neurogenic tissue is found and the greater is the decrease in the component parts of the neurogenic tissue. Tumours of the filum terminale internum should be similar in type to those found in the spinal cord.

R. M. S.


Slight muscular movements are normal in man and animals in the first half hour of sleep. They are commoner in the first sleep and in light sleep. They are as a rule small in extension, unorganized and asynergic, but sometimes amount almost to a general convulsion. They may occur in any part of the musculature and are not influenced by external stimuli or change of position.

No definite explanation of the phenomenon is given.

R. G. G.

NEUROPATHOLOGY.


In ten experiments performed by the methods of Marigold and Spiegel the behaviour of the resting tone of muscle was studied in its dual aspect of duration and resistance to stretching during the period of action of 1 grm. of bulbocapnine injected intravenously.

In harmony with the results of previous experiments bulbocapnine caused in nine experiments a first phase of relaxation and in five experiments a second phase of catalepsy. The subjects used were four mental defectives, two paretics, and two dementia praecox cases.

In the relaxation phase there was an abrupt lowering of tone followed by a return to normal. For many reasons this did not appear to be a mere relaxation of muscle but a hypotonia due to the direct effect of the bulbocapnine on the central nervous system.

In the cataleptic stage there is no increase of muscular tone; the condition would seem to be due to a ‘psychomotor stupor’ and transitory interference with subcortical mechanisms.

R. G. G.

One of the most characteristic features in the behaviour of monkeys under the influence of bulbocapnine is their tendency to hold on to any object placed within their grasp. A normal monkey with three limbs tied will cling to a horizontal bar brought within reach of the free hand but will drop from it and attempt to escape as soon as he is left hanging by the experimenter. A monkey similarly bound but given an injection of bulbocapnine will not only grasp the bar but will hang from it for several minutes. This hanging response, probably closely related to the grasp reflex of the new-born infant, is doubtless a part of the catalepsy produced by the drug, in that the animal continues to grasp the bar once it has obtained a hold, just as it tends to maintain any other posture in which it is placed.

The strength of the reflex can be determined by measuring how long the animal will hang from a horizontal bar. By testing the animal at regular intervals after the injection of bulbocapnine, a curve can be obtained of the effect and its intensity at various times following the injection.

With these curves as a basis, a study was made of the effect of carbon dioxide and scopolamine on catalepsy produced by bulbocapnine.

Scopolamine caused a marked prolongation of the effects of bulbocapnine from 60 or 80 minutes to 300 minutes or more, despite the high degree of muscular relaxation present. The animals showed no sign of recovery from the stupor.

Carbon dioxide has different effects, depending on the dosage. In lower concentrations, from 15 to 25 per cent., administered for from one to two minutes, it caused an increase in the length of time that the animal hung immediately after administration of the gas was discontinued. In higher concentrations, from 35 to 50 per cent., with the appearance of anaesthesia, it caused a decrease in the hanging response with a subsequent increase, the total duration of the effect of bulbocapnine often being increased, as it was with scopolamine.

In marked contrast to scopolamine, however, carbon dioxide given in a higher concentration caused a transient disappearance of the hanging response for a few minutes following the administration of the gas, and a complete respite from the stuporous symptoms. The effect was practically identical with that produced by the gas on catatonic symptoms, in man.

The fact that carbon dioxide and scopolamine produced an increase in the hanging time suggested that these agents have a positive action on the response and that they might produce it when given without bulbocapnine. It was found that both carbon dioxide and scopolamine, when given alone, elicit the grasp reflex and the hanging response.
To this extent they are not counteracting agents. However, it is pointed out that carbon dioxide might have either an augmenting or a counteracting effect, depending on the concentration of the gas.

On the basis of these observations, the relationship of catalepsy produced by bulbocapnine to human catalepsy and paralysis agitans is discussed.

R. M. S.

[150] **Effect of röentgen rays on the central nervous system.**—R. S. Lyman, P. S. Kupalov, and W. Scholz. *Arch. of Neurol. and Psychiat.*, 1933, xxix, 56.

Four adult dogs received heavy dosage of röentgen rays on the occipital part of their heads. Physiological variations followed irradiation, as determined by conditioned reflexes. Histological examination showed diffusely scattered degenerative changes in the precapillaries and capillaries of the brain six weeks after irradiation. One dog was allowed to live for six months after irradiation and in the fifth month there developed signs of diffuse damage to the functions of the cortex and subcortex. At autopsy the changes in the precapillaries, capillaries and larger vessels of the brain had progressed and there were marked hyaline degeneration and obliterating sclerosis of arterioles with resulting areas of complete and incomplete necrosis.

The conclusion is reached that röentgen rays may alter the function of the central nervous system, but their action does not seem to be primarily on the cells of the cerebral cortex. After a high dosage in adult dogs there may be some lowering of excitability of cortical cells, as determined by conditioned reflexes, but this appears to be secondary to changes in blood supply. Even when directed at a single area of the brain, irradiation gives a diffuse physiological and pathological effect, involving the subcortex as well as the cortex, and probably the vegetative nervous system as well. Accordingly, in spite of some photographic evidence that the physical action of the röentgen rays can be fairly localized inside the skull, there is little hope of selecting one spot in the brain for cross-fire with a small beam and of increasing the vascular permeability at that spot by irradiation, and then treating through the blood-stream so that the desired area will get relatively more medication than other parts of the brain.

R. M. S.


It was found that malarial parasites could be introduced into the cerebrospinal fluid and cross the barrier into the blood even in patients in whom there were no evident lesions of the structures composing this barrier. The
malarial infection provoked by this method has the ordinary characters of that transmitted from man to man. It is not possible so far to establish the indications for producing malaria in paretics by the lumbar route. The introduction of malarial blood into the dural sac does not seem to be attended by harmful results.

R. G. G.


The histological structure of the spinal cord is similar to that of the brain, and in their study of intramedullary tumours the authors found them to correspond in type with tumours arising from the substance of the brain. There was considerable difference in the distribution of the numbers of tumours in the various types of glioma, and there was a slight variation in the characteristics of the individual tumours in some of the subgroups, but for the most part they corresponded closely. Study of the normal conus medullaris and filum terminale and the observations of Harmier have shown that they contain all the elements that are present in the spinal cord. There were relatively more ependymal cells, sometimes growing as tubules but usually without any definite cell arrangement except in the ventriculus terminalis, than any other type of cell, and consequently it should be expected that ependymomas would be relatively more common than in the spinal cord. This proved to be true, as 68 per cent. of tumours arising from the region of the cauda equina were ependymomas.

R. M. S.


The motor nerve-endings of Macacus rhesus monkeys have structural characteristics common to other mammals, with slight variations in finer details, such as an elaborate terminal branching and abundance of neurofibrillar end-loops and buds.

Following nerve section, degenerative changes occur which are evident by the end of twenty-four hours. These are ushered in by irregular swelling and staining of the fine terminal twigs of the neurofibrillar end-brush. By the second day, fragmentation of the neurofibrils appears, and the axon and myelin sheaths outside the muscle fibre show irregularities in contour and in staining qualities. After the third day, the ending is replaced by a granular strand which goes on to complete absorption, and the more proximal portions of the motor nerves show advanced fragmentation of axons and segmentation of myelin. Subsequently, only remnants of nerve-endings can be made out, although occasional persisting neurofibrils are encountered.
In poliomyelitis in the preparalytic stage the motor nerve-endings appear normal, but with the onset of paralysis perceptible changes occur. These changes, associated with the appearance of muscle weakness and advancing through the various stages of paralysis, are identical in most respects with those observed after section of the nerves. The distinguishing feature, however, is the lack of uniformity in the degree of damage displayed by the endings at any given time in contrast to the uniformity found following section. This may perhaps be explained by the unequal involvement of the anterior horn cells in poliomyelitis and also by the plurisegmental innervation characteristic of striated muscle.

Direct contact of motor nerve-endings with the virus of poliomyelitis (as implied by saturation of muscles with the virus) failed to produce perceptible histological changes sufficient to indicate primary involvement.

These findings lead to the conclusion that the changes in the motor endings observed in experimental poliomyelitis are secondary to primary damage of the anterior horn cells.

R. M. S.

SENSORIMOTOR NEUROLOGY.


The present case and two others previously described in the Rivista are reviewed and considered. A full description of the morbid anatomy with illustrations is given, and a clinical description of the course of the disease with the mental disturbance. Diagnosis in life rests on the presence of eosinophils in the cerebrospinal fluid; these may not be present in the blood if the cysticercus is confined to the central nervous system.

R. G. G.

[155] Neurinomata: their association with acromegaly and possible malignancy (Contributo allo studio dei neurinomi con particolare riguardo all’associazione con acromegalia ed alla loro trasformazione maligna).—C. Fittipaldi. Riv. di pat. nerv. e ment., 1932, xxxix, 521.

Two cases are described and the literature is reviewed. The first case presented no unusual symptoms, but the second showed a clinical syndrome of acromegaly and was evidently malignant, as proved by clinical and histological evidence. The author thinks that the acromegaly was due to the presence of a blastoma of the same type as the peripheral tumour in or about the hypophysis. The malignancy of the tumour showed itself in the rapid growth of the primary neurinoma and by the presence of metastases.