The Hereditary Factor in Mental General Semi-
Semantics, Psychiatry, Effect of Benzedrine Sulfate Alternated with Sodium
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The Therapy in Psychosis,
The Clinical Value of Hallucinations in Localizing Brain Tumors. S. Tarachow. 1,434.
The Influence of the Times upon the Teaching of Psychiatry. D. E. Cameron. 1,443.
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Dulness as an Epileptic Equivalent. T. J. Putnam, and H. H. Merritt. 797.


Technical and Occasional Notes:

*Changes in Retinal Arteries Before Convulsions Induced by Electric Shock. E. C. Mich. 848.

Therapy of Involutional Melancholia with Estrogens.—Case records are presented in support of the view that treatment with estrogen and androgen may effect marked improvement in patients exhibiting manic depressive psychoses associated with the menopause. (R. M. S.)

Dilantin Sodium Poisoning.—A case of dilantin sodium poisoning has been reported. In addition to pyrexia and severe widespread dermatitis that eventuated in dermatitis exfoliativa, marked enlargement of the liver and spleen developed. A recrudescence occurred five days after an apparent recovery. (R. M. S.)

Corpus Callosum: II. Higher Visual Functions following Complete Section.—In six epileptic patients in whom the corpus callosum was completely sectioned the higher visual functions in each homonymous field were studied. No disturbance of absolute or relative orientation, absolute or relative discrimination of size or recognition of colour, objects or letters was found in either homonymous field of vision. (R. M. S.)

Dulness as an Epileptic Equivalent.—A group of cases of "epilepsy" is reported in which periods of dulness, mental retardation, apathy and mild confusion occurred, lasting hours to days, in addition to definite attacks of typical grand mal, petit mal or psychomotor type. (R. M. S.)

Pick's Disease.—It is claimed by the authors that the outstanding and unique feature in Pick's disease is the discrepancy between the relatively mild parenchymatous changes and the severe neurological changes. (R. M. S.)

E.E.G. of Children.—A series of cases of so-called focal cortical seizures was studied by electroencephalographic, pneumoencephalographic, and clinical neurological methods. In none did electroencephalographic studies show that purely focal cortical disturbances were responsible for the seizures. (R. M. S.)

Retinal Artery Changes in Electric Shock Convulsions.—In cases of convulsions following electric shock a spasm of the retinal arteries usually precedes the generalized convulsion, and, as a rule, a spasm does not occur if the effect of the shock is to give only a minor seizure. In addition, if one can infer that the appearance of the retinal artery accurately reflects the condition of the smaller cerebral arteries, one may conclude that the arterial spasm does not cause the convulsion, but is itself an early part of the process sent into action by something else, in this case the electric shock. (R. M. S.)
with estrogenic substances is of value. Ten to twenty thousand units of estrone should be administered every other day until the patient shows improvement. (R. M. S.)

Human Pyramidal Tract.—There is great variability in the size of the large motor, or so-called Betz, cells in area 4 of man. Of the cells measuring between 900 and 4,100 square microns there is a somewhat gradual and uniform decrease in numbers from the smallest to the largest. In each third of the motor region there is a mixture of cells of various sizes, but all have a preponderance of the diminutive type. The upper third has more cells of all sizes than the middle portion, and the latter has more cells of all magnitudes than the lower third. The average size of the cells measured in the upper third is 1,978 square microns, in the middle third 1,702 square microns, and in the lower third 1,592 square microns. These figures are Betz or giant cell size, non-specific. Therefore, it cannot be said with assurance that these cells give sole origin to the pyramidal tract fibres. (R. M. S.)

Peripheral Blood Flow in Schizophrenia.—The rate of peripheral blood flow in various mental states was studied by means of the venous occlusion plethysmograph method. The authors' studies demonstrate that there is no lesion of the arterial tree at the periphery in schizophrenia or in the other mental diseases studied. The conflicting results obtained in studies on circulation time in patients with schizophrenia can be attributed, in part at least, to the variable blood flow in the hand observed in this state. (R. M. S.)

ENCEPHALOPATHY DUE TO BURNS.—An unusual case of encephalopathy attributed to burns is presented. Aphasia, ataxia and mental deterioration ensued after the scald which affected 30 per cent. of the body surface. Pneumoencephalographic examination revealed dilatation of the third and lateral ventricles, and also cortical atrophy affecting the frontal and parietal regions. This damage to the nervous system is evidently assumed to have occurred within a period of fifteen weeks. (R. M. S.)

Intracranial Chordoma.—A case of intracranial chordoma arising from the clivus Blumenbachii with anterior extension into the retro-orbital space, causing unilateral proptosis, is reported. The histological features of the chordoma partially duplicate the morphological features of the chorda dorsalis during its stages of evolution. Malignant infiltrating chordomas at the base of the brain have a tendency to include large blood vessels, thereby making surgical removal difficult. On the other hand, small, encapsulated, non-invasive chordomas might be eradicated by excision. (R. M. S.)

Pilocarpine Sweating Test.—After preganglionic sympathectomy pilocarpine hydrochloride (½ grain given hypodermically) will induce free sweating up to at least two years after operation. After postganglionic sympathectomy the pilocarpine test performed two months or longer after operation will demonstrate an anhidrosis, the area of which agrees precisely with that of the thermoregulatory anhidrosis. When two months at least has elapsed after operation, the sweat gland the postganglionic neuron of which has been severed will not respond to pilocarpine hydrochloride in ½-grain doses. (R. M. S.)

Sublingual Absorption of Prostigmine Bromide.—As a result of the improved reaction to prostigmine bromide when given by the sublingual method, it has been possible to reduce the daily dose. Undoubtedly more rapid absorption takes place when the tablet is dissolved in the mouth. When parenteral administration of prostigmine methylsulphate is not available and more prompt response from the drug is desired, sublingual administration of prostigmine bromide is recommended. (R. M. S.)

Porencephalic Cyst.—A case of porencephaly is presented with encephalographic and arteriographic studies demonstrating marked involvement of the middle cerebral artery in relation to the cerebral cyst. (R. M. S.)

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July 1941.  

*Dietetic and Related Studies on Multiple Sclerosis. R. M. Brickner, N. Q. Brill, with the Assistance of F. M. Naylor and K. Montgomery. 16.  

*Prognostic Value of Intravenous Administration of Sodium Amytal in Cases of Schizophrenia. J. S. Gottlieb and J. M. Hope. 86.  
Case Reports.  
Marcus Gunn Phenomenon. F. D. Ingraham and J. B. Campbell. 127.  

Multiple Degenerative Softening.—Three cases of disseminated degenerative softening were studied clinically and pathologically. The clinical features were indefinite and
varied in each case, but the pathological features were definite and similar in all. The essential pathological features were a combination of demyelination and inflammatory changes. The demyelination was in the nature of degenerative softening, caused by the direct action of a toxin on the nerve tissue, and was not of vascular origin. The pathological features of multiple degenerative softening can be produced experimentally by injecting into animals foreign substances such as extracts of brain tissue. (R. M. S.)

Dietetic Studies on Multiple Sclerosis.—An investigation was made on the lifelong dietary habits of thirty-four patients with multiple sclerosis. In general, patients with multiple sclerosis are poor eaters, the consumption of visible fat, particularly of dairy fat, being especially poor. In seventeen patients (group 1) these defects were obvious. In five others (group 2) the material gave ground for strong suspicion that the defects existed. In eight (group 3) there was suggestive, but uncertain evidence, and in four (group 4) there were no signs of abnormality. Study of the relationship of food intake, weight, intercurrent events, and course of the disease suggested a possible connection between nutritional adequacy and the disease. (R. M. S.)

Death in Shock Therapy.—In shock therapy, the death rate is low—seventy-three per ten thousand patients treated with insulin and twenty-three per ten thousand patients treated with metrazol. (R. M. S.)

Multiple Primary Tumours of Spinal Cord. —The clinical and pathological features of two cases of multiple intra-medullary tumours of the spinal cord are presented. Multiple intra-medullary tumours are most frequently ependymomas, and they may be associated with Recklinghausen's disease of the central nervous system. The association of ependymomas with neurinomas and meningiomas is emphasized. The clinical course of such tumours may be greatly protracted and frequently many of the growths are asymptomatic. (R. M. S.)

C.S.F. Dynamics in Man.—The authors describe a new type of neck cuff which appears to compress effectively the deep veins of the neck. The response of the cerebrospinal fluid pressure to jugular compression, either in terms of magnitude or of rate of rise, may be greatly influenced by (1) the manner in which the neck veins are compressed; (2) the initial cerebrospinal fluid pressure; (3) leakage of cerebrospinal fluid; (4) hyperventilation; (5) variations in intracranial blood flow, and (6) pathological block in the spinal subarachnoid space. A knowledge of these variable factors should aid in the clinical interpretation of dynamic responses of the cerebrospinal fluid pressure. (R. M. S.)

Prevention of Traumatic Complications in Shock Therapy.—Solution of magnesium sulphate, a drug with a curare-like action, has proved to be satisfactory for prevention of traumatic complications in convulsive shock therapy. The dosage of magnesium sulphate is more accurate and easier to gauge with relation to the patient than that of curare, as the margin of safety is much greater. The preparation of this drug is relatively simple and economical. (R. M. S.)

Administration of Sodium Amytal in Cases of Schizophrenia.—The type of response obtained by the intravenous injection of sodium amytal is of distinct aid in the evaluation of the prognosis for a given schizophrenic patient. The more closely the patient's behaviour approaches normal under the influence of the drug, the better the prognosis. The reactions produced by the drug may be helpful in the evaluation of new types of therapy. (R. M. S.)

Histogenesis in Senile Plaques.—The great majority, if not all, of senile plaques arise primarily from nerve cells which have undergone degeneration: in a great proportion of these cells the degeneration consists of Alzheimer's neurofibrillary change. The resulting neurobiotic focus (consisting of remnants of nerve cells, axons, dendrites, and neurofibrils) attracts the microglia cells, which, while attempting to function in their physiological role, may become a part of the plaque. The oligodendroglia cells most probably become involved in the plaque by mere coincidence. There is evidence that the astrocytes, at least at times, attempt glial repair of the plaque. Methods of research are, as yet, not adequate enough to provide an explanation of the complex biochemical processes which cause degeneration of the nerve cells, and hence initiate formation of the senile plaque. (R. M. S.)

Oclusion of Superior Cerebellar Artery. —A case of occlusion of the superior cerebellar artery is presented, with correlation of the clinical picture and the post-mortem observations. The classic aspects of the syndrome of the superior cerebellar artery are reviewed, and some atypical features are discussed with a view to correlating the anatomic lesions and indicating some problems of functional localization. (R. M. S.)
**Acute Postoperative Aseptic Leptomeningitis:** Review of Cases and Discussion of Pathogenesis. A. J. Finlayson and W. Penfield. 250.

**Pathologic and Mental Alterations in a Case of Simmonds' Disease.** R. C. Wadsworth and C. McKean. 277.


**Influence of Locomotion of the Plantar Reflex in Normal and in Physically and Mentally Inferior Persons: Theoretic and Practical Implications.** P. J. Yakovev and M. J. Farrell. 322.

**Patterns of Cerebral Integration Indicated by the Scotomas of Migraine.** K. S. Lashley. 331.

**Fibre Connections of Corpus Striatum.** In this investigation isolated lesions were made in various parts of the corpus striatum with the Horsley-Clarke apparatus, and the resulting degenerations analysed through the study of Marchi preparations. The results obtained correct certain misapprehensions and clarify some ambiguities regarding the myelinated efferent fibres of the globus pallidus. This is an important research which does not lend itself to a brief abstraction. (R. M. S.)

**Acute Postoperative Aseptic Leptomeningitis.**—According to the authors, acute postoperative aseptic leptomeningitis has the following mechanism. There persists, after operation, a cavity at the site of operation, particularly when removal of a neoplasm or scar has been extensive. This fills with blood clot, and the clot subsequently undergoes liquefaction and degeneration. Its products, high in protein, accumulate and are periodically discharged into the general subarachnoid space, either indirectly, through a ventricle which has been opened by the operative procedure, or directly, through subarachnoid channels from the cisterna magna. (R. M. S.)

**Pathological and Mental Alterations in Simmonds' Disease.**—A case of Simmonds' disease is presented which appeared after child-birth and was associated early in the course of the illness with a manic depressive psychosis. The pituitary gland showed a unique, progressive, nonspecific granulomatous process resembling allergic necrosis. There was secondary atrophy of the thyroid, adrenals, parathyroids, ovaries, uterus, and breasts. These atrophic processes were accompanied by the development of marked cachexia and microsplanchia. Scattered focal lesions observed in the central nervous system are attributed not to the psychosis but to the repeated attacks of hypoglycaemia. Degenerative lesions in the supraoptic and paraventricular nuclei of the hypothalamus are thought to be secondary to destruction of the anterior lobe of the pituitary gland. (R. M. S.)

**Displacement of the Hippocampal Gyrus.**—Medical displacement and herniation of the hippocampal gyri into the space of Bichat and through the incisura tentorii occurred in 83 per cent. of a hundred cases of a supratentorial expanding lesion. Such herniations were present in most cases of increased intracranial pressure from any cause. Then they were rather narrow, slight, and usually equal on the two sides. Midline and parasagittal lesions produced equal, marked herniations with little lateral difference. Unilateral cerebral lesions, in the temporoparietal region notably and in the temporal lobe particularly, produced a significantly greater of changes in the temporal region. These were: ipsilateral medial displacement and herniation of the hippocampal gyrus; contralateral shift of the brain stem, hypothalamus and optic chiasm and tracts with distortion of these structures, and, less frequently, hemorrhages in the brain stem and hippocampal, fusiform, and occipital gyri. (R. M. S.)

**Influence of Locomotion on Plantar Reflex.**—The extensor response of the big toe can, in certain persons, be induced by physical exertion. The authors claim that the occurrence of a Babinski sign following exertion has a characteristic relation to the type of exertion and to such factors as a history of prenatal and early postnatal developmental abnormalities, influencing the ultimate constitutional organization of the individual. (R. M. S.)

**Cerebral Integration in Migraine.**—Maps of the scotomas of ophthalmic migraine sketched at brief intervals during an attack suggest that a wave of intense excitation is propagated at a rate of about 3 mpm per minute across the visual cortex. This wave is followed by complete inhibition of activity, with recovery progressing at the same rate. Sometimes the inhibition spreads without the preceding excitatory wave. Limitation of the disturbance to the primary visual cortex raises questions as to the nature of the interconnections between architectonic fields. The observations are interpreted in relation to the possible integrative effects of radiating waves of excitation in the cortex. (R. M. S.)

**BRAIN**

Vol. 64. No. 1. March 1941.

*The Phenomenon of Myotonia.** D. Denny-Brown and S. Nevin. I.


*Visual Object-Agnosia with Special Reference to the Gestalt Theory.** W. Russell Brain. 43.

*The Significance of Lesions in the Dentate Nuclei in the Posterior Multiple Lobes Syndrome.** G. E. Smyth. 63.

*Unilateral Exophthalmos (Proptosis): Causation and Differential Diagnosis.** G. Joly Dixon. 73.
Myotonia.—Electro-myographic records show that the mechanism of delay in relaxation of voluntary muscular contraction in both myotonia atrophica and congenital is due to a complex abnormality. The difficulty in relaxation is partly due to myotonia recurring in the muscle itself, but is mainly caused by a reflex spasm of the prime movers and synergists, of central origin. This double abnormality affects the pharmacological approach to the disease. The peripheral abnormality is hyperexcitability of the muscle fibre, which leads to repetitive discharge, probably merely an exaggeration of the normal state. The prolonged reflex discharge may lead to hypertrophy in muscles which were not otherwise myotonic. This is especially seen in Thomsen's Disease and acquired myotonia. (D. J. W.)

Vitamins E and B₆ and Motor Neurone Disease.—Ten cases of muscular dystrophy and ten cases of motor neurone disease were adequately treated with Vitamins E or B₆ alone or in combination without clinical or biochemical evidence of improvement. The authors draw attention to the validity of the experimental basis for the positive claims made by other observers. (D. J. W.)

Visual Object-Agnosia.—A boy of seven developed visual object-agnosia with alexia, agraphia, finger and lateralizing agnosia, and constructional apraxia. The boy's case is reported in detail, and the effect of these defects upon his intellectual development and appreciation of forms is described. There did not appear to be any evidence of a disorder of visual Gestalt-formation, but the interpretation of visual agnosia in terms of the Gestalt theory is discussed. (D. J. W.)

Lesions in Dentate Nuclei consequent to Disease of Frontal Lobes.—Pathological cell changes were found in the contralateral dentate nuclei of four subjects with unilateral frontal lesions, although the cerebellar, cortex, and pontine nuclei were normal. These changes support the anatomical evidence that most of the superior cerebellar peduncle fibres connect with the cortical areas 4 and 6, through cell stations in the thalamus. They also support the view that cerebellar function is exerted through the cortex and not through the extrapyramidal motor system. The observations also explain the simulation of cerebellar dysfunction occurring with frontal lesions and make their incomplete nature, their variability and tendency to regress, more easily understood. (D. J. W.)

Unilateral Exophthalmos.—Symmetrical proptosis of the eye may be due to a mass within the cone of extraocular muscles, or, usually glioma or meningioma; lymphatic and venous engorgement, or paresis of the muscles. In the last two cases, the proptosis is reducible. Asymmetrical proptosis indicates a mass outside the cone of muscles. The symptoms of speed of onset, papilloedema, usual and papillary changes, often pain, are indicated. (D. J. W.)
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An amount of ataxia seen in these animals was related to the amount of yeast in the diet; but as autoclaving did not affect the results, the deficiency was thought to be inorganic and not that of a vitamin. Two pigs, deprived of vitamin A, but receiving adequate amounts of yeast, showed no ataxia. One showed peripheral myelin loss in the spinal cord, while the others, to whose diet vitamin A was restored, did not. (D. J. W.)

Familial Cortical Cerebellar Atrophy.—An heredo-familial ataxia of cerebellar type similar to that described by Holmes in 1907, was encountered in two generations of a family. One autopsy revealed a pure chronic cortical parenchymatous atrophy involving the Purkinje cells with secondary degeneration of the olivary neurones. (D. J. W.)

JOURNAL OF ANATOMY

Vol. 75.

No. 1. October 1940.

I. ANATOMICAL NOTES AND COMPARISONS

No. 2. January 1941.


The Normal Occurrence, Structure and Homology of Prostate Glands in Adult Female Mastomys Eythroduscal Temm. F. W. Rogers Brambell and D. H. S. Davis. 64.


The Evolutionary Significance of the Embryology of the Amphibian Nephric System. R. J. O’Connor. 95.


The Angioarchitecture of the Thalamus in the Rabbit. B. Schlesinger. 176.

The Normal Histology of the Thalamus in the Phalanger, Trichosurus Vulpecula. F. Goldby. 197.


The Dental Comb of Lemurs. D. Roberts. 236.

The Differentiation of the Brain and other Tissues in an Implant. P. Gieso. 239.

Tension Lines, Cleavage Lines and Hair Tracts in Natura. F. W. Jones. 248.

The Distribution of Ascorbic Acid (Vitamin C) in the Early Stages of the Developing Chick Embryo. S. A. Barnett and G. Bourne. 251.


Note on the Histology of Lymph Nodes in Echida. M. A. Basir. 267.

Cell Columns in Spinal Cord of Human Foetus.—The cell columns in the cervical and lumbar enlargements of a human fetus are described and compared, and several points of similarity are shown. The cell columns are already adult in their arrangement by the fourteenth week of fetal life. (G. W.)

Angioarchitecture of Thalamus in Rabbit. —A description of the angioarchitecture of the thalamus has been given. There are no individual nuclear arteries in the thalamus, for the areas vascularized by the parenchymal arterioles do not coincide with those of the nuclei or their subdivisions. Individual nuclei have a composite vascularization and any one parenchymal arteriole supplies parts of adjacent nuclei and fibre tracts. The lack of correspondence between individual nuclei and individual vascular territories is a very common feature in the brain, and the existence of arterial areas involving adjacent fragments of grey and white matter provides no foundation for the theory of functional constancy which claims that functional units existing in the brain have arteries of their own throughout evolution, and that they may even be homologized on the basis of their arterial supply throughout a phylogenetic series. (G. W.)

Normal Histology of Thalamus in Phalanger.—The thalamus of Trichosurus Vulpecula has been described on the basis of serial sections of normal brains stained by toluidine blue, a modification of the Weigert method, and by Davenport’s silver method. In structure it is essentially similar to the thalamus of Didelphys virginiana (Bodian, 1939, 1940) and to that of primitive placental mammals; it shows, however, a number of progressive features in which it resembles rather closely the published account of Tupaia (Clark, 1929a). These progressive features are shown most clearly in the following observations. The lateral geniculate body (dorsal nucleus) is laminated as in higher mammals. The nucleus lateralis posterior (the equivalent of the pulvinar) is large, and differentiated into medial and lateral parts. A possible
representative for the "pars arcuata" has appeared in the ventral complex. There is a well-marked lateral differentiation in the dorsomedial nucleus which appears to correspond with the main part of that nucleus in the higher primates. Commisural fibres between two sides are feebly developed. In nearly all other respects the structure is that of typical of primitive mammals in general and no undoubted marsupial specializations were observed. (G. W.)

Association Fibre System of Visual Cortex.—In three experimental lesions in the visual cortex of the monkey, the examination of Marchi material failed to show the existence of long association fibres leading to other parts of the visual cortex, or to the cortex in front of the lunate sulcus. These negative results are in accordance with the results of recent electro-physiological studies of the cortex. In one of the experiments there was an indication of association fibres leading from the visual cortex to a narrow strip of perirhinal cortex lying on the lower part of the occipital operculum. The organization of the visual cortex in relation to the projection of retinal impulses is discussed. (G. W.)

Differentiation of Brain in Implanted Portion of Embryonic Head.—An account is given of the differentiation of tissues in a portion of the head of a 12-days embryo, implanted in the brain of a young rabbit. The differentiation of nervous tissue had proceeded to the formation of a definite cortical structure with a laminar arrangement of ganglion cells, of groups of cells showing a nuclear arrangement, and of circumscribed fibre tracts. (G. W.)

Vol. 75. No. 3. April 1941.


*The Pattern of Cutaneous Innervation in Relation to Cutaneous Sensibility. G. Weddell. 346.


Anatomical Note: A Note on the Actions of the Cruciate Ligaments of the Knee Joint. R. Wheeler Haines. 373.

Optic Fibres in Lateral Geniculate Body of Monkey.—Seven days after section of one optic nerve in the monkey, the corresponding lamina in the lateral geniculate body are filled with thickened terminal fibres and enlarged and deeply staining boutons. These lamina, therefore, stand out in strong contrast with the normal lamina which receive the terminal fibres of the intact optic nerve. It is established that each main optic nerve fibre commonly terminates in a spray of 5–6 branches, and therefore in relation to 5–6 geniculate cells. The boutons of the degenerate optic fibres lie in contact with the cell body, and no geniculate cell is related to more than one bouton. By the study of the degenerating terminal fibres and boutons direct evidence has been provided in confirmation of the conclusion, previously based on transneuronal atrophy that crossed optic fibres end in laminae 1, 4 and 6 of the lateral geniculate body, while uncrossed fibres end in laminae 2, 3, and 5. (G. W.)

Visual System in Phalanger.—The normal anatomy and histology of the optic chiasma, optic tracts, lateral geniculate body, superior colliculus and area striata of the cerebral cortex have been studied by means of serial sections stained by the Weigert method (Weil's modification) and by toluidin blue. These structures have been shown to be essentially similar to those in other primitive mammals (marsupial or placental) except for the marked lamination of the lateral geniculate body. Their connections have been studied by the use of the Marchi, retrograde and transneuronal degeneration techniques, following enucleation of an eye, or the placing of lesions in the area striata. The experimental results are summarized as follows: (1) All fibres of the optic nerve are myelinated, all degenerate after section of the nerve, and about 75 per cent. of them cross in the optic chiasma. The 25 per cent. which remain uncrossed lie ventrolaterally in the chiasma, and superficially in the beginning of the optic tract; as the tract passes dorsally they become mixed with crossed fibres. (2) Crossed retinal fibres can be traced to the dorsal and ventral nuclei of the lateral geniculate body, to the superior colliculus and to the nucleus opticus tegmenti via the anterior accessory optic tract and the transverse peduncular tract. Uncrossed retinal fibres can be traced only to the lateral geniculate body (dorsal nucleus), but the possibility that a few go to the superior colliculus cannot be excluded. No evidence was found for retinal connections with the nucleus lateralis posterior of the thalamus or the preoptic nucleus: if such connections are present they must be scanty. (3) In the lateral geniculate body (dorsal nucleus) crossed and uncrossed fibres end chiefly in alternate laminae; the ventral quarter of this nucleus is poorly laminated and receives only crossed fibres. (4) Corticopetal fibres...
from the lateral geniculate body end mainly (probably exclusively) in the area striata, where there is a reversed representation of the parts of the lateral geniculate body similar to that described in the opossum (Brodian, 1935) and other mammals. Corticofugal fibres from the area striata can be traced to the lateral geniculate body (dorsal nucleus) and to the superior colliculus of the mid-brain, but to no other parts of the nervous system. (G. W.)

**Sensory Component of Hypoglossal Nerve in Rabbit.**—At no stage in the development of the rabbit hypoglossal nerve could Froriep's type be found. Muscle spindles, or other specialized sensory endings could not be found in the intrinsic muscles of the rabbit's tongue. In the extrinsic muscles, although muscle spindles are absent a few atypical endings can be found close to the attachments of the muscles to the mandible and hyoid bone. The macroscopic and microscopic anatomy of the rabbit hypoglossal nerve, when considered in relation to the relevant experimental findings, appears to demonstrate that any afferent fibres in the nerve can reach the central nervous system only by way of the upper cervical dorsal roots. (G. W.)

**Relation of Cutaneous Innervation to Cutaneous Sensibility.**—The cutaneous nerve plexuses in skin from Acanthias vulgaris, the rabbit, the rhesus monkey, and Man are constructed on a similar pattern. Only one type of nerve ending was seen in skin from Acanthias vulgaris, two types were seen in skin from the ear of the rabbit, and multiple types in skin from the monkey and from Man. The pattern of cutaneous innervation in skin from the ear of the rabbit has been demonstrated. It is such that in general each unit area is evenly innervated by a few afferent fibres approaching it from all directions. A single nerve fibre in the dorsal nerve at the base of the ear of the rabbit breaks up into terminal ramifications which are distributed to approximately three hundred hair follicle groups. The terminal ramifications of a single nerve fibre distributed to hair follicles in the ear of the rabbit cover an approximately circular area of 1 cm. in greatest diameter. Each hair-follicle group and each hair is innervated by at least two separate nerve fibres whose terminal ramifications are evenly interlocked with each other. After section of approximately one-quarter of the dorsal ear nerve in the rabbit, degenerating nerve fibres can be seen throughout the whole extent of the skin of the dorsum of the ear. The size of a single superficial nerve net in skin from the pad of the thumb of the monkey covers an approximately circular area of 1-5 cm. in diameter. It is closely interlocked with nerve nets from neighbouring areas. Multiple groups of Krause's end-bulbs are found beneath each cold spot in the skin of the human forearm. They are situated about 1 mm. from the skin surface and are borne on widely separated nerve fibres. A single isolated superficial nerve net in a hypalsgeic area of skin from the dorsum of the hand in Man covers an approximately circular area of 0-75 cm. in greatest diameter. This distance corresponds to the limen of two-point discrimination for pain in a similar normal area. The pattern of sensory loss after certain nerve root, nerve plexus, and nerve trunk lesions in Man has been described. The pattern of sensory recovery after certain complete nerve trunk interruptions has been described. The clinical findings have been correlated with the histological findings and discussed. (G. W.)

**Denervation and Hormonal Responses of Monkey Prostate.**—Denervation of the sacral parasympathetic fibres alone or of the related hypogastric nerves together appears to have no effect on the histological structure of the immature rhesus prostate; in this respect the monkey behaves like the dog, guinea-pig, and rabbit. On the other hand, division of the hypogastric nerves was without effect on the prostate of an almost mature monkey: a result which is not fully in accord with Golub's observations on dogs. Androgenic stimulation leads to rapid maturation of the prostate after division of the sacral nerves while division of the hypogastric nerves has no effect on the responses of the prostate to oestrogenic stimulation. (G. W.)
are more or less specific for different regions: (a) The changes common to all regions are a decrease in Nissl material, increased basophylic properties of the nucleus, increasing paleness of the nucleus, loss of regularity of cell outline, and degeneration and death of some of the cells. (b) The change most characteristic of the ventral horn cells is pigment accumulation, which is found in senile animals in almost 100 percent of the cells. (c) The change most characteristic of the trigeminal ganglion is vacuolar degeneration. (d) An increase of interstitial elements about degenerating cells has been found in all regions except the layer of Purkinje cells. These satellites consist, in the central nervous system, primarily of oligodendroglial cells; and in the ganglia, of amphiocytes. The role of such cells seems to be almost undoubtedly phagocytic. The astrocytes of the mouse brain do not show signs of degeneration in senility. (G. W.)

Laminar Organization and Cell Content of Lateral Geniculate Body in Monkey.—A wax reconstruction model of the lateral geniculate body of the monkey is described and figured. The crossed and uncrossed fibres of the optic tract do not become segregated until they have penetrated the lateral geniculate body. Computations of the cell content of the lateral geniculate body have been made by a direct method of counting, and also by estimating the number of cells involved in retrograde atrophy following a localized cortical lesion of known dimensions. The number of cells in the small-celled lamina is assessed at approximately 1,590,000, and in large-celled lamina 209,000. Approximately 1,350 fibres of the optic radiation project on to each square millimetre of the visual cortex. Evidence is adduced that, so far as the retinal fibres ending in the large-celled laminae are concerned, approximately 60 percent are crossed and 40 percent uncrossed. All the cells of the large- and small-celled laminae project on to the visual cortex, and no evidence is found for the existence of intercalated neurones in the nucleus. (G. W.)

Termination of Optic Fibres in Lateral Geniculate Body of Cat.—It has been found in the cat that the optic fibres arising as collaterals from the optic tract terminate in the lateral geniculate body in special end-formations, i.e. fine terminal rings. After section of an optic nerve these optic terminals undergo a characteristic degeneration. The number of synaptic contacts of optic terminals with one principal cell of the geniculate body is estimated to be about forty. Synaptic contacts are established with the dendrites as well as with the cell body. The axo-dendritic contacts are more numerous than the axodendritic. The evidence suggests that one optic fibre covers with its terminal branches an area containing about ten cells. It is almost certain, however, that the same region receives a supply from more than one optic fibre and that there is an extensive overlap. (G. W.)

Multiple Innervation of Skin Sensory Spots.—Microscopical evidence has been brought forward which shows that in an area of acute tactile sensitivity (finger pad) in the human skin each "spot" is commonly innervated by two or three nerve fibres approaching from different directions, and ending in separate Meissner's corpuscles. (G. W.)

Motor Cortex in Galago and Perodicticus.—The motor area in Galago is not bounded either rostrally or caudally by sulci. It extends below and above the sulcus rectus and on to the upper part of the medial surface, the hindlimb area being dorsal to the forelimb zone. In perodicticus the motor area lies rostral to the central sulcus and a line projected upwards and downwards from its dorsal and ventral extremities. The general disposition of representational parts of the body is the same as in man. (G. W.)

Nerve Supply of Mammalian Ductus Arteriosus.—The mammalian ductus arteriosus is a sensory innervation very similar to that possessed by the aorta and the carotid sinus. This nerve supply is derived from the left vagus nerve and, when it is present, from the left aortic nerve. Fine nerve fibres, presumably motor, are also found terminating in relation to the muscular coat of the ductus, but the available material does not permit of a statement as to their origin. The distal portion of the pulmonary trunk and the proximal portions of the pulmonary arteries also possess a sparse afferent innervation. The nerve supply of the ductus arteriosus is discussed in relation to the behaviour of the ductus at birth. (G. W.)


Degeneration of Cutaneous Nerve Fibres.

—An account of the early stages in Wallerian degeneration which follow nerve section in the skin of the dorsum of the rabbit’s ear has been given. The results of methyl blue staining, silver impregnation, and specific staining for myelin have been compared. The Schwann cells in the skin from the dorsum of the rabbit’s ear show no reactions to vital dyes for 336 hours after nerve section. In skin from the dorsum of the ear of normal unoperated rabbits a small proportion of the nerve fibres show evidence of either regenerative or degenerative changes. Similar changes have been seen in a piece of skin from the elbow region of a human subject. These changes are most marked in the cutaneous nerve plexus. There is an appendix which contains an atlas of 91 photographs showing the early stages in the degeneration of cutaneous nerve fibres. (G. W.)

Development of Cell Columns in Ventrall Horn of Rabbit Spinal Cord.—The adult anatomy and development of the motor cell columns in the ventral horn of the cervical enlargement in the rabbit are described in relation to the developing peripheral structures. Four chief stages have been noted: (1) A thickening in the ventral part of the germinal epithelium of the neural tube to form a ventral horn. (2) The outgrowth of processes from the ventral horn cells, the latter grouping themselves together to form longitudinal aggregations. (3) The secondary splitting of these aggregations into subsidiary columns of cells coinciding with their connection to the muscles which they supply, but prior to reflex activity. (4) The appearance of co-ordinated neuro-muscular activity leading to contraction of the peripheral muscles. In this stage true Nissl granules appear in the cytoplasm of the ventral horn cells. The establishment of neuro-muscular connections, which are distinct only in the last stage, proceeds peripherally from segment to segment along the limb, a new column appearing as each segment is innervated. Thus the columns are embryologically related to segments of the limb, and there is evidence in the adult to suggest that such a functional relation exists, though it is not complete owing to the unsatisfactory nature of the chromatolytic reaction. (G. W.)

Lateral Geniculate Body in Platyrhine Monkeys.—A description is given of the laminar organization of the lateral geniculate body in six genera of New World monkeys. The laminar organization is less highly differentiated in these monkeys than in the catarrhine primates. Within the group of New World monkeys the laminar organization is most highly differentiated in Cebus, and least in Atelis and Saimiri. The significance of the variability in laminar organization is discussed. (G. W.)

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Further Observations on Skin Reactions to Antigens from Heterologous Cestodes in Echinococcus Disease. J. T. Culbertson and H. M. Rose. 249.

Calcium and Phosphorus Metabolism in Osteomalacia. XI. The Pathogenic Role of Pregnancy and Relative Importance of Calcium and Vitamin D Supply. S. H. Liu, H. I. Chu, H. C. Hsu, and S. H. Cheu. 255.


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Spontaneous Recovery from Nutritional Macrocystic Anemia in Young Swine following Initial Enuresis. S. G. Smith, R. Reiser, and G. T. Harrell. 369.


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*Studies on Pain. Observations on Pain Due to Local Cooling and on Factors Involved in the 'Cold Pressor' Effect. S. Wolf and J. D. Hardy. 521.


Studies on Neoplasms with the Aid of Radioactive Phosphorus. III. The Phosphorus Metabolism of the Phospholipid, Acid Soluble and Nucleoprotein Fractions of Various Tissues of Normal and Leukemic Mice following the Administration of 'Tracer' and 'Therapeutic' Doses of Radio-Phosphorus. L. W. Tutle, L. A. Erf, and J. H. Lawrence. 577.

Experimental and Clinical Studies on Gramicidin. W. E. Herrell and D. Heilman. 583.

Acute Hemolytic Anemia from the Sulfonamides. C. L. Fox and R. Ottenberg. 593.

Spectrophotometry of Fairley's New Blood Pigment, Melanobasmin. C. L. Fox. 603.

Studies in Pain. Pain caused by local cooling is separate from the sensation of cold. It appears to be mediated by Class C fibres. The intensity of the pain depends on the degree of cooling. The stimulus required for the production of "cold pain" may be found in the thermal gradient in the tissues of the part immersed. It may be that this stimulus brings about a painful vasospasm in the part. The "cold pressor" effect is a measure of reaction to pain. (J. N. C.)

September 1941.

Sensitivity of Blood Vessels in Skin.—A method is described for measuring the excitability of the smallest blood vessels in human skin. The effect of certain physiological variables is demonstrated. (J. N. C.)

Chemical Diagnosis of Pellagra.—Chemical studies show that no urinary abnormal "nicotinic acid" values are found in patients with pellagra. There is, however, a decrease in urinary trigonelline in deficient subjects. (J. N. C.)

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The Incidence of Conjugal Neurosyphilis. E. L. Hutton. 313.


Fatigue and the Effort Syndrome. E. Guettmann and H. Rimoldi. 349.

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A Self-governed Patients' Social Club in a Public Mental Hospital. J. Bierer and F. P. Haldane 419.
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Bilateral Fracture of the Femoral Necks caused by Metrazol-Induced Convulsions. S. Androp. 701.
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Color Blindness and Tone Deafness Restored to Health during Psychotherapeutic Treatment using Metrazol Analysis. K. Stewart. 716.
Paramyoclonus Multiplex of Friedreich. E. S. Brewster. 723.
The Physico-Social Basis of Mental Disorder. G. W. Kisker and G. W. Knox. 731.
Allergy and Nervous Diseases. N. W. Winkelman and M. T. Moore. 736.
*Permeability Changes in the Brain induced by Metrazol and Insulin Convulsions. E. A. Spiegel and M. Spiegel-Adolf. 750.

Adaptation of Patients with Dementia Praecox.—A study of the progress of 127 patients with dementia praecox from the U.S. Army has particular value because of the early detection, adequate hospitalization, and facilities for rehabilitation on discharge. After a period varying from 1–12 years 28 per cent. were well adjusted, 25 per cent. tolerably adjusted with assistance, 35 per cent. were again in hospital, 2 per cent. were in goal, and 10 per cent. had died. (W. M. H.)
Permeability Changes in Brain Induced by Metrazol and Insulin.—Taking conductivity at high and low frequencies as the measure the authors find the polarizability of brains of guinea pigs to be lowered after convulsions induced by metrazol and insulin. They consider this a sign of increase in the permeability of cellular surface films. (W. M. H.)

The Paralyzing Effect of Fright. E. F. Reaser. 1.
The Chronic Alcoholic as a Neurotic and a Dreamer. B. Karmman. 17.
The Innervation of the Limbs. J. A. Abbott and M. Moore. 41.

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Blood Phosphorus in Mental Diseases. F. Pascual del Roncal. 133.
The Etiology of the Psychosis of Dementia Paralytica. With a Preliminary Report of the Treatment of a Case of this Psychosis with Metrazol. V. B. Kenyon and D. Rapaport. 147.

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*Estrogen Therapy in the Psychoses. C. C. Burlingame and M. B. Patterson. 265.
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**Experimental Insulin Shock**, particularly in the Guinea Pig. F. M. Allen. 305.


The Deforming Dystony: Its Kinesiologic Analysis. M. S. Burman. 324.


**Estrogen Therapy and Psychoses**.—Estrogenic substances (estradiol benzoate and estrone) favourably influence menopausal depressions. Thus 59 per cent. of 63 cases of involutional psychoses and 52 per cent. of 27 manic depressive psychoses in the depressed stage showed definite improvement. The improvement rate in mixed psychoses and schizophrenia was found to be unaltered by like therapy. (W. M. H.)

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**JOURNAL OF NEUROPHYSIOLOGY**

Vol. 4. No. 3. May 1941.

**Cortical Extinction in Convulsions**.—Cortical potentials and excitability following electrically induced convulsions were studied in ten human subjects with paroxysmal convulsive disorders. Cortical extinction following a convulsion is shown by lack of response to supraliminal cortical stimuli; during the period of extinction the cortical electromgram is isoelectric. For a brief period thereafter the cortex near the epileptogenic focus may show increased excitability, a liminal stimulus evoking a seizure of greater violence. (W. M. H.)

**Hypothalamic Stimulation Response**.—In cats the hypothalamus was stimulated with electrodes manipulated stereotactically. The magnitude of pressor and respiratory responses was found to increase with the frequency of stimulation up to several hundred per second beyond which figure the response diminished. In some instances changes of frequency altered the character of the response. For this reason strict localization of areas for pressor, depressor, pupillary dilator, and constrictor responses is questionable. (W. M. H.)

**Gasstic Activity and Cortical Control**.—The smooth muscle of the stomach and cesophagus is shown to be similar to vesical muscle in its central nervous control. In cats cerebral ablations alter stomach activity, contractions being stronger and more persistent, tone in distension increased and a marked stretch reflex with delayed relaxation of the stomach wall appearing on sudden distension. (W. M. H.)

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Vol. 4. No. 4. June 1941.

**"Motor" Cortex of Chimpanzee**.—In young chimpanzees under dial the effects of electrical stimulation were studied in the entire sensory cortex. As in the macaque responses depend on the parameters of stimulation. All parts of the sensory cortex yield contraction of skeletal muscles save two bands III and VII which, with two others just outwith, cause suppression of motor responses to cortical stimulation, suppression of motor after discharge after cortical stimulation, and relaxation of skeletal muscles. In the parietal area facilitation and existing...
muscular tension are necessary for motor responses. Otherwise the results of electrical stimulation agree with those of strychninization. (W. M. H.)

**Interdependence of Cortex and Thalamus.**—Corresponding cortical areas and sensory thalamic nuclei are shown to be functionally interdependent, impairment of one or of the resultant pathway causing a decrease in the spontaneous electrical activity of the other. (W. M. H.)

**Motor Response Suppression by Stimulation.**—Suppression of motor responses to electrical stimulation of area 4 by electrical or other stimulation of area 4S does not depend on corticocortical connections, the nucleus caudatus, putamen, globus, pallidus, thalamus, substantia nigra, or cerebellum. Its long latency indicates an indirect "delay" path: its long duration suggests a continuous activity antagonistic to the activity excited by stimulation of area 4 rather than an extinction of that activity. The failure of suppression to affect the knee jerk is, however, not easily explicable on this hypothesis. Suppression may also be obtained from areas 8S, 2S, and 19S from which suppression of electrical activity of the cortex can be obtained although its occurrence is not dependent upon the suppression of cortical activity. (W. M. H.)

**Functional Organization of Cortex.**—The effects of strychninization on activity of adjacent cortical areas is schematically summarized for the monkey. Subdivision of areas 5 and 7 into bands as in the chimpanzee has not been shown. (W. M. H.)

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**JOURNAL OF PHYSIOLOGY**

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The cerebral cortex is relatively rich, while nuclei and tracts vary considerably. (W. M. H.)

**Skeletal Changes in Vitamin A Deficiency.**—In the absence of Vitamin A the bones of the growing dog show an increase in osteoblastic and osteoclastic activity with resulting proliferation of cancellous at the expense of compact bone. The positions of bone overgrowth in the skull and vertebral column described account for degenerative changes in the brain, cranial and peripheral nerves, the posterior root ganglia and anterior root nerves. The greatest hypertrophy is in the bones of the posterior fossa and of the cervical column. Advanced cases of Vitamin A deficiency show an increase in C.S.F. pressure and internal hydrocephalus. (W. M. H.)

**Ether and Absorption Rate of Saline.**—Ether in small concentration reduces the rate of absorption of normal saline solution from the subarachnoid space in animals anesthetized with avertin, amytal, or chloralose. It is concluded that ether causes a dilatation of cerebral vessels. (W. M. H.)

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Further Evidence Concerning the Role of the Hypothalamus in the Induction of Ovulation in the Rabbit following Injections of Copper Acetate.  G. W. Harris.  231.

**Histamine and Reactive Hyperemia.**—A new technique of assaying small amounts of histamine with guinea pigs' ileum is described. In reactive hyperæmia in man
and in the rabbit the histamine content of venous blood is unaltered. Cysteine prevents the fall of blood pressure on injection of histamine in the cat, but fails to modify the fall in reactive hyperaemia. (W. M. H.)

Afferent Discharges from Sense Organs.—
The importance and size of representation in the receiving area of the cortex for different parts of the body surface varies in different animals; thus in the rabbit the mouth parts, in the cat the claws, in the monkey the hand and face are more important. The afferent volley produced by touch shows a potential wave in the cortex with its first phase surface positive due to activity in the afferent fibres. It may be followed by a rhythmic after discharge from the thalamus. The consequent efferent waves seen in chloralose anaesthesia are mainly surface negative and associated with discharge of impulses from the cortical neurones. Convulsant drugs increase the efferent responses. Under dial or nembutal afferent discharges may have little effect on cortical activity; and in deep anaesthesia with chloroform and ether afferent discharges may fail to reach the cortex. In light ether touch may produce widespread activity in other parts of the cortex. Auditory and visual stimulation may produce general increase in activity. Signals from tactile receptors are shown to be passed to the cortex without much alteration, frequencies varying as in afferent nerves. (W. M. H.)

Gaseous Tensions in Brain.—$\mathrm{CO}_2$ tension of air from the human ventricle 3 hours after ventriculography was found to be slightly higher than that of the jugular blood and much higher than that of the arterial blood. Oxygen was found to diffuse out from the enclosed air. In cats a like change in gaseous tensions occurred more quickly. (W. M. H.)

Oxygen Lack and Cerebral Circulation.—
Oxygen lack is found not to increase the arterial-venous (torcular sinus) oxygen difference in cats until the inspired air contains less than 15 per cent. oxygen. Presuming cerebral metabolism is unaltered it is concluded that only severe degrees of anoxaemia increase the cerebral circulation. Increase is due to rise in blood pressure and partly to a dilatation of the cerebral vessels caused by a rise in lactic acid. Other factors preventing fall in oxygen tension in brain tissue are the increase in pulmonary ventilation and the change in the oxygen dissociation curve in anoxaemia. (W. M. H.)

Potassium Accumulation in Muscle.—
Under suitable conditions potassium will gather against a gradient in excised sartorius muscle without increase in weight. The quantitative relations of its entrance are accurately described by theoretical equations based on considerations of osmotic, electrical, and Donnan equilibria. The principle seen in the change of diffusible anion to indiffusible with corresponding entry of potassium to the cell may be of general application to cells. (W. M. H.)

Morphothebaine Dimylether.—Morphothebaine-dimethyl ether, an alkaloid closely related to bulbocapnine and corydine, in general resembles ergotoxine in its effects but differs in having no primary stimulant action on smooth muscle in paralysing more readily the peripheral cardio accelerator mechanism of the heart, in causing “adrenaline reversal” on the blood pressure and uterus of the rabbit and not in the cat, and in having a very transient action in the intact animal. (W. M. H.)

Permeability Change of Stimulated Nerve.
—If the lipid part of the plasma membrane of nerve oxons be a binolecular film composed of two partly expanded monolayers, then the injury potential might arise from an increase in the degree of expansion and the increase in the permeability, on discharging the injury potential, from a reversal to close packed film with gaps permeable to ions. The heat evolved by condensation into micelles and by flow of ions across the membrane is calculated and in its limits shown to agree with the value for initial heat found in experimental conditions. The theory presented would explain the increase in accommodation with $K$ and Ca. (W. M. H.)

Thinking and Motility Disorder in a Schizophrenic Child. J. L. Despert. 522.
A Study of the Use of Curare in Metrazol Convulsant Therapy with Some Electroencephalographic Observations. M. M. Harris, B. L. Pacella, and W. A. Horwitz. 537.
Tuberculosis Control at Rockland State Hospital. W. A. Thompson. 563.
Notes on the Unusual Course in Certain Cases of Migraine. W. Mayer. 571.
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Results obtained from the Administration of 12,000 Doses of Metrazol to Mental Patients. M. Zeifert. 772.
The Relation of a Group of Highly-Improved Schizophrenic Patients to One Group of Completely-Recovered and Another Group of Deteriorated Patients. O. Kant. 779.
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The Rorschach Method as a Prognostic Aid in the Insulin Shock Treatment of Schizophrenics. Z. A. Pietrowski. 807.
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