protein content. The percentage error was found to be less than 5. The normal protein content was found to be between 13 and 38 mgm. per 100 cc. They regard any figure above 40 as pathological. The protein may be derived from exudation from meningeal vessels under pathological conditions. All sorts of pathological conditions showed an increase, and often this was the only sign of any abnormality in the cerebrospinal fluid. After repeated lumbar punctures the protein content diminished, suggesting a possible compensatory hydorhrexa which may have some relationship to so-called lumbar-puncture headaches.

R. G. Gordon.


The author has carried out an elaborate investigation as to the causes and significance of changes in the viscosity of the cerebrospinal fluid. This is found to be increased by the amount of protein, by the alkalinity, and by the number of cells, but to little or no extent by variations in other constituents. Its diagnostic value is slight, and can only be regarded as confirmatory to other tests which would seem more certain and more easily carried out. The chief value of the paper would seem to be to dissuade ardent pathologists from expending their time and energy on the investigation of this property of the cerebrospinal fluid, since in the hands of several investigators it has proved to be practically without value.

R. G. Gordon.

SENSORIMOTOR NEUROLOGY.


The writers draw attention to the occurrence of symptoms of vertigo, loss of equilibration, etc., in an epidemic of encephalitis, and they describe the following features of a special clinical type of the affection:—

1. A pure type, which was found 12 times in 110 cases. In this type the onset is sudden, with vertigo; the patient often falls down, or staggers like a drunken man. There are general symptoms of malaise and feebleness, with vomiting in some cases. There are no eye symptoms, and no somnolence. Rest abates the symptoms, while walking exaggerates them, especially walking in street traffic, when a veritable crisis may occur, with transient diplopia and mental excitement.

The objective signs are usually only elicited when the eyes are moved to their extreme lateral range, and are worse on looking to one particular side. Rombergism is present, and the Babinski-Weil test with outstretched hands is positive (slow displacement of an arm to the right or left will occur after a few moments). The last described sign has proved more sensitive in the writer's experience than rotation tests, thermic or galvanic tests, etc. Another sign will be found in some cases, consisting in a derangement of convergence either in the upward or horizontal direction. A minor sign
is immobility of the head on the trunk when associated movements are performed, and modified Parkinsonian features also occur.

2. The second type or group comprises those mixed types in which some of the above features occur.

Treatment by quinine, etc., is shortly mentioned.

J. LE F. B.


The patient was a woman, age 39, with right progressive hemiplegia and double optic neuritis. Owing to her mental state she was somewhat difficult to examine minutely. Not long before death, well-marked exophthalmos of the right eye made its appearance, whereas the left eye was normal in this respect.

At the autopsy an abscess was found in the middle of the left optic thalamus, which had made its way towards the left crus, involving, amongst other things, the left red nucleus.

Among the unusual features of the case are (1) the absence of the ordinary symptoms of thalamic lesions, though herein the case is by no means unique, and (2) the presence of contralateral exophthalmos. In the author’s opinion the case provides pathological confirmation of the experiments of Karplus and Kreidl, according to whom there is a central sympathetic representation in the region subthalamica, excitation of which in animals produces all the signs of stimulation of the cervical sympathetic.

S. A. K. W.


In the brain of a patient who showed the clinical symptoms of apraxia on both sides, particularly on the left, three tumours were found: the first in the left frontal region between the second and third frontal gyri, almost reaching to the precentral gyrus; the second rather further back on a vertical transverse section, lying in the first frontal gyrus; the third, in the corpus callosum.

From their position they interrupted connection between the motor area and the frontal cortex, as also between one motor area and the other via the corpus callosum, whereas the motor regions themselves were intact; there was not, however, interruption between the latter and the temporal and parietal lobes.

Forster considers the apraxia in his case can be explained by the interruptions of the frontal connections, and that the left-sided apraxia is additionally produced by the interruption of callosal fibres; but he is unable to exclude the possibility of defect of temporal or temporo-parietal function as an indirect result of the tumours.

S. A. K. W.
[159] The medical significance of disorders of speech.—S. BLANTON.  
 _Jour. Amer. Med. Assoc.,_ 1921, lxxvii, 373.

Leaving aside the various forms of aphasia, four forms of speech disorders are distinguished: (1) Delayed speech (as infants), due either to mental defect or to a functional failure of adaptation to the environment commencing in infancy. (2) Letter substitution (lisping and lalling), due to mental deficiency, persistence of infantile habits, or regression to the infantile personality. The author does not think malformation of the palatal or dental arches has much, if anything, to do with this. (3) Oral inactivity (slurring speech). The author describes this as idioglossia, but does not refer to what is usually understood by this term in the English literature. It occurs in organic brain defects such as G.P.I., cerebral hemorrhage, etc., also in severe fatigue and toxic conditions, and in states of extreme fright or timidity. In addition, a type said to be due to endocrine-vitamin defect is described. (4) Stuttering. Four varieties of this are described: (a) Organic (G.P.I., etc.); (b) Endocrine-vitamin defect; (c) Hypomanic type; (d) Psychoneurotic.

The latter type is described in full, and that occurring in soldiers and children compared. The author concludes that there is always a mental emotional maladjustment behind this, and believes this must be considered in treatment; hence treatment by elocutionists, voice-producers, etc., is not likely to succeed, since they deal with the stutter _per se_. He calls attention to the high percentage of stutters amongst left-handed children who have been more or less forced to become right-handed and so have undergone a disturbance of their general motor adjustment.

R. G. GORDON.

[160] The abdominal crises of migraine.—J. A. BUCHANAN.  

Seven cases are described with severe abdominal pain associated with typical migraine. Five of these had been operated upon without benefit. The author claims that his studies in the family history of migraine patients prove that it is handed down as a simple Mendelian characteristic. For this reason he considers it a physiological manifestation in those in whom it occurs, and concludes that it is owing to this fact that it cannot be benefited by medical or surgical means.

R. G. GORDON.

[161] A study of patients subject to convulsive seizures.—L. H. ZIEGLER.  

The study is based on twenty cases of epilepsies selected at random from the inmates of St. Elizabeth's Hospital, Washington. They were examined from various standpoints. First, it was found that these cases had a larger proportion of anatomical abnormalities such as cranial asymmetry, high palates, etc., than would be found in non-epileptics. These abnormalities were such as would suggest dyspituitarism, especially of the infantile type. The author leans to the theory that hypopituitarism is associated with epilepsy, and quotes Cushing as maintaining that pituitary secretion has an influence in stabilizing cortical cells.
ABSTRACTS

The physiological attributes of the cases are found to be as follows: They are unstable and undergo profound changes within short intervals. As regards food and comfort, they are in many respects infantile, and in their periodic reactions there are evidences that they are characteristically infantile as well as adult. The infantilism may not be constant, but may appear at irregular intervals, and makes a most motley and incongruous character.

Next, the observation that cheese increases epilepsy is considered. Casein, the chief constituent of cheese, contains the three amino acids, histidine, tyrosine, and tryptophane, and the chemical similarities between these and pituitrin, adrenalin, and thyroxin are noticed.

The author considers that the undoubted tendency to psychological regression shown by epileptics is simply the psychological counterpart of the anatomical and physiological infantilism. His conclusion is that epilepsy is the particular way that a person has of behaving in the presence of real or imaginary situations. The individual is a biologically inferior. He may compensate for some of this inferiority by unusual abilities. His inferiority, whether from pituitary disorder or of other origin, nevertheless exists, and concomitant with it are certain physiological conditions which represent the epitome of a tendency to act in a mass reflex. On the assumption that epileptics are biologically inferior we should not throw up our hands as a fatalist would do, but strive by our studies in anatomy, physiology, chemistry, pharmacology, and psychology to meet them half-way, to build what barriers we can around their weakest traits.

R. G. Gordon.


Some cases of tabes are met with which exhibit painful Charcot joints. This at first seems paradoxical, since Charcot joints are supposed to be due to traumatic lesions to joints unprotected by the defensive sensation of pain. In these cases, however, if a pin is passed through the skin the patient feels the sensation as it passes the skin, but the point can then be moved over the peristeum without eliciting response. The arthritis therefore does arise in an insensitive joint, but the pain is due to the stretching of the skin by the swelling from the inflammatory exudations. From this it follows that pain fibres from the skin and from the deeper structures pass up through the cord by sufficiently different routes to allow of one being affected by disease while the other escapes.

R. G. Gordon.


The case detailed in this paper is that of a woman of 38, with no history of syphilis other than a transient diplopia and dimness of vision in 1912. In October, 1917, she commenced to have weakness of the extensor muscles.
of the left foot, with preservation of knee-jerks. This progressed, and was accompanied by slight loss of sensibility on the dorsum of the left foot and lancinating pains in the right leg. In April, 1918, there was weakness and incoordination of both legs, particularly the left, diminution of the knee-jerks, and loss of the ankle-jerks. By this time there was definite wasting of the left calf. Both pupils showed the Argyll Robertson phenomenon, the right being myotic. The right ear was deaf. The cerebrospinal fluid contained 40 cells per c.mm. and excess of albumin.

In spite of energetic antisyphilitic treatment with injections of soluble mercurial salts and neosalvarsan, as well as one intrathecal injection of colloidal mercury, the paralysis increased steadily. On her return to hospital in August, 1919, the weakness and wasting were found to affect all the muscles of both upper and lower limbs and the trunk muscles. The scapular muscles were greatly atrophied, and the scapulae were 'winged'. The neck and face muscles were only slightly affected. There was loss of sensibility to the tuning-fork over the whole of the right lower limb, and in the left leg below the knee. Sense of position was lost in the toes but preserved elsewhere in the limbs. No other loss of deep or cutaneous sensibility was discovered.

The patient died at the end of August, 1919, about two years after the beginning of the paralysis. During this time she had undergone several courses of intensive antisyphilitic treatment, but this had no effect on the progress of the paralysis.

Post-mortem examination showed recent tuberculosis at the apices of both lungs, but no other disease outside the nervous system. The cord was abnormally thin along the whole of its length. The anterior roots were greyish and atrophied, and there was some thickening of the arachnoid over the dorsal surface of the cord. Microscopically there was surprisingly little evidence of cellular infiltration either in the meninges or around the walls of the vessels. In a few places a slight degree of perivascular infiltration was seen, but this was not pronounced. The connective-tissue septa and pia arachnoid were thickened, and this was practically the only sign of syphilis observable. The cells of the ventral horns and of Clarke's column were greatly diminished in number, and those which remained showed chromatolytic and other degenerative changes, but there was no neuronophagy.

Sections stained for myelin showed an irregular degeneration of the posterior and lateral columns resembling much more closely that seen in subacute combined degeneration than that of tabes dorsalis. The degeneration of the posterior columns was not systematized, although the column of Goll was more degenerated than that of Burdach. In the lateral columns the pyramidal tracts and the cerebellar tracts were both involved, and there was also irregular degeneration at the surface of the ventral part of the cord. The degeneration in the lateral columns was greatest between the 5th and 10th thoracic segments, with degeneration of the cerebellar tracts above and of the pyramidal tracts below this level.

Although the authors use the word sclerosis in describing the case, they insist that there was no overgrowth of neuroglial fibres and little
evidence of proliferation of neuroglial cells. In contrast to what is observed in subacute combined degeneration, no compound granular corpuscles were seen.

This case is of interest, both on account of its unusual nature, and also owing to the doubt as to the rôle played by syphilis in its etiology. It is known that syphilis may produce amyotrophy, but this is usually, though certainly not always, associated with tabes. Its power of producing primary degeneration of the nerve-cells in the cord along with a diffuse degeneration of the posterior and lateral columns has, so far, been unknown. The case, however, presents resemblances to those described by Henneberg, Sioli, Holmes, and others, to which the authors make no reference.

J. G. Greenfield.

[164] Disturbances of pallæsthesia in traumatic lesions of the peripheral nerve trunks (I disturbi della pallæstesia nelle lesioni traumatiche dei tronchi nervosi periferici).—C. Frank.

Arch. gen. di Neurol., Psychiat., e Psicoanalisi, 1921, xl, 66.

In considering the disturbances in the pallæsthesia (vibration sense) of a limb, it is necessary to study the nervous supply of the periosteum. Hitherto the supply of the large bones has been accurately worked out, but that of the hands and feet has never been carefully established. This the author has done, and he appends tables and figures. Thus, for the arm he finds that the radial nerve supplies the periosteum of the humerus, of the epicondyle (sometimes of the epitrochlea), the radius, the styloid process of the radius, the radial half of the carpus, the first metacarpal, and sometimes the second, third, and fourth metacarpals and the first, second, third, and fourth fingers. The median nerve supplies the second and third metacarpals, the first, second, and third fingers, and sometimes the radius and radial half of the carpus.

The ulnar nerve supplies the epitrochlea and sometimes the epicondyle, the olecranon, the ulna, the styloid process of the ulna, the ulnar half of the carpus, and the fourth and fifth metacarpals and fingers. These periosteal branches transmit vibration sense, for in lesions of the median nerve which supplies the diaphyses of the radius and ulna the vibration sense on these bones is retained, while in lesions of the radial and ulnar nerves which supply their periosteum it is lost. Analogous results are found in the lower limb.

He concludes that pallæsthesia is conveyed by different fibres from those for superficial sensibility, since he found that it was possible to observe clinically (1) disturbances of pallæsthesia without disturbances of superficial sensibility, and vice versa; and (2) disturbances of both, but with differences of extensity and intensity. The sympathetic fibres relating to bones do not convey sensory impulses, but have to do with the trophic functions and preservation of elasticity. The fibres relating to pallæsthesia would seem to run with the motor nerves, but are more resistant to injury than the motor fibres. Rarely hyperpallæsthesia may be observed and has been described in tabes. The author considers its presence in a nerve
lesion as of prognostic value with regard to regeneration of the motor fibres. In one case he observed parapallæsthesia.

Functional disturbances of pallæsthesia may occur either alone or in conjunction with organic disturbances. Pallæsthesia may be lost without loss of pressure sensation, but pressure sensation is never lost without loss of pallæsthesia. This is because if pressure sensation is to be lost a lesion of the whole nerve is necessary, since pressure sensation derives its stimuli from so many sources.

The author concludes then that pallæsthesia is a form of deep sensation which is independent of all other forms of sensation. He was able to test the perception of vibrations on a piece of exposed bone, and found that this was more intense than on the opposite side, so proving that the soft parts had nothing to do with this sensation; and, as the nerve to the diaphysis of the bone does not subservce this sense, it follows that the periosteuim and the nerves to the periosteuim are concerned in its transmission. The author thinks that vibration sense is the perception of a special stimulus, and not merely of rhythmical tactile or pressure stimuli.

If pallæsthesia is present in the bones whose periosteuim is supplied exclusively by the ulnar or sciatic nerves, a complete lesion of these nerves may be excluded, and, if it is absent, it is probable that the nerves are completely divided; but the same conclusions must not be drawn with regard to the radial and median.

R. G. GORDON.


The authors comment on the paucity of reference in the literature to diaphragmatic paralysis. Paralysis of some sort occurs in 10 to 25 per cent of cases, and in spite of the statements of earlier writers this incidence is diminished by the early administration of antitoxin. Paralysis of the phrenies occurred in 8 out of 4259 cases of diphtheria, and was fatal in all. These paralyses occur from the fifth to the seventh week of the disease, and the condition may be mistaken for lobar pneumonia. The breathing is entirely intercostal, helped by raising of the shoulders. The abdomen is scaphoid in most cases, and before paralysis is established there is vomiting, tachycardia, and dyspnœa. There is cyanosis and pallor and occasionally acute epigastric pain. No treatment seemed to be of any use in the authors’ experience, but they quote a case of Dr. Marriot’s in which a child recovered after artificial respiration had been carried on for five days. They remark on the necessity of rest in cases of paralysis, and the futility of administering antitoxin after the third day.

R. G. GORDON.

TREATMENT.


The author states that the older views of motor aphasia have not taken into account adequately a fact, fully emphasized by P. Marie, that