
This is a fairly comprehensive study of recent literature on the function of the basal ganglia, from which the author draws the following conclusions:—

1. The function of 'tonus' is a purely vegetative function under the control of part of the corpus striatum. Its normal function gives the required plasticity to contraction of muscles and its partial or total lack of control is exhibited in degrees from the impossibility of complete relaxation to tremor and rigidity.

2. The other part of the corpus striatum and lower centres connected with it (in addition to the general tonic function) must control automatic or in any other way stereotyped movements, as this system represents the highest motor centre in those low forms of life where there is no cortical function. It is an instance of loss of independence on the part of a centre which otherwise sticks to its functional characteristics. The human corpus striatum may be compared to a horse which has found its rider. The horseman has the leadership, but the motions are the horse's motions and not those of the rider.

3. The thalamus is exclusively a sense organ, and through its three connections (with (1) cortex, (2) corpus striatum, (3) subthalamus) are obtained in line of motor reaction respectively, voluntary motions, tonus, automatic motions, and 'vegetative proper' motor phenomena.

4. The true place of localizations is the spinal cord as well as the medulla, while the superior centres do not act as real motor or sense centres, but purely as fields of association, with the result of either release or inhibition of lower centres.

5. Through the vegetative function of the basal ganglia the action of the endocrine glands on the nervous system can be readily understood.

R. G. GORDON.


The author summarises his theory of the dual modality of motor function and lays stress on the function of the cerebellum as the ganglion of the static or postural system. On this theory he gives an explanation of commonly observed cerebellar symptoms as a disharmony between motor and static activity in the action of muscles.

R. G. GORDON.

NEUROPATHOLOGY.


The authors describe a method of fixation of the cells of the cerebrospinal fluid with iodine vapour.
fluid which in their hands has given excellent results. A strip of thick plate-glass is placed in a petri dish, and a few crystals of iodine are scattered over the bottom of the dish. Very gentle warming soon fills the dish with purple fumes. The slide or cover-slip, with a drop of fluid on it, is then placed in the dish and rested on the strip of plate-glass, and the cover replaced. Within a few moments the drop of fluid turns a light yellow brown, the cells becoming well fixed almost at once, long before the drop as a whole has dried. The drop is kept in the iodine chamber until dry, in order to fix the cells firmly to the slide or cover-slip. At this stage the preparation looks very unpromising. It is a dirty purple, with minute crystals of iodine sublimated on it, and a film of coagulated proteins overlying all. The iodine can be completely removed, however, by washing the preparation for a few moments in a fresh, concentrated solution of potassium iodide. It is important to do this thoroughly, as the presence of residual iodine affects the staining; but one or two changes are always adequate. The potassium iodide is rinsed off with distilled water, and the preparation is then ready for staining. Pyronin methyl green or Mayer's carmalum is recommended.

R. M. S.

[9] The correction of colloidal gold solutions as applied to the Lange reaction.—N. Novick, Arch. of Neurol. and Psychiat., 1926, xv, 471.

The author refers to the difficulties often encountered in the preparation of a proper colloidal gold solution. To be of any value, a solution must be absolutely neutral, and the usual method of correcting a slightly acid or alkaline gold sol. is not very satisfactory, for when alizarin red is used as an indicator the end point is not easily determined. Novick has obtained satisfactory results by using in titration one per cent. sodium chloride solution to the extent of 1.7 c.c. as an indicator. This salt is an electrolyte and a precipitant of colloidal solutions, and serves as an accurate and highly satisfactory indicator of the reaction state of a prepared colloidal gold solution.

R. M. S.


Historical.—Nonne states that Quincke discussed suboccipital puncture but considered it too dangerous. Obregia recommended it; he called it 'Rachicentese sous-occipitale' and considered it suitable for obtaining fluid from the seat of disease in cases of infections of the brain and meninges. Eden practised it several times before 1918 in cases of meningitis and tetanus. Its use for diagnostic purposes was introduced by Wegeforth, Ayer and Essick in 1919. Eskuchen, Nonne and Sicard in Europe have been largely responsible for its introduction.
Cisternal puncture was preceded by the surgical method of exposing the
cerebello-medullary cisterna to relieve pressure in cases of meningitis and
hydrocephalus.

Practical.—The occipito-atlantal ligament is usually pierced at a depth of
three to five centimetres and the depth of the cisterna itself in adults is from
one-and-a-half to two centimetres.

Several techniques are described, differing in the landmarks selected. The
author prefers that of Eskuchen, in which the needle is entered at a point
about midway between the spine of the axis and the level at which the liga-
mentum nuchae is felt to leave the occipital bone. It is directed towards the
point at which the occipital bone is gauged to end. If the bone is encountered
with the point of the needle one feels one's way carefully along it to the foramen.
The foraminal edge of the occipital bone is the point for orientation.

Cisternal puncture should be practised first on the cadaver, although the
 cadaver differs from the living in that the tissue resistance is greater and the
 piercing of the occipito-atlantal ligament cannot be appreciated.

The procedure is dangerous except in skilful hands and deaths have been
reported. The advantages over lumbar puncture are: fewer unpleasant sequelae
such as headache, and less chance of blood-stained fluid being obtained; the
fluid is obtained almost immediately from the ventricles; for encephalography
less air requires to be introduced than by the lumbar entrance; for intro-
duction of lipiodol it is valuable.

The patient may be sitting or lying down but in cases of suspected spinal
blockage more information is obtained if he is recumbent and lumbar puncture
is performed at the same time.

The operation is dangerous in cases of cerebral tumour but less dangerous
than lumbar puncture.

J. P. Martin.

[11] Significant chemical changes in the spinal fluid in meningitis.—
M. Osnato and J. A. Killian. Arch. of Neurol. and Psychiat., 1926,
xv, 738.

The lactic acid content of normal spinal fluid during the fasting and resting
state varies from 6 to 10 mg. per hundred cubic centimetres. The lactic acid
concentration of the spinal fluid bears a close relation to its concentration in
the blood. An increase of the lactic acid of the blood is associated with a
similar increase in the spinal fluid, and the reverse of this appears true. An
increase of the lactic acid of the spinal fluid and of the blood was found in
nephritis and epilepsy following the convulsions. In epilepsy the spinal
fluid after the convulsions gave figures for lactic acid exceeding those for the
blood obtained at the same time. Spinal fluids obtained from cases of menin-
gitis showed high figures for lactic acid. The source of this increased formation
of lactic acid appears to be the cellular metabolism. In some instances no
decrease was noted in the sugar in fluids in which the lactic acid was increased above normal; in others, however, no reaction for sugar was obtained. In no instance did the increase in lactic acid account for all the sugar lost.

R. M. S.


Xanthochromic spinal fluid associated with tumour of the brain indicates a tumour involving the external or the ventricular surface, and sufficiently soft and vascular, or so surrounded by engorged vessels, as to permit haemorrhage or transudation into the cerebrospinal fluid. The available evidence points to a haemolytic origin for this xanthochromia, and the haemorrhages accounting for the colouration are probably scanty and repeated. The number of erythrocytes present is a measure of the softness and the vascularity of the tumour, and when they are numerous in a yellow spinal fluid operative procedures which markedly reduce the intraventricular pressure are possibly contraindicated.

R. M. S.


Rather elaborate theories have been advanced concerning the cause of cerebrospinal rhinorrhoea, but according to Locke the escape of cerebrospinal fluid from the nose is almost invariably associated with internal hydrocephalus and increased intracranial pressure. The most common lesion which causes a combination of these two factors is a cerebral neoplasm, but inflammatory or congenital obstruction of the cerebrospinal fluid may also be responsible. It is possible that increased intracranial pressure causes atrophy of the cribiform plate, as the dura overlying this region is especially susceptible to penetration because of the tiny holes which are normally present for the exit of the olfactory nerves. Furthermore, the arachnoid membrane and the subarachnoid space continue for a short distance along them. When the thin cribiform plate is atrophied, and the normal openings in the overlying dura and arachnoid are enlarged by increased intracranial pressure, there remains only the ethmoid mucous membrane between the cerebrospinal fluid spaces and the nasal cavity; and this membrane is unable to withstand the pressure placed upon it.

Why there should be a continuous flow of cerebrospinal fluid in cases in which there is an intraventricular obstruction and a proved communication between the cisterna basalis and the nose is not very clear. It may be that we still lack the correct conception concerning the circulation of the cerebrospinal fluid, and that more fluid than we suspect is formed in the subarachnoid spaces. It is also possible that the extraventricular portion of the choroid plexus may be excessively active and in hydrocephalus there may be accessory
openings between the cerebral ventricles and the subarachnoid spaces. The intermittent nature of many of the cases of cerebrospinal rhinorrhoea may be accounted for by a localized, ascending inflammation, the exudate from which may close the fistula for a time until the accumulation of the fluid has caused sufficient pressure for it to break through again.

The only rational form of treatment for this condition is one directed towards the relief of the obstruction of the cerebrospinal fluid pathways, but too great an operative risk should not be taken, as some patients with rhinorrhoea and brain tumour have lived for many years, the escape acting as an effective decompression.

R. M. S.


An old woman who had been for some time under medical care at the Salpêtrière but had not been specially examined, died suddenly. At the autopsy three intracranial tumours were discovered. Two were subtentorial, arising from the dura mater investing the transverse sinus, the larger having the size of a tangerine orange, the smaller that of a cherry. The third of about the same size was attached to the falx cerebri. All these tumours presented the macroscopic and microscopic features common to the group of benign meningeal growths which are best called meningiomas. The situation of the two tumours in this case, in the posterior fossa, was unusual, but in arising from the wall of the transverse sinus they were true to type. It was remarkable that they had given rise to no noticeable symptoms during life.

Various theories as to the origin of these tumours are discussed. When multiple they are frequently associated with multiple neurofibromata. The latter tumours are considered to arise from the sheath of Schwann, which is a development of the ectoderm. Oberling has suggested that the meningeal growths are also of ectodermal origin and has proposed the name meningo-blastoma for them. This theory would explain the association.

C. P. S.


Two cases of bifurcation of the cord are described. Each was an accidental finding at autopsy; during life no symptoms referable to the condition were discovered. In each the developmental defect arose at the lumbosacral level. A brief discussion of the nature of this diplomyelia is appended.

S. A. K. W.
Further studies on the etiology of epidemic hiccup (singultus), and its relation to encephalitis.—E. C. ROSENOW. Arch. of Neurol. and Psychiat., 1926, xv, 712.

A STREPTOCOCCUS, alike in morphology and with similar cultural characters and having similar immunological reactions, was isolated from the nasopharynx of twenty cases of epidemic hiccup, and with each strain spasms of the diaphragm or other muscles were produced in animals. From these, the organism was isolated and characteristic symptoms again induced on inoculation. It was demonstrated in the lesions, and proved absent elsewhere, by microscopic examination of sections.

Similar experiments, made with streptococci from cases of poliomyelitis and other diseases of the nervous system, from poliomyelitis contacts, from normal controls, and from patients that had recovered from hiccup, gave strikingly different results. The possibility of an accompanying filterable virus (in the usual meaning of that term) being the cause of the spasms was excluded by the successful reproduction of characteristic symptoms with some of the strains after many rapidly made subcultures, with the dead streptococci, and with filtrates of active cultures, the symptoms in the case of filtrates beginning in from one to three hours after injection.

The close relationship believed to exist between epidemic hiccup and epidemic encephalitis, and indicated by epidemiological findings, receives much support in these experiments. The symptoms and lesions in the animals that succumbed were similar to those in fatal cases of hiccup reported in the literature. In some instances, especially after one or more passages through animals, and after many subcultures, the streptococcus from cases of hiccup no longer produced spasms of the diaphragm but instead lethargic or other forms of encephalitis. Spasmodic torticollis, which developed as a late manifestation, was as common in the hiccup series as in the encephalitis experiments. The strains from the two diseases, culturally indistinguishable, are cross-agglutinated, and the cleared nasopharyngeal extracts in a sodium chloride solution cross-precipitated by the respective antistreptococcus sera; and the encephalitis hyperimmune horse serum had marked curative effects in animals having spasms of the diaphragm following injection of the streptococcus from cases of hiccup. The results from serum and vaccine treatment of cases, while striking, were too few to be conclusive. The facts, however, that the serum had a marked curative effect on animals under controlled conditions, that horse serum had no effect and that active immunization afforded protection for rabbits injected with the hiccup streptococcus, afford a rational basis for attempts at passive and active immunization. R. M. S.


Ordinary cultures of the spinal fluid of patients suffering from Sydenham's
chorea are negative. The fluid, however, contains a filterable virus, capable of producing nervous and corneal lesions when suitably injected into rabbits. It has a special affinity for ectodermal tissue, and may be designated a neurotropic virus (cf. the virus of epidemic encephalitis, poliomyelitis, rabies, herpes). When rabbits are inoculated with it clinical symptoms (convulsions, tremulous movements) may develop, and pathological changes (mainly of a general character) may be found.

S. A. K. W.

SENSORMOTOR NEUROLOGY


A man, age 26, had a typical attack of encephalitis lethargica followed by Parkinsonian rigidity, chiefly affecting the left limbs. On the left side also, the plantar response was absent and an ankle clonus was obtained, indicating pyramidal involvement. Three years after the onset of the original illness he began to develop palilalia. Words and short phrases were repeated, at first slowly and then with increasing rapidity as breath failed him until the end of expiration. The number of repetitions varied from two or three to twenty or twenty-five. Spontaneous and dictated utterances were equally affected and the disability was equally marked in answers to questions. There was no aphasia. The mental state was that of 'viscosity,' commonly encountered in these cases, without any other psychic disturbance. The palilalia disappeared when the patient chanted or intoned his sentences. The symptom was least apparent after waking in the morning. It was unaffected for better or for worse by a variety of psychotherapeutic and electrical methods of stimulation but temporarily improved by the application of a vibrating machine to the body.

Palilalia has been recorded as a rare symptom of pseudobulbar palsy and in several other cases of encephalitis lethargica. The authors discuss at length the probable localisation of the lesion without arriving at any definite conclusion except that it is a release-phenomenon. They remark that in several recorded cases, including their own, the symptom has been associated with motor involvement, chiefly of the left side of the body.

C. P. S.


The similarity between paralysis agitans and the so-called postencephalitic Parkinsonian syndromes is so great that certain authors consider them, clinic-