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Personality Disorders with Brain Tumours.

1. Symptoms of psychic disorders were found with few exceptions in a series of 205 cases of neoplasm of the brain.

2. The mental disorders with brain tumours are essentially similar to those found with other types of organic psychoses and range in severity from mild neuroses to delirium and dementia.

3. Four groups are distinguished on the basis of the psychiatric findings.

4. The type of clinical picture which develops is influenced by the premorbid personality, by the specific psychic disabilities dependent on regional localization, and by the course and extent of the underlying pathological changes.

5. The adjustments of the personality to the psychic problems resulting from the brain tumour are analysed.

6. The need for adequate psychopathological studies as a basis for the localization of mental symptoms is discussed. (Author's abstr.)

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The Internal Environment and Behaviour.

In this paper the importance of constancy in the internal environment for the stability and well-being of the organism as a whole and the cerebral cortex in particular has been emphasized. Numerous illustrations were cited from studies at high altitude to demonstrate the basic role of oxygen in neural activity. The way in which psychological functions can be altered by changes in the oxygen tension was illustrated by reference to specific experiments in neuro-muscular control, memory and light sensitivity. The results showed in striking fashion how sensitive psycho-physiological processes are to oxygen changes in the internal environment. The application of these observations and experimental findings were then discussed in relation to certain mental disorders. By placing these familiar psychological and psychiatric problems in this new setting they are seen in broader perspective for further study. (Author's abstr.)

Paradoxical Vestibular Reactions in Schizophrenia under the Influence of Alcohol, of Hyperpnoea and CO_2 Inhalation.

1. The nystagmic reaction to caloric stimulation under the influence of alcohol, increased CO_2 tension and decreased CO_2 tension has been studied in schizophrenic and normal persons.

2. Under these experimental conditions the schizophrenic patients showed an apparently paradoxical reaction.

(*a*) Under the influence of alcohol the normal showed an increase, the patients a decrease in the number and frequency of nystagmus.

(*b*) CO_2 depresses the nystagmic reaction in normals. In 40 per cent. of the patients CO_2 causes an increased reaction; 45 per cent. show no change, and 15 per cent. behave somewhat similarly to the normals.

(*c*) Hyperpnoea causes an increase in the normals and a decrease in the patients. (Authors' abstr.)

The Effects of Testosterone Propionate in Impotence.

1. Eighteen men who complained of impotence and who had no obvious disease of the central nervous system, no marked structural changes in the genito-urinary tract except for absence of spermatozoa in one case, or no manifest deficiency in the internal secretion of the testes, were given intramuscular injections of testosterone propionate in 25 mgm. doses three times or more weekly.

2. In some patients psychic and emotional influences played a large part in the production of the impotence.

3. In seven instances relief from the impotence was obtained, while in the eleven other subjects the testosterone propionate did not produce any beneficial effects.

4. In one patient there was a definite reduction in the number of spermatozoa during the course of treatment.

5. It was concluded that the successful results were probably explained by pyschological factors, since there was no decrease in potency when sesame oil was substituted and when all injections were stopped.

6. The amount of androgens administered was thought to be sufficient to make up for deficiency in testicular secretion. It is, however, desirable to secure experience with larger amounts of the agent.

7. It is the authors' opinion that the depth and degree of neurotic conflicts present in the individual patient may play an important role in determining the nature of the results. They suggest that beneficial effects may be observed in those patients in whom neurotic trends are minimal, and who react to such physiological stimulation as testosterone propionate may induce by enough increase in self-confidence to overcome the impotence. Failure may be noted in those patients who have severe neuroses, and whose conflicts are so enhanced by the physiological stimulation that the anxieties and fears thus aroused lead to still further inhibition

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of sexual expression. But it should not be forgotten that testosterone propionate may have had no influence whatsoever on sexual excitability, as seems to be the case in normal men, and such benefit as we have observed may be due only to suggestion. (Authors' abstr.)

Physiological and Pharmacological Investigations on the Nature of Hypothalamic Excitation.

1. Experiments are briefly cited in which in narcotized cats, the hypothalamus was stimulated and the contraction of the nictitating membrane on the same side recorded. In addition to this the cephalad end of the cervical sympathetic was stimulated on the contralateral side, and the contractions of the corresponding nictitating membrane were recorded also. This preparation allows one to distinguish between central and peripheral effects. It was shown that anoxia, inhalation of excess carbon dioxide and various convulsant drugs, such as metrazol, coramine, picrotoxin and coriamyrtin, increase the excitability of sympathetic hypothalamic centres on intravenous injection. The most effective drug is metrazol, which may produce signs of increased sympathetic discharges as measured by the height of the contraction of the nictitating membrane for long periods of time.

2. The effects of anoxia and of metrazol convulsions were investigated on normal rats and animals in which the adrenals had been removed. Furthermore, rats were used in which, in addition to the removal of the adrenals, the vagi had been divided below the diaphragm. It was found that anoxia and metrazol, while producing a hyperglycaemia in the normal animal, lower the blood-sugar level in the adrenalectomized rat. If, however, the vagi are divided in adrenalectomized animals, anoxia and metrazol no longer produce a hypoglycaemia, but call forth merely a slight and delayed rise in blood sugar. The experiments are interpreted to mean that anoxia and metrazol produce a simultaneous excitation of the sympathetico-adrenal and vago-insulin system in the normal animal, but that the excitation of the latter does not become apparent on account of the predominance of the sympathetico-adrenal system.

3. It is shown that electrical excitation of the hypothalamus leading to a typical rage response produces a rise in the blood sugar in the normal, but a fall in blood sugar in animals with adrenals eliminated and liver denervated. If, however, the vagi are cut, the hypoglycaemic effect disappears and a delayed slight hyperglycaemia (due to sympathin ?) occurs. It is inferred that the process of sham rage is characterized by a simultaneous discharge over both divisions of the autonomic nervous system.

4. If cats in which the spinal cord had been divided at the sixth cervical segment, in order to eliminate excitation of the sympathetico-adrenal system, are exposed to a barking dog they react with reversible hypoglycaemia. This reaction is absent when the vagi are cut below the diaphragm. It is inferred that emotion involves both vagal and sympathetic excitation. The former leads to increased secretion of insulin, the latter enhances the secretion of adrenalin.

(Author's abstr.)

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Inheritance of Cerebral Dysrhythmia and Epilepsy.

Electroencephalographic tracings have been made of the parents, siblings and children of 94 patients who had both clinical epilepsy and cerebral dysrhythmia. The relatives numbered 183. Tracings were made simultaneously from six areas of the cortex. Definitely abnormal records were obtained in 60 per cent. of the relatives of patients and in 10 per cent. of a control group of 100 persons who had no near relative with epilepsy. In 55 of the families records were obtained from both parents. In 35 per cent. of these the records of both parents were definitely abnormal. In only 5 per cent. were the records of both parents unmistakably normal. Dysrhythmia occurred as often among the relatives of patients with so-called symptomatic epilepsy as among the relatives of patients with "essential" epilepsy. It occurred more often among the relatives of female (64 per cent.) than of male patients (56 per cent.) and more often among female relatives (65 per cent.) than among male relatives (54 per cent.). Females probably have more predisposition ("essential" epilepsy) than males. The data included 5 families in which there were similar twins with seizures or dysrhythmia. In each pair of twins there was a similarity of the fundamental rhythm, though seizures in both twins occurred in only one pair.

The authors believe this evidence indicates that the dysrhythmia of epilepsy is inheritable and that such a dysrhythmia when demonstrable may represent a predisposition to epilepsy or some allied disorder. Dysrhythmia may prove to be a dominant trait. Because approximately 2·4 per cent. of the near relatives have epilepsy and approximately 60 per cent. of relatives have dysrhythmia, persons with the predisposition to epilepsy or an allied disorder outnumber actual epileptic subjects by about 25 : 1. The incidence of epilepsy is about 0·5 per cent.; hence persons with a predisposition to epilepsy form about 12 per cent. of the population.

These observations should be of practical value in the prophylaxis and eugenics of epilepsy. They should assist the physician in tracing the descent of epilepsy and in advising patients and their relatives about marriage. The presence of dysrhythmia in both parents was thirty-five times the expected chance mating of two dysrhythmic persons. If a person with epilepsy marries, his chance of having epileptic offspring will be minimized if he chooses a person whose cortical electrical activity is normal. (Authors' abstr.)

Electroencephalograms of "Constitutionally Inferior" and Behaviour Problem Children. Comparison with those of Normal Children and Adults.

A detailed analysis of the electroencephalograms from the occipital, central and frontal regions of the head is presented for four groups of subjects: 30 normal adults, 36 normal children, 50 behaviour problem children and 22 "constitutionally

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inferior " children. The analysis is in terms of the frequency, amplitude and per-cent. of time of the rhythms grouped according to frequency bands.

The electroencephalograms of the behaviour problem children differ from those of the normal children in three main ways: by showing a higher per cent. of subjects with (1) 2 to 5 per second waves, (2) 5 to 8 per second waves, and (3) abnormal activity induced by hyperventilation. In addition, the average percentage of time present and the amplitude of the slow waves are greater for the behaviour problem group than they are for the small group of normal subjects with such rhythms. The " constitutionally inferior " group resembles the behaviour problem group, but has a lower percentage of subjects with 2 to 5 per second waves. The frequency bands above 8 per second are of no value in differentiating the three groups of children. There is little evidence of either type of slow waves or of response to hyperventilation in the normal adult group.

The differences in the amount of abnormal slow waves among the various groups are discussed, and the suggestion is made that such disturbances of cortical function are probably important factors in the causation of behaviour disorder.
(Authors' abstr.)

Cerebral Metabolism in Mongolian Idiocy and Phenylpyruvic Oligophrenia.

In mongolian idiocy the brain removes less than the normal amount of oxygen and sugar from each hundred c.c. of blood passing through that organ. The same phenomenon, though to a lesser extent, is observed in phenylpyruvic oligophrenia. Such results might be caused by a decrease in cerebral metabolism or by a faster cerebral blood flow. A review of the literature indicates that the diminished metabolism of the brain is the more probable of the two alternatives. Possible relationships between mental deficiency and diminished cerebral metabolism are discussed. (Authors' abstr.)

Vascular Changes in the Thalamic Nuclei Undergoing Retrograde Degeneration.

The projection areas on the left hemisphere for the medial geniculate body, the ventral and lateral thalamic nuclei and the centrum medianum were destroyed in 8 adult albino rats. Seventeen to twenty-two days after the operation the blood vessels of the experimental brains were injected with a carmine-gelatin mixture. The thalamic nuclei were studied microscopically, with the following results:

The thalamic nuclei undergoing retrograde degeneration showed generally an increase in vascularization. This manifested itself in enlargement of the blood vessels and multiplication of the capillaries. The vascular wall became highly permeable to carmine, so that heavy perivascular infiltrations were invariably present. The relative prominence of these changes varied with the different animals.

In the thalamic nuclei, the ascending fibres from which focalize in a small cortical area, greater vascular changes developed than in those the axons of which project diffusely to wide cortical fields. The medial geniculate body showed the severest vascular disturbances; the ventral and lateral thalamic nuclei came next; the centrum medianum was the least affected.

The vascular changes are interpreted as measures for increasing the blood flow and for removing and detoxicating the products of nerve disintegration.

In the light of the vascular changes induced in the thalamic nuclei by destruction of their cortical fields, Waller's localization of the cortical areas for the few thalamic nuclei in question is correct in a general way. (Author's abstr.)

A Thirteen Year Follow-up Study of a Series of Cases of Verified Tumours of the Brain.

The late results (after from 13 to 14 years or more) in 152 verified cases of tumour of the brain in which Dr. Cushing performed operation in 1925–1926 are reported. Twenty-three of the patients died before leaving the hospital; 81 died in from a

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few months to 17 years after the first operation; 45 were alive and most of them well, at the time of this survey, from 13 to more than 14 years after operation.

The results of the work for the year 1925–1926 (a year as resident in Dr. Cushing's service) are compared with those reported by Van Wagenen for the year immediately preceding (1924–1925) and by Cairns for the year immediately following (1926–1927).

A total of 457 cases are thus reviewed, in 287 of which the patients had died and in 170 of which the patients were still living at the time the three studies were made, from 7 to 14 years after operation.

In Table I the ultimate results for the individual types of tumours are indicated.

The general impression is gained that improvement in the future treatment of tumours of the brain must take two directions: in the case of benign tumours, technical improvement to make surgical removal more complete and less hazardous; and in the case of malignant tumours, some form of therapy other than surgical.

(Author's abstr.)

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Petechial Haemorrhages of the Brain Experimentally Produced in Rats by Concussion.

By a special device white rats were subjected to a propulsion impact injury to the head, similar to the mechanism of head injuries in man frequently occurring in automobile accidents.

The severity of the trauma was regulated by the height of the fall, and effects of single, as well as repeated, traumas directly after the trauma and at varying intervals following the last trauma were noted.

By the methods employed by us, histologic alterations in the brain produced by concussion trauma were referred chiefly to the vascular apparatus.

Traumatic petechiae by diapedesis, thrombotic and hyaline vascular changes and haemolysis were reproduced in the concussed brain of the albino rat which were in all respects similar to those observed in concussed human brains.

These changes were in the main proportionate to the severity of the trauma, but a considerable variation of effect was noted in different animals.

The vascular pathologic lesions described are due to specific concussion effects, and differ from contusion, laceration and tearing; they are the result of vascular dilatation, stasis and anoxaemia. Reversible effects of concussion were demonstrated by the resorption of perivascular petechiae constantly found in recently traumatized animals, but rarely observed in the animal killed at an interval after trauma. Irreversible effects may be followed by demonstrable organic lesions.

The pathologic alterations due to irreversible concussion effects involving the blood vessels and the surrounding parenchyma were found to have a definite tendency to reparation by final obliteration of the damaged vessel and replacement gliosis. There was no instance of a large secondary haemorrhagic or softening process, and no tendency to progression of vascular pathologic lesions.

(Authors' abstr.)

Arsenic as a Possible Cause of Subacute Encephalomyelitis: Correlation of Chemical, Clinical and Histologic Observations.

Well recognized chronic arsenical poisoning frequently is manifested by diffuse cerebral symptoms: fatigue, headache, vertigo, drowsiness and impairment of mental activity. These are precisely the same symptoms from which the patients in this group suffered and which constitute a syndrome that is summarized as "progressive diffuse cerebral failure."

The toxic effect of arsenic on the nervous system is not specific, and is marked by alterations in the ganglion cells and by regions of perivascular necrosis. In subacute and chronic forms these regions of necrosis become filled with lymphocytes and plasma cells. In the cases in this series such changes were exhibited.

The actual concentrations of arsenic in the brain (0·1 mgm. of arsenic or more per 100 gm. of brain tissue) in these cases were abnormally large. These concentrations were the same as those found in cases of acute arsenical poisoning due to either inorganic or organic compounds of arsenic, and recorded both in the literature and in our own series of such cases.

Therefore all the observations, clinical, pathological and chemical, that concern these twelve cases of subacute encephalomyelitis are consistent with the hypothesis that they represent instances of chronic arsenical poisoning. Further evidence for or against this hypothesis can be obtained by microscopic studies of brains in cases of recognized chronic arsenical poisoning and by the determination of the content of arsenic in the excreta and tissues, especially the nervous system and hair, in other cases of subacute or chronic meningo-encephalomyelitis.

(Authors' abstr.)

Changes in the Brain in Alcoholism.

The changes in the brain have been studied in 44 cases of chronic alcoholism of various clinical types.

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A summary of the clinical and pathologic findings in 22 cases of a condition diagnosed as alcoholic encephalopathy is given in the form of tables. Nine of these cases were regarded as instances of encephalopathy due to nicotinic acid deficiency.

The authors have illustrated the most pronounced neuropathologic changes observed in the 44 cases.

The principal conclusions are: (*a*) Since the pathologic alterations in the nervous sytem in cases of chronic alcoholism demonstrated in this study are relatively slight as compared with the severe and fatal illness of the patient, the changes usually responsible for death and for the clinical picture cannot be demonstrated under the microscope. Most of the changes are probably due to avitaminosis (B_1 and B complex) rather than to alcohol itself.

(*b*) There is little correlation between the clinical picture and the anatomic distribution of lesions, except in some cases of Wernicke's syndrome.

(*c*) The authors were unable to confirm the observations and conclusions of some previous authors with regard to (1) frequent and severe involvement of the optic nerves; (2) frequent and severe lesions in the medulla; (3) frequent changes of importance in the blood vessels; (4) severe ependymitis or gliosis; (5) usual or constant marginal localization of the lesions; and (6) the presence of important lesions in the cerebellum. (Authors' abstr.)

Representation of the Sympathetic and Parasympathetic Nervous Systems in the Forebrain of the Cat.

The excitation of various parts of the forebrain of the cat with faradic currents and the recording of the reaction of the pupil (normal and sympathectomized), the nictitating membrane, the blood pressure and the galvanic reflex have shown that parasympathetic inhibition, as indicated by pupillary dilatation of equal degree in the normal and in the sympathectomized eye, may be obtained from the corona radiata, the basal ganglia and the hypothalamus and pretectal area. In the hypothalamus this response may be associated with signs of sympathetic excitation.

In general it has been found that the intensity of the autonomic response increases as the electrode descends from the corona radiata through the thalamus into the hypothalamus.

From the pretectal region constriction of the pupil is elicited, followed by dilatation (inhibition of parasympathetic control).

Parasympathetic and sympathetic responses may appear in various combinations, indicating that the excitation or inhibition of one branch of the autonomic nervous system does not determine the nature of the excitatory process in the other, functionally opposed division. (Authors' abstr.)

Mescaline Hallucinations in Artists.

These observations provide material for discussion of the two opposing views concerning the origin of hallucinations; the physiologic theories, by which they are regarded as the result of irritation of sensory centres or pathways, and the psychologic, by which they are regarded as projected mental images assuming an external sensory appearance when presented to consciousness.

All the pictures presented show features well known in the physiologic process of seeing or in pathologic conditions due to organic lesions of the visual apparatus. The first few pictures can be accounted for entirely in physiologic terms; in the later ones there are more and more features, the last picture almost representing the free play of fantasy.

In other words, the hallucinations during mescaline intoxication cannot be explained in either physiologic or psychologic terms alone. The fact of hallucinating and some formal characters of the hallucinations are so similar to physiologic and pathologic phenomena that they can be assumed to be physiologic in origin, but psychologic experiences determine the contents of the hallucination; for

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example, it can be said that the appearance and repetition of similar shapes are caused physiologically, but the facts that the subject sees women and not men and that the scotomas take on the shape of lotus flowers can be accounted for only in psychologic terms.

These observations on mescaline intoxication cannot be applied to other conditions without further study. In other hallucinatory states the relative importance of physiologic and psychologic factors may be different; the former may be more important in patients with gross cerebral irritation, the latter in patients in a hysterical twilight state. Further investigation is necessary to determine the factors which are responsible for their relative importance.

(Authors' abstr.)

Connections of the Medial Geniculate Body in the Cat.

1. Recurrent fibres pass from the medial geniculate body to the inferior colliculus and to the trapezoid body by way of the brachium of the inferior colliculus and the lateral lemniscus, respectively, and thus provide a system of reverse innervation between subcortical acoustic nuclei.

2. Diffuse fibres leave the medial border of the medial geniculate body and pass to other parts of the thalamus and mid-brain.

3. No evidence is found to support the contention that the medial geniculate body has any important function as an acoustic reflex centre.

4. The commissure of Gudden does not connect the two medial geniculate bodies.

5. Fibres pass from the medial geniculate body to a cortical area bounded anteriorly by the anterior ectosylvian sulcus, posteriorly by the posterior ectosylvian sulcus, superiorly by the suprasylvian sulcus and inferiorly by the superior extremity of the pseudo-sylvian sulcus. This area coincides with that responsive to acoustic stimulation. (Author's abstr.)

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Experimental Studies on Headache. A. *Contrast of Histamine Headache with the Headache of Migraine and that Associated with Hypertension.* B. *Contrast of Vascular Mechanisms in Pre-headache and in Headache Phenomena of Migraine.*

Histamine headaches were abolished by increasing the intracranial pressure, thereby giving extramural support to the cerebral arteries at the base of the brain. This is further evidence that histamine headaches result mainly from the dilatation and distension of cerebral arteries.

The headaches of migraine were not reduced in intensity by increasing intracranial pressure. This is further evidence that such headaches arise from extracerebral arteries.

Scotomas occurring as pre-headache migraine phenomena result from dysfunction of cranial arteries and represent contrasts in vascular mechanisms and vascular beds. Pre-headache disturbances follow occlusive vaso-constriction of cerebral arteries, whereas the headache results from dilatation and distension chiefly of branches of the external carotid arteries. (Authors' abstr.)

Observations on Reflex Responses during Prolonged Periods of Human Refrigeration.

Neurologic studies were made on 42 patients during a state of reduced generalized body temperature. These patients received a total of 83 periods of refrigeration. Each period varied in duration from 24 hours to 5 days. Approximately 400 neurologic examinations were made on the patients in this series.

Increase in deep reflexes was found when the body temperature was between approximately 97° and 85° F. At that range of temperature no change in the abdominal reflex was noted. The period of hyperreflexia corresponded closely to the shivering stage. Abolition of deep tendon, abdominal and gag reflexes occurred when the body temperature approached 78° F.

The pupils remained equal, regular and normal in size throughout the hypothermic period, but response to light stimuli became progressively more sluggish as the body temperature was lowered. The light reflex became abolished at 78° F.

Dysarthria began at a temperature of approximately 93° F., and response to the spoken word became practically *nil* below 80° F.

Cerebration was progressively delayed with reduction of body temperature. Mental faculties were fairly well preserved until the body temperature approached 93° F.

Retrograde amnesia was present for the period the body temperature remained below 92° F.

Appreciation of pain, heat and cold perception was not lost during or after refrigeration.

The symptoms of pain, if present prior to refrigeration, was completely relieved in all but two instances (4·7 per cent.).

No permanent alteration of objective neurologic responses resulted from hypothermia. (Authors' abstr.)

Memory Defects during Metrazol Therapy.

Four cases are reported in which moderately severe amnesia developed with metrazol treatment. Less marked changes are reported in 20 of 32 other cases. Usually the defect is minor and transient and may even escape detection if not sought for. Occasionally severe impairment, even the Korsakoff syndrome, may occur. Recovery is the rule.

The nature of the amnesia is that of the " organic " type and is the cumulative result of the residual post-convulsive memory impairments.

The memory abnormality is related to the number of metrazol convulsions. Two treatments a week for six to eight weeks is fraught with little or no disability. Arteriosclerosis and toxicity call for caution and possibly fewer treatments. Seda-

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tive drugs may predispose to memory complication. The induction of a period of confusion has not been established as desirable, and may be harmful.

Similarity in the development of amnesia and therapeutic recovery suggests a common basic mechanism, related in part at least to the depressive or noxious action of metrazol convulsions on the brain.

The reversibility of the memory impairment in almost all patients removes this complication as a contraindication to metrazol therapy. (Author's abstr.)

Tumours of the Brain in Aged Persons.

From this review it appears that the incidence of tumour of the brain in the aged is more common than is usually appreciated. Glioblastoma multiforme, meningioma and acoustic neuroma, in the order named, made up 82 per cent. of the tumours in this series of cases. The cerebrum was the most common site of development of tumour, tumours in this region constituting 69 per cent. in our cases. In the posterior fossa the cerebello-pontile angle was the usual site of the neoplasm, which usually was an acoustic neuroma. As a result of the penalties of advancing years, the symptoms and signs of tumour of the brain were exceedingly variable and at times resulted in difficult diagnostic problems. The presence of papilloedema or defects in the fields of vision was an important diagnostic aid; however, their absence could not be accepted as proof of the absence of a tumour of the brain. Only 32 of 96 patients examined had papilloedema. It is at present probably too early to draw conclusions regarding the value of the electroencephalogram as a diagnostic procedure, but it may be hoped that this divining tool may be of considerable diagnostic aid in cases of elderly persons suspected of having a tumour of the brain. The operative mortality accompanying tumour of the brain, although it is higher among patients of advanced years than it is in a group of younger persons, probably could be justified on the grounds that operation might save a life which otherwise the tumour would end. There is always the possibility of uncovering a removable tumour of the brain in spite of a patient's relatively short clinical history, thus justifying the increased surgical risk.

(Authors' abstr.)

Ingestion of Large Doses of Dilantin Sodium.

The case is recorded of a young man who on three occasions ingested 60, 90·5 and 105 gr. (3·9, 5·883 and 6·825 gm.) respectively of dilantin sodium over a period of minutes, six hours and ten hours. The chief symptoms were exhilaration, light-headedness, dizziness, nausea and vomiting, headache, staggering, diplopia, nystagmus, difficulty in converging the eyes, pupillary abnormalities, ataxia, tremor and changes in reflexes. Of all these signs, nystagmus persisted the longest, and was present for eight days on the last occasion. Significant laboratory findings were the acute elevation of the cerebro-spinal fluid protein.

The reason the patient gave for taking large doses of dilantin sodium was that it was an effective substitute for whisky, particularly because of its exhilarating action.

Note.—The patient was readmitted on July 18, 1940, after the ingestion of 57 gr. (3·705 gm.) of dilantin sodium over a period of three hours. His symptoms and clinical course were the same as on his previous admissions.

(Authors' abstr.)

Effects of Insulin and Metrazol Therapy on Cerebro-spinal Fluid Proteins.

Both insulin and metrazol caused appreciable changes in the cerebro-spinal fluid proteins of schizophrenic patients. The immediate effect of metrazol was a lowering of the albumin-globulin ratio. Later, after one to eight weeks of treatment and a rest of three to four days, the albumin and albumin-globulin ratio increased, while the globulin decreased. Insulin caused a rise in globulin and a depression of the albumin-globulin ratio; when the treatment was discontinued the albumin and albumin-globulin ratio returned to higher values, while globulin decreased. (Authors' abstr.)

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ARCH. PSYCHOL.

JULY–SEPTEMBER, 1940.

Reaction Time of Young Intellectual Deviates. *Scott, W. S.* . . No. 256
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The Influence of Attitude Upon the Remembering of Pictorial Material. *Seeleman, V.* . . . . . ,, 256

BRAIN.

VOL. LXIII. DECEMBER, 1940.

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Suprapituitary Adamantinoma and Eunuchism. *Griffiths, G. M.* . . 350
*Primary Degeneration of the Granular Layer of the Cerebellum : An Unusual Form of Familial Cerebellar Atrophy Occurring in Early Life. *Norman, R. M.* 365

Primary Degeneration of the Granular Layer of the Cerebellum : An Unusual Form of Familial Cerebellar Atrophy Occurring in Early Life.

Two cases of familial congenital cerebellar ataxia have been described. Both patients and their affected sibs were mental defectives. An increase in incoordination was observed during the last years of life in the first case ; in the second the clinical condition remained stationary. Both cases came to autopsy and showed closely similar pathological findings. The brains as a whole were small. In each a small, sclerosed cerebellum of normal macroscopic configuration showed histologically a generalized and almost complete atrophy of the granular layer. The small nerve cells of the molecular layer were absent in the atrophic folia, though the parallel fibres of the basket cells were present as a narrow bundle. The tangential fibres of the granule cells were absent. Little distinction was found between the degree of affection of lateral lobes and vermis save that the nodules in the cells were relatively well preserved. Marked heterotopia of the Purkinjë dendritic abnormality was seen including thickening, argyrophilia and cactus-like formations, some of which showed peculiarly dense radial branching. Axonal torpedoes were unusually numerous in the first case. There was a dense proliferation of fibrillary neuroglia in all layers of the atrophic cerebellar cortex and generally throughout the white matter, being particularly intense round the dentate nuclei. There was some thinning of myelinated fibres, especially in Case 2, but on the whole myelin abnormalities were inconspicuous. A well-marked sclerosis of the inferior olives unaccompanied by nerve cell loss occurred in the first case. No atrophic changes were found elsewhere in the nervous system. It is concluded that the condition is an unusual type of congenital cerebellar atrophy, the salient feature of which is a primary degeneration of the granular layer, the other cerebellar abnormalities found being secondary to this process. It differs from the cerebellipetal atrophy of amaurotic family idiocy not only in the absence of lipoid changes but also in the preservation of the basket fibres. It appears to be constantly associated with mental defect. (Author's abstr.)

BRIT. J. EDUC. PSYCHOL.

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BRIT. J. MED. PSYCHOL.
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*The Experimental Effect of Sex-Hormone Therapy upon Anxiety in Homosexual Types. *Rudolf, G. de M.* 317
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*On Schizophrenia. *Symons, N. J.* 344
Character and Mentality as Related to Hand-markings. *Wolff, C.* . . . 364
Nescience, Science and Psycho-analysis. *Ashley-Montagu, M. F.* . . . 383

General Trend of the Knee-jerk.

An investigation of the knee-jerk with a special apparatus and under experimental conditions on 100 students was undertaken. It is concluded that knee-jerks of average size will be found to be associated with balanced and normal personality conditions, and that either jerks that are too exaggerated or too small point to less balanced conditions. Some of the subjects, who had manifest neurotic symptoms, appeared at times to discharge their jerks on an all-or-none principle. It seems that neurotics have vigorous jerks, but as noteworthy is their tendency not to show progressive diminution in their jerks under conditions conducive to relaxation. S. M. COLEMAN.

Mental and Physical Function in the Hypnotic State.

This investigation is based on a study of one case, from which it is concluded that both mental and physical function may be improved by hypnosis. The extent of the improvement depends among other things on the nature of the function tested, on the subject used, and perhaps on the depth of hypnosis. There is roughly an inverse relation between the difficulty of the test and improvement in it under hypnosis ; the easier and more mechanical the test, the greater the improvement. Memory in its various aspects does not show any significant improvement. Under hypnosis, fatigue is inhibited to varying degree. Both mental and physical functions show improvement following post-hypnotic suggestion.

S. M. COLEMAN.

Sex-hormone Therapy.

Four homosexuals, two men and two women, suffering from anxiety, were given antuitrin S, and one of these cases testoviron in two courses later. Totals of seven courses of hormone therapy and seven of psychotherapy were given.

There was a constant improvement in anxiety upon the administration of sex-hormone therapy, with, however, the return of the anxiety at periods of from a few days to four months after the cessation of treatment. It is therefore concluded that anxiety in predominantly homosexual cases is directly dependent upon deficient stimulation of the gonads. S. M. COLEMAN.

Development of Knowledge in the Mental Defective.

The examination of 367 adult defectives with Kent mental ages of from 7 to 12 inclusive showed that the males learned more than the females. The tests were not repeated on each subject, but the results were obtained by comparing the knowledge possessed by each age-group. S. M. COLEMAN.

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On Schizophrenia.

According to the views put forward in this paper, the content of the schizophrenic delusion of persecution lies in a fear of disappearing, either wholly or in part, within the hostile object. In paranoia, on the other hand, what the subject fears is that a part of the hostile object will effect an entry into his body and that he will be unable to rid himself of it, this fear being associated more especially with one of being poisoned by it. In the schizophrenic delusion of persecution the fear is still one of having the body consumed or its vitality absorbed by the object, whereas in the corresponding paranoic delusion it is one of being invaded by the poisonous influences sent out by it; although these actions are now conceived of as being carried out against the subject from a point within himself.

S. M. COLEMAN.

BULL. MENNINGER CLIN.

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INT. J. PSYCHOANAL.

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IRISH J. MED. SCI.

FEBRUARY, 1941.

*Further Observations on the Excitability of Bulbar Nerve Centres. *Barry, D. T., and Loughnan, O. T. D.* 81

Further Observations on the Excitability of Bulbar Nerve Centres.

The actions of CO_2 and of drugs injected into the fourth ventricle on the spontaneous and reflex activities of bulbar centres have been studied in dogs and rabbits. Small doses of CO_2 increase the degree of apnoea caused by vagal excitation. Larger doses depress this inhibitory reflex and may abolish it. When anoxia accompanies increase of CO_2 the apnoeic vagal reflex is more easily diminished. A vasodilator response to vagal excitation from the vasomotor centre is usually converted to a pressor one by CO_2.

Potassium bromide in the fourth ventricle causes irregular breathing or apnoea, followed by hyperpnoea and rise of blood pressure. Sodium bromide may at first stimulate the respiratory centre. Its pressor action is less than that of the other. Bromides abolish the respiratory reaction to carotid sinus occlusion, leaving the pressor response. They cause but little depression of the vagal apnoeic reaction. They frequently reverse the pressor response of the vasomotor centre.

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Cocaine in the fourth ventricle causes apnoea, which may be fatal according to dose. Its action on the respiratory centre is more pronounced than on the vasomotor centre. It needs an almost fatal dose of cocaine to cause temporary abolition of the apnoeic vagal reflex. This reflex is very resistant to the various agents tested for its depression.

The pressor vasomotor centre is also very resistant to the influence of anoxia as it responds to vagal excitation in profound degree of this. A long period of survival of its reflex excitability is observed in asphyxia.

(Authors' abstr.)

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VOL. LXXIV. FEBRUARY, 1941.

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J. COMP. PSYCHOL.

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Reciprocal Facilitation of the Conditioned and Conditioning Mechanisms. *Eccher, W., and Cutler, E.* 223

Studies in Electrically Induced Convulsions in Animals.

1. Convulsions, closely similar to the clinical forms of epilepsy in man, were experimentally produced in rats and cats by electrical stimulation of the intact cortex.

2. Attempts to condition these electrically induced seizures were unsuccessful.

3. The amount of shock required to provoke an attack in rats was unaffected by the emotional excitement associated with exposure to the sound of an air blast or adrenalin injection.

4. Small amounts of alcohol had no effect on the convulsion threshold, but injections of about 1 c.c. tended to raise the resistance of the rats to electric shock.

5. Repeated convulsions resulted in marked personality changes in both rats and cats. The animals lost weight and became submissive, passive and inactive. Fear reactions were common. Some of the cats developed a pronounced tremor of psychogenic origin.

6. The implications of the above findings are discussed with respect to some aspects of epilepsy and the use of shock therapy in the endogenous psychoses.

(Author's abstr.)

J. CRIM. PSYCHOPATHOL.

VOL. II. JANUARY, 1941.

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J. GENET. PSYCHOL.

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J. NERV. MENT. DIS.

VOL. XCII. SEPTEMBER, 1940.

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*Metrazol Remission in Severe Obsession-Compulsion Neurosis of Five Years' Duration. *Zeifert, M.* 290
*Two Cases showing Tonic Neck Reflexes and Tonic Fits Following Vascular Lesions in the Brain Stem. *King, A. B.* 302
*Observations and Results Obtained in the Hypoglycaemic Treatment of Schizophrenia. *Coyne, A. R.* 309
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Adipositas Cerebralis and Emaciatio-cerebralis. *Gordon, A.* . . . 342
Meningeal Permeability and Metrazol Therapy. *Skorodin, B.* . . . 348

Localized Non-suppurative Encephalitis.

Four cases of localized non-suppurative encephalitis are reported. Three cases are secondary to disease of the temporal bone and one to disease of paranasal sinuses. The pathology of this condition is largely conjectural. The symptomatology closely simulates brain abscess and at present the diagnosis can only be suspected. Even the mere suspicion of the existence of localized non-suppurative encephalitis compels the prompt eradication of foci of infection in the temporal bone and paranasal sinus, and justifies the avoidance of too early exploration of the brain. S. M. COLEMAN.

Metrazol Remission in Obsession-Compulsion Neurosis.

A case of severe obsessive-compulsive neurosis with phobias of five years' duration is detailed and the mechanisms pointed out. This case was treated with induced metrazol convulsions at the age of 51 and achieved a good remission 24 months ago. Previously all other forms of therapy had failed.

S. M. COLEMAN.

Tonic Neck Reflexes and Tonic Fits.

Two patients showed tonic neck reflexes and tonic fits for a limited period of time following vascular lesions in the brain stem. Post-mortem studies showed that the anatomical transection of the brain stem was unilateral. It is suggested that there may have been a temporary physiological block of the opposite half of the brain stem which aided in producing the tonic phenomena.

S. M. COLEMAN.

Results of Hypoglycaemic Treatment.

A series of 57 cases, 55 schizophrenics, were given insulin shock therapy. 19 per cent. were ill six months or less, 31 per cent. one year or less and a total of 75 per cent. two years or less. Following treatment 14 per cent. recovered, 50

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per cent. were improved and 36 per cent. unimproved. Within a year the results were 19 per cent. recovered, 17 per cent. improved, 63 per cent. unimproved. No patient ill over five years showed permanent improvement. No beneficial relationship was noted between convulsive seizures during treatment and the ultimate results obtained. Those who had shown no response by the sixth or seventh week showed no permanent improvement. S. M. COLEMAN.

OCTOBER, 1940.

*Bilateral Cortical Thrombosis. *Palmer, D. M.* 429
Hypoglycaemic Epilepsy. *Robinson, L. J.* 442
*Degeneration of the Basal Ganglia Associated with Olivo-Ponto-Cerebellar Atrophy. *Aring, C. D.* 448
Vigilance and the Vitalistic Hypothesis. *Jelliffe, E. J.* 471
*Cerebellar Agenesis. *Rubinstein, H. S., and Freeman, W.* . . . 489

Bilateral Cortical Thrombosis.

A case of bilateral temporo-parietal cerebral softening is presented. Clinico-pathologically it is established that there were two separate cerebral accidents, the one in the right, non-dominant lobe appearing 18 days before the lesion in the left lobe. The lesion in the non-dominant lobe resulted in initial confusion with subsequent euphoria and restlessness. When the additional lesion appeared in the dominant lobe, the symptoms were jargon aphasia and the facial appearance and mannerisms which usually denote confusion and bewilderment. The patient passed over into a psychotic state. S. M. COLEMAN.

Degeneration of Basal Ganglia.

Clinical and pathological studies are recorded of a patient who had degeneration of the basal ganglia, as well as olivo-ponto-cerebellar atrophy. Clinically this patient presented the symptoms of progressive lenticular degeneration. The duration of the disease was for 22 years. Two siblings were similarly affected.
S. M. COLEMAN.

Cerebellar Agenesis.

Cerebellar agenesis which may be complete or incomplete is usually accompanied by antemortal signs and symptoms of cerebellar defect. Here a case is reported in which, in spite of extreme attenuation in cerebellar development, antemortal signs did not develop until two years before the patient's death, aged 71. The brain was found to show numerous atheromatous infarcts on the cortex cerebri, particularly the parietal lobes. The cerebellum was limited to a rather small flocculo-nodular lobe.

It is concluded that the patient was afflicted with a constitutional inferiority which was so generalized that he could only function as a fairly well balanced psychobiogenic entity on a lower psychosomatic, social, economic and intellectual level. S. M. COLEMAN.

NOVEMBER, 1940.

*The Cerebral Arc of the Corneal Reflex. *Walker, A. E.* 569
*Constitutional Differences between Deteriorated and Non-deteriorated Patients with Epilepsy. III. Dactylographic Studies. *Brown, M., and Paskind, H. A.* 579
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Cysticercus Cyst of the Fourth Ventricle with Surgical Removal. *Adelstein, L. J.* 623
Electric Changes and Corpse Reaction on the Peripheral Nerves in Insulin-Treated Schizophrenic Patients. *Kastan, M.* 630
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The Mental and Neurological Sequelae of Carbon Monoxide Asphyxia in a Case Observed for Fifteen Years. *Raskin, N., and Mullaney, O. C.* . 640

Cerebral Arc of the Corneal Reflex.

Three cases of intracranial neoplasm involving the cerebral hemispheres in which the contralateral corneal reflex was markedly diminished are reported. A fourth case with softening of the internal capsule, presenting a markedly diminished corneal reflex initially which gradually returned to normal, is added as a typical example of the findings in vascular insults of the internal capsule. These findings suggest that at least some of the fibres subserving the corneal reflex reach the cerebral hemisphere of the face area of the pre- and/or post-central gyri of the opposite side. The impairment is usually more pronounced when sensory disturbances are associated with the motor paresis. S. M. COLEMAN.

Dactylographic Studies in Epilepsy.

Dactylographic patterns were studied from 1,446 fingers of 146 deteriorated epileptics and from 1,147 fingers of 115 non-deteriorated epileptics. The statistical findings lend support to the view that there are constitutional differences between deteriorated and non-deteriorated epileptics, and that this difference in constitutional trend as reflected in finger-prints is established at the third or fourth month of intra-uterine life, since it is at this period that the dactylographic pattern is laid down. S. M. COLEMAN.

The Imagination and Its Exploitation.

A commentary on the creative imagination as manifested in Psalmanazar's literary forgery of an account of Formosa, and in the Martian revelations of Flournoy's medium, Helénè Smith. S. M. COLEMAN.

DECEMBER, 1940.

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Nasopharyngeal Tumours and Their Neurological Complications. *Titrud, L. A., and Peyton, W. T.* 727
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The Occurrence of Complications of the Nervous System following the Extraction of Teeth. *Alpers, B. J.* 752
*Compression Fractures of the Dorsal Vertebrae Resulting from a Convulsion Occurring during the Course of Insulin Shock Therapy. *Rupp, C.* . 762

Some Peculiar Manifestations of Memory.

The case of lightning calculation in a boy, aged 6, is described, and this is followed by a review of the relevant literature. It is concluded that like the neurotic who is seriously handicapped in his adjustment to life because he has to cope with a fragment of his infantile sexuality in adult life, the infant prodigy is even more afflicted because for some as yet unknown reasons he has to cope with a fragment from his phylogenetic existence. S. M. COLEMAN.

Compression Fractures and Insulin Therapy.

Following a severe convulsion occurring during hypoglycaemic coma in insulin shock therapy, a patient complained of severe backache and showed tenderness

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over the mid-dorsal spine. Subsequent X-ray examination revealed compression fracture of the 6th, 7th and possibly the 5th dorsal vertebrae. The patient suffered no permanent disability. S. M. COLEMAN.

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*Hypoglycaemia and the Automatic Nervous System. *Fortuyn, J. D.*. . 1
*A Psychiatric Study of 100 Criminals. *Oltman, J. E., and Friedman, S.* . 16
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*An Analysis of Results in the Metrazol Shock Therapy of Schizophrenia. *Colomb, H. O., and Wadsworth, G. L.* 53
Mass-Psychosis and Its Effects. *Abrahamsen, D.* 63

Hypoglycaemia.

During hypoglycaemia both sympathetic and parasympathetic symptoms are present. It is suggested that these symptoms are due to diencephalic mechanisms. In favour of this hypothesis it is pointed out that hypoglycaemic symptoms are very like those of automatic epilepsy. Again much experimental evidence favours a diencephalic origin. S. M. COLEMAN.

One Hundred Criminals.

It is concluded that adolescent delinquency and adult criminality may be regarded as one symptom of a disorganized personality structure which is derived from the conflicts, insecurity and maladjustments of childhood. The latter derive from the various psychological and situational determinants by which the child may be moulded, such as a disrupted home, a cruel, domineering or alcoholic father, an over-protective mother or unsuccessful competition with siblings or schoolmates, and these may be enhanced by economic insecurity.
S. M. COLEMAN.

Results in Metrazol Shock Therapy.

Ninety-seven cases of dementia praecox treated with metrazol showed a 50 per cent. increase in recovery rate over a standard control group. This increase is relative because it is a shift from the improved group. There was no increase in discharge rate.

No serious complications attended its use except for reactivation of quiescent pulmonary tuberculosis in four cases. The duration of the illness was shortened in favourable cases. Some of the others became better hospital patients. Those in whom good results were obtained began to improve with the first five convulsions.
S. M. COLEMAN.

J. NEUROPHYSIOL.

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*Observations on Cortical Somatic Sensory Mechanisms of Cat and Monkey. *Marshall, W. H., Woolsey, C. N., and Bard, P.* 1
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*Pupillodilator Reactions to Sciatic and Diencephalic Stimulation. *Weinstein, E. A., and Bender, M. B.* 44
*Flicker Potentials and the Alpha Rhythm in Man. *Toman, J.* . . . 51
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*Recovery of Responsiveness in Motor and Sensory Fibres during the Relative Refractory Period. *von Brücke, E. T., Early, M., and Forbes, A.* . . 80
*Technique and Evaluation of the Encephalogram. *Davis, P. A.* . . 92
*Activity in Neurons of the Bulbospinal Correlation System. *Lloyd, D. P. C.* 115

Observations on Cortical Somatic Sensory Mechanisms of Cat and Monkey.

1. The application of a brief tactile stimulus of low intensity to a very small cutaneous area evokes discrete surface positive potential waves in specific places on the contralateral cortex of the cat or monkey. These potentials constitute the primary cortical response to sensory stimulation.

2. In the cat a weak tactile stimulus applied to hairs on the dorsal surface of the forepaw (the only peripheral area given detailed examination) evokes separate maximal primary responses at three regions on the contralateral cortex. In the monkey the application of such a stimulus to any part of the body always evokes, within the cortical area of representation of that part, primary responses at two or more regions. The response having the shorter latency occurs in area 3 (Brodmann); the other with slightly greater latency is usually found in area 2. A third region of maximal primary response is often found in or very near area 1.

3. Each region or spot of maximal primary response is surrounded by a fringe or margin of submaximal responses. The overlap of the submaximal margins for peripheral regions which are adjacent or which have adjacent cortical representations is reciprocal and definite. Demonstrable interaction is usually found within the overlap.

4. Nembutal and certain other anaesthetics greatly reduce the spontaneous activity of the cortex, but do not appreciably affect any characteristics of the primary response except the recovery time, which is greatly prolonged.

5. Moderate ether anaesthesia does not reduce the spontaneous activity of the cortex and it does not appreciably affect the threshold, latency or size of the primary response. With ether (even extremely deep ether) the recovery time is shorter than with nembutal. With light and moderate ether the absolutely unresponsive time is very short.

6. The primary response is present in the absence of anaesthesia. As compared with the responses evocable in the anaesthetized preparation those of the unanaesthetized animal are characterized by a shorter recovery time of the primary response, greater complexity of various secondary reactions, and the occurrence of long lasting facilitation effects. (Authors' abstr.)

Observations on Subcortical Somatic Sensory Mechanisms of Cats under Nembutal Anaesthesia.

1. Under nembutal anaesthesia a tactile stimulus applied to hairs on the forefoot of the cat consistently evokes measurable electrical reactions in the tegmentum, the thalamus, the internal capsule, and the cortex.

2. The reactions in the tegmentum and internal capsule, which are evoked by tactile or electrical stimulation of the periphery, appear as spike barrages 5 to 15 msec. in duration. The capsule barrage is either longer or it decrements more slowly than the lemniscus barrage and has about the same duration as the cortical wave.

3. In deep anaesthesia the absolutely unresponsive time for the reaction rostral to the ventrolateral nucleus pars externa of the thalamus was found to be 25 to 50 milliseconds. The absolutely unresponsive time caudal to the thalamus was too brief to determine by the procedure used in these experiments. It appears that the mechanism chiefly responsible for the long recovery time is in the ventrolateral nucleus pars externa.

4. Three types of electrical activity resulting from the peripheral stimulus can be recorded from the thalamus. These are in order of occurrence (*a*) the lemniscus

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spike barrage which presumably detonates the thalamic neurones, (*b*) a burst of diphasic spikes of axon spike dimensions which is associated with activation of the radiations, and (*c*) a long slow positive wave, the time course of which approximately parallels the recovery time and which probably represents a post-synaptic after-potential.

5. In the regions rostral to the ventro-lateral nucleus pars externa, a definite absolutely unresponsive time is seen in the responses of single units as well as in the summed activity of many units.

6. It appears that a single thalamic neurone can discharge repetitively at a high frequency for 6 to 8 msec. (4 or 5 spikes in that interval), and that this repetitive discharge is due to a sustained lemniscus bombardment during that interval or longer. This brief, high-frequency train of spikes represents a unit or quantum of activity after which the mechanism is refractory or unresponsive for a definite period as a result of summation of subnormality in each thalamic neurone involved. (Author's abstr.)

Pupillodilator Reactions to Sciatic and Diencephalic Stimulation.

1. Comparative studies of pupillodilatation obtained on sciatic nerve and diencephalic stimulation were made in the cat and monkey.

2. The reflex pupillodilatation obtained with sciatic stimulation in the cat was not abolished by section of the cervical sympathetic trunk, the trigeminus or by lesions of the hypothalamus, but the reaction was eliminated by section of the oculomotor nerve.

3. In contrast, this reflex pupillary dilatation in the monkey was abolished or greatly reduced by cutting of the cervical sympathetic, but it failed to disappear after section of the third cranial nerve.

4. Similarly the pupillary dilatation obtained by stimulation in the thalamus and dorsal hypothalamus in the cat was little reduced by section of the cervical sympathetic, and it could not be obtained after sectioning the third cranial nerve.

5. Stimulation of the hypothalamus in the monkey resulted in bilateral pupillary dilatation, which was abolished, or greatly diminished, by section of the cervical sympathetic, but it was not abolished by destruction of the oculomotor nerve.

6. In each species pupillary dilatation is accomplished by both parasympathetic inhibitory and sympathetic excitatory mechanisms. In the cat, inhibition of the parasympathetic mechanism is predominant, while in the monkey excitation of the sympathetic mechanism is of greater importance. (Authors' abstr.)

Flicker Potentials and the Alpha Rhythm in Man.

Flicker potentials in response to intermittent light stimulation were observed in the electroencephalograms of 21 subjects. Subjects having a low per cent. time alpha rhythm showed the widest frequency range of flicker-following. In amplitude and regularity flicker potentials were best at about the frequency of the alpha rhythm. They were confined to the occipital region except for occasional appearance at the cortex. They were found to require a period of time for organization at the beginning of a train of flashes. Once organized, they showed an inherent rhythmicity, and could continue for a short time after the cessation of the stimulus. " On " responses to isolated light flashes were observed in some subjects, but " off " responses were never seen and are considered to be absent even in the phenomenon of " doubling."

Flicker-following is interpreted as a succession of over-lapping " on " responses comparable to the slowest components of the cortical response to optic nerve stimulation studied by Bishop and collaborators in the cat and rabbit. It is suggested that the cortical elements involved include not only some of those whose spontaneous activity may be recorded as the alpha rhythm, but also others of different natural frequency which are ordinarily prevented from synchronization by the dominant alpha rhythm. (Author's abstr.)

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Effects of Prefrontal Lobotomy on Depressed Patients.

From a study of the behaviour of 13 patients undergoing a prefrontal lobotomy operation for a depressed condition, we note a definite heightening of the emotional tone. The subsequent course of this emotional change varies, but there is a tendency to remain above the level of depression that characterized the patients prior to the operation. The psychometric test did not reveal any significant changes in the intellectual abilities. The efficacy of the operation should not be determined from the present study because of the lack of a control group and the difficulty of objectively defining social recovery. Studies of those patients who had a history of previous mental attacks do not reveal any trends distinct from those patients who had no former mental upsets. (Authors' abstr.)

Sympathetic Preganglionic Outflow to Limbs of Monkeys.

1. The sympathetic preganglionic outflow from the spinal cord to the limbs has been re-investigated by recording action potentials in the peripheral nerves following stimulation of ventral roots.

2. In the cat the outflow to the lower extremity extends from T11–L4, with the major contribution from T13–L13 (inclusive), whereas in the Rhesus monkey (*Macaca mulatta*) it extends from T12–L3, with the major contribution from L1–L3 (inclusive). Thus 7 spinal roots in the cat participate in the outflow to the lower limb, whereas only 4 roots contribute in the monkey.

3. The sympathetic preganglionic outflow to the upper extremity extends in the Rhesus monkey (*Macaca mulatta*) from T4–T8 (inclusive), with the major outflow from T5, T6, and T7. This outflow is also more restricted than that observed in the cat and dog by previous workers.

4. There is no definite difference between the extent of total outflows to the median, ulnar and radial nerves, nor between the outflows to the medial and lateral popliteal branches of the sciatic.

5. Variations in the fixation of the lumbo-sacral and brachial plexuses were not associated with any clear differences in the preganglionic outflows to the limbs.

6. Crossed pathways, between the lumbo-sacral sympathetic chains, of fibres destined for the opposite sciatic nerve were not demonstrated in either the cat or the monkey.

7. Large C waves were recorded in both "animals." B waves were recorded in the cat, but were only occasionally seen in the monkey.

8. Nicotine injected intravenously in suitable doses abolished both B and C waves, thus establishing their autonomic nature. (Authors' abstr.)

Recovery of Responsiveness in Motor and Sensory Fibres during the Relative Refractory Period.

Recovery of responsiveness (height of spike) and of conduction velocity in motor and sensory fibres during the relative refractory state was studied in bullfrogs and cats. A Lucas pendulum was used for timing the stimuli and a cathode ray oscillograph for recording.

In bullfrogs recovery of responsiveness in the sensory fibres, including the spinal ganglion, was always much slower than in the motor fibres. The sensory and motor curves attained 90 per cent. recovery within about 0·8 and 4·0 msec. respectively after the end of absolute refractoriness. In dorsal roots without ganglia, however, responsiveness recovered at the same rate as in ventral roots.

The passage of the impulse through the ganglion seems to modify the responsiveness of the fibres beyond the ganglion.

In cats recovery of responsiveness was slower in general (average temp. in moist chamber 31° C.), and no influence of the spinal ganglion could be observed.

In both bullfrogs and cats conduction velocity recovered at the same rate in sensory fibres including the spinal ganglion and in motor fibres.

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Acetylcholine was found to have no observable effect upon recovery of responsiveness.

It is suggested that the subnormal period is a late continuation of the relative refractory period (cf. Gasser, 1937). (Authors' abstr.)

Technique and Evaluation of the Electroencephalogram.

The measurement of specific features of the EEG is described. The limitations in measuring single factors, and of synthesizing them, is pointed out. A system of evaluating the EEG pattern as a whole on a 5-point scale from normality to abnormality is described. The underlying quality of stability versus instability of pattern is the basis of this system of evaluation.

Normal patterns are divided into types as follows: A patterns are dominated by regular alpha sequences, which are clearly countable. B patterns lack alpha sequences when subjects are run under standard conditions. M patterns include EEG's which are composed of mixed frequencies. The latter group is subdivided into the MS group, in which the slow waves are responsible for the mixed frequencies, and the MF group, in which the fast frequencies are prominent. The M group, though regarded as normal, appears to be intermediate between the normal and the abnormal.

The abnormal features of the EEG known at present are described as "episodal" or as "continuously dysrhythmic." They include every graduation of dysrhythmia up to the well-recognized epileptic patterns; the "choppy" quality obscuring a normal pattern (shown to have been associated with brain damage in three cases); and localized slow-wave activity associated with tumours or focal lesions. These features are discussed in relation to the evaluation of an EEG.

The importance of the technique and procedure of recording and the necessity for standard conditions are emphasized.

The method has been validated on selected groups of adult individuals which are compared with one another, such as a known normal group, a presumably normal or average group, and known abnormal groups. (Author's abstr.)

Activity in Neurons of the Bulbospinal Correlation System.

The bulbospinal correlation system may be divided into two fibre groups, the long fibres represented by the reticulospinal tracts and long propriospinal tracts, and the short fibres represented by the short propriospinal tracts. Activity traverses the length of the neuraxis in the long fibres and enters the short propriospinal nuclei, apparently at all levels, to travel a short distance as relayed impulses along the short propriospinal fibres.

Impulses from the long fibres reach the spinal motoneurons directly and by the appropriate short propriospinal relays. These tract impulses also activate local interneuron pools of the ventral horn region, which in turn deliver impulses to the motoneurons.

In activity initiated from the upper cord and medulla the summation of impulses in the short propriospinal relays with local internuncial impulses from the ventral interneuron pools controls the time of firing of the earliest motoneuron volleys. The direct tract impulses, arriving at the motoneurons approximately 1 msec. earlier than the propriospinal relays, are ineffective. For the direct impulses to become effective the dorsal interneuron pools must be active. These dorsal interneuron pools are under the control of primary afferent neurons. When these pools are activated by a dorsal root volley, temporal control of the volleys in the motoneuron discharge passes from the relayed tract impulses to the direct tract impulses.

The total motoneuron discharge is in strict parallelism with the activity of intimately related interneuron pools. With repetitive volleys descending the cord, the internuncial activity is synchronized and augmented, and the activity so changed determines the size and duration of the motoneuron discharge. The

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subliminal fringe within the motoneuron pool varies with the discharge zone of that pool.

The propriospinal nuclei are subject to vestibular, reticular, corticospinal and primary afferent influences. They are, therefore, correlation centres in as true a sense as is the reticular formation.

The temporal exactitude with which discharges occur in the interneurons of the column tracts, and in the motoneurons guided by these discharges, attests to the importance of timing as a factor in synaptic transmission in the spinal cord.

(Author's abstr.)

OCCUP. THER. AND REHABIL.

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Occupational Therapy for Cerebral Palsies at the Children's Rehabilitation Institute. *Martin, E. F.* 331
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Literary Club for Schizophrenia.

A club which edits its own journal was formed by schizophrenic patients. The patient, adjusting to this social situation successfully, was thereby assisted in solving his own problems, and showed improvements varying from increased socialization to actual discharge. S. M. COLEMAN.

DECEMBER, 1940.

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Utilization of Wastes in Therapy.

Advice is given on how to extend occupational therapy to wards in the form of a prevocational training with a minimum expenditure for materials and no increase in trained personnel. S. M. COLEMAN.

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*Insulin Shock Therapy in the Older Patient with Schizophrenia or a Schizophrenia-like Reaction. *Robinson, G. W., jun.* 177

An Objective Sign (Gans-Rodiet) in Chronic Alcoholism.

The Gans-Rodiet sign consists of a hemi-anaesthesia of the external or lateral part of the sclera of the eye, i.e. the lateral part of both eyes loses the sensation of touch, and the motor or defensive reflex is weakened or even lost. The normal brisk blinking reflex becomes sluggish or even absent. The writers carried out the exact technique of Obrastzov on 300 patients, 100 of whom had a definite alcoholic history and 200 of whom only one of very light or no alcoholic indulgence. 62 of the first group had a positive bilateral Gans-Rodiet. Only 7·5 per cent. of the second group yielded a positive sign, and of these 15, 12 had an anaesthesia of the entire sclera, medial and lateral; these 12 were all syphilitic. The Gans-Rodiet sign appears to be a very useful clinical sign. G. W. T. H. FLEMING.

Studies in Senile Nocturnal Delirium.

1. Senile patients suffering from nocturnal delirium were found to develop this delirium on being placed in a dark room during the day.

2. They were also found to suffer from severe impairment of their capacity to retain what they had registered.

3. It was suggested that their delirium may be based upon an inability to maintain a spatial image without the assistance of a repeated visualization.

4. Thirteen out of 16 of these patients when blindfolded showed a severe distortion of their spatial image within an hour. This supports the above hypothesis. (Author's abstr.)

Prognosis of Hebephrenia.

One hundred cases of " unmistakable " hebephrenic schizophrenia admitted to the New York State Psychiatric Institute during the years 1929–1933 were analysed from the standpoint of potential prognostic indications.

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These cases were considered from the point of view of mode of onset, symptomatology and clinical course. As a result of the investigation, a more complete clinical syndrome is presented. This consists of a prodromal period which may be of insidious or of acute nature, followed by an acute stage of the disease, a stationary stage and a chronic stage. Recovery or improvement may follow the acute or stationary stages.

In studying the cases from the point of view of nature of onset, it was shown that cases of acute onset show a greater recovery rate. Cases of insidious onset may be considered as having a poor prognosis. One symptom, however, that of " mirror-gazing," appeared frequently and as one of the earliest manifestations of the disorder. Insufficient attention has been paid to this symptom.

Early recognition of faulty habits and training in childhood, with easy accessibility to mental hygiene clinics so that prompt adjustments can be made, will tend to reduce the number of individuals developing hebephrenia.

(Author's abstr.)

Intravenous Sodium Amytal Medication as an Aid to the Rorschach Method.

1. The use of intravenous sodium amytal in prenarcotic doses as an aid to the Rorschach method is described.

2. Following sodium amytal injections, the Rorschach responses show a greater number of responses and fewer rejections of cards, making diagnosis possible in cases previously considered unavailable.

3. The responses under sodium amytal medication are qualitatively less bizarre and stereotyped and permit far finer nuances of personality description.

4. The need for further experimental work on normals is stressed.

(Authors' abstr.)

Schizophrenic-like Reactions in Children.

1. Seven children, varying in age from 9 to 13 years, showing schizophrenic-like reactions, were observed continuously over a period of three to seven years.

2. Five of the seven cases showed evidence of organic diseases of the brain, probably on a hypoplastic basis as judged by the pneumoencephalograms.

3. All seven cases revealed the presence of slow waves in the electroencephalograms. Four of these had non-equivalence of both sides of the head.

4. Only one case was adjudged " organic " on Rorschach interpretation.

5. The authors cannot propose any definite conclusions regarding the problem of schizophrenia in children, but feel that further investigation along the same lines is indicated. (Authors' abstr.)

The Use of Curare in Modifying Metrazol Therapy.

1. Metrazol modified by curare has been safely given to 50 patients ranging in age from 16 to 70. No resulting trauma of any description has been demonstrable.

2. It is possible with this method to treat patients who, because of debility, age or disease might not be safely treated otherwise.

3. The satisfactory results formerly attributed to unmodified metrazol are still present and apparently not changed by the addition of curare.

(Authors' abstr.)

Insulin Shock Therapy in the Older Patient with Schizophrenia or a Schizophrenic-like Reaction.

1. This series of 13 patients who, at the age of onset, were in the upper age limits for onset of schizophrenia, gave 92·31 per cent. excellent results for immediate recovery rate, and 90 per cent. excellent results for the one and one-half year follow-up, following insulin shock therapy.

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2. The older patient with schizophrenic elements in his psychosis should be treated with insulin shock therapy.

3. Prognostic criteria for the individual patient when insulin shock therapy is proposed should take into consideration the type and quality of the adult adjustment before onset, the age of the patient at the onset of the symptoms, in addition to the other factors which have been proposed, such as duration of illness before treatment and the type of symptoms presented. (Author's abstr.)

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The Effect of a Painful Stimulus and Its Recall upon Respiration in Psychoneurotic Patients.

(1) Respiratory tracings were obtained on a series of 39 psychoneurotic patients and 14 control subjects during the administration of a painful stimulus and during the subsequent recall by the patient of this experience.

(2) The respiratory records were analysed period by period for rate and depth of respiration, minute respiratory volume, metabolic rate and expiratory-inspiratory angle.

(3) As a result of a previous study the patients were divided on the basis of hospital diagnosis into two groups. Group 1 included 27 patients diagnosed as hysteria, phobia or anxiety neurosis. Group 2 included 12 patients diagnosed as hypochondriasis, reactive depression, compulsion neurosis or questionable schizophrenia.

(4) Most of the patients of Group 1 showed during pain an increase in rate, in minute respiratory volume, and in metabolic rate, as well as a shift towards sharper expiratory-inspiratory angles. During recall there was an increase in minute respiratory volume which was not great or as consistent as during the pain period.

(5) Patients of Group 2 showed during pain little or no change in rate. They

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showed an increase in depth of respiration, and correspondingly a small increase in minute respiratory volume. The changes in metabolic rate and in expiratory-inspiratory angle were not consistent. During recall there was some increase in rate, no consistent change in depth, or in minute respiratory volume. The metabolic rate decreased slightly in most cases for recall, and the expiratory-inspiratory angle was more acute.

(6) A majority of the control tests showed during pain an increase in depth or respiration, and a moderate increase in minute respiratory volume. There was no increase in metabolic rate. The expiratory-inspiratory angles became more acute. During recall there was some increase in rate of respiration, and again in the majority of cases an increase in minute respiratory volume. Metabolic rate decreased slightly in most cases for recall and the expiratory-inspiratory angles became more acute. (Authors' abstr.)

Physiological Aspects of the Obsessive State.

It is thought that a " neurointellectual " system exists, and that its behaviour is influenced by the physiological and pathological processes as the neuromuscular, neurosensory and other systems.

One of these processes, that of repetitive or fixed neural action, has been studied in its relation to both neurointellectual and neuromuscular function. Many different clinical symptoms of various types are the result of such neural action. In the " psychological " sphere, these symptoms appear as obsessions and compulsions. The neural basis of obsessive and compulsive states is illustrated and discussed.

It is believed that such a concept does not conflict with the theories of the " psychological " origin of such symptoms under other circumstances, but rather that it adds to our understanding of the physiological structure and function of the thoughts and feelings which ignite these " psychological " disturbances. In demonstrating how an intricate symptom such as an obsession may be viewed as a function of a neural unit, form and body is given to an entity which has existed clinically as a reality, but physiologically only as an abstraction.

(Authors' abstr.)

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