left limbs freely when told to do so.

He was made to continue voluntary movements of his limbs whilst the depth of narcosis was decreased and until he was fully conscious that he was moving his limbs. Before the commencement of narcosis his left limbs exhibited much rigidity. At the depth of narcosis, at which his “voluntary” movements became free in the left arm, this rigidity had just disappeared. It re-appeared again as the depth of narcosis decreased. After the chloroform was finally withdrawn the rigidity was found to be considerably less than before, and the subject could move his left arm comparatively freely, but the movements were feeble. He

was given opium and put to bed. It was observed that in his sleep he moved his left arm. When he awoke he complained of great pain in the left shoulder, but could move his left arm freely, but his movements were, however, slow and weak.

H. Twenty-Sixth Day.—Boundaries of the area of left hemianæsthesia and hemianalgesia unaltered. Kinæsthetic sensations apparently absent in left limbs.

I. Twenty-Seventh Day.—Kinæsthetic sensations obtained for the first time in the left upper limb. They were at first inverted (as described elsewhere), but after training became normal.

K. Twenty-Ninth Day.—Slight jaundice and vomiting; no pyrexia.

L. Thirty-Third Day.—In the course of a general neurological examination the following changes were noted:—The ticking of a watch just heard at 40 in. from the right ear is only just heard at 6 in. from the left. His reaction-time to light shows no difference on the two sides. The patient stated that he could feel nothing on his left side, left upper limb feels a dead weight. When he lies on his left side the bed seems to be swaying. The headaches, which at first were severe and frequent, are now rare. He still experiences pain, which is referred to the anterior aspect of the left shoulder, but this is much less than it used to be. The area of skin round the left orbit which is not anæsthetic is smaller than before. It seems to correspond in its outline with the bony margin of the orbit, and does not now include any part of the left eyebrow (Fig. 2). The analgesia is now accurately to the middle line on the dorsum penis. Recognition of passive movement at the left shoulder, elbow, and radio-ulnar joints is now accurate; passive movement recognised at left wrist, but no discrimination between passive extension and flexion there. Passive movements of fingers and thumb not appreciated by subject. The patient with his eyes closed points with his right hand fairly accurately to different parts of his right upper limb when these are named; the accuracy of this localisation is also fair after the left upper limb has been moved passively into another posture while the patient's eyes are still covered. The subject, with closed eyes, points with his left hand fairly accurately to different named parts of his right upper limb. The subject imitates with his right arm different postures and different passive movements (at shoulder, elbow, and radio-ulnar joints) of

his left upper limb with perfect accuracy. He recognises passive movement at the left hip accurately, but there is defective recognition of passive movement at the left knee and ankle, and in the left toes. He points accurately with his left heel in the "heel to knee" test.

Voluntary movement is very weak in the left fingers, less so in wrist; good at left elbow and shoulder. Good at left hip and knee; weak at left ankle and in left toes. The movements of his left lower limb during progression are almost perfect. He swings the leg and bends it to the knee, but he still fails to swing his left arm. He explains this by stating that he has pain at the left shoulder when he does so, and he says that he also experiences pain in the left hip when moving the left lower limb. Reflexes;—abdominal and epigastric now brisk.

M. Thirty-Fifth Day.—On this day the subject was transferred to another hospital.

N. Forty-Seventh Day.—By the courtesy of Captain Smith, R.A.M.C. (T.), we were able to examine the subject in another General Hospital. We noticed the following changes in his condition:—

Captain Smith found that his visual acuity was 6/60 in the left eye, but that under suitable conditions he could read Jaeger No. 1 type.

The left ear was much redder than the right; the whole face rather congested. During the examination of his eye there was marked lachrymation; the patient stated that he sweated a great deal on the left side of the body.

The area of hemianæsthesia and hemianalgesia is, on the whole, the same as before, except that its right lateral margin encroaches more on the right side of the body. This is especially the case on the right lower quadrant of the abdomen, where there appeared to be patchy anæsthesia and analgesia. In this region the right lateral margin of complete analgesia ran from a point about 4 cm. to the right of the umbilicus to the right ant. sup. iliac spine, and then ran down to the symphysis pubis accurately along the line of Poupart's ligament—the boundary of complete analgesia being here very accurately defined.

No part of the scrotum or penis was included in the area of analgesia. Stimuli applied anywhere in these regions were accurately localised by the subject—the phenomenon of allocheiria

now being absent. (We omitted to test the testicular sensations.) Stimuli applied to the area of skin round the left side of the anus were recognised by the patient but still referred to the corresponding area on the right side of the body. Stimuli applied to the left half of the soft palate were wrongly localised by the subject on the right side.

The left circumorbital area, within which touch and pain stimuli were recognised by the subject, was of nearly the same size as before, but had slightly extended so as to include part of the left eyebrow. Stimuli applied within this region were now correctly localised by the subject when he was told to localise where the stimuli "really were." But when told to localise the stimuli where he "felt" them, he referred them to the physiologically corresponding points on the right skin, eyelashes, eyebrows, conjunctivæ, and cornea. The localisation in this phenomenon of allocheiria was very exact. We estimated the average error in the localisation at about 3 mm.

Kinæsthetic sensibility. The only point to note under this heading is the fact that the subject could now recognise passive movements of the left fingers, but could not discriminate between passive flexion and passive extension.

Retinal localisation in the left visual field. The phenomena showed no change from those which we had last observed when the subject left our care.

Voluntary movements of the left upper limb showed no change; those of the left lower limb were stronger than before. Muscle tonus diminished in both left limbs.

Reflexes. Knee jerks now brisk. Upper limb reflexes all present on right side; on left side the attempt to elicit the supinator reflex evoked a well-marked abduction of the left thumb. No change in the other reflexes.

As we see from the above description, analgesia and anæsthesia existed over almost every part of the left side of the body (and encroached upon the right side) throughout the period during which we had the patient under observation. But throughout the whole of that time (or in some cases only through a part of that time) the patient was able to recognise various stimuli applied to the left side of the scrotum, the left glans penis; an area of skin round the left side of the anus; the left cornea, the left conjunctiva, the left eyelashes, together with an area of skin

surrounding the left eye; the left side of the soft palate (but not of the hard). He could also, throughout the whole of this period recognise pressure stimuli applied to the left testicle. Up to the twenty-seventh day of his condition the patient was unable to recognise, through kinæsthetic sensations, active or passive movements of his left limbs. On the twenty-seventh day he first became able to do so, and thereafter these movements remained recognisable. Smell and taste were absent on the left side of the nose and tongue respectively. Auditory acuity was reduced on the left side. Amblyopia and concentric constriction of the left visual field were present on the left side throughout the whole period of observation. (Perimetric observations were not possible while the patient was under our care.) The right side of the body was normal.

The touch, pressure-touch, and pain stimuli which he was able to recognise when they were applied to the various small areas on the left side of the body, were localised by the patient upon the right side of the body. There was a curious inversion in the localisation of visual stimuli applied to the left retina; and for a short time there was also a curious inversion of the patient's interpretation of his kinæsthetic sensations. Auditory stimuli applied to the left ear were always referred to the left side. The patient thus exhibited allocheiria, and as some of these have characters not hitherto described, we give our observations of them in detail in the following sections.

We discovered the presence of allocheiria accidentally when investigating the distribution of the anæsthesia on the left side of the body in the region of the face. The subject spontaneously referred the stimuli which he felt to the opposite right side of the body; there was no possibility of "suggestion" from us playing a part in the genesis of the condition. After its discovery, and until late in the course of our investigations, we performed all the experiments (except the retinal) with the patient's eyes either closed or covered, and never let him know that he made any error in his localisation. In the case of the scrotum we did not at once discover allocheiria — on our first examination noticing only that touch, pressure-touch, and pain stimuli were recognised when applied to the left side, but that the sensations which they conditioned appeared to be blunted. On the third day of the condition, after we had discovered the presence of

allocheiria in the region of skin round the left eye, we made the subject localise the stimuli applied to the left side of the scrotum, left glans penis, &c., and found allocheiria present. As far as we know the subject was never made aware that his localisation of stimuli applied to points in these areas was incorrect. We think that the possible influence of suggestion on the part of the observer in the conditioning of the allocheiria may be absolutely eliminated in this case.

V. ALLOCHEIRIA SIMPLEX.

The phenomena of allocheiria which we observed when stimuli were applied to the skin of the left side of the scrotum, left side of the dorsum penis, and left anal region; to the mucous membrane of the glans penis, left side; and to the mucous membrane of the left side of the soft palate, were similar to those which have been described by other observers for stimuli applied to the skin of the limbs. A stimulus (touch, pressure-touch, pain) applied to any spot within one of these areas is recognised by the subject and referred by him exactly to the corresponding spot on the other side of the body. As this is the usual form of allocheiria—that described by most of the previous observers—we venture to suggest the term "*allocheiria simplex*" to distinguish it from the other types of allocheiria with which we shall deal later. The regions in which we observed this form of allocheiria—and we think we may say with confidence that the phenomenon was present in no other part of the body—are not those in which the condition is usually seen. In every case the allocheiria persisted up to the mesial plane of the body. It will be observed that the areas in which the allocheiria was present in our case were in close relation to orifices of the body. Allocheiria of the palate was seen only in the case of the *soft* palate. Hemianalgesia and hemianæsthesia of the palate were present on each occasion on which the *hard* palate was examined. We were at some pains to observe the accuracy with which the subject referred the stimulus to the corresponding spot on the other side of the body. As far as we could judge for these areas, the accuracy of this reference was as great as the accuracy with which the subject made a localisation of a stimulus applied to a

spot on the normal side of the body. He did not vaguely refer a stimulus applied on the left side to the right side of the body in general, but placed it with fair accuracy on the corresponding spot on the other side; he made a fairly accurate "mirror" localisation. When a certain spot in one of the affected areas on the left side was stimulated, and the corresponding spot on the normal side was stimulated, either before or after it, the subject was unable in any way to distinguish between the two stimuli. He thought they had been applied to one and the same spot on the normal (right) side of the body.

Scrotum.—We made the following observations for pressure-touch stimuli applied to the scrotum. When a hard-pointed instrument was drawn across the surface of the *left* side of the scrotum in an upward (cephalic) direction, and the subject (with covered eyes) was made to indicate with his right hand the position of the stimulus, and the direction in which it travelled, he referred it at the start to the corresponding spot on the *right* side of the scrotum, and followed the further movement (upwards) in the same direction as the true movement. But if the movement of the instrument was made in a transverse direction across the scrotum (let us say from left to right), the subject indicated the apparent movement of the stimulus as in the opposite direction (let us say, from right to left).

We carefully examined the left auditory meatus, the left side of the lips, the left axilla, and the left nipple, for the possible presence there of phenomena of allocheiria. This was absent, there being profound anæsthesia and analgesia in these regions—trichalgia in the case of traction of the hair on the left side of the upper lip and in the left axilla.

Allocheiria of the Testicular Sensation.—So far the phenomena of allocheiria which we have described have been associated with the "somatic" sensations. The presence of allocheiria of the testicular sensation—a so-called "visceral" or "organic" sensation—is of sufficient interest to merit a section to itself, although there is little to describe.

Although it is difficult or impossible to eliminate in the normal subject the scrotal sensations which are evoked when painful pressure is applied to a testis, there seems little reason to doubt that the "testicular sensation" can be accurately referred by the subject to the side of the body on which it is applied. In

this case the subject experienced testicular sensation when the left testicle was pressed, but referred that sensation to the right testicle. The presence of allocheiria in the case of the testicular sensation, as well as in the case of sensation of pain evoked by stimuli applied to the scrotum, glans penis, &c., is of peculiar interest if Head's views concerning their chief localisation in the optic thalamus be correct. For in this case we would then have a phenomenon of allocheiria associated not only with the cerebral mechanism (touch stimuli, &c.), but also with the thalamic.

VI. ALLOCHEIRIA PARADOXICA

The phenomena of allocheiria which we observed for stimuli applied to the skin and hair in an area which surrounded the left eye, present unusual features which justify their description under the term "allocheiria paradoxica." We use this term to indicate that while the stimuli applied to spots in this region were referred by the subject to spots upon the opposite (right) side of the body, these spots were not those which corresponded anatomically to those stimulated. For example, if a touch stimulus was applied to a spot on the skin near the *outer* canthus of the left eye, it was localised by the subject on a spot just to the left of the *inner* canthus of the right eye; and if a stimulus was applied to a spot just to the right of the *inner* canthus of the left eye, it was localised to a spot just to the right of the *outer* canthus of the right eye (Fig. 3).

(a) *The Area Involved.*—When we first examined this area, on the second day of the condition, it was comparatively large. The line bounding it ran parallel with, and about 1 cm. above, the left eyebrow. At the outer end of the eyebrow it turned downwards, and passed about 2 cm. to the left of the left external canthus. It then turned and passed transversely across the face about 2.5 cm. below the margin of the left lower eyelid; when approaching the nose it turned slightly upwards, running parallel with the lower eyelid until it ran up upon the bridge of the nose nearly to the mesial plane. Then, turning upwards, it ran parallel with and only 1 or 2 mm. to the left of the mesial plane of the body until, about 1 cm. above the inner end of the left eyebrow, it turned sharply to the left (see Fig. 2). As the condition proceeded, this area became gradually more restricted

until it coincided almost exactly with the bony margin of the orbit, and did not include the left eyebrow (Fig. 2). As we thought that, in the case of pressure-touch stimuli, sensations from the periosteum on the edge of the bony orbit might play a part in determining the limits of the area, we investigated these while the skin was displaced in various directions by traction, and found that the limits of the area did not vary on the surface of the skin.

The allocheiria was present not only when the stimulus was applied to the skin within this area, but also when it was applied

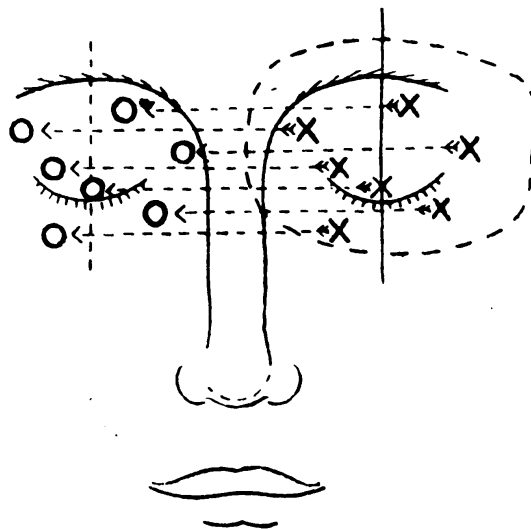


FIG. 3.—Diagram to illustrate the phenomenon of "allocheiria paradoxa" in left circumorbital area.

The broken line round the left orbit shows the extent of this area. The vertical unbroken line on the left side gives the mesial sagittal plane of the left orbit: the vertical broken line on the right side gives that of the right orbit.

Seven crosses mark, within the left circumorbital area, the point of application of seven stimuli (in each case either touch, pressure-touch, pain, heat, or cold). Seven circles on the right side mark the spots on which the subject localised these stimuli. Each cross is connected to its corresponding circle by means of a broken horizontal arrow. It will be observed that the cross and the circle in each case lie upon the same side (that is, right side or left side) of the mesial sagittal orbital plane, and that where a cross lies on that plane of the left orbit, the circle lies on the corresponding plane of the right.

to the cornea (both within and outside of the pupil of the left eye), and to the conjunctiva (upper palpebral, lower palpebral, and ocular). Stimuli applied to the hair of the eyebrow and to the eyelashes (the stimuli being either gentle traction or gentle bending) were referred to the right side of the body.

(b) *The Localisation of the Stimuli.*—We made the following observations in connection with the localisation of the stimuli. The stimuli which we used were touch (Von Frey's hairs), pressure-touch, pain, heat, and cold, and, for the hairs of the eyebrows or eyelashes, traction or bending. A stimulus applied to a certain spot within this sensory field was localised by the subject, not upon the corresponding anatomical spot in the similar sensory field of the right side, but on a spot which lay on the same side (right or left) of, and at the same distance from (to the right or to the left), the mesial sagittal plane of the right orbit as the stimulated spot lay in relation to the corresponding plane of the left orbit (see Fig. 3). If a spot lying at a certain distance to the *right* of the mesial sagittal plane of the *left* orbit was stimulated (that spot lying either on the skin, or on the cornea, or on the conjunctiva, or in relation to one of the hairs of the eyebrow or eyelashes), the subject referred it to a spot which lay on the same side of (that is the *right* side), and at approximately the same distance from, the mesial sagittal plane of the *right* orbit. In other words, the localisation was made as if the spot to which the stimulus was referred and the spot to which it was applied were related as are "corresponding points" on the two retinae. It will therefore be observed that a stimulus applied to the left side was referred to the right, and that its *anatomical* relationship to the mesial sagittal orbital plane (that is its site external or internal to that plane) was inverted; but that its *physiological* relation to that plane (its leftness or rightness) was not inverted. And it will also be observed that the anatomical inversion was one simply in the transverse direction across the ocular *plane* and not diametrical inversion across the ocular *axis*. We may say for brevity, as we shall show later, that the localisation of a stimulus applied to the left circumorbital sensory area was made by the patient to the *physiologically* corresponding spot on the right.

When the eyes were closed, and a few of the left eyelashes were touched, the subject localised the stimulus on the (physiologically) corresponding spot on the right eye. When, the eyes being closed, the subject was made to turn his eyes to one side, and the eyelashes immediately in front of the left pupil were touched, and the subject was then made to turn his eyes directly to the front or to the opposite side, before making the localisation,

he still made that localisation upon the (physiologically) corresponding part of the right eyelashes, and not upon that part which lay immediately above the right pupil at the moment when he made the localisation.

The same observation holds good for stimuli applied to the ocular conjunctiva either just to the left or just to the right of the cornea. When two physiologically corresponding spots were selected, the one on the right and the other on the left side of the body, the subject was unable to distinguish between stimuli applied to them as regards their localisation, but referred the stimulus always to the spot on the right side. When these two spots were stimulated synchronously, the subject often said that he experienced a double sensation (polyæsthesia). But this test was quite inconclusive, because he often stated during it that a single stimulus (applied to one or other of the spots) was a double one. In another test double touches applied simultaneously to two different spots on the left cornea were accurately experienced as such when the points stimulated lay 3 mm. apart, and were never confused with single touches, nor were the single touches ever experienced as double. The sensations conditioned by equal stimuli applied to corresponding spots appeared to be of the same intensity, except in the case of those applied to the palpebral conjunctiva, when the intensity appeared to be slightly less upon the left side. Yet the patient described the sensation evoked on the left side by a very weak Von Frey hair as "like a prick," although painful sensations themselves were of less intensity on the left side. If a fairly strong Von Frey hair was moved transversely across the left lower eyelid, the subject indicated that he experienced the stimulus on the right lower eyelid, and that it seemed to be moving in a certain direction which was the same as the true one (from right to left, or from left to right).

When a very bright light was directed straight into the left eye along the ocular axis he stated that he felt it in the left eye itself, but when the light was directed from the side so that it impinged upon the left cornea obliquely, he stated that he felt it in the right eye, and he localised it upon the physiologically corresponding spot of the right cornea. He described the sensation as one of "light and pain," or of "pressure upon the eye." The same phenomena were observed when the light was directed

against the closed left upper eyelid. The localisation was performed with the normal right hand. When, late in the course of the period during which we had this case under observation, the "voluntary" movements of the left arm were greatly restored, we found that he made the localisations with his left hand exactly as he had previously made them with his right. Later, in the course of his condition, the subject was able to recognise stimuli applied to spots within this left circumorbital area as located in that area. A form of allocheiria was still present, and this we describe in the next section.

VII. HOMONYMOUS ALLOCHEIRIA.

On the twenty-ninth day after the shock it was found that, although the patient still localised touches applied to spots within the left circumorbital area as if they had been applied to the physiologically corresponding spots upon the right side of the body (and stated that he felt the stimuli as if they were there), he was yet able to distinguish in some manner between stimuli applied to either of a pair of corresponding spots upon the two sides of the body. We at once made use of this difference as the basis of a short training in which we applied stimuli to the right and left members of a large number of pairs of (physiologically) corresponding spots—at each stimulation telling him on which side of the body, right or left, the stimulus was applied. After this training we found that the subject could always correctly state on which side the stimulus had been applied. His answer to the question, "Right or left?" was always correct, and throughout the remainder of the period in which we had him under observation he never again made the mistake of localising a stimulus which was applied to the left circumorbital area to a spot in the right. Nevertheless, he always told us that he still *felt* the stimulus upon the right side. It is not easy to describe exactly his sensations. As it were, he *knew* that a stimulus was applied to the left side, but *felt* that it was applied to the right. The patient himself explained the fact that he could distinguish between stimuli applied to physiologically corresponding spots on the left and right circumorbital areas, by saying that he thought he was able to do so because those applied to the left side were weaker than those applied to the right. We at once tested this by making

use of a very weak Von Frey hair for applying them to the spots on the right side, and a strong hair for applying them to the spots on the left side. When this was done the patient could still accurately distinguish to which side of the body the stimulus was applied (Fig. 4).

When the patient was made to localise touch-stimuli applied to spots on the left circumorbital area, we found that, though the stimulus was now localised to a spot within that area, a form of allocheiria still existed. The patient localised the stimulus on a spot on the other side of the left mesial sagittal orbital

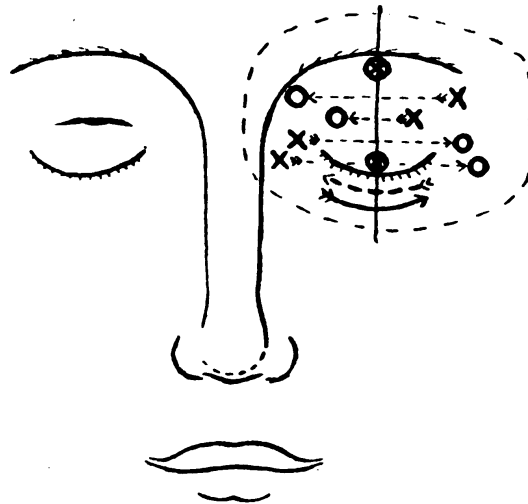


FIG. 4.—Similar to Fig. 3, but demonstrating the phenomena of “allocheiria duplex.”

The crosses enclosed in circles demonstrate that stimuli applied to spots upon the left mesial sagittal orbital plane were correctly localised by the subject. Stimuli applied outside this plane (shown by crosses) are localised upon spots on the other side of it (shown by circles). The unbroken arrow under the left eyelid shows the direction and length of the path of a moving stimulus; the broken arrow above it shows the direction and length of the path in which the subject indicated that he thought the stimulus had travelled. The two arrows are separated in position for diagrammatic purposes. Actually they coincided in everything save direction.

plane, and at the same distance from it as the stimulated spot (Fig. 4). Thus, if the stimulus was applied to a spot near the outer canthus of the left eye it was localised on a spot near the inner canthus of the same eye and so on. We carefully examined this error of localisation, and found that the spot on which a stimulus was localised by the subject in every case lay at almost exactly the same distance from the mesial sagittal orbital plane of the left eye as the spot actually stimulated, but on the other side

of the plane. The line joining the two spots cut the mesial sagittal orbital plane at right angles. Stimuli applied to spots which lay upon the plane itself were always correctly localised. A stroking stimulus applied transversely along one of the left eyelids was localised by the patient upon the same eyelid but represented by him as apparently travelling in the reverse direction. This form of allocheiria bears a strong resemblance to that seen by Purves Stewart, where a stimulus applied to a spot upon one side of the upper limb was referred to a corresponding spot upon the other side of the same limb. We suggest the term "homonymous allocheiria" to indicate that the inversion is not about the mesial plane of the body, but about a plane belonging to one side of the body; antero-posterior axial (or mesial sagittal) plane of orbit, antero-posterior axial plane of limb, &c. This form of allocheiria persisted in our subject for five days. On the fifth of these we corrected it by training. We had found that when the patient was told to localise stimuli applied to spots in the left circumorbital area where he "felt" them (not where he "knew" them to be), he still localised them upon the corresponding spot in the right area, the original "allocheiria paradoxica." We made use of this in our training. The patient was told to localise a stimulus applied in the left area upon the spot in the right area where he "felt" it. He was then made to point to the (physiologically) corresponding spot in the left area, and was told that was the correct localisation. This procedure was followed for a large number of stimuli which were applied to different spots in the left circumorbital area. At the end of it the subject was made to point directly to the correct spot in the left area without making the intermediate localisation upon the right. The effect of this training was entirely a successful one. Henceforward the patient always correctly localised stimuli applied to spots in the left circumorbital area. But up to the end of the period during which we had the case under observation, when the patient was told to localise the stimuli where he "felt" them, the old "allocheiria paradoxica" was still found to be present.

It may be only a coincidence that the commencement of the period in which the patient was able to recognise, as different, stimuli applied to physiologically corresponding spots in the left and right areas coincided with the beginning of a slight attack of jaundice,

VIII. REMARKS ON THE ALLOCHEIRIA IN THE LEFT CIRCUMORBITAL REGION.

It will be observed that, in the first phase, the allocheiria phenomena in the left circumorbital region consisted in the reference of the stimuli to the corresponding circumorbital area on the right side of the body but without inversion of the apparent site of the stimulus about the mesial sagittal orbital plane. In the second place it consisted in inversion about the left mesial sagittal orbital plane without a reference to the right side of the body. These observations are of interest, for in the usual forms of allocheiria the inversion is about the mesial sagittal plane of the body. It must be remembered that each eye is a mesial organ when considered from the standpoint of the physiologist. Each has a right and left half rather than internal and external half, as the anatomist describes them. Thus each eye (being physiologically a central organ) is connected with both sides of the cortex cerebri—the two right sides of the two retinae send their afferent fibres to the right side of the occipital cortex, and the two left sides to the left side of the cortex. Each retina is a mesially situated organ with paired left and right halves; each macular region of the retina is, as it were, a mesially “unpaired” organ. From the standpoint of the physiologist (though not from that of the anatomist) the axial sagittal plane of either orbit and of either retina is really, in a sense, a part of the mesial sagittal plane of the body. But it must be remembered that the conditions are more complex than those which would obtain if the two eyes were really situated in the mesial sagittal plane of the body—for instance, one above the other. Thus, a subject for some purposes associates the idea of “leftness” with one eye, and that of “rightness” with the other. While for other purposes, because of the invariable conjugate movements of the eyes, he associates the idea of *movement to the left* (*internal rotation right eye, external rotation left*) with both eyes.

Bearing these observations in mind, the curious anomalies which we found to be associated with the allocheiria of the left circumorbital region become more easily understood. It is of interest that the only part of the left side of the face which, when stimulated, evoked sensations recognisable by the patient was that associated with the left eye—as we have shown, a central organ.

It would look as if, to a certain extent, the conjunctiva (ocular and palpebral), the skin of the eyelids, and the skin overlying the orbital cavity take a share in the curious mesial characters of the orbit and retina.

We would suggest that the phenomena of allocheiria paradoxica are explicable on the assumption that the subject failed to recognise the general "leftness" (in the anatomical sense) of stimuli applied to the left circumorbital area, but still recognised the leftness or rightness (in reference to the mesial sagittal plane of the left orbit) of stimuli applied within that region. This allocheiria paradoxica appears therefore to be a phenomenon different from that described by other observers, although the same factors in localisation (failure of the "position" factor) appear to be at fault.

The homonymous allocheiria is in a different category. Here the inversion was about the mesial sagittal plane of the left orbit. The subject now clearly recognised the *general* rightness or leftness of stimuli applied within the right or left circumorbital areas; he inverted the rightness or leftness about the mesial sagittal plane of the left orbit of stimuli applied to spots in the left circumorbital area. As that vertical plane is (physiologically) a part of the mesial sagittal plane of the body, our homonymous allocheiria is probably a comparatively similar phenomenon to the ordinary allocheiria (allocheiria simplex) described by other observers.

In the localisation of various stimuli applied to the retina, orbit, and circumorbital cutaneous area, the factor of "position" is certainly more complex than that in the localisation of stimuli applied to other receptive fields. In this factor itself various sub-factors may be recognised. It is probably because of this complexity that the phenomena of allocheiria which we have observed in this part of the body have shown the various characters with which we have dealt. That the stimuli applied to the eyelids and palpebral conjunctiva should show phenomena of allocheiria which we would associate with such a physiologically mesial organ as the orbit itself is not singular. In many activities (movements of the eyes) these receive stimuli of physiologically similar (but anatomically different) localisation upon the two sides of the body. But in many other states the stimuli which impinge upon the skin of the eyelids are localised by the subject more

anatomically—that is, on the right or left side of the body, and on the internal or external surface of the organ. Thus it is perhaps to be expected that in the phenomena of allocheiria the factor in “position,” which may be at fault, would be either that of the *general* (anatomical) leftness or rightness of the stimuli or that of the local *physiological* leftness or rightness of them about the mesial sagittal optical plane.

If the phenomena which we have described as homonymous allocheiria are really similar to those encountered in the more common conditions, a further point of interest must be noted. The subject not only localised stimuli applied on the left side of the left eyelids, &c., to corresponding spots on the right side of the left eyelids, *but also referred stimuli applied on the right side of the left eyelids to spots on the left side of them.* There was thus a *double* inversion of the localisation within the left circumorbital area. As far as we know, double allocheiria has not been described before. If the subdivision of the phenomenon is justifiable, we would suggest the term “*Allocheiria duplex*” to describe that condition.

IX. ALLOCHEIRIA RETINALIS.

In this case the subject exhibited phenomena of allocheiria in the localisation of visual stimuli upon the left retina. These were first observed by us about thirty-six hours after the shock, but we did not look for them before. Before passing to the description of these phenomena we may note that the patient had no photophobia, that the apparent size of an object, as seen with either eye singly, were the same (*i.e.*, no micropsia or macropsia); that his judgment of the distance of an object from his left eye, when his right was shut, was fairly accurate; that objects when viewed with the left eye alone “looked less plain” than when viewed with the right eye alone. At first he could not read with the left eye alone, but on the fourth day of the condition he could with difficulty read half-inch print held at a distance of eight inches. He gradually improved on this, and on the nineteenth day he could read ordinary print slowly with the left eye alone. At first the reaction-time to light stimuli appeared to be longer for the left retina than for the right, but on the nineteenth day of the condition there was apparently no difference between the two (we had

no means of measuring the reaction-time accurately). When a very bright light was directed straight into the right eye, the patient stated on the fourth day of his condition that he experienced the usual after-images, but when it was directed into the left eye, he stated that he did not experience them but only had a "dull feeling" in the *right* eye.

On the nineteenth day of his condition he experienced after-images in either eye, but stronger in the right. When the Müller-Lyer illusion was presented to the left eye, he correctly named the longest-looking line, whether the two lines were horizontal or vertical. We tried several other visual illusions without detecting any abnormality. The subject could close the left eye alone whilst the right eye remained open, but could not close the right eye alone. Von Graafe's sign was absent throughout the whole period of observation. Ophthalmoscopic examination revealed no abnormality of the retina.

A. "*Allocheiria simplex*" of *Retinal Localisation*.—When we first examined retinal localisation we did not extend the investigation to each retina singly. The subject was able correctly to localise the position of objects exhibited to him at different points in the periphery of the combined visual field. But when, on the third day of his condition, we examined retinal localisation of the two eyes separately, we found that in the case of the left eye the subject always localised the site of the object to the left of the mesial sagittal orbital plane, whether that object was exhibited to the right or to the left of it. If the object was exhibited in this plane (whether above or below or in the optical axis) it was correctly localised. The localisation was normal in the case of the right eye. The object which we exhibited was the flash of a pocket lamp. The wrong localisation occurred when the left eye was open (one second flash at three feet distance), and also when the left eye was closed, and the light, guarded from the right eye, was directed against the left eyelids (three second flash at about six inches distance from the eye). At the same time he experienced a feeling in the right eye to which we have already referred. On the fourth day of his condition the direction of the allocheiria was reversed, the patient then localising the object to the *right* of the sagittal optical plane of the left eye (see Fig. 5). An interesting phenomenon was observed when a bright light was moved across the left field of vision (the left eye being closed)

and the subject was made to follow its movements with his right hand. If the movement was from right to left horizontally across the field of vision, and through the left visual axis, the patient localised it correctly at first, and followed its subsequent movement correctly, nearly, but not quite, up to the left visual axis. But when the light crossed this point and passed further to the left, the movement of the patient's hand reversed, and his hand travelled back to the right (Fig. 6). This, however, was observed only when a light was directed upon the closed eyelid of the left

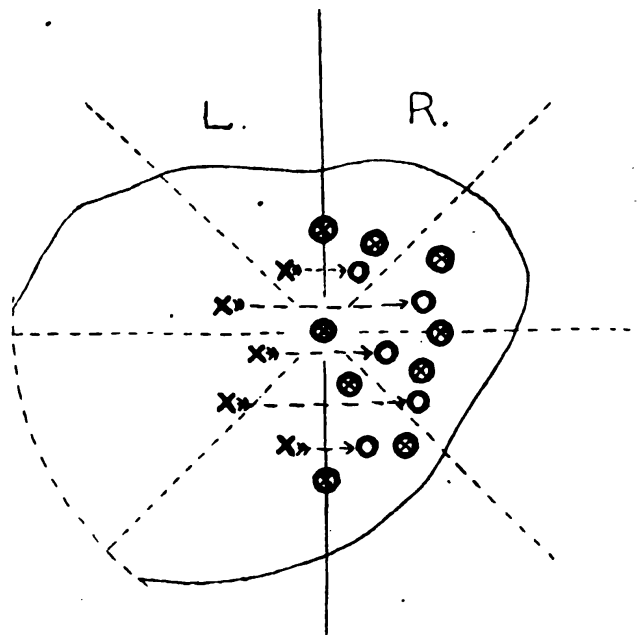


FIG. 5.—Allocheiria Retinalis.

Diagram to illustrate the phenomena of "allocheiria simplex" in the localisation of visual stimuli in the left visual field. The same symbols are used as before. A cross within a circle (on the left sagittal axial visual plane and in the right lateral half of the field of vision) indicates that the visual stimulus was correctly localised. The unencircled crosses in the left lateral half of the field of vision indicate the position of visual stimuli which were localised on the circles on the right lateral half. Broken arrows connect each cross with its corresponding circle.

eye. When the light was exhibited to the open left eye phenomena of "allocheiria duplex" occurred, and later these were also seen when the light was directed against the closed eyelids. There was thus, as it were, an intermediate stage between the phenomena of allocheiria simplex and allocheiria duplex which we observed.

B. "*Allocheiria duplex*" of Retinal Localisation.—From the third or fourth day of his condition onwards the patient exhibited the

phenomenon of *alloecheiria duplex* which persisted almost without variation in the localisation of visual stimuli applied to the left retina. The localisation phenomena were throughout normal in the right eye.

1. *Localisation of Stationary Objects in the Left Visual Field.*—When an object was exhibited in the left optical axis it was correctly localised by the subject; it was also correctly localised (as a rule) when the object was exhibited in other points upon the

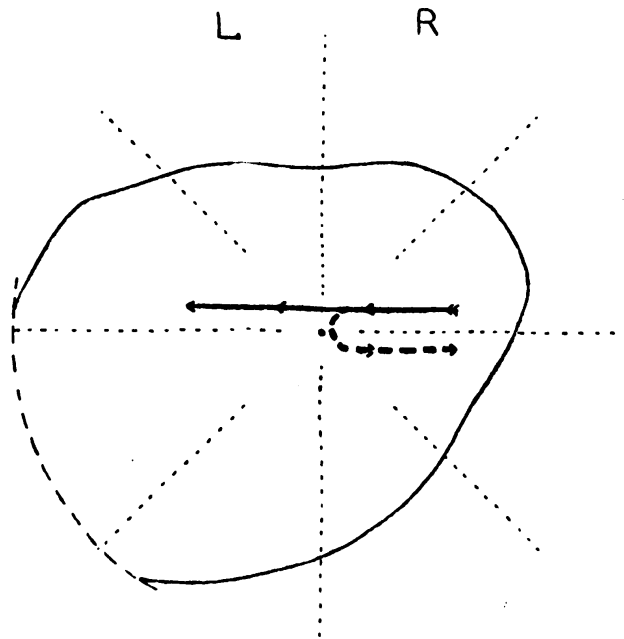


FIG. 6.—*Alloecheiria Retinalis*.

Diagram to illustrate the subject's localisation of moving visual stimuli during *alloecheiria simplex*.

The unbroken arrow indicates the direction and extent of a visual stimulus moving horizontally from right to left. The first part of this arrow also gives the direction and extent of the subject's localisation of that stimulus nearly up to the sagittal axial visual plane, that localisation being so far correct. The broken arrow indicates that when the visual stimulus crossed this plane, the subject imitated its movement in a reverse direction back to its original starting point. The broken arrow should really coincide with the first part of the unbroken one. The two are only separated for purposes of demonstration.

left mesial sagittal optical plane, but if the object was exhibited to one side of this plane, it was localised as if it lay upon the other side, but at the same horizontal level in the visual field (Fig. 7).

There was thus transverse inversion in the localisation of objects in the left visual field. This phenomenon was first observed

when the object, shown in a dark tent, was a very dim light of about five seconds' duration at a distance of eight feet from the subject. But next day we discovered that it also occurred when any object was exhibited by daylight. In making his localisation, the subject pointed his right (normal) index finger where he thought the object was. When he did this in the daylight test we asked him how he could explain the fact that he could see the object in one place and the finger with which he was pointing at it in another. He replied that his finger did not *look* as if it

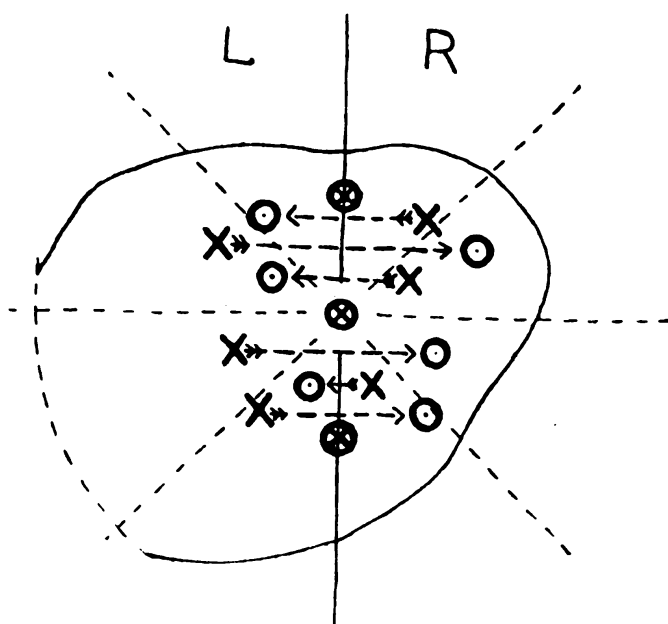


FIG. 7.—Allocheiria Retinalis.

Diagram to illustrate the phenomena of "allocheiria duplex" in the localisation of visual stimuli in the left visual field. The symbols used are similar to those used in the previous diagrams.

was pointing correctly, but *felt* as if it was. The reversed localisation obtained when the act was made with the left eye closed after the object had been exhibited, as well as when the eye was allowed to remain open. Late in the course of the condition, when the movements had returned in the paralysed left arm, the same reversal of the act of localisation occurred if it was performed with the left hand. Occasionally the subject performed a reverse localisation in the vertical direction; this was rare, and we found that it did not occur when the object was exhibited

comparatively near to the optic axis, but only when exhibited far from it.

2. *Fixation of the Left Eye.*—Notwithstanding the fact that the subject always localised an object exhibited to one side of the left mesial sagittal optical plane in the opposite position when the localising act was made with one hand, we found that if he was told to look straight at the object (his right eye being covered

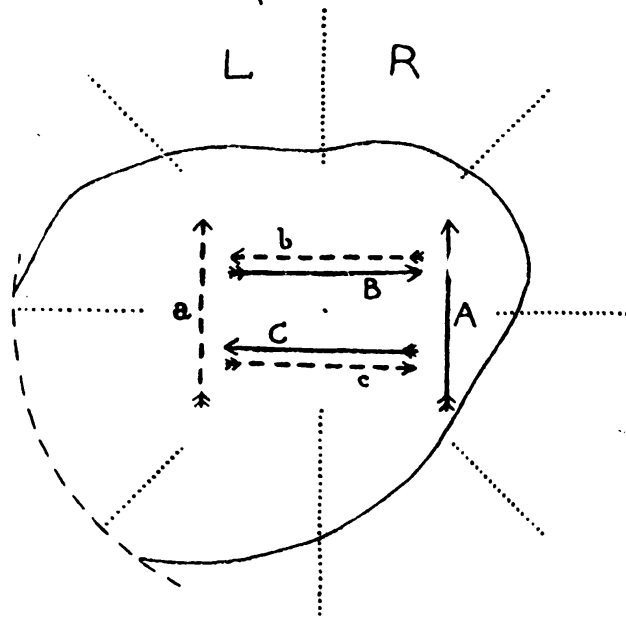


FIG. 8.—Allocheiria Retinalis.

Diagram to illustrate the subject's imitation of the paths of visual stimuli moving in straight lines in the left visual field during the phenomenon of "allocheiria duplex."

The unbroken vertical arrow (*A*) shows the direction and extent of the path of a visual stimulus which moved vertically in the right half of the left visual field. The broken vertical arrow (*a*) demonstrates the extent and direction of the path which the subject indicated (by pointing with his right hand) that he thought the visual stimulus had moved in. It will be observed that these two arrows are similar in direction and extent, but that they lie in different half of the field of vision. The unbroken horizontal areas (*B*, *C*) similarly indicate the true paths of horizontally moving stimuli, the corresponding broken arrows (*b*, *c*) give the apparent paths of these stimuli as indicated by the subject.

It will be observed that these differ in direction. Arrow *B* should coincide in situation with arrow *b*, and arrow *C* with *c*. They are drawn somewhat apart for diagrammatic purposes.

throughout), he almost always did so accurately. He also followed movements (rectilinear or circular) of objects accurately with his left eye.

3. *Localisation of Stationary Objects after Fixation of the Left*

Eye.—On the thirteenth day of the condition (not having tried this experiment before that) we found that this localisation was perfect with the left eye if he was first made to fixate the object (which was shown at the periphery of the field of vision), then again to direct his gaze in front, close the left eye, and finally point to the object with the right hand.

4. *Localisation of Objects moving in Straight Lines across the Left Visual Field.*—In these tests the subject was made to follow a moving object with his right hand. When the direction of movement was transversely across the left visual field (either from right to left or left to right) the subject moved his hand along the same line but in the reverse direction (left to right or right to left). The objects shown were either lights in complete darkness or small pieces of white paper in daylight. At the moment when the object crossed the left mesial sagittal plane of the visual field, the pointing hand was directed straight at it. For a reason to appear later we thought that this reversal would not occur if the object was moved through a very small distance near the visual axis, so that the retinal image of the moving object was confined within the macular region. As a matter of fact this was not the case. Even very small movements near the optical axis were imitated by the subject in the reverse direction. Similar small movements in a horizontal direction at the periphery of the field of vision were also imitated in the reverse direction. Movement in a vertical direction was almost always correctly imitated by the subject. But if the object was moved vertically to one or other side of the left mesial sagittal visual plane the patient imitated the movement on the other side of it (Fig. 8).

5. *Localisation of Objects moving in Circles round the Left Optical Axis.*—An object (a light in complete darkness, or a white piece of paper, or a bright metal disc in daylight) was moved circularly round the left visual axis, while the patient's left eye was fixed and the right eye was covered. After the movement he was made to imitate it with his right hand. Whether his left eye was closed or remained open during the imitation, the subject almost always imitated it in the counter direction. If the object was moved (let us say) in a clockwise direction, and the patient was made to point to it with his right hand while the movement was in progress, the movements of his right hand were accurately counter-clockwise; his finger coinciding with the object

at the points where it crossed the vertical axial visual plane (Fig. 9). If, however, the patient was allowed to follow the movement of the object with his left eye his imitation, either during the movement or after its completion, was correct.

This counter-clockwise imitation is a matter of interest, for it is just what we would expect to occur if the inversion of the apparent position of seen objects was in a transverse direction only, and we hardly think that the subject was sufficiently intelligent to realise that this would be the case immediately this test was applied without any warning. Later in his condition, and on only one of the many occasions on which we

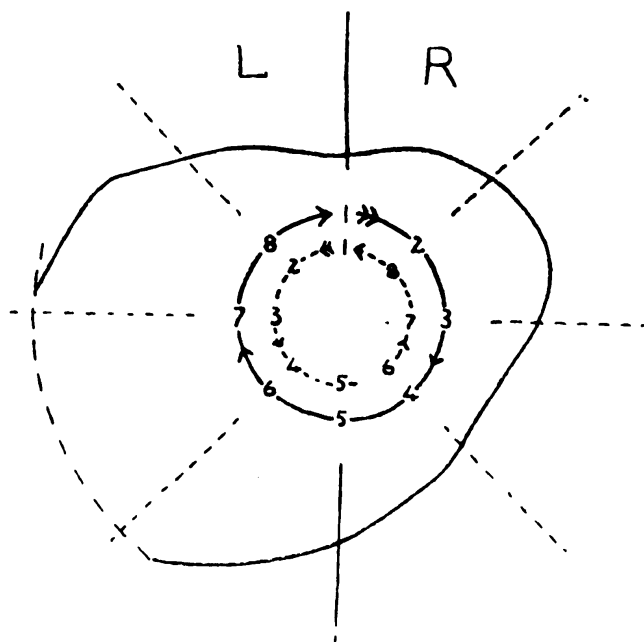


FIG. 9.—Allocheiria Retinalis.

Diagram to illustrate the subject's imitation of circularly moving visual stimuli in the left visual field during the phenomena of "allocheiria duplex."

The unbroken arrow shows the true path of the moving stimulus, and figures along it give different points in its path (movement in clockwise direction). The broken arrow shows the apparent path of the stimulus as imitated by the subject while the actual visual stimulus was moving. The figures along it indicate the points to which his finger was directed at the moments when the stimulus was at the points marked by the figures along the unbroken arrow.

The centre of the circle in which the visual stimulus moved was the visual axis, and it will be observed that at points 1 and 5, where the visual stimulus was on the mesial sagittal optical plane, the subject's finger pointed directly at the moving object. The two circular arrows should coincide. For diagrammatic purposes one has been drawn inside the other.

made this test, he imitated the movement while it was in progress by a movement in the same direction round the circle, but with a difference of 180° . It is interesting that on this day his retinal localisations were reversed across the visual axis (one of the rare occasions on which this was observed), and not merely in the horizontal direction across the vertical axial visual plane.

C. On the Reproduction of Objects Exhibited in the Left Visual Field.—This test consisted of two parts. In the first of these, various irregularly shaped figures were shown in the subject's

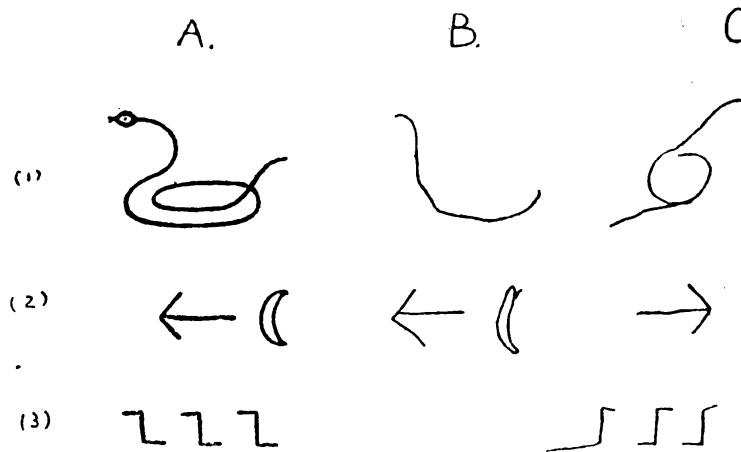


FIG. 10.

Column *A* shows some diagrams exhibited in the left visual field of the subject. In column *B* are shown the subject's attempts to reproduce three of those from memory immediately after the diagrams had been exhibited in the left visual axis. In column *C* the attempts at reproduction made by the subject immediately after the diagrams had been exhibited in one lateral half of the field of vision are shown. It will be observed that where the diagrams are shown centrally, they are reproduced correctly; where shown peripherally the mirror images are reproduced (inversion about the vertical axis of the diagrams).

left field of vision, and after their removal he was made to draw them on another piece of paper and using his right eye. We found that he reproduced these correctly if the figures had been exhibited in the visual axis, but that he reversed them (*i.e.*, reproduced the mirror-image) if the shapes were exhibited peripherally to one side of the vertical axial visual plane. Occasionally, however, the image was inverted vertically, that is, was "stood upon its head." It must be remarked that some of the shapes were rather complicated, that a natural error of memory in the repro-

duction might easily occur, and that these tests were performed on two occasions only (Fig. 10). The second form of this test we found to be a much easier one for the subject to carry out. Large flat objects were cut out of thin white cardboard; the shapes of these were **D**, **E**, **L**, **J**, Δ . As both sides of the object were white, the mirror image of each could be exhibited also. At first our method was to show one of these objects in a certain position to the left eye, and then to let the subject, using his right eye, pick it out from all the objects, and place it in the position in which he thought that it was exhibited. As he never made a mistake in selecting the object, we modified this test in as far as, immediately after the exhibition of an object, we put an exactly similar object in his right hand and made him place it in the posture which he thought it occupied when it had been exhibited to the left eye. We made him thus imitate the apparent posture either whilst he used his right eye alone, or whilst both eyes were covered. In the latter case he did it by feeling the model with his right hand.

When the shapes were exhibited in the visual axis the patient on no occasion made any mistake in imitating the sixteen or more different postures of the different shapes which were shown to him. When the shape was exhibited, either directly above or directly below, the visual axis posture also was on every occasion correctly imitated. But when a shape was shown to the right or to the left of the vertical axial visual plane he always imitated its posture as if it had been turned through two right angles in a plane at right angles to the optical axis. [It should be noted that for many of the shapes (**D**, **E**, \triangleright , &c.) this erroneous apparent posture might also be described as that which should result if the shape was rotated through two right angles about a vertical axis perpendicular to the optical axis, but for other of the shapes (**J**, **L**, &c.), this description would not hold good, and that which we have given is the description which covers almost all cases.] (Fig. 11).

This type of inversion of seen objects is not that which we could have expected to occur, as it does not correspond with the horizontal inversion which was exhibited in the subject's localisation of objects seen in the periphery of his left field of vision, but rather with a diametrical inversion about the optical axis. We cannot believe, however, that the subject intentionally

inverted the shapes in this test. His reactions were too rapid, and the numbers of different shapes we exhibited in any one test too great, for this to have been the case. But more than this, the correctness of the imitation when the visual image fell upon the macular region of the retina speaks strongly for the subject's sincerity. As far as we could discover he had no knowledge at all of the physiology of vision. An interesting point which we

	A	B	C
1.	L	L	L
2.	J	J	J
3.	L	L	L
4.	J	J	J
5.	>	>	>
6.	<	<	<
7.	J	J	J
8.	L	L	L
9.	L	L	L
10.	J	J	J
11.	D	D	D
12.	D	D	D
13.	D	D	D
14.	D	D	D
15.	L	L	L
16.	J	J	J
17.	L	L	L
18.	L	L	L

FIG. 11.

Column *A*. A series of shapes exhibited in these different positions in the left visual field. Column *B*. The corresponding shapes as indicated by the subject with models (either with both eyes shut after the exhibition of the original shape, or while the subject looked at the model with his right eye only).

A. When the original shape had been exhibited in the left visual axis. *B*. When the original shape had been exhibited in the left axial sagittal plane of the field of vision either above or below the visual axis. (In every case the shape is correctly imitated.)

Column *C*. The shapes as reproduced after the original shapes had been exhibited in either lateral half of the left visual field. (It will be observed that the shapes in every case are inverted.)

may note here is, that when a shape was exhibited to the right or left of the centre of the left visual field, and he was told to

imitate its posture with a model, while looking at that model directly with the left eye, he also inverted it. When the patient's eye was fixed, and a shape was moved transversely across his field of vision, he told us that it seemed to turn upside down at a certain point in its path, and then to reverse again. We controlled the fixation by making the subject look with his left eye straight into the observer's right, and these reversals took place when the object was immediately between the eyes of the subject and the observer. The subject told us that when he was looking at an object with the left eye (right eye covered), and then looked away to one side, the object at which he had been looking seemed to turn upside down. This did not occur in the case of the right eye. The subject could not read mirror writing nor inverted writing with his left eye.

D. On the Correction of Inverted Localisation.—We found that when an object was exhibited to the right or left of the vertical axial visual plane of the left eye (that eye being fixed), the patient pointed to it as if it lay on the other side of that plane. He then saw the object and his finger in different parts of the left visual field. It was pointed out to him that this was the case, and he was made to move his finger until it touched the object. In doing this he appeared to be greatly confused, but thereafter was able to follow with his finger any further movements which were given to the object correctly, though slowly and hesitatingly. After he had been made thus to touch the object, he was also made to take his finger away again, and then told to point at once to the object. This he did accurately, but with some hesitation. He explained that he then *felt* that he was pointing wrong, but could do it by seeing how his hand moved. After several days' training in this manner the *allocheiria* disappeared, and the subject was able correctly to localise objects presented to the left visual field, and to imitate correctly the direction in which objects moved. Later we found that the *allocheiria* was still present if the subject was asked to localise an object where he "felt" that it was; but that, when told to indicate where it "really" was, he did so with perfect accuracy.

X. ON THE ABSENCE OF ALLOCHEIRIA IN THE CASE OF THE OTHER SPECIAL SENSES.

The presence of allocheiria in the case of retinal localisation naturally suggests the possibility that it may have been present in the case of other special senses. As far as we know this was not the case. *Taste* was absent on the left side of the tongue, *smell* on the left side of the nose; there was no recognition of taste and smell stimuli when these were applied on the left side of the body, and of course no erroneous reference of these stimuli to the opposite side. *Hearing* was present on both sides, but auditory acuity was diminished on the left side. We carefully tested hearing for the presence of allocheiria. In this test we used the stethoscope method previously described by one of us. An ordinary binaural stethoscope is placed in the ears of the patient. A ticking watch is placed against the chest piece. Normally, if one of the rubber tubes is closed by the observer, the ticking of the watch is heard *in* the opposite auditory meatus. With one tube partially closed, the ticking of the watch appears to the subject to be located outside of the body, but to one side of the sagittal plane of the head. With both tubes fully open it is localised in the sagittal plane. In this test the subject correctly localised the ticking in the left ear when the right tube was closed. We may also note here that the subject knew with accuracy the direction in which his head rotated when it was moved, and the direction to which his eyes turned when he looked to one or other side of the sagittal plane. This is not surprising, but had the allocheiria been present in the case of the right retina as well as the left, it is possible that other results might have been obtained; for, as one of us has shown before, the centripetal impulses from the end-organs in the muscles, tendons, and joints of the neck, and from the semicircular canals, from the end-organs in the extrinsic muscles of the eyes, and perhaps also those in the conjunctiva, and from the retina itself, all form a great complex which subserves the sensation of "movement" either of the head within the environment or of the environment about the head or of parts of the environment within itself.

XI. ALLOCHEIRIA (?) OF THE KINÆSTHETIC SENSATIONS.

We may refer briefly to the following phenomena which are possibly allied to that of allocheiria. Up to the twenty-sixth day after the shock the subject was apparently unable to recognise active or passive movement of the left limbs through kinæsthetic sensations alone. We may note the fact that during a large portion of this period we attempted to improve the "voluntary" movements of the left limbs by a process of training. In this process the subject was made to perform vigorously with his right limb the *opposite* movement to that which he attempted to make with his left. Thus if he was trying to flex his left elbow he was made synchronously to extend his right elbow strongly. On the twenty-seventh day of his condition we found that the subject could recognise passive movement of the left upper limb at the shoulder, elbow, and radio-ulnar joints when his eyes were closed. But when told to imitate these movements with the right upper limb he always replied with an antagonistic movement. Thus, when passive flexion was applied at the left elbow joint, he imitated the movement with active extension at the right elbow. We investigated this phenomenon with care. The imitation of the amplitude of the movement was accurate. Only its sense was reversed. When very small passive movements (flexion or extension) were applied at the left elbow and given in very rapid series in an indeterminate order the patient was never confused but always made nearly synchronous movements at the right elbow, each imitation being always in an opposite sense to the passive movement at the left elbow, which it imitated. This was the case although we tried continuously to "catch the subject out" throughout the test. We repeated this test on ourselves, the subject trying to imitate each passive movement in an opposite sense, and found that under the same conditions we became confused, and failed to reply always with the opposite active movement in the upper limb. This phenomenon lasted in our subject only for a few hours, for we at once took steps to correct it by training. Thereafter the subject's recognition of passive movement at these joints of the left upper limb was normal. On the last occasion on which we examined the subject we repeated the test and told him to imitate the passive movements at the left elbow joint by the *opposite* movements at the right. The test was applied exactly as before,

and the subject repeatedly became confused, and often did not reply with the opposite movement.

We cannot decide whether this phenomenon is really analogous to allocheiria, but think that it very possibly is. In this case it might be termed "allocheiria kinæsthetica." Regarded as a type of allocheiria it is not, however, analogous to the ordinary phenomenon ("allocheiria simplex"), for the passive movements of the left limb were not referred by the patient to the right. It is more analogous to the phenomena described by Purves Stewart in which the patient refers to the radial side of the forearm a stimulus applied to the ulnar side. As, from the anatomical standpoint, a limb has two sides—let us say radial and ulnar (internal and external), or better, anterior and posterior—so, from the physiological standpoint, its movements have in general two senses, flexion and extension. These two senses of the movements have their psychical counterpart in the self-generated kinæsthetic sensations. In this case the kinæsthetic phenomena showed inversion of the two types of sensation in the same arm, although the kinæsthetic sensations were always referred to the correct arm. Thus the phenomena are perhaps analogous to those described by Purves Stewart (in a single case) for cutaneous sensations. But it must be noted that the inversion was a double one. Not only was extension thought by the subject to be flexion, but flexion was thought to be extension. The phenomena are thus in some way analogous to those which we have described for the localisation of visual stimuli applied to the left retina, and to which we have ventured to give the term "allocheiria duplex." Before leaving these phenomena we may again recall the method which we used in the training of voluntary movements in the left upper limb. Is it possible that this method of training in part conditioned the allocheiria of the kinæsthetic sensations?

XII. CONCLUSIONS.

At different places throughout this paper we have briefly discussed the phenomena which we encountered, and there is no object in again referring to these different points. We may, however, summarise our results, by saying that this case exhibited many curious types of allocheiria which have not previously been described. He showed the ordinary type of allocheiria for touch

and pain stimuli applied to certain parts of the left side of the body (scrotum, glans penis, dorsum penis, skin round anus, and soft palate).

He also showed it for the testicular sensation on the left side. He showed an unusual form of the phenomenon ("allocheiria paradoxa") for stimuli of touch, pain, heat, and cold, applied to a certain other part of the left side of the body (circumorbital area of skin, eyebrows, eyelashes, palpebral conjunctiva, ocular conjunctiva, cornea). He showed the phenomenon in the localisation of visual stimuli applied to the left retina ("allocheiria retinalis"); and at first the form of the allocheiria was analogous to the ordinary cutaneous type ("allocheiria simplex"), the localisation of visual stimuli applied to either side of the retina being always to one specific side of the mesial sagittal plane of the field of vision, save when the visual stimuli fell upon the muscular region of the retina. Later the inversion was a double one ("allocheiria duplex"), the localisation of a visual stimulus being given in the opposite direction from the true one whichever side of the left retina it was applied to. Finally, he showed a phenomenon, analogous to allocheiria, in the recognition of passive movements of the left limbs. This phenomenon ("allocheiria kinæsthetica") seems to be analogous not to the ordinary allocheiria but to that rare type which we have ventured to term "homonymous allocheiria."

This case shows that the phenomenon of allocheiria (or a phenomenon similar to allocheiria) is not necessarily exhibited only in the case of the cutaneous sensations. It seems to extend for the first time the observation of allocheiria to such other types of sensations as the visual and kinæsthetic ones, as well as to that which we term the testicular sensation.

Before bringing this paper to a close, we may again refer to the point which we wish chiefly to emphasise. The patient exhibited that error in the localisation of stimuli to which the term allocheiria has been applied. His error in localisation was not such that he was unable to recognise the difference in location of stimuli applied to definite spots in the affected areas. Nor was it such that he failed to recognise that a stimulus was applied to one and the same spot each time it was so applied. That this was the case is shown by the accuracy of his inverted localisations. In the case of different stimuli applied within the

left circumorbital region the localisation of these by the subject upon physiologically corresponding spots within the right circumorbital region was apparently very accurate. In other words, the wrong localisations showed little or no error in the factors of "character" and "individuality." The error which existed was one of the factor of "position" only. In the case of some of the phenomena which we have described ("allocheiria simplex"), it would appear that the subject erroneously related the stimuli to a "schema" which was proper to stimuli applied to the other side of the body. It is almost as if the "schema" for the left side of the body had become unavailable, and that the stimuli applied to that side of the body were yet referred to the available "schema" for the other side. In other of the phenomena ("allocheiria duplex") it would appear that the "schemata" for both sides of the body were available, but that the stimuli applied to one side were referred to the "schema" of the opposite side. It is interesting that, in a so-called functional case, it should only be the factor of "position" which is at fault. This suggests that the factor of "position" may be, as it were, in a higher hierarchy than those of "character" and "individuality" in the localisation of stimuli, as is perhaps to be expected.

Finally, we would note that the phenomena with which we met in the case of retinal localisation suggest that our three factors are present also in the localisation of visual stimuli. They may be present as well in the localisation of stimuli applied to the testicle, and the phenomena of inverted recognition of the kinæsthetic sensations appear to suggest that possibly similar factors are present in the recognition of passive movement and in the appreciation of its direction.

Abstracts

PHYSIOLOGY.

NOTE ON STRYCHNINE TETANUS. ARTHUR R. CUSHNY, *Quart.*
(1) *Journ. Exp. Physiol.*, 1919, xii., p. 153.

It is unnecessary to assume that strychnine changes the ordinary co-ordinated reflex not only in quantity but also qualitatively, by inducing a reversal of inhibition into contraction. Strychnine tetanus is merely a quantitative change of the "start" reflex which occurs under normal conditions. A. NINIAN BRUCE.

PSYCHOLOGY.

SYMBOLISMS IN PSYCHOPATHOLOGY. H. FLOURNOY, *Archiv. de*
(2) *Psychol.*, 1919, April, p. 187.

IN this paper Dr Flournoy gives five cases of pathological symbolism with their interpretations: (1) symbolism in a dream of a psychopath; (2) symbolism of a hallucination; (3) symbolism of a hysterical spasm; (4) symbolism of a childish rite; (5) symbolism of a drawing of a dement.

MARGARET DRUMMOND.

OBSERVATIONS ON SYMBOLISM IN HYSTERIA. H. FLOURNOY,
(3) *Archiv. de Psychol.*, 1919, April, p. 208.

THIS is an account of a case of hysteria characterised by violent trembling and inability to walk. Dr Flournoy succeeded in tracing the symptoms to unconscious imitation of a neighbour, and in showing that they corresponded to a repressed wish. Dr Flournoy goes on to discuss the psychic origin of hysterical symptoms in general and the nature and function of symbolism. The phenomenon to which Freud has given the name conversion—that is, the transformation of an unbearable idea into a physical symptom—is regarded as a special case of symbolisation. There are copious references to the literature.

MARGARET DRUMMOND.

CLINICAL NEUROLOGY.

ON ABDOMINAL REFLEXES. (Om abdominal reflexerne.) G. H. (4) MONRAD-KROHN, *Tillægshæfte til Norsk. Mag. f. Lægevid.*, Kristiania, 1918, p. 180.

THIS monograph is based on the study of 472 cases, the great majority of which were suffering from various diseases of the nervous system. The author confirms the statement of previous writers that under normal conditions of the abdominal wall, abdominal organs and nervous system, the abdominal reflex is practically constant and equal on both sides. It is, however, inconstant in infants, and therefore has very little diagnostic value in the first year of life, and especially during the first six months. It is also inconstant in old age. Repeated pregnancies also account for loss of the reflex in a number of cases, although it may remain brisk after numerous pregnancies. During the puerperium the reflex is frequently unequal, apparently owing to unequal stretching of the abdominal wall. In pathological conditions the writer found that a pyramidal lesion (cortical, capsular, mesencephalic or spinal) as well as a lesion of the more peripheral part of the reflex arc tended to abolish the reflex. Although peripheral motor disturbances cause a distinct change in the abdominal reflex, reflex changes do not occur so markedly in peripheral sensory disturbances. Thus in tabes, even when there is slight hypæsthesia over the abdomen, the abdominal reflexes are generally brisker than usual. It is only when there is a pronounced diminution or loss of sensation over the abdomen that the abdominal reflex is diminished or abolished. In hysteria with unilateral sensory disturbances over the abdomen, the abdominal reflexes are as a rule unequal, being exaggerated in the case of unilateral hyperæsthesia, and diminished or abolished in the case of unilateral hypo- or anæsthesia. In paralysis agitans and chorea, the abdominal reflexes are, as a rule, found exaggerated on the affected side.

The writer suggests that the reflex has a long cerebral arc which reaches up to the psychosensory and psychomotor areas of the brain, and that there is also an inhibitory apparatus represented by the rubral system, lesion of which causes an increase of the abdominal reflex.

J. D. ROLLESTON.

INVERSION OF THE OCULO-CARDIAC REFLEX AS A SIGN
(5) **OF CEREBRAL COMPRESSION.** (Inversion du réflexe oculo-cardiaque. Signe de compression cérébrale.) F. LAVAL et J. GIROU, *Gaz. des Hôp.*, 1919, xcii., p. 668.

THE writers record a case of suppurative otitis media with pronounced bradycardia (pulse, 48 a minute) in which the oculo-

cardiac reflex was inverted when the brain was compressed by the subdural abscess, but became normal again when the abscess was evacuated. The following explanation of the inversion is given. The reflex arc of the oculo-cardiac reflex is formed by the centripetal sensory fibres of the fifth nerve, the medulla and the centrifugal fibres of the pneumogastric and sympathetic. The pressure of the abscess gives rise to a hypertonus of the vagus, which is manifested by bradycardia. When the vagotonic stimulation reaches its limit, the bradycardia cannot increase, and when ocular pressure is superadded to the compression caused by the abscess, the stimulus will pass along the sympathetic instead of along the vagus, giving rise to acceleration of the cardiac rhythm or inversion of the oculo-cardiac reflex. But as the pus is evacuated, the vagus becomes susceptible to stimuli again from ocular pressure, as is shown by the reduction of the pulse rate, and the oculo-cardiac reflex becomes normal again.

J. D. ROLLESTON.

THE OCULO-CARDIAC REFLEX IN ANXIETY STATES. (Le (6) *réflexe oculo-cardiaque dans les états anxieux.*) J. EUZIÈRE et J. MARGAROT, *Gaz. des Hôp.*, 1919, xcii., p. 570.

THE writers have found that the oculo-cardiac reflex is often inverted in anxiety states, *i.e.*, instead of the normal slowing an acceleration of the pulse takes place on ocular pressure. Patients of this kind are sympathicotonic; in other words, their sympathetic reacts more readily to stimulation than their vagus. The greater the anxiety, the more marked the inversion of the reflex, the acceleration disappearing as calm is regained.

J. D. ROLLESTON.

HERPES ZOSTER OF THE CERVICAL PLEXUS WITH MOTOR (7) DISTURBANCES. (Zona du plexus cervical avec troubles moteurs.) A. LEMIERRE et P. LANTUÉJOUL, *Bull. et mém. Soc. méd. d. Hôp. de Paris*, 1919, 3e sér., xlii., p. 1005.

A RECORD of a case of a soldier, aged 21, with zoster, accompanied by sensory disorders in the area of the second, third, fourth, and fifth cervical roots, and paresis involving the movements of flexion of the head and neck. Of the flexor muscles, the longus colli and rectus capitis anticus major and minor, which are exclusively supplied by anterior branches of the first four cervical nerves, especially C²—C⁴, were affected, while the sterno-cleido-mastoid was intact. There was thus an exact coincidence of eruptive, sensory and motor phenomena in the cervical region. The pathogeny of paralysis in herpes zoster is still obscure. It is possible,

as Souques suggests, that inflammation of the posterior spinal ganglia may spread secondarily to the anterior roots, or that the infective agent of zoster which is usually localised in the posterior ganglia only may simultaneously affect the anterior cells of the cord. It is noteworthy that the patient had suffered from paraplegia in childhood, and that he presented disturbance of the vesical sphincter, and had a patch of occipital canities, so that his nervous system was specially predisposed.

J. D. ROLLESTON.

VISCERAL ANALGESIA IN TABES. (*Viszerale Analgesie der*
(8) *Tabischen.*) A. HANSEN, *Deutsche Med. Wchnschr.*, 1919, xlv., p. 129.

A MAN, aged 45, suddenly developed nausea and slight rise of temperature without vomiting or any other objective digestive disturbance. The bowels acted several times after administration of castor oil. There was no pain or tenderness on examination of the abdomen, but all the signs of tabes were present. Death took place after three days' illness, preceded by collapse during the last twenty-four hours of life.

The necropsy showed diffuse purulent peritonitis as the result of a perforation of a duodenal ulcer, with free gas and fluid fæces in the abdominal cavity. The peritonitis was apparently several days old, although, apart from nausea, there had not been the slightest sign or symptom of this possibility, such as pain, meteorism, or intestinal paresis. The duodenal ulcer, which showed no adhesions or hæmorrhage, may have been a trophic lesion similar to perforating ulcer of the foot. Apart from painless childbirth and the symptomless pleurisy in tabetics, Hansen has not been able to find a single case of a similar complication in a fatal case of tabes. The practical importance of the present case is that the possibility of visceral disease in tabes should be considered under certain circumstances in spite of the absence of local symptoms, which are always well marked in the non-tabetic.

J. D. ROLLESTON.

PHYSIOPATHIC CONTRACTURES OF PARETIC EXTREMITIES
(9) **FROM CRANIO-CEREBRAL WOUNDS.** (*Contratture fisio-*
patiche di estremità paretiche per ferita cranio-cerebrale.)
L. DE LISI, *Riv. di Patol. nerv. e ment.*, 1919, xxiv., p. 1.

IN some wounds of the skull with crossed paralysis of the upper limb there is a physiopathic contracture of the paretic extremity. In these cases the cerebral disturbance is not sufficient to create the physiopathic contracture, but the coexistence of a peripheral traumatic lesion is always required. That the cerebral factor and

peripheral traumatism are not independent of one another is shown by De Lisi's case, in which a small wound which preceded the cranio-cerebral wound by about three months did not of itself produce any physiopathic disturbance, but gave rise to the *main d'accoucheur* deformity of the hand, which became paretic as the result of the cortical damage a few days after the onset of the monoplegia.

J. D. ROLLESTON.

A METHOD OF DISTINGUISHING THE ORGANIC OR FUNCTIONAL NATURE OF MUSCULO-SPIRAL PARALYSIS: THE SIGN OF ABDUCTION OF THE FINGERS. (Un procédé de distinction de la nature organique ou fonctionnelle des paralysies radiales: Le signe de l'abduction des doigts.) J. BOISSEAU, *Presse méd.*, 1919, xxvi., p. 247.

ACCORDING to Boisseau the organic or functional nature of a musculo-spiral paralysis may be readily detected by the attitude assumed by the fingers in active abduction. In organic paralysis the middle finger remains motionless and the index separates from it, but at the same time its first phalanx becomes flexed and the other two remain extended. The ring finger shows a similar but more pronounced movement, which is even more marked in the case of the little finger. The thumb is opposed and abducted and is turned to the ulnar border of the hand in spite of the patient trying to carry out the opposite movement. In *hysterical paralysis*, the patient when told to separate his fingers either says that he is unable to do so and his fingers remain motionless, or the separation occurs normally as on the sound side. If he says that he is unable to carry out the movement the fingers should be separated passively and he should then be told to keep them in that position. As a general rule this method proves successful. In *mixed or hystero-organic cases* the sign of abduction of the fingers shows that the nerve lesion is not repaired, or on the other hand, if abduction takes place normally, that the lesion is cured. The following explanation is given of the attitude assumed by the fingers in organic musculo-spiral paralysis during attempts at abduction. Normally the interossei produce (1) a movement of flexion of the first phalanges and of extension of the last two, which movement does not necessitate the extensor tendons being stretched; (2) a movement of abduction which can only take place when these tendons are stiffened by contraction of the extensors. It is therefore obvious that in musculo-spiral paralysis while the first movement is possible the second cannot be carried out. The efforts made by the patient involve the synergic contraction of other muscular groups, the thenar and hypothenar muscles placing the thumb and little finger in the position

described. The index and ring finger respectively are passively drawn over by the displacement of the thumb and little fingers.

J. D. ROLLESTON.

CAUSALGIA AND PAINFUL SYNDROMES OF SYMPATHETIC

(11) **ORIGIN.** (*Causalgies et syndromes douloureux d'origine sympathique.*) E. GIROU, *Presse méd.*, 1918, xxv., p. 584.

CAUSALGIA which occurs in lesions of the peripheral nerves, especially the median and internal popliteal nerves, must be distinguished from painful syndromes due to lesions of the sympathetic, though the two forms may be associated. Causalgia, as its name implies, is a burning pain, constantly present, but subject to paroxysmal aggravation evoked by the least contact of the affected limb with a hot and dry object or by any sudden act or disagreeable idea. The sensory changes are accompanied by motor symptoms due to motor interferences with the affected nerve. No circulatory disorders, however, are present, nor any trophic changes apart from maceration of the skin caused by constant contact of water applied for the relief of pain. In the painful lesions of the sympathetic, on the other hand, the pain is not so intense as in causalgia, and rarely prevents the patient from eating or sleeping. The dominating feature of the sympathetic lesion is the presence of contractures, circulatory disturbances (violet hand) and trophic disorders consisting of ulceration of the finger tips and dorsal surface of the hand. Diminution or even disappearance of the radial pulse is almost constant.

Girou has operated on a large number of cases of causalgia and has invariably found lesions of the median or internal popliteal and never of the sympathetic. The affected nerve passes through two stages: in the first, three to five months after the wound it is increased in size, red and soft. Subsequently it is found to be thinner than normally, flattened, yellow, and fasciculated. Moreover the lesions are not localised, but spread over about 10 cm. in length. They are always accompanied by almost complete RD. In flexion contractures of the hand Girou has also found lesions of the periarterial sympathetic which is irritated either by a surgical ligature or by a tight band of cicatricial fibrous tissue which forms a sort of physiological ligature of the artery and gives rise to circulatory disorders.

The treatment required for causalgia is quite different from that for sympathetic irritation. In the former the conductivity of the nerve must be destroyed either by intravenous injections of alcohol or ligature of the nerve, and in the latter Leriche's operation of periarterial sympathectomy is indicated. J. D. ROLLESTON.

VASCULAR MEDULLARY DISEASES. KNUD H. KRABBE, *Bibliotek* (12) *for Læger* (Copenhagen), 1919.

THE author publishes six cases of acute medullary diseases, which are not to be considered as myelitis, but rather as vascular affections, hæmorrhages, thromboses, or emboli of the spinal cord. The characteristics of these cases are the following:—

- (1) They begin acutely, often apoplectic.
- (2) They are not preceded by fever or other signs of acute infectious disease.
- (3) They have no relation to any traumatic condition.
- (4) There are no signs of syphilitic origin.
- (5) The symptoms belong to one single distinct focus.
- (6) The cases have been cured completely, or with a slight defect.

In two of the cases the lumbar puncture has showed yellow colouring or considerable augmentation of the albumin in the spinal fluid. These cases are probably hæmatomyelias. In the other case it is more difficult to say if they have been caused by hæmorrhages or thromboses. AUTHOR'S ABSTRACT.

THE CURABLE FORMS OF ACUTE MENINGITIS WITH SPINAL (13) **LYMPHOCYTOSIS.** (Les formes curables des méningites aiguës avec lymphocytose rachidienne.) P. MAURIAC, *Paris méd.*, 1918, ii., p. 326.

IN the case of a young patient with meningitis, in whom the cerebro-spinal fluid shows an abundant lymphocytosis, the diagnosis is usually limited to syphilis or tuberculosis. During the war, however, it has been found that lymphocytic meningitis is more frequent and of a more varied character than had been suspected. Apart from zoster, which Barbier is inclined to associate with tuberculosis, spinal lymphocytosis is very frequent in mumps. Nobécourt and Pape have also described a syndrome characterised by the association of cervical rheumatism and sciatic neuralgia, which in about a third of the cases is accompanied by spinal lymphocytosis. From October 1917 to 15th April 1918, Mauriac has had five soldiers in his ambulance who presented meningeal symptoms with spinal lymphocytosis; in two, the diagnosis of tuberculosis was confirmed by autopsy, the remaining three recovered. Although tuberculous meningitis appeared to be the most probable diagnosis, no tubercle bacilli were found in the cerebro-spinal fluid, and inoculation of guinea pigs was negative. Syphilis was excluded by the absence of any history of

infection and by the Wassermann reaction being negative in two and doubtful in one. Mauriac concludes that every chronic meningeal reaction occurring in young subjects is not necessarily syphilitic, and even when it is accompanied by acute manifestations it does not always imply a tuberculous infection, at least of the type usually described in the text-books. The medico-military aspect of these cases is of interest. There is no justification for discharging these men from the service, as their clinical recovery is complete and there is every likelihood of their making good soldiers. They should, however, be kept under the observation of the regimental medical officer.

J. D. ROLLESTON.

EPIDEMIC LETHARGIC ENCEPHALITIS. (L'encéphalite léthargique épidémique.) A. NETTER, *Paris méd.*, 1918, ii., pp. 81-86.

NETTER contests the view held by some writers that lethargic encephalitis is merely a special form of poliomyelitis on the following grounds:—1. The present epidemic in France and England as well as the small outbreak in Vienna in 1917 and the "nona" of 1890 occurred in the spring and declined in the beginning of summer; whereas, with very rare exceptions, poliomyelitis is much more prevalent in summer and autumn. 2. Lethargic encephalitis has been chiefly found in adults, whereas poliomyelitis is a disease of early life. 3. The changes in the cerebro-spinal fluid are much more marked in the initial stage of poliomyelitis than in encephalitis. 4. The microscopical lesions do not differ essentially in the two diseases, but the affection of the nerve cells is much greater in poliomyelitis. 5. The mortality of poliomyelitis is less than that of encephalitis. 6. Complete recovery is the rule in encephalitis, whereas permanent paralysis and atrophy are common in poliomyelitis. Netter is also opposed to the view that lethargic encephalitis is a localisation of influenza in the nerve centres, as he has never found *B. influenzae* in these cases either during life or *post mortem*. Although somewhat similar conditions have been reported in some epidemics of influenza, they are absent in most, so that their occurrence in influenza must be regarded as a mere coincidence. According to Netter lethargic encephalitis is neither a form of food poisoning like botulism nor an aberrant form of influenza or poliomyelitis, but an autonomous disease of which the causal agent has an affinity for the nervous system, though it has not yet been isolated. As regards treatment, Netter employs urotropine in doses of fifteen or thirty grains in the twenty-four hours, as Crowe has shown that after ingestion of this drug formic aldehyde, which possesses a bactericidal action, can be found in the cerebro-spinal fluid.

J. D. ROLLESTON.

- A CASE OF LETHARGIC ENCEPHALITIS SIMULATING THE**
 (15) **MENINGITIS OF MUMPS.** (*Un cas d'encéphalite léthargique simulant la méningite ourlienne.*) H. GRENET, *Gaz. d. hôp.*, 1919, xcii., p. 155.

GRENET records a case of lethargic encephalitis, characterised not only by the ordinary symptoms such as somnolence, ptosis, squint, inequality of the pupils, paralysis of the frontalis and orbicularis oris, but also by cerebro-spinal lymphocytosis and swelling of the parotids with trismus and erythematous-pultaceous stomatitis.

Mumps was excluded by the fact that though the patient was not isolated, none of the seven other children in the family developed mumps. Similar cases have been seen by Netter.

J. D. ROLLESTON.

- POLIOMYELITIS IN THE ARMY.** (*Ueber Poliomyelitis im Heere.*)
 (16) A. STERN, *Deutsche med. Wchschr.*, 1919, xlv., p. 40.

STERN records five cases of typical poliomyelitis which occurred in soldiers, aged 23, 24, 30, 38, and 43 years respectively. The disease in each case ran a typical course. The regions of the cord affected were the dorso-lumbar, cervical, lumbo-sacral, lumbar and cervical, and lumbar only in each case. There was no evidence of syphilis in any case. All the cases had come from the Ukraine. There was no history of an epidemic of poliomyelitis among children in that locality, but it was a remarkable fact that in two cases the occurrence of the disease was associated with a heavy mortality among fowls.

J. D. ROLLESTON.

- CEREBRAL GAS EMBOLISM OCCURRING DURING ADMINIS-**
 (17) **TRATION OF ARTIFICIAL PNEUMOTHORAX.** J. D. THOMAS,
Journ. Amer. Med. Assoc., 1919, lxxiii., p. 1936.

A MAN, aged 37, suffering from a tubercular cavity in his right upper lobe, was given several injections of nitrogen gas in the fourth interspace midway between the nipple and sternum. Improvement followed. After one injection, however, he suddenly became unconscious and rigid with tonic convulsions, and loss of sensation and reflexes. He made a good recovery a few days later.

A. NINIAN BRUCE.

- INFANTILISM.** (*L'Infantilisme.*) KNUD H. KRABBE, *Nord. med. Arkiv.*,
 (18) 1919, Bd. 51, Avd. II., No. 21.

THE author gives the histories of four cases of infantilism in children. The results of his considerations are the following:—

In defining infantilism it must be emphasised that it is a combination of stoppage of growth with incomplete development of the genital organs. Infantilism is to be distinguished sharply from eunuchoidism, but can scarcely be distinguished from chetivism. Infantilism can be produced by diseases in the thyroid gland and in the pituitary body. These forms can be called dysendocrine infantilism. But in other cases the infantilism may be found without any other sign of endocrine disease, and it is not proved that these infantilisms are related to the endocrine organs. These infantilisms can be called essential infantilism in that this term only means that we do not know anything about the origin of these cases.

AUTHOR'S ABSTRACT.

OCULO-MOTOR PALSY WITH PERIODIC EXACERBATIONS.

(19) (**Periodisch-exazerbierende okulomotorius (Lähmung).**) J. RÓZSA,
Wien klin. Wchnschr., 1919, xxxii., p. 340.

RÓZSA records a case in a soldier, aged 20, who had been subject at regular intervals, since the age of two, to attacks of migraine, which had led to permanent damage to the right eye. His parents and nine brothers and sisters were healthy. Between the attacks there was complete right internal ophthalmoplegia and a paresis of the right external ocular muscles, the movements of the right eye inwards (rectus internus), upwards and inwards (superior rectus), downwards and inwards (rectus inferior), upwards and outwards (obliquus inferior) being somewhat limited. During the attacks of migraine, which lasted twenty-four to thirty-six hours, the paresis increased until there was complete ptosis, the right eye being turned outwards and downwards. The paralysis outlasted the pain and gradually subsided, the attack completely subsiding in forty-eight hours. The Wassermann reaction was negative in the blood and cerebro-spinal fluid. The number of cells in the cerebro-spinal fluid was not increased during or between the attacks, but on the other hand the blood showed an absolute lymphocytosis and distinct increase of the eosinophil polynuclear leucocytes both between and during the attacks. Another symptom was present which indicated an organic process in the oculo-motor trunk, viz., exaggeration of the reflexes on the left, and greater electrical excitability of the facial nerve. This exaggeration of the reflexes on the left side might indicate a slight disturbance of the pyramidal and supranuclear facial tract on the right side. Nuclear disease was negatived by reaction of the pupil to eserine.

J. D. ROLLESTON.

THE LIGHT PUPILLARY REFLEX, ITS PATH, AND ITS ABOLITION CALLED IMMOBILITY OF THE PUPIL TO THE LIGHT REFLEX, AND REPORT ON A CASE OF UNILATERAL ARGYLL-ROBERTSON PUPIL, IN WHICH CONSENSUAL REACTION EXISTED IN BOTH EYES.
 AUTON LUTZ, Havana, *Archives of Ophthalmol.*, 1918, xlvii., Nos. 3 and 4.

THIS exhaustive examination of the light pupillary reflex occupies sixty pages of the *Archives of Ophthalmology* and is illustrated by eight diagrammatic figures.

The author's case was a man of 51 who consulted his doctor for a slight paræsthesia of his right hand and was referred to Lutz on account of a marked anisocoria. The Wassermann was negative. The right pupil measured 1.5 mm., reacted well on convergence and on accommodation, doubtfully to light in the other eye, not directly to light or to excitation of the trigeminus. The left pupil measured 4.5 mm. and reacted normally both directly and consensually to light and to accommodation convergence and trigeminus stimulation. Each eye had full vision. A year later the condition was practically the same, the trigeminus reaction only being a little doubtful in both.

The mechanism of the normal pupillary reaction to light and that of the Argyll-Robertson pupil are discussed in detail and the various theories compared. The author believes that the lesion in the Argyll-Robertson phenomenon is situated in the region of the photo-motor centre and not in the spinal cord or in the ciliary ganglion. The paper is too long to do justice to in an abstract but will repay perusal in the original. H. M. TRAQUAIR.

THE JAW-WINKING PHENOMENON AND ITS EXPLANATION.
 (21) AUTON LUTZ, Havana, *Arch. of Ophthal.*, 1919, xlviii., No. 2.

AFTER discussing the various theories advanced in explanation of jaw-winking, the author states his conclusion that the phenomenon is due to "alterations of the supranuclear connections of the bulbar nuclei travelling in the fasciculus longus posterior, and probably by a lesion of the inhibitive mechanism just before the dendrites of the damaged nuclear cells of the nervus oculomotorius." H. M. TRAQUAIR.

UNILATERAL INHERITANCE. LOSS OF THE HEREDITARY CORRELATION BETWEEN THE TWO HALVES OF THE BODY, THE PAIR ORGANS, AND ESPECIALLY THE EYES. DESCRIPTION OF TWO CASES OF THE SO-CALLED PHYSIOLOGICAL ANISOCORIA. AUTON LUTZ, Havana, *Arch. of Ophthal.*, 1918, xlvii., No. 6.

LUTZ believes that physiological anisocoria is much rarer than commonly supposed, and that before accepting cases as such it

is necessary to be extremely careful to exclude anisocoria due to disease. The bulk of the paper is devoted to an examination of unilateral inheritance in general. H. M. TRAQUAIR.

**ON A CASE OF ASSOCIATED MOVEMENT OF THE UPPER
(23) LID, WHICH CAN ALSO BE PRODUCED INTENTIONALLY.**

(Ueber einen Fall von Mitbewegung des oberlides, die auch willkürlich hervorgerufen werden kann.) AUTON LUTZ, Havana, *Klin. Monatsbl. f. Augenheilk.*, 1913, Januar.

IN this case on moving the lower jaw sideways the right upper lid alone became strongly elevated. The patient could also produce this movement voluntarily without making any other movement of the face or head. There were also slight right ptosis and superior oblique paresis.

The author suggests that there may be in this case a disturbance in the region of the supranuclear connections of the eye muscle nuclei which results in the loss of a normal inhibitory mechanism and which by extension into the nuclear area itself causes a true nuclear lesion of other eye muscles. The paper is illustrated by eight photographs. H. M. TRAQUAIR.

**THE EYE SYMPTOMS IN PSEUDOTUMOUR CEREBRI, WITH
(24) REPORT OF AN ADDITIONAL OBSERVATION.** A. LUTZ,

Archives of Neurol. and Psychiat., 1919, ii., p. 539.

BY pseudotumour cerebri the author understands a syndrome presenting the cardinal symptoms of brain tumour but unconfirmed by the clinical course or by necropsy. The history of the subject and the observations of previous writers are fully discussed. The most constant eye symptoms found are choked disc, nystagmus, mydriasis, and abducens paralysis. Spontaneous retrocession of the papilloedema is to be regarded as strongly indicative of pseudotumour. In the author's case choked disc, vomiting, vertigo, and headache were present and after fourteen days slowly receded. Two years later unilateral deafness occurred followed by unilateral loss of vestibular function and later by unilateral Romberg. The diagnosis lay between benign tumour of the cerebello-pontine angle and pseudotumour, to the latter of which the author inclines on account of the clinical course of the case.

H. M. TRAQUAIR.

SCIATICA WITH MUSCULAR HYPERTROPHY. (*Sciatica con
(25) ipertrofia muscolare.*) C. PASTINE, *Riv. di Patol. nerv. e ment.*, 1919, xxiv., p. 46.

PASTINE draws attention to the occasional occurrence in sciatica of hypertrophy instead of atrophy of the muscles of the leg and thigh

supplied by the sciatic nerve. He found this hypertrophy in 10 out of 98 cases of more or less pronounced sciatica. In 7 of the cases the disease was probably of rheumatic origin; in 2 others its nature was not determined, though rheumatism could not be excluded; and in 1 it followed febrile gastro-enteritis. None of the cases showed any evidence of varicose veins, phlebitis or cutaneous œdema in the limb or in the hypertrophied segment. The increase in size of the muscles underwent some variation from day to day, was more pronounced when the patient had been standing or walking for some time, and was less marked when he had been at rest for a certain period. The hypertrophy was never considerable, and did not exceed 1-2 cm. It was much more frequent in the leg than in the thigh; it might be present in both these segments, but, as a rule, hypertrophy of the leg, especially the calf, was accompanied by a slight hypotrophy or normal size of the thigh. On palpation the hypertrophied muscles did not show any abnormal consistence, or felt slightly hardened and a little more resistant than on the sound side. Idio-muscular contractility was almost always definitely diminished. Pressure on the muscles, especially deep pressure, was usually painful, sometimes more so than on the course of the nerve. On electrical examination the most frequent changes were merely quantitative, and there was either increase or diminution of excitability. These characters seem to indicate that it was not so much a true muscular hypertrophy as a pseudo-hypertrophy, and that the principal process was a hyperplasia of the interstitial connective tissue, although a certain degree of hypertrophy of the muscular fibres could not be absolutely excluded. The cause was to be found in the inflammation or irritation of the sciatic nerve and vaso-motor nerve fibres, and in the circulatory disturbances resulting therefrom. During the first stage hypertrophy of the muscles takes place, and subsequently hypotrophy. J. D. ROLLESTON.

THE POSSIBILITY OF ABORTIVE FORMS OF MONGOLISM IN (26) CONGENITAL HEART DISEASE. KNUD H. KRABBE, *Bibliotek for Læger* (Copenhagen), 1919.

THE author publishes a case of congenital heart disease which showed slight signs of mongolism. He discusses the possibility of the existence of abortive forms of mongoloid idiocy.

AUTHOR'S ABSTRACT.

A GROUP OF FITS. ALAN M'DOUGALL, *Journ. Ment. Sci.*, 1919, July, (27) p. 202.

A YOUNG girl, epileptic from the age of 5, had, while under observation for five years, an average of 200 fits a month. Included

in this average were a series of 1,694 attacks (mild major epilepsy) which occurred in the course of four consecutive days; but, to those observing the case, it seemed that the fits were suspended during examination, or if the patient was left alone in the room though indirectly still under observation.

In another epileptic isolated attacks continued, though her liability to a series was stopped by telling her that a repetition of the series would be followed by her discharge.

In both cases the series of fits were epileptic, but the condition hysteria and the series of fits were stopped by anti-hysterical treatment.

"Let the fits clinically be what they will, if they are of conscious origin the condition is malingering; if they are of subconscious origin the condition is hysteria; and if of unconscious origin the condition is epilepsy." H. DE M. ALEXANDER.

NOTES ON TWO CASES OF EPILEPSY IN TWINS, WITH (28) PHOTOGRAPHS. R. M. TOLEDO, *Journ. Ment. Sci.*, 1919, Oct., p. 262.

Two twin girls with a neurotic heredity both developed epilepsy at eight years of age. No mental disturbance occurred in either case for some years, when delirium occurred in one, to be followed by the same symptoms in the other; and the coincidental sequence has continued since. H. DE M. ALEXANDER.

THE PROVOCATION OF EPILEPTIC ATTACKS WITH SUPRARENAL EXTRACT. (Ueber die Auslösung von epileptischen Anfällen mit Nebennierenextract.) L. BENEDEK, *Wien klin. Wchnschr.*, 1918, xxxi., p. 1365.

BENEDEK carried out 55 injections of suprarenal extract (1-1.5 c.c. of 1 in 1,000 solution of tonogen) in 39 different individuals, consisting of 19 epileptics (18 essential cases and 1 organic), 7 hystericals, 5 cases of dementia, and 8 persons with a normal nervous system. Of the 19 epileptics, 7 developed a typical epileptic attack in a half to one and a half hours after the injection. None of the other groups of cases was affected.

J. D. ROLLESTON.

ARSPHENAMIN versus NEO-ARSPHENAMIN. J. F. SCHAMBERG, (30) *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1883.

NEO-ARSPHENAMIN is less active therapeutically than arspenamin, but the difference appears to be largely made up by the discrepancy of the tolerated dose, as it can be given in full doses at frequent intervals without reaction. In appropriate cases 0.9 gm. three times a week can be administered. A. NINIAN BRUCE.

DERMATITIS FACTITIA COMPLICATING HYSTERICAL PAR-
 (31) **ALYSIS.** S. AYRES, *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1838.

A CASE of a woman, aged 28, admitted to hospital with a diagnosis of osteomyelitis because of pain and paralysis of the leg with a cutaneous lesion involving the foot and leg. The illness began eight years previously. On examination the paralysis was found to be functional and the dermatitis self-inflicted. Rapid recovery resulted under proper treatment. A. NINIAN BRUCE.

ON THE CYTOLOGY OF THE CEREBRO-SPINAL FLUID IN
 (32) **MENTAL DISEASE.** G. L. BRUNTON, *Journ. Ment. Sci.*, 1919, Oct., p. 249.

THE author details the technique of Alzheimer which he employed in examining the cerebro-spinal fluid of 100 cases of mental disease.

With the exception of stating that he found the lattice-cell in a number of conditions, the author's observations coincide with those made by others. H. DE M. ALEXANDER.

CLINICAL FINDINGS TENDING TO PROVE THE NECESSITY
 (33) **OF THE SYSTEMATIC DOSAGE OF SUGAR AND UREA**
IN THE CEREBRO-SPINAL FLUID IN NEURO-PSYCHICAL
AFFECTIONS. (Constatations cliniques tendant à montrer la
 nécessité du dosage systématique du sucre et de l'urée du
 liquide céphalo-rachidien dans les affections neuro-psychiques.)
 DUMOLARD, LOCHELONGUE et REGNARD, *Bull. et mém. Soc. méd. Hôp.*
de Paris, 1918, 3e sér., xlii., p. 1121.

OUT of seventy specimens of cerebro-spinal fluid recently examined by the writers from patients in the neuro-psychical centre of the twenty-first region, eighteen, or more than a quarter of the cases, showed an excess of urea or sugar or of both, without concomitant cerebro-spinal leucocytosis or excess of albumin. A cerebro-spinal fluid, therefore, which might have been regarded as normal if the urea and sugar had not been specially investigated was found to be definitely pathological. Some of the remaining fifty-two specimens also showed an excess of sugar and urea, but in association with leucocytosis and excess of albumin. The eighteen cases in which the excess of urea and sugar were found in the cerebro-spinal fluid were as follows: eight cases of epilepsy, including one of Jacksonian epilepsy, one case of cerebral softening, one of meningeal hæmorrhage, and eight of various psychical syndromes (confusional states, profound asthenia, psychical excitement, and delirium). Although the increase in the amount of sugar and urea in the cerebro-spinal fluid may occur simul-

taneously in certain cases, the two may be independent of one another, excess of sugar being more frequent in the writers' cases than excess of urea.

J. D. ROLLESTON.

EXAGGERATION OF THE ABDOMINAL REFLEXES IN FUNCTIONAL NEUROSES. (34) **TIONAL NEUROSES.** (*Steigerung der Bauchdeckenreflexe bei funktionellen Neurosen.*) LIEBERS, *München. Med. Wchnschr.*, 1918, lxx., p. 1320.

IN the course of his examination of several hundred cases of war neurosis, with a generally much increased reflex excitability, especially of the tendon reflexes, Liebers has found that the abdominal reflexes were also much increased, and that this increase was shown not only by a vigorous contraction of the abdominal muscles, but also by a diffusion of the reflexogenous zones. He is inclined to regard the abdominal reflexes as exaggerated when they can be produced by stimulation of the first to third lumbar nerves, *i.e.*, by the ordinary investigation of the cremasteric reflex by stroking the inner side of the thigh.

J. D. ROLLESTON.

SUICIDAL IMPULSES IN PSYCHOPATHIC SOLDIERS. (35) **impulsi suicidi nei militari psicopatici.** A. CRISTIANI, *Riv. ital. di neurop. Psichiatr. ed Elettrotet.*, 1919, xii., p. 19.

CRISTIANI, who is medical superintendent of the provincial asylum at Lucca, states that during the war suicidal impulses were noted in 4.86 per cent. of the civilian patients, and in 9.64 per cent. of the military inmates of the asylum. 70.50 per cent. of the cases in soldiers occurred among those coming from the war zone, and 29.04 in those from the territorial zone. This illustrates the importance in the genesis of suicide of the etiological complex constituted by depressing psycho-physical causes. In soldiers with suicidal impulses coming from the war zone, these suicidal impulses were found in 76.06 per cent. of those with psychoneurotic forms of insanity, and in 20.80 per cent. of those with degenerative forms. On the other hand, in soldiers coming from the territorial zone these impulses were noted in 40 per cent. of those with psychoneurotic forms, and in 66.66 per cent. of those with degenerative forms. In soldiers coming from the war zone, in whom suicide is far more frequent than in those coming from the territorial zone, suicide is connected with exogenous causes which give rise to these psychoneuroses, while in soldiers from the territorial zone suicide is due to endogenous causes in the individual constitution giving rise to these degenerative psychoses. As regards the prevalence of suicide in the individual forms of insanity in soldiers, suicidal impulses were met with in 52.94 per

cent. of the depressive states, in 16.58 per cent. of epileptic insanity, in 14.70 per cent. of confusional states, in 8.82 per cent. of cases of alcoholic insanity, and in 5.88 per cent. of dementia præcox. The impulse to suicide, although it represents a grave symptom which indicates a profound change in the psychical personality, does not possess an unfavourable prognosis. 76.06 per cent. of the soldiers with suicidal impulses showed complete mental recovery. Relapses were met with in 8.82 per cent. As regards the methods adopted, hanging was tried in 23.05 per cent., jumping from a height also in 23.05 per cent., sharp instruments in 14.70 per cent., firearms in 8.82 per cent., and poisoning (corrosive sublimate) also in 8.82 per cent.

J. D. ROLLESTON.

PSYCHOSES IN THE EXPEDITIONARY FORCES. O. P. NAPIER
(36) PEARN, *Journ. Ment. Sci.*, 1919, April, p. 101.

IN his conclusions that the early treatment of the psychoses is important; that the presence of a psychiatrist on medical recruiting boards is desirable; and that it is very necessary to carefully consider the case of a man who has suffered from an established psychosis before returning him to military service, Dr Napier Pearn reiterates the opinion of other observers.

The paper is based on personal investigations of 2,000 cases admitted to the Lord Derby War Hospital; and of these cases 200 who had made a sufficiently good recovery to warrant their being returned to duty, are collected and appended in a table which shows that at the time of the inquiry, 23 still presented symptoms, 30 had had a relapse, 94 were doing well, 25 were subsequently discharged from the army, and 45 were again sent on foreign service.

Relative to treatment the author's statement that "comparatively few sedatives were found necessary, many of the patients being at a stage when a drachm of psychotherapy was worth an ounce of paraldehyde," is worthy of record.

H. DE M. ALEXANDER.

NOTES ON A CASE TREATED BY HYPNOTIC SUGGESTION.
(37) S. RUTHERFORD JEFFREY, *Journ. Ment. Sci.*, Oct. 1919, p. 258.

A CASE of mental depression and emotional instability in a young woman of 20, arising out of incidents connected with the war and accentuated by the effects of a dream, which resulted in recovery following hypnosis combined with therapeutic suggestion and persuasion.

H. DE M. ALEXANDER.

THE MANAGEMENT OF WAR HYSTERIA. TOM A. WILLIAMS,
(38) *Amer. Med. Assoc.*, 1919, June 11.

NEARLY 10 per cent. of the soldiers incapacitated during an attack are found to have hysteria. A large proportion of them can be restored immediately if skilfully managed, and returned to duty without loss of efficiency. The physician must understand thoroughly the psychological mechanism of the patient, and must exercise a dynamic volition which will compel him to use the effort demanded.

In the more complicated cases where hysteria has become fixed, individual analysis is necessary, and a longer course of suggestion and persuasion. The inert man must be differently treated to the determined man. The former is the easier to cure, but more difficult to keep well.

The best method of treatment is to change the patient's mental attitude by re-educative procedure. In order to accomplish this it is essential that the physician be able to enter into the thoughts and feelings of the patient. It is then easy to modify his view point, and lead him out of the woods into the light.

AUTHOR'S ABSTRACT.

EMPLOYABILITY OF SOLDIERS AS AFFECTED BY FUNCTIONAL NERVOUS DISORDERS OF WARFARE. TOM A. WILLIAMS, *Amer. Acad. of Med.*, 1919, June 9.

IT is natural for the employer to be intolerant of the peculiarities of those suffering from functional nervous disorders, yet it is his duty to co-operate in every way possible with the physician in the restoration to industrial efficiency of those soldiers who, during the war, have become incapacitated in this way.

Every man thus restored is a valuable asset to the community, who otherwise becomes not only an actual loss, but a source of discontent.

In many instances all that is necessary is a slight modification of the conditions of work, and a sympathetic understanding and consideration by employers and fellow-workmen. In some cases, however, the expert advice and skill of a neurologist are necessary to re-educate these men, and help them to a new mental attitude toward themselves and toward life.

This readjustment does not require long or complicated treatment, and has proven most successful. In practically every instance, men suffering from functional nervous disorders have been restored to their full efficiency. It is therefore a patriotic duty that this restoration be done after the war in the same spirit that personal sacrifices were made for the sake of military efficiency during the war.

AUTHOR'S ABSTRACT.

**MENTAL WARDS WITH THE BRITISH EXPEDITIONARY
(40) FORCE: A REVIEW OF TEN MONTHS' EXPERIENCE.**

W. D. CHAMBERS, *Journ. Ment. Sci.*, 1919, July, p. 152.

THE writer relates his experience while mental specialist to the Boulogne Base, and describes the staffing, the accommodation, and the general management of the "huts" allotted to him.

He dealt with 985 cases, and his observations on examples of the psychoses and psychoneuroses among his patients coincides more or less with those of other observers.

In the case of prisoners who were admitted on account of desertion and absence without leave, the majority were the subjects of simple hysterical fugues. All degrees of dissociation were found, and, in almost all, analytic conversation revealed the activity of a complex.

The estimation of responsibility for crime in the case of men who plead amnesia (which is the result of dissociation and repression, and in minor degrees is normal) is important; here a wholly or partly repressed complex eludes or overcomes the psychic censor and becomes sufficiently powerful temporarily to suppress consciousness and to gain control over the bodily activities. The mechanism is the same whether the desired end be trifling and unimportant, or anti-social and an infringement of law and custom. The difference is solely one of degree. In some people the instinctive individualistic wishes are very completely suppressed and are never able to influence conduct. In some the suppression is less thorough, and activities incompatible with conscious control may be aroused and displace consciousness. In others, the altruism demanded by herd instinct is feeble or non-existent and a more or less conscious career of crime is chosen. Members of the third class, who are not moral defectives, are responsible for their actions, and it is difficult to explain why wrongdoers of the second class are generally exonerated.

The author suggests the loathing of everything military as the cause of the small proportion of cases among his admissions in which firearms were used for self-inflicted wounds, but it is probable that when a soldier attempts suicide he is almost invariably successful, and thus the incident rarely appears in statistics.

The alcoholic psychoses only amounted to 1.25 per cent.

The differentiation between epileptic and hysterical fits is indefinite.

As to the ætiology of the psychoneuroses, the psychogenic factor is paramount, but fatigue, exhaustion, commotion, and emotion participate.

H. DE M. ALEXANDER.

PSYCHIATRY.

THE PRESENT POSITION IN CLINICAL PSYCHOLOGY. (Presidential Address to the Section of Psychiatry of the Royal Society of Medicine.) WILLIAM M'DOUGALL, *Journ. Ment. Sci.*, 1919, July, p. 141.

THE psychology of the clinician must be concrete and deal with the mind as a whole, and it is because we have hitherto had no such psychology that there has been growing up of late years a specialised form of mental science which may be designated clinical psychology.

During the later decades of last century the mechanistic psychology, founded on atomism, association, and hedonism, dominated the scene—this psychology afforded little help in the interpretation of mental disorder. The pioneers in the transition stage from the old to the new doctrine were Ziehen, Pierre Janet, and Charles Mercier, and they vainly strove to bring the mechanistic psychology to the aid of medicine.

Others have thrown aside all academic psychology in approaching the problems of the disordered mind, and Freud's insistence on the impulsive, demoniac, illogical nature of much of human thought and conduct; and the very partial and inadequate way in which consciousness or self-consciousness reflects the workings of this impulsive force is the key-note of clinical psychology at the present time.

Beyond these two fundamental principles the development of clinical psychology owes to Freud the conception of active continued repression of distressing memories; the conception of conflict in the mind going on below the threshold of consciousness (giving rise to disorder of thought and conduct); the symbolical significance of some dreams; the conception of the "affect" as a quantity of energy that attaches to ideas, and gives them their impulsive force in the determination of thought and conduct.

Others have contributed to the further development of these lines of thought by the recognition now given to the impulses of self-assertion (Adler); of the gregarious instinct (Trotter); of fear (Boris Sidis); and of the food-seeking impulse (Jung). The recognition of these primary or instinctive impulses shows the strong native bias of the mind to select and react upon impressions from the outer world, not only according to its individual past experience, but also according to its inherited constitution. Clinical psychologists go further than this, and believe that much of the development of the individual mind is a recapitulation of the racial mind, a gradual unfolding at the touch of experience

of modes of thinking and feeling and doing gradually acquired by many generations of ancestors.

This line of work promises to contribute very importantly towards two of the greatest problems that confront the human intellect—the problems of heredity and of the constitution of man.

Since Darwin initiated the age of biological discovery, there has been growing up a biological and inductive psychology showing the same main tendencies, the same trends, as clinical psychology; and the author hopes that clinical psychology will not isolate itself from this greater psychology, and thus lose much of its effectiveness in dealing with nervous and mental diseases.

H. DE M. ALEXANDER.

PSYCHIATRY A HUNDRED YEARS AGO: WITH COMMENTS
(42) **ON THE PROBLEMS OF TO-DAY.** BEDFORD PIERCE, *Journ. Ment. Sci.*, 1919, Oct., p. 219.

IN his presidential address to the Medico-Psychological Association the author, after giving a historical survey of the housing and treatment of mental disorder, advocates an inquiry into the value of the numerous sedatives employed in psychiatry; remarks that the Inebriate Acts are useless in preventing or arresting alcoholic addiction, and approves of Theodore Neild's suggestion of the establishment of a consultation bureau in every large centre of population to deal with voluntary applicants for treatment.

Where compulsory treatment is necessary, Dr Bedford Pierce suggests three successive procedures: firstly, a judicial private warning; secondly, the appointment of a guardian; thirdly, internment in a colony.

The disability even in definite organic maladies may in large measure be functional, and may not the symptoms of insanity bear little relation to the assigned cause?

May not some cases of chronic insanity be akin to that of the confirmed neurotic in that disordered function affects intelligence and emotion in the former in place of affecting some nervous mechanism, such as vision or muscular co-ordination, in the latter?

H. DE M. ALEXANDER.

THE PSYCHOLOGIC TREATMENT OF RETARDED DEPRES-
(43) **SIONS.** L. PIERCE CLARK, *Amer. Journ. Insan.*, 1919, Jan., p. 407

IT is only during the last decade that any consistent attempt has been made to treat the benign psychoses on the basis of their psychogenesis. The author has specially interested himself in cases of retarded depression, and has attempted not only to make the recovery from the individual attacks sounder, but also

to discover a possible manner of preventing recurrences. He has employed a modified psychoanalytic reconstruction therapy along with baths, diet, occupation, recreation, and the like. Short summaries are given of eight cases.

In this type of case analysis is often very painful, and usually should not be for more than half an hour at a time. The analysis of the conscious and fore-conscious life should be considered first, and a complete dream analysis should follow. By keeping a watch on the dream content, one can usually judge whether or not the analysis is being pushed too rapidly; if it is too fast, stress and suicidal symbols begin to present themselves as resistance to the treatment.

D. K. HENDERSON.

PSYCHOLOGY, ENGLISH AND GERMAN. HENRY MAUDSLEY, (44) *Journ. Ment. Sci.*, 1919, April, p. 65.

THERE is nothing new in this article though it is written in the delightful phraseology characteristic of the late Dr Henry Maudsley.

The article is pessimistic, and would provide a rude shock to those who believe in the future beneficial influence of the "League of Nations."

H. DE M. ALEXANDER.

PSYCHIC SECRETION: THE INFLUENCE OF THE ENVIRON-
(45) **MENT.** E. P. CATHCART, *Journ. Ment. Sci.*, 1919, July, p. 180.

THE term "Psychic Secretion," *e.g.*, mouth-watering, apart from the taking of food, is really a misnomer; it, in reality, is a reflex secretion in which the stimulus is not the usual commonplace one.

Pavloff has carried into the realm of the central nervous system the experimental methods which have given such successful results in connection with mere glandular activity, and has shown how "conditioned reflexes" are formed from what were primarily "unconditioned reflexes"; or, in other words, he has demonstrated how an indifferent stimulus may become a true reflex. Hence the "prandial ritual" (the influence of environment) of refined social life is as important as the taking of the food itself. The author gives examples of the methods used by Pavloff.

H. DE M. ALEXANDER.

GOITRE AND THE PSYCHOSES. NORMAN ROUTH PHILLIPS, *Journ.*
(46) *Ment. Sci.*, 1919, Oct., p. 235.

GOITRE is frequently associated with the psychoses, and was present in 12 per cent. of the patients examined in a mental hospital.

Auto-intoxication with mental symptoms may be induced by hypo- or hyperthyroidism—the former generally being associated with states of apathy and indifference (*e.g.*, dementia præcox), and the latter with excitement, agitation, &c. (*e.g.*, manic-depressive insanity).

Treatment by thyroid extract is indicated in hypothyroidism, whereas psychotherapy is called for in hyperthyroidism.

H. DE M. ALEXANDER.

THE GENESIS OF DELUSIONS: CLINICAL NOTES. COLIN
(47) M'DOWALL, *Journ. Ment. Sci.*, 1919, July, p. 187.

OUR social and political tendencies are the outcome of an analysis more or less critical and believed by the individual to be impartial. A scattered phrase or an apparently insignificant incident may attract attention, and be the beginning of a prolonged mental conflict which is finally determined by a definite line of thought. It does not follow that the reasoning is always logical, or the argument conclusive to people of other opinions, but, nevertheless, a conclusion is arrived at, and it is final.

In those mental states in which distinct abnormality exists, the mind of the patient works along the same lines, and false beliefs arise as the result of thought directed irregularly to experiences in the lives of the individuals.

Probably the presence of the hereditary taint is the most important factor in the preparedness of anyone to become mentally disturbed or actually insane. The tendency to insanity exists, and it is the personal experience which goads the intellect along an illogical and unreasonable path, and thus an incident may start a complicated system of delusions in the psychopath. (Delusions and hallucinations do not arise accidentally; they have a definite basis, the foundation of which is in the personal experience of the sufferer.)

It is the duty of the medical man to analyse the mental processes by which the abnormality has arisen, and work back to the taking-off point.

The determining factor in the mental abnormality may not be far from the surface, and it may be so insistent that it is always present in the thoughts of the patient. The physician should explain to the patient his symptoms, and educate him by showing the interconnection of cause and effect. The mere elucidation of the cause is not enough to effect a cure, and the patient should be taught to follow in their logical sequence all the ideas which he had misinterpreted and misunderstood.

A number of illustrative cases are given in which, without

the personal history having been probed, nothing could have been understood, and treatment would simply have resolved itself into a matter of improved hygienic conditions and rest.

H. DE M. ALEXANDER.

THE TREATMENT OF GENERAL PARALYSIS OF THE INSANE
 (48) **BY THE INTRODUCTION OF SALVARSANISED SERUM**
INTO THE LATERAL VENTRICLE, AND A SUGGESTION
FOR THE ARREST OF TABETIC ATROPHY BY THE
SAME MEANS. H. CAMPBELL and C. BALLANCE, *Lancet*, 1919,
 i., p. 608.

IN May 1914 Campbell and Ballance reported three cases of general paralysis in which salvarsanised serum was introduced into the lateral ventricle. The first case was that of a violin player, who had lost the power of using his instrument and the memory of 400 tunes which he used to play. The serum was introduced on two separate occasions at short intervals into the lateral ventricles. Nearly four years had elapsed since the operation, and he had resumed his occupation as a violin player in a London orchestra, though he was not quite so expert with his instrument as before.

The writers recommend that the same method should be used to arrest tabetic nerve atrophy.

Whether the injection should be made into the lateral ventricle or through the outer angle of the sphenoid tissue into the subarachnoid space at the base of the brain remains to be determined.

J. D. ROLLESTON.

A CRITICAL REVIEW OF THE PATHOGENESIS OF DEMENTIA
 (49) **PRÆCOX: With a Discussion of the Relation of Psychoanalytic**
Principles. MICHAEL OSNATO, *Amer. Journ. Insan.*, 1919, Jan.,
 p. 411.

AN interesting detailed review is given of current conceptions in regard to the nature of dementia præcox. In investigating this problem it is important to approach it without preconceived notions as to its psychobiological or organic nature. The views of Meyer, Hoch, and the psychoanalytic school generally are contrasted with the organic findings of other investigators. The author admits the importance of the psychological point of view, but he is more inclined to the possible organic basis; and he calls particular attention to the work of Southard, Nissl, Kleist, Alzheimer, Sioli, Rosanoff, and Morse. This review is one which is well worth reading.

D. K. HENDERSON.

RECENT AMERICAN CLASSIFICATIONS OF MENTAL DIS-
(50) **EASES.** E. E. SOUTHARD, *Amer. Journ. Insan.*, 1919, Jan., p. 331.

THE classification of mental diseases adopted by the American Medico-Psychological Association is highly satisfactory, but the point which the writer wishes to emphasise is that it is much more satisfactory for the insane, in the committable sense, than for the type of case seen at the psychopathic hospitals. In the classification of the A.M.P.A. there are two groups included, namely, "undiagnosed psychoses" and "not insane," which are very small groups so far as committable cases are concerned, but are important groups in connection with the material seen at a psychopathic hospital. At the Boston Psychopathic Hospital an attempt is made to determine, in all instances where there can be the slightest doubt, whether the condition is—

- A, a psychosis, committable ;
- B, a psychosis, not committable ; or
- C, a psychopathic condition too ill defined to warrant the term psychosis.

And beyond these psychopaths might be D, a group of eccentrics or anomalous persons who only concern the psychiatrist remotely, amongst whom might be, *e.g.*, many defective delinquents.

The question is raised, Whether it would not be better to order the groups and types of mental disease in a pragmatic rather than a theoretical order ; that is, in an order having therapy in mind rather than an order having etiology in mind? The writer proposes such a pragmatic order as follows :—

- | | | | | |
|---|---|---|---|---------------------|
| 1. Syphilitic - | - | - | - | Syphilopsychoses. |
| 2. Feeble-minded | - | - | - | Hypophrenoses. |
| 3. Epileptic - | - | - | - | Epileptoses. |
| 4. Alcoholic, drug, poison | - | - | - | Pharmacopsychoses. |
| 5. Focal brain (organic) | - | - | - | Encephalopsychoses. |
| 6. Bodily disease (symptomatic) | - | - | - | Somatopsychoses. |
| 7. Senescent, senile - | - | - | - | Geriopsychoses. |
| 8. Dementia præcox, paraphrenic | - | - | - | Schizophrenoses. |
| 9. Manic-depressive, cyclothymic | - | - | - | Cyclothymoses. |
| 10. Hysteric, psych-, neurasthenic | - | - | - | Psychoneuroses. |
| 11. Psychopathic, paranoiac, <i>et al</i> | - | - | - | Psychopathoses. |
- D. K. HENDERSON.

EFFECTS OF HOOKWORM DISEASE ON MENTAL DEVELOP-
(51) **MENT OF NORTH QUEENSLAND SCHOOL CHILDREN.**

J. H. WAITE and I. L. NEILSON, *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1877.

HOOKWORM disease in North Queensland children produces measurable mental sluggishness and retards their mental develop-

ment in proportion to the massiveness of the infection. Prolonged hookworm infection appears to produce cumulative mental retardation.

A. NINJAN BRUCE.

PSYCHOPATHOLOGICAL OBSERVATIONS IN A GROUP OF
(52) **FEEBLE MINDED.** ESTHER LORING RICHARDS, *Amer. Journ. Insan.*, 1919, Jan., p. 379.

THE special point emphasised from a study of thirteen cases is the great variety of reactions which these patients display. Four of the cases showed a schizophrenic reaction type, while the nine remaining cases presented no definite psychosis, but showed temper tantrums, panic states, and so on.

D. K. HENDERSON.

AN ANALYSIS OF THE ACCURACY OF PSYCHOPATHIC
(53) **HOSPITAL DIAGNOSES.** LAWSON GENTRY LOWREY, *Amer. Journ. Insan.*, 1919, Jan., p. 352.

IN this paper data are presented dealing with the diagnoses in 419 cases committed to some State hospital, after a residence in the Psychopathic Hospital, Boston, for from a few days to a month or more. Reports were obtained from the State hospitals in regard to the progress of these cases, and the group was followed for from a year to a year and a half. Of the 419 patients 23, or 5.5 per cent., were left unclassified. In 91 cases, or 23 per cent., the original diagnosis was changed. The greatest accuracy of diagnosis occurred in epilepsy in neurosyphilis, and in dementia præcox. The diagnosis was much less accurate in arterio-sclerotic psychosis, in Korsakow's psychosis, in acute alcoholic psychoses, and in manic-depressive and chronic alcoholic psychoses.

D. K. HENDERSON.

SOME PRESENT-DAY PROBLEMS CONNECTED WITH THE
(54) **ADMINISTRATION OF ASYLUMS.** BEDFORD PIERCE, *Journ. Ment. Sci.*, 1919, July, p. 198.

THE financial problems raised by the reduction of hours, increased salaries, and increased cost of commodities are very serious in private institutions; and already many patients with limited income cannot possibly pay increased charges.

A want of harmony has slowly developed between the staff and management; and in the recent demands of the Asylum Workers' Union the author can see no trace of any concern for the patients; no sign of any proper nursing spirit; all the staff are counted equal; and demands are made for reduction of hours irrespective of the duties undertaken.

But asylum physicians are also to blame, as in pre-war days the pay and conditions of the mental nurse were unsatisfactory and this matter was not pressed on the governing Boards of asylums as it ought to have been.

There is room for considerable improvement in the present system of training, and the regulations of the Medico-Psychological Association require amendment. The remuneration should rise steeply as training progresses, the certificated nurse should receive adequate remuneration and in due course a better social status.

Departmental Councils, on the lines of the Whitley Council, have been introduced by Dr Pierce at the Retreat.

H. DE M. ALEXANDER.

THE ORGANISATION OF THE STATE HOSPITAL SERVICE IN (55) ILLINOIS. H. DOUGLAS SINGER, *Amer. Journ. Insan.*, 1919, Jan., p. 371.

AN historical summary of the growth of the State hospital system in Illinois.

D. K. HENDERSON.

THE REHABILITATION IN THE COMMUNITY OF PATIENTS (56) PAROLED FROM INSTITUTIONS FOR THE INSANE. SAMUEL N. CLARK, *Amer. Journ. Insan.*, 1919, Jan., p. 433.

A GENERAL plea for a "follow-up" system in connection with patients discharged from asylums. It is the duty of the hospital to fit the patient for life outside the institution, so far as this is possible, by advice, instruction, and habit-formation.

D. K. HENDERSON.

THE FACTORS OF CRIMINAL ACTION. SIR H. BRYAN DONKIN, (57) *Journ. Ment. Sci.*, 1919, April, p. 87.

THE writer replies to the criticism of his former article—"Notes on Mental Defect in Criminals"—by the late Dr Goring. The paper is somewhat discursive, and unsuitable for abstraction.

H. DE M. ALEXANDER.

ARTES ET MEDICINA. ALAN F. GRIMBLY, *Journ. Ment. Sci.*, 1919, (58) April, p. 96.

THE author advocates conjoint teaching in arts and medicine for all students of medicine. The professional man should have a sound knowledge of his own tongue, a broad acquaintance with Latin and Greek, and, above all, a thorough grounding in logic and ethics.

“It is absurd if men are expected to become successful diagnosticians while they are unacquainted with the very framework of the process of reasoning, or if they are supposed to deal in wisdom with the varied problems of social life that come to their notice, if ignorant of the sciences that treat of right conduct and of the workings of the human mind.”

As the youth of sixteen is far too young to learn “the first cruel incompatibility of life—the incompatibility of work and play—” the minimum age of entry to a medical school should be fixed at eighteen years.

H. DE M. ALEXANDER.

Reviews

VICIOUS CIRCLES IN DISEASE. JAMIESON B. HURRY, M.A., M.D. (59) Third and Enlarged Edition. Pp. xx+377, with 22 plates. 1919. J. & A. Churchill, London. Pr. 15s. net.

EIGHT years have passed since the publication of the first edition of this monograph, which has now been reviewed and enlarged, eight new chapters being incorporated. Attention is directed to the evidence here that the vicious circle complicates disease not only in man, but in all organised living things, and depends on a fundamental biological law to which all the higher animals and plants are subject. Increased space is also allotted to the various methods of breaking the circle. The second chapter discusses circles associated with the nervous system, and further chapters deal with circles associated with the eyes, nose, throat, ears, and other systems (*v. Review*, 1916, xiv., p. 102).

JOHN COAKLEY LETTSOM, and the Foundation of the Medical Society. Presidential Address by Sir ST CLAIR THOMSON, M.D., F.R.C.P. Pp. 63, with 16 figs. 1918. Harrison & Sons, London. Pr. 2s. 6d. net.

THIS address gives a most interesting account of medical life in the Georgian period, and supplies an excellent pen-picture of the celebrated Dr Lettsom, who founded the first of all the Medical Societies in London in the year 1773.

HEREDITY. J. ARTHUR THOMSON, M.A., LL.D. Third Edition. Pp. (61) xvi+627, with 47 figs. 1919. John Murray, London. Pr. 15s. net.

THIS book, originally published in 1907, is intended as an introduction to the study of heredity, and presents an analysis of the

different problems involved in this subject with unusual clearness and interest. Special attention has been directed to three kinds of conclusions—those reached by microscopic study of the germ cells, those reached by the application of statistical methods, and those reached through experiment. Many of the questions involved are still very obscure, and the conclusions reached still matters for discussion and debate, but as the literature is widely scattered and often very technical, it is of great value to possess a summary which is at the same time simple, accurate, and comprehensive. Particular attention has been paid to the bibliography, which together with the subject-index add to the value of the book.

AUTO-EROTIC PHENOMENA IN ADOLESCENCE. An analytical (62) study of the psychology and psychopathology of onanism. K. MENZIES. With a Foreword by Dr Ernest Jones. Pp. 96. 1919. H. K. Lewis & Co., Ltd. Pr. 4s. 6d.

THIS book is divided into four parts, dealing respectively with the psychology, pathology, and treatment of masturbation, and with ethical considerations of the subject. Auto-erotism is a normal and universal phase of human development. If this phase be unduly prolonged, the case is one of arrested development, the treatment of which is to discover the forces which have brought about this arrest, and to set them free for their full development. Further, the harm associated with undue erotism is mostly the result not of the phenomena itself, but of the conflicts arising from the mental attitude towards them.

The book closes with a bibliography.

MEDICAL DISEASES OF THE WAR. ARTHUR F. HURST. Second (63) Edition. Pp. vii+319, with 6 plates. 1918. Edward Arnold, London. Pr. 12s. 6d.

THE first edition of this book was reviewed in the *Review*, 1917, xv., p. 272. The present edition has been revised, and eleven chapters are now devoted to the war neuroses, as compared with one chapter in the original edition. A new chapter has been added on tetanus. The author is of opinion that hypnotism is not the most satisfactory means of treating hysterical paralysis, contractures, gaits, or speech defects. Massage and electricity only confirm the belief in the mind of the patient that his paralysis is serious. Electricity was found particularly harmful when tremor is present. Psycho-analysis is not suitable for passed emotional disturbances or illnesses, which may since have been forgotten.

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PSYCHONEUROSES OF WAR AND PEACE

Thesis approved for the Degree of Doctor of Medicine in the University of London

By MILLAIS CULPIN

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Review

of

Neurology and Psychiatry

Original Articles

ON SOME UNUSUAL CASES OF ACUTE ANTERIOR POLIOMYELITIS.

By KNUD H. KRABBE, M.D., COPENHAGEN.

ACUTE anterior poliomyelitis is, as is well known, most common between the ages of 1-6 years. In patients below half a year and over 50 years it is very rare. Leegaard¹ mentions, in 952 cases, five who were half a year old, one who was 1 month old, and one patient aged 2 months, the last, however, being somewhat doubtful. He mentions, in addition, six cases over 50 years, four of which, however, had only fever and back pains. Edwards² mentions in a thesis on acute spinal paralysis in adults, only one aged more than 50 years in eighteen cases, and this even was somewhat doubtful. Erb³ has among seven adults no cases aged more than 50 years. Gombault⁴ has described a patient, aged 67 years, with an undoubted poliomyelitis.

It is therefore of some interest to describe two cases of poliomyelitis in ages respectively of below 3 months and over 50 years, especially as the former patient presents a symptom which seems to be very unusual in poliomyelitis. The history of this patient is as follows :—

M. M. H., daughter of a labourer, born 10th May 1915, died 2nd January 1916. The parents of the patient are well. She is their only child, born at the right time in a natural manner.

¹ *Videnskabernes Selskabs Skrifter*, Christiana, 1907.

² *Thèse de Paris*, 1898.

³ *Archiv. f. Psychiatrie*, 1875.

⁴ *Cit. after Bicket, Inaug. Diss. Bonn*, 1898.

She was breast fed for six weeks; after that time, milk and barley-water.

When the patient was 2 months old she became suddenly ill, had fever (temp. 39·8°), much sweating, and "cramps," after which she lay absolutely flaccid and did not move her arms or legs. The cramps appeared only on the first day of the illness, and in the evening there were only small contractions in the facial muscles. Following this, the patient became flaccid in all the extremities, and could only move her feet and arms very slightly.

She was quite well after this disease, having only sometimes a little vomiting and a few mucous stools.

On 14th September 1915, when she was 4 months old, she was admitted to the children's department of the Rigshospital (University Hospital) of Copenhagen. The examination on admission showed—

The child was of natural size, with a good constitution, and was well nourished. There were some oedema of both feet, a little of the hands, legs and lumbar region. The patient had snuffles conjunctivitis, a little angina, and a slight discharge from the right ear. Stethoscopic examination normal. No glandular swelling. Abdomen somewhat distended, but without swelling of the organs.

Pirquet reaction, negative. Bordet-Wassermann reaction, negative. Hæmoglobin (Sahli), 90. Urine contained no albumin, pus, blood, or sugar. Temperature normal.

The patient could not lift her head from the pillow, but when she was sitting up, the head did not fall forwards or to the sides. The muscles of the extremities were flaccid and seemed somewhat atrophic. The upper arms were held abducted, the forearms flexed at the elbow-joints to an angle of 90°, and fell back to this position when attempts were made to straighten them. The patient could actively move the upper extremities a little in all the joints, flex slightly in elbow and finger joints, but not extend them. The movements were feeble and the patient could not lift her arms. The lower extremities were extended and somewhat outwardly rotated, and were not moved spontaneously. Only when the patient was pinched, she drew the lower extremities a little upwards and moved the left foot. Tendon reflexes could not be obtained, nor abdominal reflexes.

The patient was afterwards treated with massage and faradic electricity. She got different mixtures of milk and barley-water, but throve badly, and was then given buttermilk, following which she increased in weight and had good stools. The movements of the arms and hands improved gradually.

On 2nd November 1915 it was noticed that there was a bluish discoloration of the outer part of the second finger of the left hand, and the second and fourth fingers of the right hand. There was, however, less œdema of the hands. In the following week the discoloration increased, and there appeared more œdema of the affected fingers. (It is to be remarked that the patient at that time had rather vigorous massage.) Sometimes there was a little bleeding from the finger ends. These fingers were afterwards very swollen and red, and further there now developed œdema of the face.

On 18th November 1915 the patient was examined at the nerve-clinic of the hospital, and the examination there showed: Pupils react well to light. No ptosis, strabismus, or nystagmus. No facial paresis.

Upper Extremities.—No joint affections. Tonus markedly diminished. Tendon reflexes could not be produced. Finger ends gangrenous at the affected fingers. The patient reacted with pain outbursts to pricks everywhere. When the child was lying on its back and the extremities were rested down, the child could slowly, and with a slight power, draw the arms and hands upwards and move the fingers a little. The pulse was strong in the radial arteries on both sides.

Body.—The back flaccid. Abdomen soft. Abdominal reflexes could not be obtained.

Lower Extremities.—Tonus markedly diminished. Complete paralysis of both the lower extremities. Tendon reflexes and plantar response could not be obtained. The patient reacted by weeping to pricks everywhere at the lower extremities.

During the following time there was no change in the condition of the patient. The œdema of the lower extremities changed somewhat.

Lumbar puncture was tried twice, but without result, as bleeding occurred.

On 29th November 1915 the patient began to get feverish, coughed, and was short of breath. On examination, signs of

pneumonia were found in the right lung. The fever, cough, and shortness of breath remained unchanged; the child drank badly, and was feeble and dozing. For a short time she improved, but the temperature increased again, and signs of pneumonia in the left lung developed. The patient died on the 2nd January 1916. The mobility did not improve during the disease, but the gangrene had been more limited, and the fingers had begun to be cured.

The autopsy showed purulent bronchitis and broncho-pneumonia of both lungs. Pieces of the spinal cord, muscles, and the outer piece of one of the gangrenous fingers were taken for microscopical examination. The specimens were stained after the methods of Nissl, Weigert-Kulschitsky-Wolters, and Alzheimer. The sections showed as follows:—

At the medullary substance sections the anterior roots and the dispersed medullary fibres from the anterior cornua were quite pale (degenerated); the other medullary fibres were not affected. The glia sections showed a slight diffuse augmentation of the fibrillar glia in the anterior cornua, and a considerable augmentation corresponding to the degenerated anterior root bundles. In the Nissl-stained sections the anterior cornua cells were very much diminished in number and in size. The Nissl granules, however, were very well preserved in the remaining anterior horn cells, and there was nowhere chromatolysis. In the muscles, some muscular bundles were completely normal; others showed atrophic fibres, with a centrally placed nucleus and loss of transverse striation. In other parts transitory forms between atrophic and normal fibres were found. No sign of inflammation and no hypertrophic fibres.

From one of the gangrenous fingers the outer phalanx was examined after decalcification, embedding in paraffinoid (Claudius), cutting in series, and staining with iron-hæmatoxylin and picrofuchsine of Hansen. The examination of these specimens showed no change of the vessels, especially no endarteritis. There was a dark, gangrenous scab at the end of the finger, but under this there was a thin layer of cicatrized skin and no other remarkable changes.

There is scarcely doubt that this case has been a poliomyelitis: an acute febrile disease with cramps, which left flaccid paralysis of the extremities without sensory or other symptoms, and which anatomo-pathologically showed atrophy of the anterior cornua

cells and the muscular fibres. The only diseases which could raise diagnostic difficulties are amyotonia congenita and progressive muscular dystrophy of the Werdnig-Hoffmann type. But the acute onset of the disease in a child, who has been well before, will exclude these two diseases.¹ The interest of this case, beside the unusually early occurrence, is tied to the gangrene. In the literature I have found descriptions of some few cases, in which gangrene was found in polyneuritis, but no cases in which it was found in poliomyelitis. It is not easy to demonstrate the pathogenesis of this gangrene. A vascular origin seems not to be ostensible. It must be considered if the massage could have produced the gangrene; this explanation, however, does not seem probable, as massage should rather prevent the gangrene. It is therefore most probable that the affection of the nervous system has been the main cause of the gangrene, probably in connection with the œdema and the somewhat general debilitated condition of the child.

The other case, which in a certain point has a diagnostic interest, is the following:—

J. B., aged 54 years, farmer servant, admitted to the Koebenhavns Amtssygehus (hospital for the country environs of Copenhagen), 13th August 1919, died there 19th August 1919. The patient had been treated at the same hospital a year before for a traumatic condition of the head, which had left a slight left-sided facial paresis. Otherwise the patient had been well.

On 9th August 1919 the patient developed pains in both legs with general debility, and had to go to bed. The doctor found that there was fever.

Two days later the patient suddenly remarked that both lower extremities could scarcely be moved. This paresis of the legs increased. He had further a little headache, but no other symptoms, no cramps, no vomiting, no joint affections, no trouble with the urine, no pain or paresthesia.

On admission to the hospital the temperature was 38·2°; the urine contained a little albumin, and on microscopical examination a few hyaline cylinders were found.

Neurological Examination.—No affection of the cranial nerves (the facial paresis was now completely cured).

¹ The so-called "acute" forms of amyotonia have certainly been cases of acute poliomyelitis.

Upper Extremities.—On the left arm the tonus was a little more feeble than at the right one; at rest, no affection of the joints, trophic condition, co-ordination, reflexes, or sensibility.

Trunk.—The spine was somewhat stiff with pain on movement. The abdominal muscles were soft, and were not extended when the patient tried to lift his head. Abdominal reflexes absent. No troubles regarding sensibility.

Lower Extremities.—No joint affections, no atrophies. Tonus very markedly diminished. Complete paralysis of the thigh and most of the leg muscles, only the toes could be moved actively, rather strongly on the left, feebly at the right side. Knee-jerks, Achilles-jerks, and plantar responses were completely absent. No diminution of sensibility for pain, localisation, touching, or movements. Lasègues symptom present at both sides by 45°.

Lumbar puncture was performed, and the cerebro-spinal fluid showed a content of sixty-seven cells per mm³. Nonne-Apelt reaction negative. Bordet-Wassermann negative both in the blood and in the cerebro-spinal fluid.

After a few days the patient contracted pneumonia and died the 19th August 1919.

After the neurological examination it was suggested that the patient had a poliomyelitis or a thrombosis of the vessels at the anterior surface of the spinal cord. Such cases have been described, and considering the age of the patient—54 years—it was thought most probable that the patient had caught some febrile disease, perhaps influenza, and in the course of this had got a thrombosis of the vessels.

The result of the lumbar puncture changed the view, so that it afterwards was considered as somewhat more probable that the patient had suffered from a poliomyelitis. It must be remembered that just at that time there was an epidemic of poliomyelitis in the environs of Copenhagen.

The autopsy and microscopical examination of the spinal cord confirmed this view. Immediately after death, formalin was injected into the brain ventricles (through the ethmoidal bone), and the cerebro-spinal fluid at the same time withdrawn by lumbar puncture. After the autopsy, the spinal cord was hardened in a 10 per cent. solution of formaldehyde, embedded in paraffin, and stained with iron-hæmatoxylin. The specimens showed no thrombosis of the vessels of the spinal cord. There were marked

signs of inflammation, especially in the anterior cornua; small collections of leucocytes, especially round the vessels; partial destruction of the nerve-cells in the anterior cornua; no signs of affection from the other parts of the spinal cord.

The cases show that, in cases of acute flaccid paralysis, it always may be considered that it might be poliomyelitis, even in persons over 50 years of age. Lumbar puncture will certainly be the most important examination to decide if the case is a poliomyelitis or a thrombosis of the vessels at the anterior surface of the spinal cord.

I am indebted to Professor C. E. Bloch, consulting physician at the children's department of the Rigshospital, and to Dr Helsted, M.D., consulting surgeon at the Koebenhavns Amtssygehus, for permission to publish these two cases.

SPEECH INSCRIPTIONS IN PROGRESSIVE BULBAR PARALYSIS.

By E. W. SCRIPTURE, M.D.

FOR a number of years the attempt has been made to register and analyse speech in the various nervous diseases. The object is twofold. In the first place it is desired to establish the characteristics of each disease so definitely that a diagnosis can be made from the speech inscription alone. The ideal is to do for a series of nervous diseases what the urinary tests do for nephritis and diabetes. For three diseases this has already been accomplished. A peculiar form of curve appears in every case of disseminated sclerosis; the disease can be diagnosed from the speech inscription at a time when nothing can be detected by the ear (*Brain*, 1916, vol. xxxix., p. 455). A quite different speech peculiarity appears in every inscription of general paralysis. Here again it can be found long before it can be detected by the ear (*Quarterly Journ. Med.*, 1916-17, vol. x., p. 20). Epileptic speech has a peculiarity not found in any other disease (*Proc. Roy. Soc. Med.*, 1920, vol. xiii. (Sect. Psychiatry), p. 18).

The other object is to furnish a new method of investigating the pathology of the disease. Speech inscriptions of cerebral diplegia have shown not only that the underlying trouble is an

excessive response to each act of will, but also that one of the chief methods of treatment should be in training the patient to use his will more gently (*Proc. Roy. Soc. Med.*, 1917, vol. x. (Sect. Dis. Child.), p. 36).

Several cases of progressive bulbar paralysis have been studied. The speech inscriptions show some peculiarities that have not yet been found in any other disease. These inscriptions are the first ones ever made of this disease. It may, perhaps, be added

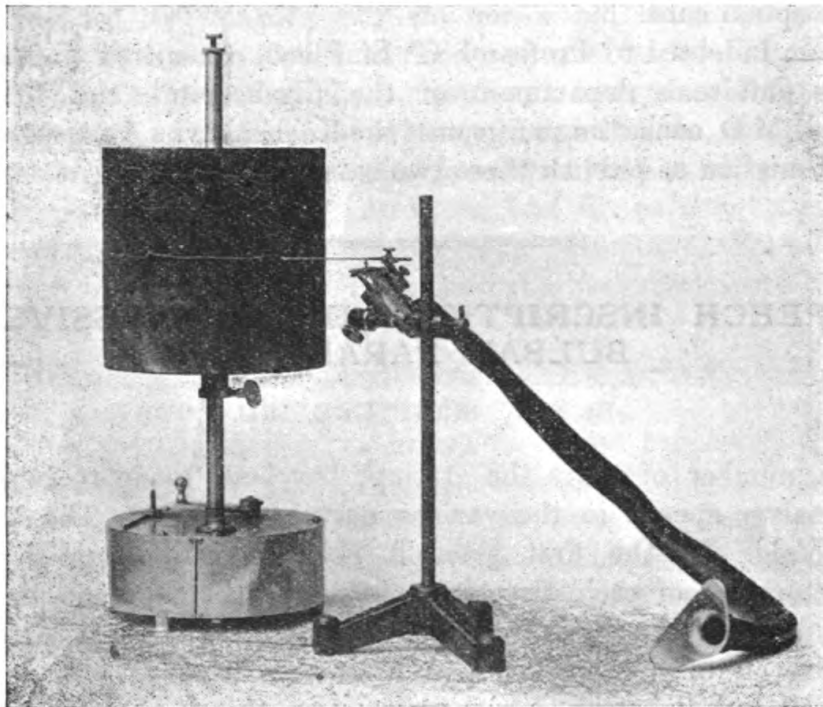


FIG. 1.—Apparatus for making speech inscriptions.

The words are spoken into a mouthpiece. The vibrations and puffs of air pass down the wide tube to a flexible membrane whose movements are registered by a light lever on a moving blackened surface.

that the same statement is true of the other diseases referred to above, and that this entire line of work is at present carried on nowhere except in London.

The speech is recorded by the apparatus shown in Fig. 1. The vibrations and puffs of air pass from the mouthpiece down a wide tube to the recorder. They reach a flexible membrane that moves a long light lever. The movements are recorded on a revolving blackened cylinder.

A normal inscription of "hippotamus" made with this apparatus is reproduced in Fig. 2. The initial rise registers the breath of air for "h." It is followed by the vibrations of "i." These are cut short by the fall of the line as the lips close for the "pp"; the straight line—the occlusion—is followed by a sharp rise—the explosion—of this sound (of course, there is only one sound and not two for "pp").

The next "p" is similar. The "t" shows a shorter occlusion and a weaker explosion; there are faint vibrations during the occlusion, a fact that is not abnormal for a "t" between two vowels. The "m" shows an occlusion with vibrations. The "s" is recorded as a raised line due to the steady rush of breath.

The case of bulbar paralysis first studied was a man 65 years old. He had noticed that two years before he presented himself

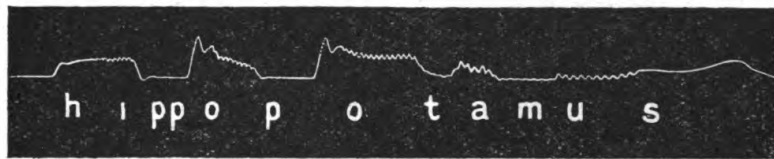


FIG. 2.—Inscription of "hippotamus" by a normal voice.

The letters are placed beneath the beginning of each sound. There is a well-marked breath for "h" (rising line). The "pp" and "p" show occlusions (straight lines) followed by explosions (sharp rising lines). The "t" shows a short occlusion with a faint explosion. The "m" shows an occlusion with vibrations. The "s" shows a strong rush of air (raised line). The vowels show well-marked regular vibrations.

at the clinic his speech was like that of a drunken man. Examination showed weakness and atrophy of the muscles of mastication and of the floor of the mouth. The lower part of the face was masklike; the muscles were weak and atrophied; they showed fibrillary twitchings; the movements were very weak. There was some weakness of the sternocleido-mastoid and trapezius muscles. The larynx did not rise well in swallowing. Liquids often passed out the nose during swallowing; the velum hung low but could be raised fairly well. The action of the vocal cords, as observed with the laryngoscope, was clumsy and defective.

These symptoms are typical of degeneration of the centres of the motor trigeminus, facial, vagus, accessory, and hypoglossal nerves. It was a clear case of progressive bulbar paralysis. The man was watched for two years. Inscriptions were taken from

time to time as the condition became worse. The inscriptions now to be discussed were made at the first examination.

An inscription of "hippopotamus" by this patient is given in Fig. 3.

The rush of air for the "h" is abnormally strong. It is followed by strong waves for "i" high above the base line. The strong waves indicate strong vibrations of the vocal cords. The height of the line depends on the amount of the air emitted; here it is excessive and indicates unusual strength of the vowel. The "i" is also quite long. It is characteristic of this patient's speech that he starts each phrase with a strong effort at loudness.

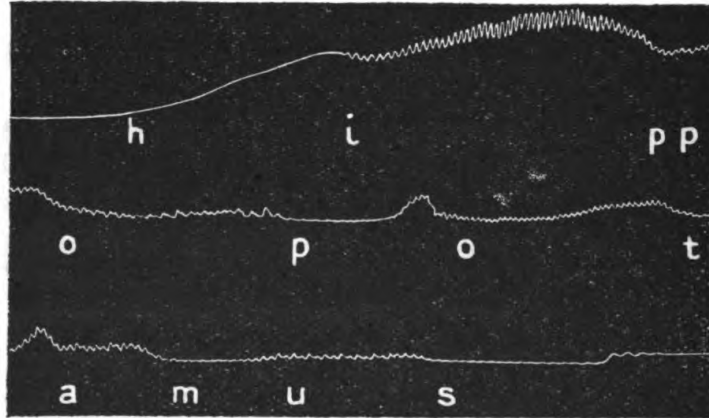


FIG. 3.—Inscription of "hippopotamus" by a patient with progressive bulbar paralysis.

The record starts with strong sounds (initial bellow), but steadily fades until it ends in an "s" too weak to raise the recording lever. The sounds cannot be separated (blurring). The vowel vibrations show irregular rattling.

In the normal record the "i" is followed by a straight line as the lips are shut for the "p." Here there is only a series of weak vibrations with some fluctuation in the height of the line. This shows that the lips were merely approximated and not closed, and also that the larynx did not stop vibrating as it should have done.

The next "p" is better made. The straight line with the sharp rise at the end shows that there was really an occlusion with an explosion. The small vibrations, however, persist through the "p"; it was thus more like a "b" than a "p." The small vibrations are likewise seen to be present during "t" and "s,"

whereas they are absent in a normal record. The flatness of the line for "s" shows that the emission of air was weak.

Aside from the loud beginning, the entire word is seen to be

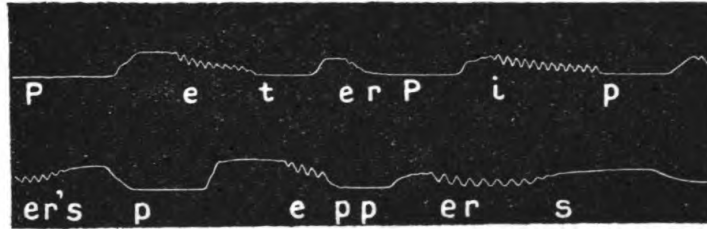


FIG. 4.—Inscription of "Peter Piper's peppers" by a normal voice. Each of the sounds is sharply cut, and typical.

weak. The effect was that of a bellow that rapidly fades away. This characteristic may be termed the "initial bellow."

An inscription of "Peter Piper's peppers" by a normal voice is given in Fig. 4, one by the case of bulbar paralysis in Fig. 5. The waves of the laryngeal tone begin in Fig. 5 in the latter part

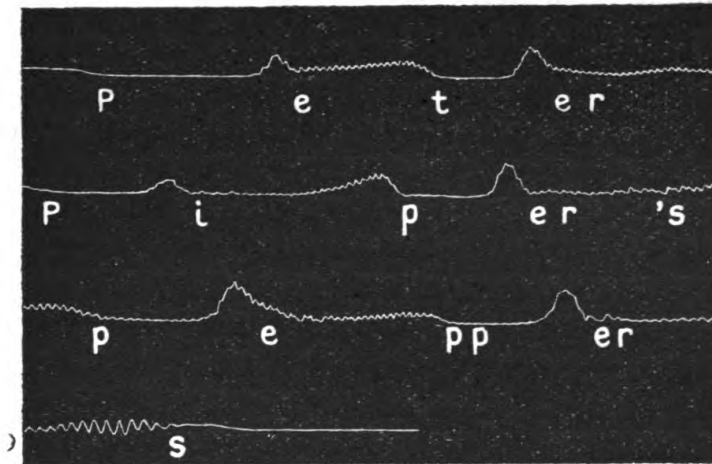


FIG. 5.—Inscription of "Peter Piper's peppers" by a patient with progressive bulbar paralysis.

The sounds are longer than in Fig. 4. They are not so clearly cut. The laryngeal vibrations appear not only in the vowels, but throughout almost the entire record.

of the initial "p," and continue uninterruptedly to the end of the phrase. In the normal record in Fig. 4 they cease during each "p." The initial bellow does not appear in this phrase. The sounds are not so blurred together as in Fig. 3; the weakness is

also not so great. The phrase is dragged out to great length as if it cost an effort.

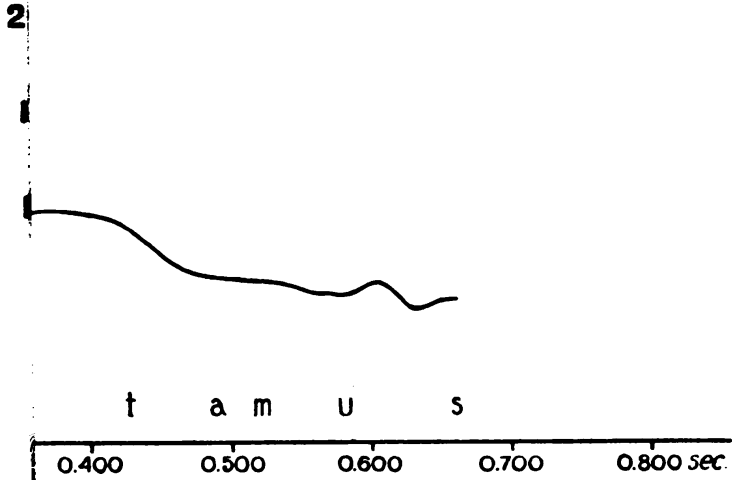
In both Fig. 3 and Fig. 5 the laryngeal vibrations are not smooth and regular as in the normal records; they are shaky or rattling. The rattle in the voice could be distinctly heard.

The length of a bulbar inscription is always much greater than that of the corresponding normal one.

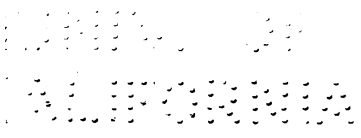
In a normal inscription the limits between the sounds can be marked off fairly well. A chart of their durations for Fig. 2 is given in Fig. 6. In the bulbar inscriptions the sounds seem to run together; the place where one ends and the next begins can only be vaguely and rather arbitrarily picked out. This is indicated by "?" in the duration chart in Fig. 7. This condition can be expressed by the term "blurring," whereby we have in mind that each single sound is not clearly cut, but has indefinite edges that lap over the neighbouring sounds. The sounds are longer than in normal speech, especially in the initial bellow.

By measuring the horizontal length of one of the vowel waves and calculating the number of times it would be repeated in one second, we get the pitch of the laryngeal tone at that instant. All the vibrations in the inscriptions in Figs. 2 and 3 were measured under a microscope, and the pitch at each instant was computed. The results, plotted on cross-section paper, show how the voice rises and falls. Such "melody plots" for Figs. 2 and 3 are given in Figs. 8 and 9. The bulbar melody plot shows not quite so much rise and fall as the normal, but the difference is so small that the bulbar melody may be considered as normal.

The characteristics of bulbar speech may be explained in the following way: Weakness of the muscles and of the innervation impulses will account for the general weakness of the sounds and for the incomplete closure of the lips, &c., that produces the defective enunciation. It will also account for the rattling tone if we assume that the M. vocalis (glottal lip) flapped because it could not be well contracted, or that the cricarytenoid articulations rattled because they were not tightly held. The husky tone that was heard by the ear is due to incomplete closure of the glottis; it likewise indicates defective action of the thyro-arytenoid and vocal muscles. The initial bellow is evidently due to an attempt to overcome the weakness of speech. The speech is properly described as "asthenic," or weak. The initial bellow is an



Melody plot for Fig. 2.
 the gradually falls with minor fluctuations.
 sec



gh to be considered abnormalities.

[To face page 84.]

example of "anasthenia," or an attempt to counteract the weakness.

The blurring—that is, the overlapping of neighbouring sounds—cannot be due to muscular weakness; there is no blurring in inscriptions of muscular dystrophy. It can hardly arise from weakness of innervation; the blurring is just as great in the initial bellow; moreover, there is no reason why nerve impulses should become inco-ordinated just because they are weak. For a sound to begin or end sharply, the groups of muscles of enunciation (lips, tongue, velum), of phonation (crico-thyroid, interarytenoid, thyro-arytenoid, vocalis, &c.), and of breathing (diaphragm, abdominal wall, intercostals, &c.) must all begin, continue, and end their contractions at the proper times and with the proper degrees of force. A disturbance of this co-ordination is called "ataxia." It may be suggested that the taxic mechanisms of speech are involved in this disease.

That the melody of speech is not essentially altered in this disease is due to the fact that speech melody is the direct expression of emotion and character, and that it changes only when there is some organic hindrance (as in the spastic conditions), or when the emotional or character disturbance alters the form of expression (as in epilepsy, stuttering, &c.).

It is possible to define bulbar speech as having the following characteristics: weakness, initial bellow, indistinctness, nasalisation, huskiness, rattling tone, blurring, slowness, slight deficiency of rhythm, and sometimes slight monotony. These signs may not all be present in mild cases, but they develop sooner or later. In bulbar speech there is asthenia, or weakness of the muscular action. There is also ataxia, or improper co-ordination. There is also, as in all speech troubles, the effort to combat the defects. If the results of such an effort are indicated by the prefix "an," then the formula for bulbar speech will be "asthenia + anasthenia + ataxia + anataxia." This formula may be compared with the formulas for the speech manifestations of other diseases. For disseminated sclerosis the formula is "hypertonia + anatonina + ataxia + anataxia" ("Records of Speech in Disseminated Sclerosis," *Brain*, 1916, vol. xxxix., p. 455). For early general paralysis the speech formula is "asaphia + anasaphia"; for later stages it is "asaphia + anasaphia + apraxia + anapraxia"; for still later stages it is "asaphia + anasaphia + apraxia + anapraxia + ataxia + ana-

taxia," and so on ("Records of Speech in General Paralysis," *Quart. Journ. Med.*, 1916-17, vol. x., p. 20). For spastic conditions such as cerebral diplegia, the speech formula is "hypertonia + anatonia" (*Proc. Roy. Soc. Med. (Sect. Dis. Child.)*, 1916, vol. x., p. 10; 1917, vol. x., p. 36).

A CASE OF FACIAL TETANUS.

A. NINIAN BRUCE, M.D., Lieut.-Col. R.A.M.C.,
Late Officer-in-Charge, Dunblane War Hospital.

A PRIVATE, aged 29 years, was referred to the Neurological Clinic, Ministry of Pensions, Edinburgh, in the beginning of February 1920, on account of a muscular spasm of the left side of the face which had lasted five months, appeared to be in a stationary condition, and only permitted of a partial opening of his mouth.

Previous to enlisting he had been employed as a miner. He enlisted in January 1915 in an infantry regiment, and after training was sent to France in July 1916. He fought through the Somme battles without being wounded, and carried on successfully until August 1918, when, after being nine days continuously in action, he was buried by a shell explosion. He did not lose consciousness, and was later dug out. It was then found that he had dislocated his right knee, broken his left ankle, and had several cuts about the upper part of the face. He was given an injection of anti-tetanic serum immediately on admission to the dressing station, and was sent down the line to hospital at Rouen. Shortly after this he was transferred to England. He made a good recovery and was discharged to the Command Depot. About the middle of December 1918 he was considered fit to return to his unit, and was later in the month demobilised to return to his previous work in the mines. He returned to his work as a miner for a few months, but gradually found it too heavy for him, began to get nervous, sleepless, tremulous, and to complain of headaches; he also began to lose weight.

In September 1919, *i.e.*, thirteen months after his original wound, he noticed a pain on the left side of his face "like toothache," which very slowly and gradually increased in intensity until his mouth became firmly closed. It was at first thought he was suffering from a dental abscess, but it so happened that his teeth

had been carefully attended to and put in order before his discharge from hospital. His mouth became firmly clenched, and the pain "terrific." For the next four or five days he himself thought recovery was impossible. His throat became swollen, and he could only swallow a little milk and potash with the greatest difficulty. Saliva accumulated in his mouth, which he was unable either to swallow or to spit out. Severe headache was also present. The only relief he could obtain was from the application of hot flannels to his face, the heat—which gave most relief—being so great that his wife could not touch them. The relief was only temporary and lasted as long as they were pressed against his face. He became quite convinced he could not stand such severe pain much longer, and he states his medical attendant held a similar view; but on the fifth day it gradually began to subside and finally disappeared. Apart from slight twinges it did not return.

He came under my observation in March 1920. His mouth then was still firmly shut but could be opened with difficulty. He was able to swallow. Pain was absent. The condition varied with the weather, being aggravated by cold weather, and benefited by warm weather. Headaches were still present, at times very severe.

The left masseter was stiff and tense, being firmly contracted. He stated that the condition had been very slowly improving during the previous few months, and that he thought it would pass away ultimately, although he lived in dread of a recurrence. The symptoms cleared up rapidly following subcutaneous injections of anti-tetanic serum.

Abstracts

PATHOLOGY.

DEGENERATION GRANULES IN BRAIN CELLS IN EPIDEMIC (64) ENCEPHALITIS. HENRY E. MELENEY, *Arch. of Neurol. and Psychiat.*, 1921, No. 2, February.

IN the routine examination of sections from the brain in a case of epidemic encephalitis minute granules were found in degenerated nerve cells in the areas involved by the disease process. The presence of these granules in cases of epidemic encephalitis has not frequently been noted, and the author is of the opinion that they should be described as a part of the microscopic pathology of this disease. The technique of the fixing and staining methods is fully described. D. K. HENDERSON.

EPIDEMIC (LETHARGIC) ENCEPHALITIS. THALHIMER, *Arch. of (65) Neurol. and Psychiat.*, 1921, No. 2, February.

THIS report confirms the findings of Loewe and Strauss with respect to the filtrability of the virus obtained from cases of epidemic encephalitis. Loewe and Strauss had inoculated rabbits and monkeys with material from cases of encephalitis, and following their death the typical lesions were found in the central nervous system. The infective agent was found in the blood and spinal fluid, and in Berkefeld filtrates of these materials. It was found that the infectious agent was a filtrable one, and it was possible to pass the virus through many series of animals. In the present piece of work about 200 rabbits have been inoculated. Most of the rabbits died in from two to four weeks, and some as long as ten weeks later. The central nervous system of a large number of the rabbits that died appeared more red and congested than normal, and showed typical microscopic lesions identical with those found in fatal human cases. These lesions were sometimes widespread, and sometimes confined to a small portion of the brain or cord. Microscopic hæmorrhages were sometimes the prominent lesion, and only an occasional blood vessel showed perivascular round cell infiltration. The brain lesions of some of the rabbits of subsequent series, injected with the same strain of virus, showed, however, focalised necroses, characteristic perivascular infiltration, &c. The technique of cultural studies using the ascitic fluid tissue culture medium as perfected by Noguchi and used by him in the cultivation of *Spirochaeta pallida* are described in detail. It may be mentioned that the organism was grown from the brains of about 80 per

cent. of the rabbits inoculated with filtered virus. It has also been recovered from the brains of rabbits inoculated with cultures of this organism.

The general conclusion is to the effect that the filtrable micro-organism cultivated by Loewe and Strauss, and also subsequently cultivated in the course of these studies, is believed to be the etiologic agent of epidemic encephalitis.

D. K. HENDERSON.

**THE PATHOLOGICAL EXAMINATION OF FORTY INTRA-
(66) CRANIAL NEOPLASMS.** J. GODWIN GREENFIELD, *Brain*, 1919,
xlii, p. 29.

THE paper deals with the examination of a series of forty intracranial neoplasms, of which four were removed at operation and the rest came to autopsy. They were diagnosed as follows:—tuberculomata, 2; granuloma, 1; sarcoma, 2; endothelioma, of which one was multiple, 8; myxo-endothelioma, 2; perivascular sarcoma, 3; sarcomatosis of meninges, 1; gliomata numbered 11, and included 1 case of multiple gliomata; 1 glioma with a spongioblastic tumour in the opposite cerebral hemisphere, and 1 case of multiple gliomata of the nerve roots. Four cases were classed as neuroblastoma, of which one of the ganglioneuroma type was extra-cerebral, apparently growing from the pars nervosa of the pituitary gland. The other three were rounded non-infiltrating tumours of the cerebral hemispheres. There were six cases of acoustic nerve tumour, one of which presented bilateral tumours of the acoustic nerves, and multiple neurofibromata of the nerve roots as well as a psammomatous tumour on the occipital cortex.

In this series, therefore, there are twenty-one cases of forms of tumour peculiar to the nervous system, and sixteen mesoblastic neoplasms, tuberculoma and granuloma making up the remaining cases.

An attempt was made to classify these tumours according to the tissue from which they were derived, and their manner of growth. Important diagnostic evidence is derived from the study of the margin of the tumour, and in most cases there is little difficulty in distinguishing sarcomata from gliomata by this means alone. For whereas gliomata present no definite margin, and areas of gliomatous tissue are often found microscopically in apparently healthy brain tissue at some distance from the area of obvious tumour growth, in sarcomata the infiltration is less diffuse and an irregular edge of tumour growth can usually be made out. Perivascular sarcoma may also be distinguished from endotheliomata in this way, for whereas the endotheliomata peel

out from the brain tissue, leaving it intact and covered by a fine membrane derived from the lepto-meninges, the perivascular sarcomata carry with them a thin layer of softened brain substance. These two types of growth are otherwise of very similar macroscopic appearance and rate of growth. The similarity of perivascular sarcomata to certain types of gliomata, especially as regards the way in which the new blood vessels are formed, is noted, and it is suggested that these tumours are possibly derived from undifferentiated nerve cells rather than from mesoblastic elements.

An anomalous case of infiltration of the subarachnoid space with tumour-like cells is recorded. The patient died of hydrocephalus, and macroscopically no very obvious cause for this was discovered. Histological examination, however, showed that the meshes of the arachnoid were everywhere filled with small epitheloid cells. It is suggested as a possible explanation that this is a form of diffuse neoplasm of the endothelial cells lining the arachnoid.

The four cases classed as neuroblastoma are fully described. These are all rounded, fairly well-defined tumours, showing little tendency to infiltrate the neighbouring brain matter. In two of them the diagnosis was undoubted, as Bielschowsky's staining method demonstrated numerous dark fibrils which appeared to proceed from large multipolar cells. In the other two the diagnosis was not so definite, but both showed an arrangement of large pyriform cells lying around the blood vessels and sending thick processes both into their walls and into the surrounding tissue. Similar cells were not seen elsewhere than in relation to the blood vessels—the greater part of the tumour tissue being composed of small cells of the glial type. These two cases are included under the neuroblastomata, as they appear to be tumours derived from rudimentary cells of the glia or nerve cell type, and to possess considerable similarity in arrangement and manner of growth to the neuroblastoma, while they differ in many ways from the ordinary gliomata.

The last part of the paper is devoted to the histogenesis of acoustic nerve tumours. The writer considers that they are in all respects identical with neurofibromata as found either on nerve roots or peripheral nerves, and agrees with Durante and Verocay in regarding their origin to be the cells of the neurilemma sheath. In the acoustic nerve tumours there are areas which present a gliomatous appearance, and it seems possible that, as Cushing believes, these tumours arise at the transition zone between glia and neurilemma, and take origin from both structures.

AUTHOR'S ABSTRACT.

CLINICAL NEUROLOGY.

SENSATION AND THE CEREBRAL CORTEX. HENRY HEAD,
(67) *Brain*, 1918, xli., pp. 57-253.

THIS is an important paper, and should be read in the original. As a result of the study of a number of cases in man of sensory disturbance produced by cortical lesions, it is concluded that the optic thalamus is the centre for the affective aspect of sensation, while discrimination and spacial projection are the product of cortical activity. The sensory activity of the cortex may be divided into three categories—(a) recognition of spacial relations; (b) a graduated response to stimuli of different intensity; and (c) appreciation of similarity and difference in external objects brought into contact with the surface of the body. These three aspects of sensation can be distributed independently of one another in consequence of a cortical lesion. Cortical activity is not associated with crude recognition of touch, pain, heat, and cold; these are associated with the optic thalamus. A prick, as far as its painful element is concerned, depends for recognition almost entirely on this organ, while the "pointedness," "clearness," "sharpness," are the results of cortical activity.

A. NINIAN BRUCE.

JUVENILE TABES. H. L. PARKER, *Arch. of Neurol. and Psychiat.*, 1921,
(68) No. 2, February.

JUVENILE tabes is a relatively rare disease, and in this article the author reviews the literature, and gives a summary of seven cases. The features of the disease are summarised as follows:—The insidious onset, the lengthy and even latent course of the disease, during which time no subjective complaint may be made, are in contrast to the frequent optic atrophy and total blindness that may also occur. The frequency of incontinence of urine, the relative rarity of such striking phenomena as ataxia, girdle sensations and lightning pain, and finally the frequent parietic termination, are features that stamp juvenile tabes with a distinctive mark and distinguish it from the adult type.

D. K. HENDERSON.

CEREBRAL SOFTENING FOLLOWING A METALLIC EMBOLUS
(69) **IN THE LEFT MIDDLE CEREBRAL ARTERY.** (Une observation anatomo-clinique d'un cas de ramollissement cérébral consécutif à l'oblitération de l'artère sylvienne gauche par une embolie métallique.) P. LECÉNE and J. LHERMITTE, *Rev. Neurol.*, 1920, xxvii., p. 1116.

A SOLDIER, aged 30 years, was injured below the angle of the left jaw, the wound being small and punctiform. The same day he became unconscious, without paralysis, but next day became

aphasic. The third day he developed a complete right hemiplegia; he became steadily worse, and died on the seventh day.

At the autopsy the internal carotid artery showed a small punctured wound. The middle cerebral artery was completely blocked by a small metallic fragment situated about 3 cm. from its junction with the circle of Willis, with thrombosis distally.

The brain lesions are described at length. The authors point out that the cerebral cortex receives its blood supply from a network in the pia formed by branches of all three cerebral arteries, and obliteration of one branch scarcely affects the flow through this network. The basal arteries, however, are terminal, and blockage produces definite areas of softening.

A. NINIAN BRUCE.

THE CAUSE OF DISSEMINATED SCLEROSIS. (*Über die Ursachen der multiplen Sklerose.*) *Med. Klinik*, KUHN and STEINER, 1917, xiii., S. 1007. *Neurol. Centralbl.*, 1917, xxxvi., S. 844.

As the result of inoculations of guinea-pigs and rabbits with blood and cerebro-spinal fluid from cases of disseminated sclerosis in man, it was found that various nervous symptoms developed, such as drowsiness, muscular weakness, and paralysis. In one case four animals were successively inoculated, the severity of the symptoms being correspondingly increased each time.

In these animals a spirochæte was found in the blood vessels and liver, which, however, differed from the *Spirochæte pallida* of syphilis.

A. NINIAN BRUCE.

SPIROCHÆTES IN THE BRAIN IN A CASE OF DISSEMINATED SCLEROSIS. (*Spirochäten im Gehirn eines Falles von multipler Sklerose.*) SIEMERLING, *Berl. klin. Wochenschr.*, 1918, lv.

EXAMINATION of the frontal region of the brain of a man who died at the age of 36 years with symptoms characteristic of disseminated sclerosis, showed a number of patches both in the superficial and deeper cortical layers, which contained living spirochætes on dark ground illumination. They could not, however, be detected in stained preparations.

A. NINIAN BRUCE.

REMARKS ON THE ETIOLOGY OF DISSEMINATED SCLEROSIS. (72) (*Einige Bemerkungen zur Ätiologie der multiplen Sklerose.*) STRÜMPELL, *Neurol. Centralbl.*, 1918, xxxvii., S. 401.

A GENERAL discussion on the etiology of this disease, with special reference to the recent discovery of spirochætes in the sclerosed patches. The author is inclined to accept this as the etiological cause of the condition, although he points out that several clinical entities may be included under this term. A. NINIAN BRUCE.

ON THE ORIGIN AND NATURE OF DISSEMINATED SCLEROSIS. (73) **OSIS.** (*Etude sur l'origine et la nature de la sclérose en plaques.*) G. MARINESCO, *Rev. Neurol.*, 1919, xxvi., p. 481.

MARINESCO injected the cerebro-spinal fluid of two patients into six guinea-pigs, the method being intraperitoneal, intraspinal, and intracerebral. The two intracerebrally injected animals developed a paresis of the hind limbs. Fluid withdrawn from the fourth ventricle showed numerous spirochætes. Roux also considered they were different from the spirochæte of syphilis.

Subsequent inoculations from the same patients into new animals proved negative, attributed to the more advanced and less infective stage of the disease.

Marinesco thus confirms the observations of Kuhn and Steiner, and concludes this special spirochæte is the cause of the disease in man, and can produce paralysis when injected into animals.

A NINIAN BRUCE.

TREATMENT OF MULTIPLE SCLEROSIS WITH SODIUM-SILVER-SALVARSAN. (74) **SILVER-SALVARSAN.** (*Die Behandlung der multiplen Sklerose mit Silbersalvarsan.*) F. KALBERLACH, *Med. Klinik*, 1919, xv., S. 792-4.

GOOD results are recorded from the intravenous injection of from 0.1 to 0.15 gm. in 10 c.c. of water. The preparation was well borne, and arsenic medication was considered to improve the general condition of the patients. Long-standing cases were unaffected, but the motor and sensory symptoms were improved in early cases.

The author thinks this drug may be as specific for disseminated sclerosis as salvarsan is for syphilis.

A. NINIAN BRUCE.

THE CAUSE OF DISSEMINATED SCLEROSIS. (75) **der multiplen Sklerose.** (*Ueber die Ursache der multiplen Sklerose.*) P. KUHN and G. STEINER, *Ztschr. f. Hyg. u. Infektionskrankh.*, 1920, xc., p. 417.

NINE additional cases, six chronic and three of recent date, form the material for the present investigation. Positive results were again obtained with rabbits and guinea-pigs. Both by staining and by dark ground illumination spirochætes were found in the blood during life and in the vessels of the organs after death.

A monkey inoculated in March 1917, intraperitoneally developed a transient paresis in February 1918, which recurred in June 1918, and lasted till it was killed in July 1918. Spirochætes were not found, but microscopic sections were considered to be identical with those found in human disseminated sclerosis.

A. NINIAN BRUCE.

THE ETIOLOGY OF DISSEMINATED SCLEROSIS. (Für Aetiologie der multiplen Sklerose.) F. KALBERLACH, *Deut. med. Wochenschr.*, 1921, xlvii., p. 102.

INTRADURAL and intraperitoneal inoculations were performed in rabbits with blood and cerebro-spinal fluid from two cases of disseminated sclerosis. Both developed paralysis, and a spirochæte was obtained from the blood of one during life. The other animal died, and a similar spirochæte was obtained from the liver.

The organism has from three to six spirals, and tapers to a point at each end. It has been termed the *Spirochæte polyserotica*.
A. NINIAN BRUCE.

EXPERIMENTAL RESEARCHES ON THE PATHOGENESIS OF DISSEMINATED SCLEROSIS. (Experimentelle Untersuchungen über die Pathogenese der multiplen Sklerose.) J. ROTHFELD, J. FREUND, and J. HORNOWSKI, *Deut. Ztschr. f. Nervenheilk.*, 1921, lxvii., S. 257.

As the result of a number of experiments of inoculation into animals of cerebro-spinal fluid from cases of disseminated sclerosis in man, and subsequent passage into a further series of animals, no post-mortem change in the nervous system could be discovered, death being stated to be due to tuberculosis and coccidiosis.

The authors therefore consider that great care should be used in interpreting the results of inoculation experiments in this disease.
A. NINIAN BRUCE.

UNUSUAL MOTOR SYMPTOMS IN DISSEMINATED SCLEROSIS, WITH REMARKS ON THE DIFFERENTIAL DIAGNOSIS FROM EPIDEMIC ENCEPHALITIS. (Über seltene motorische Erscheinungen bei multipler Sklerose, nebst Bemerkungen zur Differentialdiagnose gegenüber der Encephalitis epidemica.) A. WESTPHAL, *Deut. Ztschr. f. Nervenheilk.*, 1921, lxviii., S. 128.

THREE cases are recorded, all occurring during an outbreak of epidemic encephalitis:—

1. A man, aged 35 years, presented persistent involuntary movements rendering standing and walking impossible. Speech was unintelligible. Mental state appeared normal. Duration of illness, three years. Clinical condition resembled chorea with pyramidal involvement. Disseminated sclerosis confirmed at autopsy.

2. A woman, unmarried, aged 23 years, presented a clinical condition of dystrophia adiposo-genitalis with myoclonus and pyramidal involvement. Mental state one of fatuousness and

deterioration. Illness began following an air-raid on Cologne two years previously.

3. A man, aged 29 years, presented tonic spasms of the muscles of the legs, rarely clonic, negative Wassermann reaction. Improved with injections of silver-salvarsan.

A. NINIAN BRUCE.

THE CENTRAL NERVOUS SYSTEM IN PURPURA HÆMOR-
(79) **RHAGICA.** ALFRED GORDON, *Journ. of Nerv. and Ment. Dis.*, 1919,
1, p. 144.

A CHILD, aged 5 years, poorly nourished, suddenly commenced bleeding from the gums. The blood showed diminished platelets and normal coagulation time. Transfusion with human blood and subcutaneous injection of thrombo-plastin were ineffectual. At the autopsy the brain and spinal cord were extremely pale, and "nowhere could be seen a single vessel showing the presence of blood in it." Throughout the entire central nervous system, with the exception of the cerebellum, the pathological process was confined exclusively to the grey matter. The lesion consisted chiefly of vacuoles situated between the cells, thus destroying the cells in their vicinity. The vacuolated spaces indicate complete absorption and disappearance of cells destroyed by hæmorrhages. The extent and rapidity of the destruction, and the absence of the tendency for repair, is due to the vessels involved being of a terminal variety.

A. NINIAN BRUCE.

BILATERAL FRONTAL HÆMORRHAGE. FRED. J. FARNELL, *Journ.*
(80) *of Nerv. and Ment. Dis.*, 1919, 1, p. 218 (3 figs.).

A WOMAN, aged 49 years, married, mentally normal, and with a clear history, developed a mental state not unlike the manic state of manic-depressive insanity, which settled, after several months, into a hypomanic condition. Physically she showed albumen in the urine, and the blood pressure was 210.

Twelve months after the onset of the above psychoses she had a cerebral hæmorrhage of the intraventricular type, and developed a second psychoses characterised by intellectual loss, with deterioration in feeling, instinct, conduct, &c. Physically she improved, but the mental state remained unchanged. Five or six weeks later symptoms of cerebral compression occurred, followed by death.

At the autopsy bilateral mid-frontal hæmorrhage with organisation, secondary necrosis, and softening of the brain was found.

A. NINIAN BRUCE.

A CASE OF TUMOUR OF THE CORPUS CALLOSUM AND (81) FRONTAL LOBES. C. C. BELING and H. S. MARTLAND, *Journ. Nerv. and Ment. Dis.*, 1919, l, p. 425.

A MAN, aged 54 years, developed cerebral symptoms which were diagnosed as due to a tumour of the corpus callosum, on the grounds that the disturbances of association resulting in apraxia, chiefly of an ideo-motor, aphasic, and agraphic character, were referable to a lesion of the corpus callosum; that the automatisms were due to a right frontal lesion, and the defects of volition (lack of initiation of movement ideas) to a left frontal lesion.

At the autopsy a telangiectatic, infiltrative, non-circumscribed glioblastoma, which had invaded and destroyed the white matter of the anterior half of both superior frontal gyri, the anterior one-fifth of the cingulate gyri, and the association fibres in the genu and anterior one-third of the body of the corpus callosum.

A. NINIAN BRUCE.

A CASE OF TUMOUR OF THE PONS VAROLII. T. B. THROCKMORTON, (82) *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1279.

A MAN, aged 22 years, began to suffer from a tendency for his right eye to turn inward at the age of 8 years. This progressed slowly, and complete internal strabismus developed in five years. Later, weakness of the right face, diminution of hearing, headache, vertigo, and double optic atrophy followed, with ataxia, uninfluenced by closure of eyes, staggering gait more towards the right, dysdiadokokinesia, asynergy, and nystagmus. A decompression operation failed to expose any tumour, but the patient lived in comparative comfort for five years after this.

At the autopsy an encapsulated glioma was discovered which had apparently sprung from the longitudinal fibres of the pons.

A. NINIAN BRUCE.

INFLUENZA AND NEUROSYPHILIS. KARL A. MENNINGER, *Arch. (83) of Int. Med.*, 1919, xxiv., p. 98.

CASES are cited to illustrate three effects of influenza on neurosyphilis :—

1. The precipitation of profound symptoms in previously latent neurosyphilis by influenza.
2. The augmentation of symptoms and signs of neurosyphilis by influenza.
3. The absence of palpable effect of influenza on the neurosyphilitic process.

The latent, incipient, and early cases of neurosyphilis seem to be susceptible to precipitation or augmentation by the added

neurotoxic effects of influenza: the advanced cases are not usually perceptibly altered in symptomatology or course. No instances of improvement of neurosyphilis following influenza were observed. The scanty literature is collected and epitomised.

A. NINIAN BRUCE.

OBSERVATIONS ON THE CEREBRO-SPINAL FLUID OF ACUTE

(84) **DISEASE.** W. W. HERRICK and A. M. DANNENBERG, *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1321.

A STUDY of 76 cases not resulting in meningitis shows that the cerebro-spinal fluid often gives evidence in increased pressure, pleocytosis, and heightened globulin content of a reaction on the part of the leptomeninges to the infective agents or toxins of many acute diseases not ordinarily causing true meningitis. These are lobar and bronchopneumonia, influenza, tonsillitis, scarlet fever, measles, herpes zoster, typhoid fever, sepsis, arthritis, pleurisy, and migraine.

Most of the patients with subarachnoid reaction have clinical meningismus, but on the other hand many examples of meningismus are without pronounced changes in the cerebro-spinal fluid. Caution should be used in making a diagnosis of meningitis or poliomyelitis, and cases with less than 100 cells should be viewed with scepticism unless the clinical symptoms are decisive.

A. NINIAN BRUCE.

THE INTERPRETATION OF THE "PARETIC CURVE" IN

(85) **LANGE'S COLLOIDAL GOLD TEST.** L. J. THOMPSON, *Arch. of Neurol. and Psychiat.*, 1921, No. 2, February.

THIS work is based on 8,400 colloidal gold tests which have been made on about 7,100 different cerebro-spinal fluids. Out of this number, 677 fluids gave paretic curves, and these constitute the basis for the present study. The diagnoses of all the cases considered have been confirmed by a long period of observation at this or some other State hospital and, in addition, many have been confirmed by post-mortem examination. The writer agrees that the typical paretic curve gives a reading such as 5555543100, but he adds that there are many variations that may still be called paretic curves. The number of tubes showing complete precipitation may be increased or decreased somewhat without altering the interpretation. The number of fives may be reduced to two or three, and the result may still be called a paretic curve if the general form of the typical curve is present. A reading of 4444432100 should certainly be called a paretic curve, especially when the fours are well marked. If the reading starts with only threes, we are on the borderland between the paretic and the

syphilitic curve. Out of the author's series of 677 paretic curves, thirty-nine cases were not paretic; of these, fourteen were not cases of neurosyphilis. Cases of paresis do not always give paretic curves, because out of 638 cases of paresis a paretic curve was not found in the first fluid tested in eleven cases. Four of these later developed a typical curve, and in the remainder only one specimen of spinal fluid was examined.

The differentiation of cerebro-spinal syphilis from paresis is difficult, and the colloidal gold test cannot always be relied on to help in the differentiation. In cerebro-spinal syphilis the syphilitic type of curve (1233210000 or 3332110000) is most often found. In the author's experience, however, in his series of cerebro-spinal syphilis cases several paretic curves were found in the first fluid examined, and some fluids developed a paretic reaction later. Of thirty-one cases of cerebro-spinal syphilis, fifteen gave a paretic curve in the first fluid tested, and six gave syphilitic curves; in four the colloidal gold test was negative, and the remaining six gave atypical readings. In two cases of locomotor ataxia a paretic curve was obtained. In multiple sclerosis Moore has shown that a paretic curve is the usual reaction of the colloidal gold test. He found that of twenty undoubted cases of multiple sclerosis, eighteen gave typical paretic curves. The author has known five cases of multiple sclerosis in which paretic curves were found, and one of these cases was confirmed by post mortem. Besides these conditions, a paretic curve is occasionally found in undifferentiated neurosyphilis, in brain tumour, in brain abscess, in encephalitis, tuberculous meningitis, Korsakoff's psychosis, eclampsia, epilepsy, lead poisoning, and drug addiction. It is stated that the pathology of the above conditions would indicate more or less destruction of nerve cells in the brain, or, in other words, a parenchymatous involvement. It is therefore concluded that a paretic curve points toward parenchymatous involvement of the brain, while the milder gold curves are obtained in meningitis, vascular disease, and other conditions. The effect of treatment in favourable cases tends to change the paretic curve to the "syphilitic type," and then it may become negative. In some cases it has seemed that after treatment a provocative colloidal gold reaction was obtained.

D. K. HENDERSON.

MENINGITIC NEURO-LABYRINTHITIS. J. S. FRASER and J. K. (86) MILNE DICKIE, *Proc. Roy. Soc. of Med.* (Sect. of Otol.), 1920, xiii., pp. 23-58.

(1) MENINGITIC neuro-labyrinthitis is a frequent cause of deafness and deaf-mutism. (2) Deafness due to epidemic cerebro-spinal meningitis is certainly due to meningitic neuro-labyrinthitis.

Measles and pneumonia may also be followed by meningitis and secondary neuro-labyrinthitis. In acquired syphilis and mumps leptomeningitis is of common occurrence, and is associated with inner ear deafness, which is probably to be explained by neuritis or neuro-labyrinthitis (no microscopic examination as yet). Certain cases of deafness after influenza and osteomyelitis may also be of meningitic origin. (3) The original source of infection may be in the respiratory tract, parotid gland, genital organs, long bones, or elsewhere. (4) A blood infection (septicæmia) probably in all cases forms the connecting link between the primary disease and the onset of meningitis. (5) Meningitic neuro-labyrinthitis is usually but by no means always bilateral. The onset is usually sudden. Irritative symptoms, such as tinnitus and giddiness, are often present, but may not be observed owing to the mental condition (coma) of the patient. In epidemic cerebro-spinal meningitis and parotitis, deafness usually occurs early in the course of the disease. (6) Deafness due to meningitic neuro-labyrinthitis may be associated with other metastatic lesions, *e.g.*, orchitis, arthritis, mastitis, blindness or paralysis of the oculomotor nerves. (7) The infection usually passes along the sub-arachnoid space from the base into the internal auditory meatus, and then along the nerves and vessels to the labyrinth. In some cases the perilymphatic aqueduct is the route of invasion, while in others both paths may be involved. (8) As a rule both the cochlear and vestibular apparatus are affected. Frequently the cochlear apparatus is the one mainly or alone involved; rarely do we have a more or less isolated affection of the vestibular apparatus. (9) The pathological changes producing the deafness may be: (a) hydrocephalus; (b) changes in the walls of the fourth ventricle; (c) purulent infiltration of the eighth nerve with subsequent descending neuritis accompanied by atrophy of the spiral ganglion cells and Corti's organ; (d) purulent labyrinthitis which, if the patient lives long enough, is followed by the formation of granulation tissue and, later, of new connective tissue and bone in the hollow spaces of the labyrinth. (10) The resulting deafness is as a rule complete and permanent in the ear (or ears) affected. (11) Vestibular symptoms (loss of balancing and waddling gait) pass off rapidly in adults, but in young children they may last as long as one year. (12) In cases of sudden nerve deafness with or without vestibular symptoms, lumbar puncture should be performed and the cerebro-spinal fluid examined chemically and microscopically. The Wassermann reaction of the fluid should also be tested and cultures made. (13) Repeated lumbar punctures are of use in treatment, especially in cases of deafness due to hydrocephalus. Small doses of potassium iodide

and hypodermic injections of pilocarpin have been used in the treatment of meningitic neuro-labyrinthitis, but apparently without success.

AUTHOR'S ABSTRACT.

HYSTERICAL HEMIPLEGIA. Report of Case resulting from a (87) **Shrapnel Wound of the Scalp and presenting interesting Clinical Features.** HARRY H. DRYSDALE and J. S. S. GARDNER, *Journ. Amer. Med. Assoc.*, 1919, lxxiii., p. 1258.

A CASE of a soldier, aged 29, who developed a hemiplegia following a wound of the scalp. The scalp wound and the hemiplegia were both on the left side, and a complete Babinski sign of the left foot with left ankle and patellar clonus is recorded. Wassermann reactions were negative. The condition was later found to be functional.

A. NINIAN BRUCE.

WAR NEURASTHENIA, ACUTE AND CHRONIC. D. W. CARMALT (88) JONES, *Brain*, October 1919, xlii., p. 171.

A STUDY of 1,300 cases treated at a Neurological Centre in France, and considered from the physical as distinct from the psychical standpoint. Two conditions are recognised, one due to prolonged strain and gradual breakdown (chronic war neurasthenia), the other to sudden accidents with immediate collapse and frequent hysterical manifestations (acute war neurasthenia), but the difference is one of degree rather than kind. Acute cases are about twice as numerous as chronic, and the prognosis is far better with the former.

The condition is considered under the usual headings of Definition, Etiology, Pathology, Symptoms, Physical Signs, Diagnosis, Prognosis, and Treatment. The most frequent symptoms are those of common sensation in excess (headache and other pains), disturbance of sleep, and disturbance of co-ordination. Motor symptoms, except asthenia, are rare, and disturbance of special senses is also rare. Visceral symptoms in the circulatory, respiratory, alimentary, and excretory symptoms are frequent, but not invariable.

In diagnosis, the possibilities to be excluded are organic disease of the C.N.S., intercurrent disease, malingering, and dislike of military service. In treatment the importance of demonstration and encouragement in hysterical cases is insisted upon, and some details are given of the methods pursued in dealing with special symptoms. The results obtained were that of all cases 40 per cent. went direct to duty, 40 per cent. to light duty or convalescent camp, and 20 per cent. to Base Hospitals. Of the acute cases 50 per cent. went direct to duty, 34 per cent. to light duty, and 16 per cent. to Base Hospitals, and of those of gradual

onset 20 per cent. went to duty, 55 per cent. to light duty, and 25 per cent. to Base Hospitals.

The importance of disturbance of the ductless glands in producing the condition is discussed. AUTHOR'S ABSTRACT.

PSYCHIATRY.

UNIFORM STATISTICAL REPORTS ON INSANITY. NOW ASSURED: AN OFFICIAL CLASSIFICATION OF PSYCHOSES. JAMES V. MAY, *Journ. Nerv. and Ment. Dis.*, 1919, 1., p. 42.

THIS paper contains the set of statistical tables and classification of mental diseases adopted by the American Medico-Psychological Association, and it considers the classification "simple, comprehensive, and complete; it copies no other classification, but includes the strong features of many others; it meets the demands of the best modern psychiatry, but does not slavishly follow any single system." It has already been adopted by 145 of the 156 State hospitals for the insane in America.

The classification contains twenty types of mental disorder with forty-five sub-types and two additional divisions—"Undiagnosed Psychoses" and "Not Insane."

The classification is a good one, but no better than many others in existence, and many cases of mental disorder exist which on evolution would necessitate a transfer from the original pigeon hole of this classification in which they had been initially deposited, as must occur in any classification mainly based on symptomatology. H. DE M. ALEXANDER.

DEMENTIA PRÆCOX IN TWINS. MORRIS H. FRANTZ, *Journ. Nerv. and Ment. Dis.*, 1919, 1., p. 325.

THE cases are described of two twin brothers, born in 1897, who both developed dementia præcox. The first came under observation when 20 years of age, and had to be admitted to Central Islip State Hospital about two years afterwards, when he was found to be suffering from the catatonic type. The second came under observation when about 22 years of age, but did not require institutional treatment as he remained quiet.

A. NINIAN BRUCE.

A TYPICAL FORM OF ARTERIOSCLEROTIC PSYCHOSIS. A Report of a Case. S. UYEMATSU, *Journ. of Nerv. and Ment. Dis.*, 1919, 1., p. 513 (15 figs.).

A WOMAN developed symptoms of increasing headaches, with loss of memory, about the age of 40. This gradually progressed, and she passed into a state of dementia suggesting general paralysis,

but the Wassermann reaction was negative, both in the blood and in the spinal fluid. Death occurred about seven or eight years later. At the autopsy the brain was found extremely atrophic, giving a moth-eaten appearance. It weighed 970 gm. The larger arteries were markedly sclerosed. An old hæmorrhage was found in the internal capsule. Microscopic examination of the cortex revealed a peculiar alteration termed "spongy degeneration," with cystic cavity formation lined by proliferated neuroglia. Various stages were present of reactive growth of neuroglia and removal of degenerated products. This was attributed to cerebral malnutrition caused by cerebral arterio-sclerosis. The condition resembled the wasting found in general paralysis. The cause of the arterial sclerosis was not known. A. NINIAN BRUCE.

MENSTRUAL DISTURBANCES IN THE FEEBLE-MINDED.

(92) H. SWANBERG and H. A. HAYNES, *Journ. of Nerv. and Ment. Dis.*, 1919, l., p. 224.

A SURVEY of the 710 patients in the Michigan State Institution for Feeble-Minded showed that at least 20 per cent. suffered from menstrual disturbances. The percentage was in proportion to the degree of mental deficiency—the lower the degree the greater the percentage. Among the morons, dysmenorrhœa was the most common menstrual disorder, while amenorrhœa was uncommon; in the imbeciles, irregularity and amenorrhœa were most frequent, dysmenorrhœa being very uncommon; among the idiots, amenorrhœa and menorrhagia lead, while dysmenorrhœa was rarely found. A. NINIAN BRUCE.

HYPERGLYCÆMIA IN MENTAL DISORDERS. F. H. KOOP, *Brain*, (93) 1919, xlii., pp. 214-289.

THE paper starts with an introduction, in which the various experiments on emotional glycosuria are discussed. Just as the case in the so-called piqure-diabetes of Claude Bernard, emotional glycosuria is based on hyperglycæmia, the latter being effected by a hypersecretion of adrenalin.

In the first chapter the results are given of blood-sugar investigations on normal and insane persons. The author used the micro-method of Bang (1916). He examined the blood before breakfast, and $\frac{3}{4}$, $1\frac{1}{2}$, $2\frac{1}{4}$, and often also 3 hours after a breakfast consisting of 100 gm. of bread and butter and 200 c.c. of milk. The resulting averages in normal persons were: 0.98 before and 1.14, 1.16, 1.04, and 1.02 per mille after breakfast.

For sufferers from *dementia præcox* these per millages were: 0.93 before and 1.23, 1.10, 1.10 after breakfast. When excluding some emotional types among the patients of this group, and

taking the apathetic ones only, the amount of blood-sugar is still definitely lower. In one of the patients, who was highly excited at admission to the hospital, and who became more and more calm during the following days, a gradual decrease of the blood-sugar amount could be observed.

In *dementia paralytica* the average amount was found to be: 1.01 before and 1.31, 1.21, 1.09 per mille after breakfast. General paresis, however, being a disease with typical anatomical changes, is not very apt to help in solving the problem of emotional glycosuria; nevertheless, it could be clearly shown that strong emotions in general paralysis had a definite increasing influence on the blood-sugar amount. The same is the case with *genuine epilepsy*. The average of the calm and more or less demented cases was 0.90 before and 1.16, 1.04, 0.98, 0.93 per mille after breakfast. In excitement the amount appeared to be higher. The influence of emotions on the amount of sugar in the blood is most strikingly shown by the great differences between the sugar amount in the anxious and in the not-anxious type of *melancholia*. The averages of the not-anxious cases is also higher than the normal, being 1.03 before and 1.39, 1.22, 1.03 per mille after breakfast. For the anxious form these numbers are 1.13 and 1.63, 1.45, 1.19 per mille. The increased amount of sugar after a meal containing carbohydrates seems to be a constant feature of true melancholia; it also explains the well-known fact, that glycosuria is sometimes observed in this disease. The various theories of Raimann, of Wigert, and of Laudenheimer and Ehrenberg, who all gave a different explanation of this remarkable fact, are discussed by the author. He considers the emotion itself to be the only cause of the hyperglycæmia and the subsequent glycosuria, in the same way as it was shown by Cannon and his collaborators for animals. The increasing influence of emotion, especially of anxiety, on the amount of sugar in the blood, appears also from the cases of neuroses and of confusional insanity examined by the author.

Mania offered some difficulties, especially because of its very changeable character. The opinions of the various examiners greatly differ as to this point; in the author's opinion the blood-sugar amount is increased in the excited form or stage, whereas it is hardly above the normal in the milder types, and probably not altered in the so-called hypomania.

In the second chapter the question is discussed why it is that emotion causes this increase of the blood-sugar amount. As man and animal react in this respect in quite the same way, the solution of the problem must be looked for in the animal world. Cannon suggested already, in 1911, that hyperglycæmia might

be useful to the animal for performing actions which are liable to accompany emotions like fear and rage, *i.e.*, in flight and fight. When studying the other physical changes in emotions, it appears that all are extremely useful to the animal, and, like hyperglycæmia, dependent on an over-excitement of the sympathetic system (thoracico-lumbar outflow). The theories of Cannon ("Bodily Changes in Pain, Hunger, Fear, and Rage," 1918) and of Gaskell ("The Involuntary Nervous System," 1916) are then discussed. In Gaskell's opinion the more original, therefore the better, division of the nervous system should be into a somatic and a splanchnic part instead of a voluntary and an involuntary one. Both (somatic and splanchnic divisions) are to be subdivided in a voluntary and an involuntary part, the sympathetic system being the involuntary part of the somatic nervous system. When combining the theories of Gaskell and Cannon, one might come to the quite natural assumption that in emotions, like fear and rage, the whole somatic system is innervated, not only the part supplying the voluntary muscles, but also the involuntary (sympathetic) part. This condition is extremely useful to the animal, which wants a complete somatic innervation in the circumstances leading to the above mentioned emotions, during which a splanchnic innervation would be of no use at all. Some sympathetic reactions, not or only shortly mentioned by Cannon, are discussed in the remaining part of the second chapter. In the third chapter the author points out that several other well-known changes in mental disorders can be explained from the same point of view. He takes melancholia as an example for testing this question, though signs of sympathetic over-excitement may be observed in other psychoses too (*e.g.*, amentia-group), and all symptoms of melancholia cannot be explained by the above theory. The intestinal disorders, the vascular changes, and the dilation of the pupils are successively discussed. The inhibition of secretion and intestinal motility, the high blood-pressure and often increased pulse rate (contradictorily to the common textbook statement, the pulse in melancholia is most times to be found accelerated), and the dilated pupils are all dependent on the over-excitement of the sympathetic system (or hyper-secretion of adrenalin) in emotion. The author found that in sixty cases of true melancholia, the anxious patients showed a much more marked constipation, though they used a good deal more laxative, and were often constantly moving about; it appears that the cause of constipation in melancholia is not the general motor inhibition, the improper diet, &c., but the emotion, especially the anxiety, which by means of stimulation of the sympathetic system stops the intestinal motility.

At the end of the article a résumé is given and a diagram showing the different amounts of blood-sugar in the various psychoses.

AUTHOR'S ABSTRACT.

THE PRESENT STATUS OF THE PATHOLOGY OF MENTAL DISORDERS. ALBERT C. BUCKLEY, *Amer. Journ. Insan.*, 1921, lxxvii., p. 395.

THIS is a somewhat schematic but interesting review of the development of neuropathology. Griesinger has been credited with laying the foundation of the present pathological work. The earlier writers emphasised especially the changes in the cranial bones, the meninges, and the ependyma, conditions of morbid vascularity, atrophy, and other grosser changes. In 1858 Gerlach demonstrated that the brain tissues were capable of being stained. The most important advances occurred at the time when attention was directed to the subject of cerebral and spinal localisation. A tribute is paid to the work of Flechsig and Meynert, and it is pointed out how it was on the basis of their work that Wernicke attempted to explain all mental symptoms as originating from defects or disorders in the conduction paths connecting the various cortical areas. Histopathologic methods are still too crude in the matter of tissue fixation, dehydration, and staining, and we probably attempt to accomplish too much in a given time. The writer is of the opinion that if the same care was exercised in the matter of tissue treatment that the biological cytologists employ in their studies of chromosomes, that brains examined psychologically would give much more uniform results. Special mention is made in regard to the destruction of neurons, and the inability of nerve cells to reproduce would appear to be due to two facts: (1) most of the intracellular substance is utilised, and the energy has been expended to produce the comparatively large amount of protoplasm; (2) the nucleus is comparatively poor in chromatin, which in all other cell structures is the active material in cell reproduction. The different views in regard to the origin and function of neuroglia are discussed, and the statement is made that the consensus of opinion supports the idea that the functions of the neuroglia are multiple, that it is supporting, that it has a phagocytic action, that it serves as a means of repair, and probably has a secretory function. In acute mental conditions we find post-mortem evidence of hyperemia and acute cell changes, analogous to cloudy swelling in other tissues. The histological picture will vary with the method of staining. The Nissl, or one of its modifications, shows chromatolytic changes due to disintegration and alteration of the basic staining material in the protoplasm of the nerve cells, while the nucleus becomes deeply coloured with basic stains, is often distorted in outline, and eccentrically

displaced. With an appropriate selective stain one may demonstrate the increase of lipid material, or a condition of fragmentation and clumping of the intracellular fibrils. These changes may be brought about by febrile conditions, by exhaustion, by shock, or other exogenous toxins, but we know nothing in regard to the actual pathogenesis of the condition. A review is given of the present knowledge in regard to the pathology of dementia præcox.

D. K. HENDERSON.

WHAT AN ADEQUATE MENTAL HYGIENE PROGRAMME

(95) **INVOLVES FOR THE STATE HOSPITAL SYSTEM.** G. M. KLINE, *Amer. Journ. Insan.*, 1921, lxxvii., p. 329.

GROUP MENTAL HYGIENE. WM. BURGESS CORNELL, *Amer. Journ. Insan.*, 1921, lxxvii., p. 335.

TEN YEARS' WORK OF THE ILLINOIS SOCIETY FOR MENTAL HYGIENE. RALPH P. TRUITT, *Amer. Journ. Insan.*, 1921, lxxvii., p. 343.

AN EXTENSION COURSE IN PSYCHIATRIC SOCIAL WORK.

(98) HAROLD I. GOSLINE, *Amer. Journ. Insan.*, 1921, lxxvii., p. 355.

THE above papers all cover very much the same ground, and the whole topic is thoroughly discussed.

D. K. HENDERSON.

THE STATE PSYCHOPATHIC HOSPITAL. ALBERT M. BARRETT, (99) *Amer. Journ. Insan.*, 1921, lxxvii., p. 309.

THE State psychopathic hospital covers a very definite field, accomplishes great good, and should receive a greater amount of public support than is at present the case. Its special function should be to attack within its means all the problems of psychopathology, both practical and theoretical, having in mind the patient of the day and the patient of the future. It must be administered by a medical staff of adequate size, specially qualified for psychiatric work. It should have ample laboratory facilities for research and clinical diagnosis, and its activities should be dominated by an attitude of keen scientific interest. The most urgent motive for the development of psychopathic hospitals is to serve as teaching centres for psychiatric training. This can best be carried on in intimate connection with a medical school, so that the location of the hospital should be either in association with a medical school, or with a large general hospital. Such a hospital should also concern itself with the social aspects of mental disorder, and for this purpose the hospital should maintain out-patient clinics, travelling field services, and the family circumstances should be investigated wherever the patient's health seems dependent on them.

D. K. HENDERSON.

THE FIELD OF A STATE SOCIETY FOR MENTAL HYGIENE.

(100) E. STANLEY ABBOT, *Amer. Journ. Insan.*, 1921, lxxvii., p. 321.

NORMAL mental hygiene is positive, constructive, not merely preventive. It seeks to make the condition such that good minds shall have opportunity to be better. There is therefore a field of activity in the study of what constitutes a healthy mental environment, and in applying this knowledge to the whole population. Before the birth of a child mental hygiene has its place in the pre-natal clinic, so as to ensure that the expectant mother, and the father too, know how to create and preserve the best atmosphere for the baby to be born into. Health centres and health councils should be able to teach how to keep this atmosphere clean and wholesome, so that the right attitude and habits may be developed during the formative and impressionable years. The public schools have also a great opportunity for promoting the principles of mental health and for fostering normal psychic health. Children in schools should be carefully examined so that their education may be fitted to their individual capacities and needs. It is important that institutions and agencies should carry on investigations and research so as to provide the best guidance and aid in improving environment, and in teaching, training, and helping individuals.

D. K. HENDERSON.

Reviews

THE FORM AND FUNCTIONS OF THE CENTRAL NERVOUS

(101) **SYSTEM.** An introduction to the study of nervous diseases.

FREDERICK TILNEY, M.D., Ph.D., HENRY ALSOP RILEY, A.M., M.D., and GEORGE S. HUNTINGTON, Sc.D., M.D. Pp. xxiv+1020, with 591 figures containing 763 illustrations, of which 56 are coloured. Royal 8vo. H. K. Lewis & Co., Ltd., London. Pr. £3. 10s. net.

THIS large volume forms an important addition to the leading text-books on the central nervous system. It is designed to fill the gap between morphology and the practical requirements of clinical medicine, and adopts the method of illustrating anatomical and physiological facts by clinical examples. The anatomy and physiology of the central nervous system are not regarded as an independent branch of medical science, but are incorporated as essential parts of the practical knowledge necessary to the proper diagnosis and treatment of disease. It thus supplies a clinical as well as a physiological interpretation of the functions of the

brain and spinal cord adequate to the requirements of practical application. It is divided into fifty chapters upon an anatomical basis. The opening chapters deal with the importance and significance of the central nervous system, its embryological development, the nerve cell, the neurone theory, and the integration of neurones to form the nervous system. The different portions of the nervous system are then discussed, beginning with the spinal cord, and then ascending to the medulla oblongata, pons cerebellum, mid-brain, inter-brain, and end-brain. Each portion is worked through at length from the points of view of phylogeny, ontogeny, morphology, physiology, and pathology, the clinical syndromes associated with disease are discussed and explained, and illustrative cases are described. The result is a remarkably illuminating and satisfactory summary of our present knowledge. Particular attention has been paid to the illustrations, which are freely used all through the book, and render the various descriptions readily understood. The scheme of illustrating the lesion and its clinical effect side by side adopted by Dejerine in his well-known semiology is freely used here, and the different motor and sensory lesions are illustrated by colours. The importance and necessity of an accurate knowledge of the anatomy and physiology of the nervous system in clinical neurology and the way in which morbid conditions alter normal physiological reactions is well demonstrated here. The importance of correlating morphological and clinical neurology had resulted a number of years ago at Columbia University in the uniting of the structural, functional, and clinical aspects of neurological teaching under the directorship of the senior author of this volume.

DISEASES OF THE NERVOUS SYSTEM. H. CAMPBELL THOMSON, (102) M.D., F.R.C.P. Third Edition, revised. Pp. xvii+566, with 10 colour and 12 black and white plates, and 120 figures in the text. Cassell & Co., Ltd., London, New York, Toronto, and Melbourne. Pr. 15s. net.

THE second edition of this book appeared in 1915 and has been reviewed (*v. Review*, 1915, xiii., p. 571). The present edition has been brought up to date without materially increasing its size. The more recent work on injuries to the spinal cord, aphasia, and the functions of the cerebral cortex regarding sensation and vision, are incorporated. Encephalitis lethargica and the relation between the neuroses and the internal secretions have been now introduced, and the section on the psychoneuroses has been rearranged and rewritten. The reputation of the earlier editions is maintained.

A TEXT-BOOK OF PHYSIOLOGY. MARTIN FLACK, C.B.E., M.B., B.Ch., (103) and LEONARD HILL, M.B., F.R.S. Pp. viii+800, with 485 figures. Edward Arnold, London. 1919.

THIS book has been written with the primary object of giving to the student in an easily understandable form the fundamental facts and theories of physiology, bearing in mind the limitations necessary in a student's text-book. In view of the ever-increasing importance of the proper application of physiology to general medicine, it is hoped it may also prove of value to the general practitioner.

Twelve out of 77 chapters, occupying about 180 pages, are devoted to the physiology of the nervous system. The functions of the nerve cell and nerve fibre and of the different parts of the central nervous system are briefly described. Six pages deal with the autonomic nervous system. It is surprising to note that the authors state that the ventral spino-cerebellar tract (or tract of Gowers) arises on the opposite side of the cord from scattered posterior horn cells and possibly from cells of Clarke's column, although it is now established that this tract arises from the lower levels of Clarke's column on the same side, and that the greater portion of these fibres pass dorsally to mix with those of the dorsal spino-cerebellar tract and enter the cerebellum by the inferior peduncle. The book, however, is well adapted for the purpose for which it is written. There is a good index, but no bibliography.

PSYCHOLOGICAL PRINCIPLES. JAMES WARD, Sc.D., LL.D., Professor (104) of Mental Philosophy, Cambridge. Pp. xiv+478. Cambridge, at the University Press. 1918.

THIS important contribution is in part a development of the well-known article "Psychology," which appeared in the *Encyclopædia Britannica*. About a third of the book, however, is new, and is concerned with intellection, forms of synthesis, belief, certainty and faith, and conduct. It is an attempt to place the studious reader *au courant* with the psychological literature of the present day. "There is a psychology which arrogates to itself the term 'new.' It is certainly new, but it is not psychology, save in so far as it occasionally furnishes the psychologist with material of some value." As a *method* "it has done some good: as a pretended science in the hands of tyros whose psychological training has not even begun, it has done infinite harm."

The book is explanatory rather than descriptive, and psychology as a whole, not subsidiary details, is what is aimed at. The last two chapters deal with the general synthesis of mind and the concrete individual, and the concrete individual and characterology.

The connection of body and mind was the corner-stone of Aristotle's construction. Descartes, however, conceived these as two substances, therefore essentially distinct, and between them there was no natural connection. These two problems—the relation of body and mind, and the reality of external perception—have continued to vex philosophic thinkers from Descartes' time to our own, nor will they cease to trouble us, according to Professor Ward, till dualism is laid to rest.

War psychology does not come within the scope of this book, but in regard to pure psychology and its principles it is a mine of information.

MILITARY PHYSICAL ORTHOPÆDICS. Part I. Gunshot Wound (105) of Nerve. ARTHUR STANLEY HERBERT, M.D., B.S., Lieut.-Col., N.Z.M.C. Pp. 136, with 62 figures. M. F. Marks, Government Printer, Wellington. 1918.

THIS volume deals exclusively with the consideration of the later results of gunshot wound of nerve trunks and their treatment. It is practically a record of personal experience, as the work was done remote from other orthopædic hospitals. The grouping is in terms of convenience of treatment rather than of anatomy, and deals with the physical as distinguished from the surgical side of orthopædics. Emphasis is laid on the importance of promoting the voluntary action of partly paralysed muscles by the provision of artificial muscles, and thus rendering the results obtained by massage, electricity, baths, douches, &c., accessory rather than indispensable. It is claimed this method is simpler, less expensive, and more humane, as it removes the patient from the category of invalids to that of fairly useful workers. Great ingenuity has been exercised in devising the different mechanical supports of special splints and rubber muscles for the paralysed muscle, the use of rubber as an active elastic force being particularly utilised, and indeed is the basic idea underlying the whole system of treatment here advocated. The book is copiously illustrated by good figures, which add considerably to its value; the apparatus itself is characterised by its simplicity, and has stood the test of actual use in a large number of cases.

LOCOMOTOR ATAXIA: An Introduction to the Study and Treatment (106) of Nervous Diseases, for Students and Practitioners. WM. J. M. A. MALONEY, M.D. Pp. xxi + 299, with 97 figures. D. Appleton & Co., London and New York. 1918.

THE aim of this book is to correlate our present anatomical, physiological, pathological, and psychological knowledge of locomotor ataxia, regarded specially from the point of view of

treatment. The author considers that this disease is eminently suited for an introduction to the study of nervous diseases in general, as it is possible here to demonstrate the cause, namely the spirochæte, the lesions it produces, the results of disturbances of reflex integration and of interruption of sensory and motor pathways, vegetative disorders, and the interaction of the psyche.

The first recognition of tabes in England was by Todd in 1847, and in Germany by Romberg in 1841-51. Duchenne, of Boulogne, definitely established it as a clinical entity in 1857-58 as "ataxie locomotrice progressive." It begins about the age of 37 and lasts on an average at least fifteen years. It neither menaces nor shortens life. About one-seventh of all cases are abortive. The first symptoms usually are pupillary. The essential lesion is a syphilitic neuritis. Ataxia is largely merely a result of mental deterioration. Frenkel's exercises are disappointing: the best results are to be obtained by blindfolded teaching. The reason why optic atrophy tends to exert a beneficial influence on spinal tabes is due not to any actual change in the disease, but simply to the fact that blindness, by enforcing a life of inaction, simplifies reflex problems with resultant benefit to symptoms. Treatment tends to be too often directed towards replacing human defence by antisiphilitic remedies, and may thus contribute to increase the frequency of nervous syphilis. The treatment of the ataxic tabetic is the same as that of the preataxic tabetic, which in turn is identical with that of the syphilitic neurasthenic. The author does not support the intraspinal or intracerebral injection of salvarsanised serum. All treatment should be directed towards improving the mental state. As a general summary of the present state of our knowledge of tabes, the book is good. A bibliography of literature is appended.

THYROID AND THYMUS. ANDRÉ CROTTI, M.D., F.A.C.S., LL.D.
(107) Pp. 567, with 96 illustrations and 33 plates in colours. Lea & Febiger, Philadelphia and New York.

PROFESSOR CROTTI informs us that he was first attracted to the problem of goitre while acting as first assistant in the pathological laboratory of Professor Stilling in Lausanne. Later he worked with Kocher at Berne. Seventeen years' experience of goitre pathology and surgery in Switzerland and in America are recorded here, and the result is the production of one of the most extensive and complete monographs on this subject which have yet appeared. The first few chapters deal with the anatomy, histology, physiology, chemistry, and pathology of the thyroid, after which follow in succession chapters upon inflammation, intra-thoracic goitre,

malignant goitre, endemic goitre and cretinism, simple goitre, and exophthalmic goitre. Further chapters are devoted to the discussion of the various symptoms—cardio-vascular, ocular, muscular, digestive, nervous, respiratory, cutaneous, hæmopoietic, and metabolic. Considerable attention is paid to the etiology and treatment, both medical and surgical, of Graves' disease. Surgical technique, operative accidents, and post-operative complications come in for careful attention, and the last two chapters discuss the thymus and the surgical technic of thymectomy.

Graves in 1835 and Basedow in 1843 first gave a complete description of exophthalmic goitre, although the condition was not unknown before. The fundamental symptom is the tachycardia. The size of the thyroid is not proportionate to the severity of the disease. Unilateral exophthalmos has been described in at least 109 cases. The theory that exophthalmos is due to the muscle of Müller is discarded on the ground that it is an eyelid muscle and can thus produce eyelid symptoms, but not exophthalmos. That the sympathetic intervenes as an active and potent factor is beyond doubt, but the exact mechanism still remains to be discovered. The chief characteristics of the blood are leukopenia, hyperlymphocytosis, and hypopolynucleosis. Insomnia is also a frequent symptom. In 90 per cent. of cases malignant goitre develops in an already pre-existing goitre. The only specific treatment for simple goitre is iodine, best administered as a saturated solution of potassium iodide. Improvement should be found in two or three weeks, and if not present in two or three months with small doses, it should be discontinued on account of the possibility of producing artificially symptoms of hyperthyroidism. It is also recorded that thyrotoxic symptoms are always worse in the morning and improve towards evening, probably due to biochemical disturbances. There is no specific medical treatment for Graves' disease. Rest, which must be both mental as well as physical, is the most valuable remedy. Kocher also recommends phosphate of soda. Electricity is rarely of more than temporary benefit, with relapse as soon as the treatment is stopped. The results of X-rays are inconsistent and not lasting. Surgical treatment is the method of choice, and should be carried out in the true incipient stage. The only real danger to be feared is cardiac collapse, and hence the urgent need of operation before tachycardia and other cardiac symptoms have become established.

This review would not be complete were attention not also drawn to the excellence of the illustrations, and to the general get-up of the volume, for which both the author and the publishers are to be highly commended.

EXOPHTHALMIC GOITRE. A lecture delivered at the North-
(108) **East London Post-Graduate College, April 27, 1921.** WALTER
EDMUNDS, M.A., M.Ch., F.R.C.S. Pp. 36, with 4 plates. Baillière,
Tindall, & Cox, London, 1921. Pr. 3s. 6d. net.

THE author gives to Dr Parry, of Bath, the credit of being the first to give a clear account of the disease ("Medical Writings," 1825, ii., p. 114, where five cases were recorded). He suggests as a working theory that the condition is due to a vicious circle of mutual stimulation between the thyroid and adrenals, and that any stimulus, emotional or chemical, acting on either gland may start the disease. Besides its symptoms it has two sequelæ, myxœdema and diabetes. The function of the parathyroids is considered as quite separate from that of the thyroids, and the intimate connection of these two glands and the calcium salts of the body, with the loss of calcium in Graves' disease and diabetes, is regarded as evidence that cure should be sought by the administration of calcium or strontium.

FUNCTIONAL MENTAL ILLNESSES AND THE INTERDEPEND-
(109) **ENCE OF THE SYMPATHETIC AND CENTRAL NERVOUS**
SYSTEMS IN RELATION TO THE PSYCHONEUROSES.
R. G. ROWS, M.D., and DAVID ORR, M.D. Oliver & Boyd. Pr. 3s. 6d.

WE would recommend a perusal of this brochure to all those who are inclined to approach the study of the psychoneuroses and the psychoses from the purely psychological standpoint.

Dr Rows' contribution consists of the Morison Lectures delivered by him in 1920. He discusses the various mental symptoms exhibited by military and civil patients, and explains the physiological (and in some cases psychological) mechanisms by which their symptoms were evolved, and indicates the methods by which he dissipated them. It would be easy to quote many interesting and pregnant observations from these lectures, but to do so would be invidious where the whole is so good.

Dr Orr's communication deals mainly with the latest researches on the functions of the endocrino-sympathetic system and the disturbance of its equilibrium by psychic trauma with the production of sympathetic neuroses.

ANXIETY HYSTERIA. Modern views on some neuroses. C. H. L.
(110) RIXON and D. MATTHEW. With a Foreword by Col. Sir A. Lisle Webb.
Pp. xii+124, with 8 illustrations. H. K. Lewis & Co., Ltd.,
London. Pr. 4s. 6s. net.

A BRIEF, simple, and essentially readable account of anxiety hysteria resulting from war service and intended for those who are brought into contact with such cases without the opportunity

of much previous experience. Conversion hysteria is regarded as merely a symptom of anxiety hysteria and the harm done to such cases by treating them as if of organic origin is emphasised. The authors state that they have never known suicide attempted by a patient suffering from pure anxiety hysteria, and they regard all such cases as legally and morally responsible for their actions. They are not impressed by the abreaction, and are not convinced that there is always any marked emotional tone connected with repressed memories. As far as the war neuroses are concerned the descriptions are excellent, although the value of employment is underrated. The remarks on civilian neuroses do not hold good.

FUNCTIONAL NERVE DISEASE. An epitome of war experience (111) **for the practitioner.** H. CRICHTON MILLER, M.A., M.D. Pp. xi+208. Henry Frowde and Hodder & Stoughton, Ltd., London. 1920. Pr. 8s. 6d. net.

THE object of this volume is to present a simple picture of the functional neuroses of war-time, so that the outstanding lessons may be apprehended. Each chapter is written by a different author who has more or less specialised along that particular line. The subject-matter is discussed under four headings, viz., the physical factor, the hysterical factor, the anxiety factor, and the management of the neurotic. The last chapter is of the nature of a summary by Dr Wm. M'Dougall, who points out that the psycho-neuroses result from disharmony in the mind, which may lead to amnesia. The first step in treatment is mental exploration. Skilfully conducted conversation may suffice in many cases: if not, hypno-analysis, free association and the association reaction are needed. The psycho-genetic factors being discovered, re-adjustment must be made.

BENIGN STUPORS. A study of a new manic-depressive reaction (112) **type.** AUGUST HOCH. Pp. xi+284. Cambridge, at the University Press. Pr. 14s. net.

DR HOCH succeeded Adolf Meyer as director of the Psychiatric Institute of the New York State Hospitals in 1910. Meyer had developed the conception that the psychoses should be regarded as psychobiological reactions rather than rigid nosological entities. Kraepelin laid the foundations for systematic classification with his dementia præcox and manic-depressive groups, but the rigidity of the latter term has confused the problem of classifying many benign psychoses. It was Hoch's ambition to prove that, although elation and depression were the commonest mood anomalies in this group, they had no more theoretic importance than anxiety, distressed perplexity, or apathy. In other words, the name

“anxiety-apathy insanity” would be as appropriate, theoretically, as Kraepelin’s term. In 1917 Dr Hoch was forced to resign on account of ill-health, and he retired to California. This was to have been his first task, but he died after reaching about the fifth chapter, although copious notes indicated largely how the subsequent chapters were to be shaped. Dr MacCurdy, who had been in close touch with him all along, has completed the book.

This contribution to the benign psychoses is of great importance, and requires careful study. It represents the fruits of a long experience and unrivalled judgment. It forms a starting point for much further work. The subject is too complex to deal with in a short review.

MIND AND ITS DISORDERS. A Text-Book for Students and (113) Practitioners of Medicine. W. H. B. STODDART, M.D., F.R.C.P. Third Edition. Pp. xx+580, with 81 illustrations, including 9 plates. Demy 8vo. 1919. H. K. Lewis & Co., Ltd., London. Pr. 18s. net.

WE have already reviewed the first (*v. Review*, 1909, vii., p. 219) and the second (*v. Review*, 1914, xii., p. 505) editions of this well-known text-book. Since the last edition the author has fundamentally changed his attitude towards mental disease, having been convinced of the truth of Freud’s doctrines. He considers that mental disease can only be understood by studying the unconscious mind of patients, and that the physical manifestations must be regarded as secondary, not primary, as he taught in his first edition. The classification has been completely remodelled, and new chapters added on “anxiety neuroses” and “paraphrenia.” The author also considers that the war has not added much to our knowledge of mental disorder. It has stimulated our knowledge of functional nervous disease, but, he states, none of the war cases underwent a deep psycho-analysis.

MENTAL HOSPITAL MANUAL. JOHN MACARTHUR, M.R.C.S., (114) L.R.C.P. Pp. ix+215. Henry Frowde and Hodder & Stoughton, London. Pr. 15s. net.

THIS book is designed to supply the newly joined medical officer in a mental hospital with a practical handbook stating concisely what he is required to know and what is expected of him. No attempt has been made to give any account of mental disorders themselves. It fulfils this purpose well, being clearly written, complete, and up to date. The usual methods of treatment employed in mental hospitals are briefly described. Attention is drawn to the need of increasing facilities for the early treatment of mental disease by the establishment of out-patient clinics.

THE MANNER OF MAN THAT KILLS. L. VERNON BRIGGS, (115) Boston. Pp. 444, with illustrations. Richard G. Badger, Boston, U.S.A. Pr. \$5.00 net.

DR BRIGGS presents here an important contribution to the problem of the early supervision of mental disorders. He shows, as a result of a close study of three of the most important of recent murder trials in America, that it was very doubtful if any of the three murderers were actually and legally responsible for what they did. He records a description of their life-histories, together with photographs taken at different periods of their lives. The three men are Spencer, Czolgosz, and Richeson. The first was a defective whose early life had demonstrated that he was not a safe individual to live unguided in the community. Czolgosz was responsible for the death of President M'Kinley, and appears to have been a case of dementia præcox; and Richeson was a victim of hysteria with delusions, hallucinations, amnesic periods and delirium, and had been recognised as mentally unsound. Dr Briggs has devoted much time and labour to the life-histories of these three cases, and has produced a most convincing account of these three men, all of whom were executed.

No psychiatrist can possibly afford to omit a careful study of this volume, which is, however, written in a somewhat popular style, with the aim of instructing and influencing public opinion in such cases, and especially of emphasising the need of protecting such individuals from the effect of their actions, otherwise they not only come to grief themselves but involve innocent persons in their tragedies. As a contribution towards this end the above volume ranks very high, and has been well worth the time spent on its production. The necessity for the early recognition and appropriate treatment of such cases is becoming increasingly realised, and a contribution such as this demonstrates clearly its importance to the community at large. The views expressed regarding the difference between medical and legal insanity, and the proper examination of criminals for mental states are worthy of careful attention. Dr Briggs has rendered good service in undertaking and carrying through this investigation, the value of which is ample reward for the long and painstaking labour involved in its production.

INSANITY AND MENTAL DEFICIENCY IN RELATION TO (116) **LEGAL RESPONSIBILITY.** A Study in Psychological Jurisprudence. WILLIAM G. H. COOK, LL.D.(Lond.), of the Middle Temple, Barrister-at-Law. Pp. xxiv+192. George Routledge & Sons, Ltd., London. Pr. 10s. 6d. net.

THE law relating to the civil responsibility of lunatics stands upon a very unsatisfactory footing. The term responsibility is

a purely legal one, and means liability to punishment. The legal test of criminal liability is, according to English Law, the knowledge of right and wrong when the act was committed, but this is not the test for insanity. The law relating to the criminal responsibility of lunatics has reached an advanced stage, and definite rules have been laid down for the guidance of Courts dealing with such cases, but no such precision exists in regard to *civil* responsibility. In fact, distinguished lawyers have not hesitated to say that several of the modern cases have been wrongly decided.

The author, after an examination of 200 leading cases, has here attempted to set out a statement of the law (*a*) as declared by Statute or by Courts of Justice, and (*b*) as, in the opinion of the writer, it ought to have been or should be declared to be, having regard to (i.) reported cases, and (ii.) the principles of Common Law and of Equity. After a careful and comprehensive survey it is concluded that the Common Law of England regards a lunatic generally as being incapable of committing a tort (unlawful act), but that where it can be shown that the nature of his insanity did not preclude him from understanding the nature and probable consequences, he is liable just like an ordinary person. It is thought that the law as to contracts alleged to have been entered into by lunatics during insanity should be declared to be as follows: (1) The alleged contract is void, but with the object of preventing the lunatic from benefiting from his acts, the lunatic or his estate should be required to make restitution to the other party where (i.) the lunatic has derived benefit as a result of his act, and (ii.) where the other party has suffered loss as a result of the action of the lunatic. Inasmuch as the policy of the law of England is to protect infants on the ground of their immaturity of reason, much more is it to be expected that the law would protect lunatics who have no reason at all. The results of their actions are indistinguishable from unavoidable accidents. A comparison with the laws in other countries is given.

In an appendix the following reforms are suggested: The abolition of the law of settlement of pauper lunatics; that the Board of Control be made a sub-department of the new Ministry of Health, and that the Board be given statutory powers to deal with all cases of unsoundness of mind (*i.e.*, lunatics and mental defectives) in such manner as may be prescribed by Parliament, as well as those suffering from incipient mental disorders.

WHAT IS PSYCHOANALYSIS? ISADOR H. CORIAT, M.D. Pp. 124.
(117) Kegan Paul, Trench, Trubner & Co., Ltd., London. 1919.
Pr. 3s. 6d. net.

A BRIEF explanation is given here of the aims and purposes of psycho-analysis in the form of answers to questions that are constantly being asked about this subject. These questions are recorded, and the answers planned, partly on the basis of the theory of psycho-analysis, and partly with a view to meeting certain objections and criticisms which were made at the time the questions were answered. Particular reference is made to its aim and purpose, and its field of usefulness as a therapeutic procedure. The character of the book permits only a minimum of theory and discussion. A short and useful bibliography is appended.

TREATMENT BY HYPNOTISM AND SUGGESTION, or Psycho-
(118) **therapeutics.** C. LLOYD TUCKEY, M.D. Seventh Edition, with
a chapter on Treatment by Suggestion during the War, by
A. Percy Allan, M.D., B.S. Pp. xiv+413. Baillière, Tindall & Cox,
London. Pr. 21s. net.

THE fifth and sixth editions of this book have previously been reviewed (*v. Review*, 1907, v., p. 577, and 1914, xii., p. 534). This edition differs from the last by the omission of the chapter on psycho-analysis, as the author feels this is now a recognised and separate treatment, with its own literature. The treatment by hypnotism of anxiety and other conditions resulting from the war is merely referred to without any definite information being supplied sufficient to allow judgment to be passed of its value. No description is given in what types of cases it was found suitable or unsuitable, and the general impression is left that it was found unnecessary, as all that was necessary could be obtained by simpler methods.

THE THIRD AND FOURTH GENERATION: An Introduction to
(119) **Heredity.** E. R. DOWNING. Pp. xi+164. University of Chicago
Press, Chicago. Pr. \$1.00 net.

THE destiny of the individual is the resultant of heredity, environment, and training. The object of this book is to show how important heredity is, and in what ways it is important. Experiment and research have established certain facts clearly. These are described. Inbreeding, for instance, merely prevents the dilution of a superior stock, but if a poor stock is used, the inferior qualities continually reappear in the offspring. Due attention is directed to the work of Mendel and his successors, and their results are summarised. The more recent work of Goddard at Vineland, New Jersey, receives notice, and the importance of preventing the propagation of mental defectives is noted. The practical application of heredity to eugenics is the

subject of the last chapter, and an appendix of books for further reading concludes an interesting and instructive essay.

TEXT-BOOK OF OPHTHALMOLOGY. Hofrat ERNST FUCHS, former (120) Professor of Ophthalmology in the University of Vienna. Authorised translation from the twelfth German edition; completely revised and reset, with numerous additions specially supplied by the author and otherwise much enlarged, by Alexander Duane, M.D. Sixth Edition. Pp. xxv+1067, with 462 illustrations. J. B. Lippincott Company, Philadelphia and London. Pr. 35s. net.

THIS edition appears to be a reprint of the fifth edition (*v. Review*, 1917, xv., p. 524). The fact that this has been found necessary is the best testimonial to its value. It has to be noted that these two editions contain many additions and changes supplied by Prof. Fuchs himself, and not present in the German edition from which the translation was made:

THE CATARRHAL AND SUPPURATIVE DISEASES OF THE (121) ACCESSORY SINUSES OF THE NOSE. ROSS HALL SKILLERN, M.D. Third Edition, thoroughly revised and enlarged. Pp. xxiv+418, with 300 illustrations. J. B. Lippincott Company, Philadelphia and London. Pr. 30s. net.

THE second edition of this book has already been reviewed (*v. Review*, 1917, xv., p. 43). This edition has been brought up to date, the principal new matter being the result of the author's war experiences, especially the influence of the diseased sinuses on the general system and the amount or degree of incapacity produced in the individual, and the injuries and wounds of the sinuses themselves. These, as far as they are of interest in civil life, have been incorporated in the new edition, as well as additions of new treatments and surgical procedures which have proved of sufficient merit.

ON LONGEVITY AND MEANS FOR THE PROLONGATION OF (122) LIFE. Founded on a Lecture delivered before the Royal College of Physicians on 3rd December 1903. Sir HERMANN WEBER, M.D., F.R.C.P. Edited by F. Parkes Weber, M.D., F.R.C.P., with a Preface by Sir Clifford Allbutt, K.C.B., F.R.S. Fifth enlarged Edition, revised and partly rewritten. Pp. xxii+292. Macmillan & Co., Ltd., London. 1919. Pr. 12s. net.

THIS book, the fourth edition of which was published in 1914 when Sir Hermann was in his 91st year, was written as much for the lay as for the medical reader, and is too well known to require much comment. It is a plea that we should live healthier and more wholesome and thus more beneficent lives, the virtues of fresh air, exercise, diet, housing, climate, habits, being extolled, and morals—the hygiene of the mind—not being forgotten. A

section is devoted to the nervous system, and the importance of functional disease as a cause of later organic disease is clearly described. The precautions to be observed by those who suffer from high arterial pressures or come of apoplectic families are excellent. The cases described all through the book illustrate the author's points of view well. The importance of holidays and recreation, of the prevention of disease, and of mental exercise, are all dealt with in turn, and are summed up admirably in the recapitulation.

WHITE AND MARTIN'S GENITO-URINARY SURGERY AND (123) VENEREAL DISEASES. EDWARD MARTIN, A.M., M.D., F.A.C.S., BENJAMIN A. THOMAS, A.M., M.D., F.A.C.S., and STIRLING W. MOORHEAD, M.D. Pp. xv+923, with 424 engravings and 21 coloured plates. Twelfth Edition, revised. J. B. Lippincott Company, Philadelphia and London. Pr. 35s. net.

THIS edition does not differ from the eleventh edition, except that a section has been added on the prophylaxis of venereal disease, some of the sections have been modified so as to make them more complete or specific, and a few new illustrations have been introduced.

The authors state that they are not convinced of either the safety or the special value of subdural injections in cerebrospinal syphilis; and they do not consider that either prolonged or continuous treatment, or intensive courses, should be given merely with the sole view of changing a positive Wassermann reaction to a negative in old symptomless syphilitics, although intermittent treatment short of drug reactions are advisable.

Obituary

**HENRY MAUDSLEY, M.D., F.R.C.P.,
HON. LL.D., EDIN.**

HENRY MAUDSLEY came of a yeoman family, the De Maudsleys, long settled in Yorkshire, near the border of Lancashire.

He was born on 5th February 1835 at Rome, near Settle, Yorkshire, and was the third son and fourth child of Thomas Maudsley. He commenced his scholastic education at Giggleswick School, but subsequently he went as a private pupil to Mr Newth, of Oundle, Northamptonshire. From there he matriculated at the University of London, and he was then apprenticed to Mr Clover, afterwards the well-known anæsthetist, but at that time apothecary to University College Hospital. His career as a

medical student was most distinguished. Although he seldom attended the classes, and seemed to have devoted his time mainly to sports, yet he carried off ten Gold Medals; he also took the University Scholarship and Gold Medal in Surgery when he graduated M.B.(Lond.) in 1856.

He told me that after being House Surgeon to Mr Quain, it was an accident that he did not pursue a surgical career, for it was only by a mischance in his application that he failed to obtain a surgical appointment. Afterwards he contemplated entering the Indian Medical Service, and in order to fulfil the regulation requiring candidates at the examination to have had experience in mental diseases, he took an appointment at the Essex County Asylum. This seemed to have determined his career, for after a short period at the Wakefield Asylum, he became, at the early age of twenty-four, Medical Superintendent to the Manchester Royal Lunatic Asylum, Cheadle. He retained this appointment three years, and then, in 1862, he returned to London.

His brilliant intellectual qualities and philosophic mind were exhibited in numerous original articles published in the *Journal of Mental Science*, under Dr Bucknill's editorship, by whom he was nicknamed "the young philosopher." Thus it occurs he harked back to his grandfather, who was notable in the countryside "for his sayings, sardonic and sarcastic," which had earned him the soubriquet of "the old philosopher."

Maudsley's philosophical mind first revealed itself to the general public by a remarkable essay on "Hamlet," in which he clearly shows that the melancholic Dane was feigning insanity. His brilliant intellectual writings attracted the attention of Dr Conolly, at that time Superintendent of Hanwell Asylum, where he had attained a great and deserved reputation for fearlessly introducing the humane treatment of the insane, and casting aside the chains and all other mechanical devices of restraint.

Conolly had a small private asylum near by, and he offered Maudsley the post of resident physician there, which he took and held for a time. He afterwards married Conolly's youngest daughter.

He then settled in London, and soon after was appointed editor of the *Journal of Mental Science*. Two years later he became physician to the West London Hospital. In 1869 he was appointed Professor of Medical Jurisprudence at University

College, London, and he retained this chair for ten years. Early in his career as an alienist consultant he attained success, and contemporaneously became well known both at home and abroad as an author, by his works on the mind, which appealed not only to the profession, but to the intelligent public. In all his works his aim was expressed in his own words, in "The Physiology and Pathology of Mind" published in 1867.

"To treat of mental phenomena, from a physiological rather than from a metaphysical point of view, and to bring the manifold instructive instances presented by the unsound mind to bear upon the interpretation of the obscure problems of mental science. Also to do what he could to put a happy end to the inauspicious divorce between the physiology and pathology of mind." Again, in his latest work, "Organic to Human," he says: "There can be no mind without memory, and no memory without body."

All through his works, whether earlier or later, we find the same trend of thought and reasoning. He was strongly opposed to metaphysical explanations and introspective philosophy, which he termed "thinking on thinking." In 1876 he published his "Physiology and Pathology of Mind" in two separate parts. It would repay the present generation to read these works, which are frequently referred to by Charles Darwin and Ribot, and many other of his great contemporaries. He recognised the important influence of the sexual glands on the mind and its development. One of the most interesting chapters is "On the Emotions or Affections of Mind." It is prescient and original in thought, and is particularly interesting after the experience of the effects of emotional stress upon millions of human beings. One passage, in relation to conditions of emotional shock, may be quoted with advantage at the present time:—

"To all appearances a violent emotion may react as a strong physical shock to the nervous system, for it may produce convulsions, fainting, loss of sensation, paralysis of movement, deafness, exactly the effects which a strong electric shock may produce. We have not then to do with mysterious self-determining agencies; we have to do with phenomena which, complex as they are, will eventually receive a complete analysis."

In a copy of his work, "Physiology of Mind," which he presented to me, he said: "The quotation-notes at the end of chapters

might at any rate be interesting." These quotations and the references show his extraordinary knowledge and wide reading, whence he got the broad grasp of science and philosophy as applied to the physiology and pathology of mind, and how he has analysed and woven them into his work in a most lucid and convincing way, so that it has become his own fabric and not a patchwork of thoughts and ideas of others. In 1874 he published "Responsibility in Mental Disease" in the International Scientific Series.

In 1885 he published "Body and Will," and in 1886, "Natural Causes and Supernatural Seemings," a book which reached its third edition in 1897. Another book was "Life in Mind and Conduct," 1902; and his final work, which embodies the philosophy of his long life, is entitled: "Organic to Human, Psychological and Sociological," appeared in 1917. This work shows an extensive experience and knowledge of human character of all sorts and conditions of men, individual and collective, combined with a broad grasp of biological science, taken in its widest acceptation, whereon he founds his philosophy of the unity of the human organism and its continuity with the rest of the processes in organic nature.

MS. copies of many of his works are in the Library of the Maudsley Hospital, also many translations of his works into foreign languages. The MS. copies are remarkable in the fact that there are so few corrections; he must have written with great care. Borrowing his own words, it may be said that having done diligently the work which it came in his way to do for a livelihood, and fulfilled his life function in the *sincere utterance of himself*, Maudsley has left his philosophical and philanthropic work to the fate of time and event, well knowing that when all is said—

"Thought is the slave of life and life the fool of time,
And time that takes survey of all the world
Will have a stop."

Up to a few days before his death in January 1918, when I last saw him, he retained all his remarkable mental faculties, and his memory was marvellous, for he could quote long passages from the great authors and poets, and show, by his conversation, that he still kept abreast with the general principles underlying modern biological science.

THE MAUDSLEY HOSPITAL.

Hitherto I have dealt with Dr Maudsley as a physician and philosopher, but he will always be remembered also as a philanthropist. In 1909 he communicated to me his desire to give £30,000 to the London County Council if it would build a hospital for the study and treatment of acute mental cases.

Dr Maudsley's gift was accepted, but nearly seven years elapsed before the Council found a site; finally one was obtained at Denmark Hill, opposite the new King's College Hospital. The hospital was not finished when the war broke out, but it was completed early in 1916, and was at first part of the 4th London General Hospital, and subsequently it became the Neurological Clearing Hospital. For the past fifteen months it has been utilised by the Ministry of Pensions. Since its opening, the Pathological Department has carried on all the pathological work of the L.C.C. Asylums formerly conducted at Claybury.

The following distinguished foreigners have carried on research work in the Pathological Laboratory of the Maudsley Hospital: Dr Sano, Superintendent of Gheel; Professor Marinesco, of Bucharest; and the following Japanese medical men: Staff-Commander Kojima, Dr Matsumoto, Dr Morowka, Dr Hayao, Dr Uno, and Dr Gominami. The last three named, Dr Prado y Such, of Madrid, Dr Golla, and Mr Kenneth Walker, are at the present time carrying on valuable research work.

A course of instruction in Psychological Medicine was instituted in May of last year, and thirty-six registered practitioners attended. Another course has since been completed, and a third course will commence on 5th April. The great majority of the medical men and Asylum medical officers who have attended these courses have been successful in passing the examinations required for the diploma of Psychological Medicine, either by the University of Cambridge, the University of London, or the Conjoint Board of the Royal Colleges of Physicians and Surgeons.

Thus one part of Dr Maudsley's wish has come into actual being at last.

At the end of October the hospital was taken over by the L.C.C., and after necessary repairs and decorations have been completed, it will be opened for the civil population, and thus the objects of Dr Maudsley's great generosity will, it is hoped, meet with a rich fulfilment.

F. W. MOTT.

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