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Use of Metrazol in the Treatment of Acute Alcoholism.

The narcotic effect of alcohol has long been known. Primarily in small doses it acts on the cerebral cortex and depresses the inhibitory centres. Clinically this results in acutely agitated patients. When the narcosis is carried further, the patient lapses into a comatose state. In the present study the authors have chosen a group of patients who appear to fall into either of these classifications. The administration of metrazol to these individuals was followed by a marked improvement in the clinical state. Such improvement manifested itself in the arousal of the comatose cases, and sedation of the excited group. This improvement was not due to any changes of the concentration of alcohol in the blood. It is suggested that this apparent biphasic effect of metrazol is due to a direct stimulation of the narcotized cerebral cortex. In the mildly narcotized, or agitated group, the improvement is ascribed to a stimulation of the depressed inhibitory centres. Improvement in comatose cases is considered to be due to general stimulation of the central nervous system. (Authors' abstr.)

Nitrogen Inhalation Therapy for Schizophrenia. Preliminary Report of Technique.

Encouraging results from a year's experience in the treatment of schizophrenia in a small group of patients by nitrogen inhalation therapy have been noted.

The landmarks of treatment and the signs and symptoms of acute anoxia observed during these treatments are discussed.

As a result of the authors' experience with this form of therapy they believe that it can offer most promising and safest results if it is conducted by physicians well trained in the use of gas anaesthesia apparatus, cognizant of the signs and symptoms of acute oxygen want, and capable of instituting efficient resuscitating measures in the event of untoward reaction.

It appears that the most satisfactory results will obtain if the anoxia produced is severe and the time of the treatment limited to six minutes.

The use of nitrous oxide as a substitute for nitrogen or the employment of depressant drug sedation in conjunction with nitrogen inhalation therapy are contra-indicated. (Authors' abstr.)

The Results of Shock Therapy in the Treatment of Affective Disorders.

A follow-up study six months after discharge from the hospital of 37 patients who had shown affective disorders shows 41 per cent. as greatly improved and 76 per cent. definitely improved. Of 19 cases diagnosed involutional melancholia, 15, or 78 per cent., have been able to make a social and business adjustment. Moreover, this study shows that metrazol convulsions given with care can be used in patients in the fifth decade of life. The author found also that a few convulsions

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when used in connection with other forms of therapy may produce satisfactory results in patients suffering from the mixed forms of depression, especially with the agitated depression accompanying the period of involution. (Author's abstr.)

A Comparative Study of Hypoglycaemic Shock Treatment and Control Observation in Schizophrenia.

A group of 100 patients of the predominantly chronic type of schizophrenia, equally divided by sex, underwent a course of hypoglycaemic shock treatment, while 69 patients—36 men and 33 women—were observed as controls. Fifteen other patients, eight men and seven women, improved spontaneously while in preparation for treatment. The report is based on the state of the patients eight months to two years after termination of treatment or control observation.

Various degrees of improvement took place in 36 per cent. of the treated patients—a lower percentage than generally reported.

The percentage of improvement in the control group was 21·7.

The percentage of improvement in the combined control and spontaneously improved group was 35·7, or about the same as in the treated group.

Relapses took place in 47 per cent. of the treated patients, in 33·3 per cent. of control cases, and in 24 per cent. of the combined control and spontaneously improved patients.

The treatment was the cause of death in 3 per cent. of cases.

" Recovery " occurred in only slightly over 7 per cent. among treated patients with psychosis of not more than 18 months' duration.

The same rate of " recovery " took place among the combined control and spontaneously improved patients with psychosis of less than six months' duration.

The percentage of " improved " ranged from 75·0 to 21·5 in the treated group, from 7·50 to 8·8 in the control group, and from 57·0 to 12·2 in the combined control and spontaneously improved group, in proportion to the duration of the psychosis.

" Lack of improvement " ranged from 12·5 per cent. to 78·5 per cent. in the treated group, from 25·0 per cent. to 86·8 per cent. in the control group and from 7·2 per cent. to 79·7 per cent. in the combined control and spontaneously improved group, in proportion to the duration of the psychosis.

The duration of the psychosis in the improved treated, improved control, and in the spontaneously improved patients was shorter than in the unimproved patients.

The highest percentage of relapses occurred among patients with psychosis of longer duration.

Both treated and control patients with psychosis of shorter duration had the longest lasting remissions. (Authors' abstr.)

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Action Potentials of Muscles in " Spastic " Conditions.

Action potentials of muscles in patients presenting spastic conditions have been studied. A number of features apparently characteristic of spastic innervation have been described.

1. Voluntary innervation, whenever it is possible at all, is found to be weak both by ordinary observation and in terms of frequency and amplitude of the spike potentials produced. The management of innervation is revealed by comparison of motor unit and surface leads. Simultaneous motor unit leads show more or less complete synchronization in all muscles examined. This synchronization is considered a specific mechanism characteristic of the management of muscles in spasticity.

2. Spastic reflexes show a complicated pattern of tall spikes with after-discharges of irregular or occasionally regular grouping. They usually irradiate to

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muscles served by other reflex arcs at other levels of the cord and may reach the other side of the body. This behaviour may be explained by a spreading of impulses in the intrinsic fibre systems of the cord. An impulse may be conducted over several " delaying pathways " and thus produce a repetition of spikes in a muscle whenever a " delayed " impulse returns. It may, on the other hand, run astray and reach other levels. Such an impulse may set up a long-lasting disturbance in a distant group of anterior horn cells, as in a case of amyotrophic lateral sclerosis. Both " direct " and irradiating reflexes produce synchronization of all activated units.

3. Clonus produces synchronization of motor units, as simultaneous and successive leads from whole muscles and pairs of coaxial electrodes show. The pattern of clonus is regular, indicating that in clonus a temporary centre is formed by which the alternating innervation of protagonist and antagonist is sustained.

4. No " spastic " innervation of a resting muscle was observed, and it is concluded that spastic " tonus " does not exist except as a reflex innervation, facilitated by the general hyperirritability. Spastic resistance is therefore probably to be considered a reflex phenomenon produced by stretching of a muscle either by the examiner or by the patient himself, when he tries to innervate an antagonist of the muscle in which spasticity is perceived.

5. Curare can be used to reduce spasticity. There are two possible sites of action: either on the neuromyic junction or on centres presumably in the cord. Curare does not appear to act by way of a Wedensky inhibition in spastic patients. With proper doses volitional innervation is not appreciably disturbed.

6. Management of muscles in spasticity is explained by the release of activity of the " old " motor system of the cord by total or partial loss of the corticospinal control. Synchronization of motor units and increase in reflexes are characteristic features of this mode of innervation. In case of subtotal loss of corticospinal control the remnants of the corticospinal systems suffice to set off the intrinsic system. Voluntary movement can thus be performed to a certain extent. This explanation of undifferentiated " mass movement " is preferred to the one by which it is related to circumscribed lesions of cortical areas. (Authors' abstr.)

Results of Experimental Removal of Pineal Gland in Young Mammals.

The pineal gland has been extirpated in young rats, cats and dogs, and adequate litter mate controls of each sex have been used for comparison of their development. As nearly uniform laboratory conditions as possible have been maintained during the growth period of these animals.

No behaviour changes were noted in the pinealectomized rats. Sexual maturity was attained at the same age in both control and lesion animals. There was some indication of increased somatic development in the males at puberty.

There were no differences in somatic or sexual maturation in the female control and the lesion cats. Both experienced normal estrus and both had normal pregnancies; but their offspring, sired by pinealectomized males, were weak, and of 24 kittens only 2 lived more than 48 hours. The pinealectomized mothers showed a lack of maternal instinct and lactated inadequately. The pinealectomized males matured sexually four to five months earlier than their controls and showed a precocious somatic development, still being larger than their controls at the time of full maturity of the normal cats. The lesion males were less playful, more aggressive and more belligerent than their controls.

Second generation cats, either as midterm or term foetuses or as cats several weeks of age, did not show any gross variations from the normal animal of the same age.

Serial sections of the cat brains did not show degeneration anterior to the habenular nuclei. No significant difference was noted between the mature control and the lesion animals in the histologic picture of the thyroid, adrenals and ovaries. The testes and hypophyses of the pinealectomized males were larger than those of

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the control males, and the histologic appearance of these organs reflected the gross state.

One pinealectomized male dog outstripped his control both as to sexual development and body size before ten months of age.

This report sets forth the results of extirpation of the pineal gland in young mammals, the animals being allowed to reach maturity with continuous observation of their somatic and sexual growth, as well as of their behaviouristic and reproductive characteristics. This investigation is still in progress, and the data must necessarily change therefore from time to time. No arbitrary interpretation of our present results can be stated ; no statements of definite proof of any special function of the pineal gland can be made. It may be postulated, on the basis of the results here presented, that the pineal gland has a glandular function, probably endocrinal early in life in mammals, and that its function exerts through a yet undescribed process an influence on the sexual and somatic development of the immature animal. (Authors' abstr.)

Studies in Multiple Sclerosis : Serum Enzymes.

A manometric method is described which is more accurate and convenient than titration for determining the esterase, lipase and choline esterase activity of serum. The activity of these enzymes has been ascertained in normal persons, patients with multiple sclerosis and other patients, ethyl butyrate, tributyrin and acetylcholine being used as substrates.

Individual levels of activity are maintained nearly constant over long periods. Debilitation causes a pronounced lowering of activity of all these enzymes.

Quinine hydrochloride in vitro activates slightly the esterase, but inactivates the lipase and choline esterase of serum whether from patients with multiple sclerosis or from normal subjects.

No evidence of hydrolytic activity of any serum toward lecithin or various emulsions of brain fat has been demonstrated by this method.

No difference has been found in the behaviour of serum from patients with multiple sclerosis and serum from any other persons. Moreover, no change in the activity of these enzymes has been demonstrated during remission or exacerbation of the signs and symptoms of multiple sclerosis. (Authors' abstr.)

Effect of Phenobarbital on the Mentality of Epileptic Patients.

Psychologic tests performed before and after one year of treatment with phenobarbital showed no impairment in the mentality of 48 epileptic patients. The control group of 42 epileptic persons likewise did not deteriorate. Seven patients were tested before and after two years of phenobarbital therapy. On the whole, the slight changes after two years of treatment were in the direction of normality. In 13 cases the first year was used as a control and phenobarbital was given throughout the second year. There was some improvement in performance with the psychologic tests after the year of treatment. This study therefore indicates that phenobarbital in doses of 1½ gr. (0·1 gm.) two or three times a day can be given for two years without resultant deterioration of the intellect. (Authors' abstr.)

Relation of Anoxaemia to Early Activity in the Foetal Nervous System.

The earliest somatic activities of which cat embryos are capable made their appearance about 23 days after insemination. They were simple reflex responses to stimulation of the fore limbs or head.

Throughout the following ten days of the gestation period additional simple responses manifested themselves. Hand in hand with the appearance of simple movements there was progressive integration of the activities already laid down.

The nature of early foetal behaviour varied with changes in the respiratory metabolism of the foetuses. When deficiency in oxygenation or elevation of carbon dioxide became effective, the foetuses at first became more irritable to light tactile

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or pressure stimuli and the individuality of responses was clearly defined. However, with further anoxaemia the individual movements became depressed, some, especially movements of appendicular muscles, being lost entirely; irritability decreased, and spontaneous movements of a fully integrated mass reaction resulted. Under conditions of anoxaemia stimulation of the foetuses resulted in mass movements. The greater the asphyxia, the more tonic and sustained were these mass responses. Severe asphyxia, however, ultimately led to breakdown of the total response and to depression of all activities.

Rhythmicity of certain movements, especially of the muscles to be employed in respiration after birth, appeared in foetuses about 30 to 31 days old under conditions of partial anoxaemia. With further increase in the carbon dioxide level or decrease of the oxygen in air breathed by decerebrate cats, it was possible to bring about participation in these respiratory-like rhythms of progressively more muscles until tonic, dyspnoeic gasps alone occurred.

It is concluded that behaviour develops by a process of integration of unit reflexes, which occurs with progressive growth of connections within the central nervous system. Experimental procedures usually disturb respiratory metabolic conditions so quickly that the individual movements are destroyed before adequate stimuli can be brought into play to elicit them, the mass reaction, i.e. Coghills total pattern, being the only form of behaviour remaining during partial anoxaemia.

(Authors' abstr.)

FEBRUARY.

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Pick's Disease with Atrophy of the Temporal Lobes.

The study suggests that in Pick's disease the impairment of psychic functions occurs in a systematic manner, so that higher levels are disturbed before the more primitive levels. This would explain not only the characteristic dementia, but also the predominantly amnesic aphasia in cases of atrophy of the temporal lobes. The fact that amnesic aphasia frequently occurs as an initial phase in the course of other speech disturbances implies that it represents a systematic disturbance in the highest levels of the speech mechanism. Its prominence in Pick's disease, in which there is a general " loss of the categorical attitude," is in keeping with Goldstein's view that " amnesic aphasia is not a primary disturbance of the speech process, but a disturbance of the categorical attitude, which is a necessary condition for word finding." From an anatomic standpoint, the aphasia cannot be attributed to a specific localization, even though the restriction of the lesion to certain convolutions of the temporal lobes may have a determining influence. Thus, the involvement of additional areas, such as the insula, does not essentially alter the amnesic aphasia, as seen in our case. In other cases (Stertz), additional aphasic symptoms occur in spite of the similar localization of the lesions. Neither can the dementia be related to generalized involvement of the brain, since the latter is mild in cases of Pick's disease with atrophy of the temporal lobes, in contrast to that in diffuse degenerative disorders. It seems, rather, that the involvement in Pick's disease of genetically younger areas which are concerned with higher associative functions would result in the systematic disturbance in the highest levels of the speech and thinking mechanisms. (Authors' abstr.)

Variations in the Carbon Dioxide Content of the Blood in Epilepsy.

1. The carbon dioxide content of arterial and internal jugular blood drawn without relation to seizures was abnormal in 70 per cent. of 94 patients examined.

2. In patients subject to petit mal seizures, carbon dioxide values tend to be abnormally low, whereas in those subject to grand mal seizures they tend to be abnormally high.

3. Spontaneously occurring grand mal and petit mal seizures are preceded by abnormal fluctuations in the carbon dioxide content of arterial and internal jugular blood, the time relations being such as to indicate a causal linkage between the carbon dioxide content of the blood and the seizures.

These observations are consistent with electroencephalographic evidence that the type of cerebral dysrhythmia present in grand mal seizures is in contrast to that in petit mal attacks, and that carbon dioxide has a pronounced influence on cortical rhythms. All the available evidence indicates that carbon dioxide plays a significant aetiologic role in epilepsy. (Authors' abstr.)

Epileptogenic Lesions of the Brain.

The arteries of an aganglionic scar undergo periodic positive constriction. This may be due to the abnormal scar tissue which surrounds the vessels. It may be due to the more voluminous perivascular plexus of the arteries of the scar, or it may be that the lack of side-branches subjects the arterial trunk to abnormal stretch stimuli. (Stretch seems to be an adequate stimulus for producing local

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constrictions of cerebral vessels, according to Echlin.) Such local irritability of the arteries of the central scar would produce the continuing destructive atrophy which is the universal histologic characteristic of epileptogenic lesions.

The authors are not in a position to say that such punctate destruction does not occur in scars which have not given rise to epileptic seizures. For the present they point out that this extremely slow, advancing destruction occurs at the frontier between the lesion and the functional cortex. This is the zone where electrical stimulation may reproduce a patient's habitual seizure. They do not suggest that a spontaneous seizure results directly from widespread vasoconstriction in this zone. The invariable accompaniment of epileptic discharge is local vasodilatation, which begins shortly after the onset of the discharge.

It is evident, however, that the scattered occasional vasoconstrictions that occur in this frontier zone produce progressive damage to scattered nerve cells. The phenomenon may well be an important mechanism in the charging process that periodically results in the explosive spreading discharge of ganglion cells that constitutes the physiologic bases of each recurring epileptic seizure.

(Authors' abstr.)

Adjustment of Acid-base Balance of Patients with Petit Mal Epilepsy to Over-ventilation.

The person with petit mal epilepsy responds to over-ventilation with a greater drop in the carbon dioxide content of the internal jugular blood, and maintains the low level reached for a longer period after the over-breathing has ceased than does the non-epileptic control subject. The corresponding changes in the acid-base balance are such that the epileptic patient has an acid-base loop of greater area than the control subject. These findings can be explained on the assumption that the mechanisms which regulate the physico-chemical state of the fluids of the brain are somewhat impaired in petit mal epilepsy, so that the person with such a condition is not able adequately to control or quickly adjust the acid-base balance when it is disturbed by over-ventilation. (Authors' abstr.)

Physiology of Concussion.

Apparatus is described for recording in animals changes in intracranial pressure produced by a blow to the head.

The intracranial pressure, at the time of a blow of sufficient force to cause unconsciousness in the dog, rises to a height considerably above the systolic blood pressure. After the blow the intracranial pressure returns immediately to the normal level and remains there.

There is loss of consciousness in the dog when the intracranial pressure is mechanically raised to a level above that of the arterial blood pressure, although this pressure is maintained for only one second.

At no time is consciousness lost in the dog when the intracranial pressure does not exceed the systolic blood pressure, even though the lower pressure is maintained for long periods (30 minutes).

Bulbar stimulation does not occur until the intracranial pressure reaches the level of the systolic blood pressure (Cushing).

There may or may not be a fall in arterial blood pressure after a blow to the head. The results in cases reported in which a fall was shown are in agreement with those reported by Cannon.

The loss of consciousness as a result of a blow on the head may possibly be explained on the basis of short lasting, complete cerebral anaemia (Cannon). It is agreed with Weiss and Baker that the rate of circulatory change is important in the production of unconsciousness.

Hypotheses are advanced to explain the "knock-out" blow of the prize ring and the allied condition, "punch-drunk." The suggestion is made that the syndrome "punch-drunk" may result from damage to the central nervous tissue from cumulative anoxia caused by repeated short-lasting anaemias. (Authors' abstr.)

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Remissions in Epileptic Patients Treated with Sodium Bromide in an Out-patient Clinic.

1. Final remissions beginning with the institution of treatment or shortly after occurred in 47 of 98 cases, or 48 per cent.

2. Remissions were brought about in 80 of 98 cases.

3. In cases of idiopathic epilepsy there was a higher percentage of terminal remissions—49 per cent. as compared with 40 and 45 per cent. in cases of the focal and the organic type, respectively.

4. In 64 per cent. of the patients with *grand mal* alone a terminal remission occurred, while in 46 per cent. with both *grand* and *petit mal* a terminal remission was obtained. In patients having only major attacks it is easier to bring about a remission with treatment. (Authors' abstr.)

Evaluation of Metrazol Shock in Treatment of Schizophrenia.

One hundred schizophrenic patients have been treated with metrazol; there were 53 men and 47 women, ranging in age from 17 to 44; the duration of schizophrenia varied from five weeks to fifteen years, the average period being $34\frac{4}{16}$ months. A total of 2,697 injections were made. Patients had from 5 to 40 convulsive seizures of the *grand mal* type. There were 83 dislocations of the mandible and one fracture of the scapula; there were no deaths.

When the treatment was completed, 44 per cent. had improved and 56 per cent. were not improved. At present, three months to a year after completion of therapy (average seven months), 32 per cent. are improved and 68 per cent. are not improved.

There is a definite and persistent tendency to relapse in patients treated with metrazol shock therapy.

Catatonic patients with psychosis of short duration react in the most "dramatic" way to a few injections of metrazol, but catatonic patients always have been more apt to have remission.

Improvement is maintained longer in paranoid than in catatonic patients.

Metrazol shock therapy aids in achieving remissions earlier than routine treatment, thus reducing the duration of hospitalization; the method is convenient and economical.

Metrazol shock therapy may be utilized in preparing unco-operative, inaccessible patients for other therapeutic measures, such as occupational and recreational therapy and psychotherapy.

Metrazol shock therapy is of little or no value for patients with psychosis of long duration, unless previously they have shown a tendency to spontaneous remission.

Patients with psychosis of long duration with definite, marked deterioration fail to show any improvement; at best they become "better" institutional patients, and even then for only a short time.

Metrazol shock therapy does not seem to produce permanent and lasting recovery.

It is the author's impression that, while amelioration of psychotic symptoms occurs in many patients, the essential schizophrenic pattern remains unchanged. (Author's abstr.)

Effects of Ethyl Alcohol on the Cerebral Cortex and the Hypothalamus of the Cat.

By means of original modifications of the Horsley-Clarke technique, the effects of the intravenous administration of various concentrations of alcohol on the hypothalamus and the cruciate cortex of the cat were studied in 35 animals. The results indicate that:

1. The direct injection of alcohol in strengths of from about 0·02 per cent. may have a slightly stimulant effect on both the hypothalamus and the cruciate cortex, although the findings are not determinative. However, alcohol injected in a

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concentration greater than 0·06 per cent. is definitely toxic to tissues of the central nervous system.

2. The intravenous administration of absolute alcohol in a dose of from 1 to 3 c.c. per kilogram has a depressant effect on the motor responses of the cortex to electrical stimulation, but in unanaesthetized animals the emotional mimetic reactions of the hypothalamus are unaffected or are actually increased in intensity and duration.

3. There is support for the view that whereas the cortex has an inhibitory function on lower centres, the reverse relationship also holds true, in that the cortex is likewise under the influence of the hypothalamus, and both structures are functionally interrelated in the neural mechanisms of emotional expression.

(Authors' abstr.)

Changes in the Electro-encephalogram during Metrazol Therapy.

A man, aged 33, who had been ill with schizophrenia for six years, was given 24 metrazol treatments, in which 20 convulsions were produced. An intensive electro-encephalographic study was made during and after the course of treatments, with continuous recording throughout each treatment.

Four stages of electrical activity of the brain during the convulsions and five stages following the convulsions are described as well as the associated clinical changes in the patient's behaviour. After convulsive responses to metrazol the patient invariably exhibited a clear mental state as the electro-encephalogram returned to normal.

The electro-encephalograms taken during the onset of a metrazol convulsion and the post-convulsive recovery were unlike those obtained in epilepsy. There was a similarity to the electro-encephalogram taken during the clonic phase of an epileptic convulsion.

The non-convulsive response of the patient, in which he was confused and disoriented, revealed in the electro-encephalogram a characteristic abnormal pattern and wave formation quite unlike the typical electrical pattern of petit mal epilepsy. This pattern was not seen after a convulsive response.

Unusual changes in the occipital electro-encephalogram were observed when the eyes were stimulated by intense light. This indicated that the brain tissue was in a highly irritable condition.

After the treatment was terminated the patient had alternate periods of hallucination and a clear mental state. Changes in the electro-encephalogram coincided directly with the hallucinatory manifestations.

With successive treatments a point was reached (after the eleventh injection) at which the normal physiologic functions of the brain tissue as represented in the electro-encephalogram appeared to be definitely impaired. Impairment then increased in degree with further treatments.

The patient improved temporarily, but did not maintain his early improvement; he began to regress during the latter part of the treatment. Six days after the last treatment he had regressed to his original condition.

A year later the damage or impairment of cerebral function as recorded by the electro-encephalogram remained. (Authors' abstr.)

ARCH. PSYCHOL.

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ARQ. SERV. ASSIST. PSICOPAT. SAO PAULO.

VOL. III. NOS. 1–2. 1938.

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Psychocinoramas and Psychocinograds. *Prado, J. N. de A.* 67
Intracranial Neoplasm and Neurosyphilis. *Pupo, P. P.* 93

Some Aspects of the Problem of Paranoia.

The author, after consideration of the chronic deliriant psychoses, recalled the great value of the work of Kraepelin in isolating the paranoia from the group of the former " Verrückheit " and making a clinical distinction.

He considers the major aspects of the monumental work of revision of Kraepelin's concept before the advent of the acquisition of modern constitutionalism, the analysis of structure and the deep researches of psychology.

He concludes in showing the notable improvements and clearer insight brought about by the investigations of the psycho-analytical school in the mechanism of defence of the " ego," and he affirms that the researches founded on clinical analyses and psychology are destined to clear up the difficult problems of the psychosis of paranoia. J. R. BEITH ROBB.

VOL. IV. NO. 1. 1939.

*The Treatment of Epilepsy by Intracranial Introduction of Air. *Guerner, F.* 5
*The Treatment of Chronic Schizophrenia by Intravenous Injection of Ammonium Chloride. *Yahn, M.* 61
The Value of the Osteomyelogram Obtained by Sternal Puncture for the Study of Blood Diseases. *dos Reis, J. B.* 83
The Importance of Technique in Blood Group Determinations. *dos Reis, J. B.* 113

Treatment of Epilepsy by Intracranial Introduction of Air.

Therapeutic cisternal injection of air was performed on five epileptics.

Five of them were diagnosed as suffering from infantile cerebral lesions. Five others had had fits since infancy. Two had only developed fits in adult life and three others appear to have had very vague histories. All the cases exhibited various types of mental deficiency and abnormality.

Fifty to 100 c.c. of liquor was replaced by air using the suboccipital route, only one experiment being performed on each case. Improvement in the fit incidence was noted in twelve cases. Three cases became worse. The degree of improvement showed no relation to the type of epilepsy. J. R. BEITH ROBB.

The Treatment of Chronic Schizophrenia by Intravenous Injections of Ammonium Chloride.

A solution of 10 per cent. ammonium chloride was injected intravenously as a substitute for cardiazol in cases of schizophrenia. The initial injections were 2–5 c.c. and were increased to 10–18 c.c.

Immediately following the injection there is muscular relaxation accompanied by hyperpnoea when the face becomes congested, the pupils dilate and consciousness is simultaneously lost. The fit develops with a tonic phase—opisthotonic crisis

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—and finally a clonic phase. The duration of the whole fit does not exceed ten minutes. Thirteen cases of chronic schizophrenia were treated. Each case received 20 or more injections. No accidents were noted in a series of a thousand injections. Only one case improved. J. R. BEITH ROBB.

NO. 2.

Psycho-analysis. *Uchoa, D. de M.* 123
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*The Medico-legal Value of Post-mortem Examination of the Cerebrospinal Fluid. *Pupo, P. P., and dos Reis, J. P.* 197

Juvenile Diffuse Psychotic Encephalosis.

The author refers to his attempt to define juvenile diffuse encephalosis in 1932. For purposes of histological examination material was obtained by cerebral puncture of the frontal lobe. The lesions found showed a primary neuronic degeneration without any trace of inflammatory reaction. The author considers that his findings justify the condition being termed an encephalosis. J. R. BEITH ROBB.

The Medico-legal Value of Post-mortem Examination of the Cerebrospinal Fluid.

The diagnosis of neuro-lues can be established by the Wassermann reaction, the Takata Ara reaction and the benzoin gum reactions as long as 24 hours after death. J. R. BEITH ROBB.

BRIT. J. EDUC. PSYCHOL.

VOL. X. FEBRUARY, 1940.

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*The Results of Insulin Therapy Alone or Combined with Cardiazol Therapy. *Leulier, Leclercq, Casalis and Cappelle* 268

Convulsive Therapy by Cardiazol.

A series of 21 cases of non-schizophrenic psychotics were treated with cardiazol. The most striking results were obtained in a group of confusional cases, many of prolonged duration, and of whom 7 recovered and 3 were improved. The high percentage of recoveries was put down to the absence of any constitutional predisposition. Of 6 cases of delusional psychoses, 1 recovered, 3 were improved and 2 unchanged. Of 5 manic-depressives, 2 were improved and 3 unchanged.

S. M. COLEMAN.

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Results of Insulin Therapy.

Report on 37 schizophrenics treated with insulin, 16 of whom were also treated with cardiazol. Of these, 9 showed complete remission, 6 social remission, 8 were improved and 14 were unimproved. Detailed charts are included, showing the syndrome, duration of illness and the hereditary incidence. Regarding technique, the writers find certain advantages in interrupting coma by intravenous glucose as a routine. S. M. COLEMAN.

GENET. PSYCHOL. MONOGR.

VOL. XXII. FEBRUARY, 1940.

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IL CERVELLO.

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The Efferent Fibres of the Thalamus of Macacus rhesus.

1. The absence of degenerated fibres after lesions in the anterior and dorso-medial nuclei leads to the supposition that the majority of efferent fibres from these nuclei are unmyelinated.

2. The centre median nucleus is purely a thalamic association area sending its fibres to the surrounding thalamic nuclei.

3. Small lesions in the ventral nuclei indicate that the anterior portion of the ventral nucleus sends fibres in a diffuse manner to the frontal lobe, and that the posterior portion sends fibres primarily to the postcentral gyrus, but in addition to other regions of the parietal lobe and to the precentral gyrus.

4. The pulvinar has efferent connections to the post-parietal lobe and parastriate area of the cortex; and also sends fibres to the tectum and tegmentum of the mesencephalon. (Author's abstr.)

J. COMP. PSYCHOL.

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A Quantitative Study of Certain Changes in Schizophrenic Patients under the Influence of Sodium Amytal.

1. As measured by the battery of tests employed, the performance of the schizophrenic patients was superior under the influence of sodium amytal. With reference to the Stanford-Binet test the following changes were found: (*a*) Increase in MA over the first and third tests; (*b*) decrease in the number of tests failed; (*c*) ability to pass tests at higher levels where failure had occurred in the first and third tests; (*d*) improvement in sub-tests involving memory, sustained attention, organization of activities and thought processes toward a goal, and increased organization of the thought processes into more meaningful and pertinent responses.

2. There was superior ability to organize disconnected elements into perceptual wholes in the Rorschach test, a reduction in both time and number of moves required in order to achieve success on form-boards and a greater degree of co-ordination on motor tests, with a tendency to vary less in the performance itself.

3. The Bernreuter personality inventory, while not diagnostic for most patients, tends to indicate a slight change in attitude toward those questions which are indicative of maladjustment. In this sense these patients tend to avoid somewhat, while under amytal, answers which are symptomatic of maladjustment.

4. Correlations between MA, organization score, and the performance boards during the first period are positive, although not all are completely reliable. Those patients with higher mental age are somewhat superior on the motor tests, but also slightly more variable on them. There is a tendency for those with higher mental ages to score lower on the neurotic scales, whereas those with a high time and move score on the form-boards tend to score higher on these scales.

During the second period, correlations between MA, organization score and performance boards tend to remain about the same. Correlations with the motor tests are lowered considerably. Correlations with the measures of variability indicate that patients with higher MAs become less variable under the influence of sodium amytal. Correlations with the neurotic scale are more negligible, but negative, indicating a tendency for those with higher mental ages to score lower on this scale. Those having high time and move scores on the performance board again tend to receive higher scores on the neurotic scale.

Correlations during the third period tend to be about as in the first period, with the exception of those form-boards which were too difficult to have discriminating power during the first period. Correlations between MA and variability scores are increasingly negative and indicate a return to greater variability. Those with higher MAs tended to receive lower scores on the neurotic scale, whereas those with high time and move scores on the performance boards scored higher on this scale.

5. Performance on all tests in the third period tended to revert more nearly to the level of the first period, indicating that the superior performances under amytal are the result of the condition produced by the influence of the drug.

6. The fact that the various changes found occur prior to narcosis would tend to substantiate the theory that sleep itself is not necessary to these patients, but rather that the drug is anti-inhibitory in nature. The removal of inhibitions appears to bring about the changes found. (Authors' abstr.)

J. GENET. PSYCHOL.

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A Study of the Behaviour Records of Adults who, when they were in School, Were Judged to be Dull in Mental Ability. *Baller, W. R.* . . . 365
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*A Developmental Study of the Bodily Reaction of Infants to an Auditory, Startle Stimulus. *Clarke, F. M.* 415

A Developmental Study of the Bodily Reaction of Infants to an Auditory, Startle Stimulus.

An investigation of the bodily response of 14 infants during the first 20 weeks after birth to an auditory, startle stimulus—the dropping of a 2-lb. iron weight a distance of 3 ft. to a hard wood surface—shows a gradual breakdown of certain elements in the Moro response first elicited.

The pattern consists of an initial eyelid response; a primary extension of the upper extremities (involving lateral-wise abductive movement of the upper arm at shoulder, frequently to or near shoulder height) accompanied by extension of the elbow, supination of the lower arm, extension of the hands and fingers; and followed by a slower clasping movement (involving adductive movement in the shoulder and upper arm, flexion in the elbow, pronation in the lower arm), during which the whole arm describes an arc as the hands are brought to a mid-line position near the chest and head. During the course of movement the fingers frequently exhibit tremors. Coincident with the primary movements in the upper extremities, extensor movements in the head and trunk occur. Extensor, flexor, including secondary flexor and extensor movement in the knees and hips; turning in of the ankles; and plantar responses were observed as secondary responses in which flexor, extensor, or mixed responses appear.

This pattern, which frequently occurs in the incomplete form, persists over varying intervals of time, depending on the individual infant. The relative intensity of the response varies from individual to individual, and within the same individual from one observation period to the next.

The bodily reaction pattern gradually changes to one which is primarily flexor in character, in which the movements are less intense, and certain secondary movements (such as the subsequent clasping response of the arms) die out. Flexor forward movements of the shoulder and upper arms also gradually replace the early lateral-wise abductive, adductive movements as characteristic elements. By the twentieth week, in all subjects the primary response was generally flexor in character.

An explanation of the change in the general character of the pattern can in part be found in such neurological evidence as is at present available, which points to an imperfectly developed condition of peripheral nerves and muscles and the central nervous system during the early months following birth.

(Authors' abstr.)

J. NERV. MENT. DIS.
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Behaviour of Patients Undergoing Shock Therapy.

Observations on the actions of four schizophrenic patients, during the hypoglycaemic period, showed a progressive change of behaviour during the course of treatment in those who improved. Oral eroticism, sucking and biting movements, were found to be superseded by movements of a masturbatory character. The author is of the opinion that when genital eroticism has been aroused and maintained for several days, it is an indication for discontinuance of insulin.

S. M. COLEMAN.

Pick's Disease.

Clinical report with neurohistopathological findings in four cases of Pick's disease. In none of the four cases was a correct clinical diagnosis made prior to autopsy, despite a fairly long period of observation. S. M. COLEMAN.

Grasping and Sucking.

Grasping and sucking are inter-related in the newborn, so that the presence of one response facilitates the obtaining of the other and enhances its intensity. This relation is the expression of a basic physiological association of hand and mouth. In pathological states when grasping and sucking reappear, this relationship is again to be observed. The biological function of grasping is initially support; after hand to mouth activity has been established, it also serves for the approximation of subject and object. S. M. COLEMAN.

J. NEUROPHYSIOL.

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Facilitation and Difficilitation Effected by Nerve Impulses in Peripheral Fibers.

At a discontinuity (block) in a nerve fiber created by anode polarization, a discontinuity that can be graded by varying the strength of the polarizing current, it is possible to demonstrate and to gauge the facilitation effected by blocked action potentials and to demonstrate a phenomenon, designated difficilitation, which probably is identical with " extinction."

The facilitating action of spikes at such an artificial synapse increases with their number and with their frequency. The facilitation per impulse declines slowly

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with the number, but is demonstrable through at least 20 impulses. The facilitating action has not attained its maximum at impulse rates as high as 200 per second, nor its minimum at rates of 10 per second.

Once, in a tetanus, a spike succeeds in passing a block all of the succeeding spikes of that burst also will pass, notwithstanding the spontaneous variations in the excitability of a fiber. This effect is attributed to the supernormality that follows immediately the response of the post-fiber.

Difficilitation is demonstrable, when conduction has been established by facilitation, by interrupting this conditioning tetanus momentarily, the optimum period of interruption (under a specific set of conditions) being in the vicinity of 0·5–0·6 seconds, when, upon resumption of the tetanus, it may happen that spikes will no longer pass from the pre-fiber to the post-fiber (i.e. across the local discontinuity) as long as the tetanus continues. (Observations on this interruption of conduction have not been continued longer than 43 seconds.) But interrupting the second tetanus for a period of six seconds seems to permit the block to disappear.

Difficilitation, at least in its initial stages, is regarded as a manifestation of the subnormal phase of the excitability cycle in the post-fiber, a cycle that is started by the momentary interruption of tetanic stimulation; the spikes of the pre-fiber, with the resumption of tetanic stimulation, then no longer reach the threshold of the post-fiber.

Exactly the same phenomena of facilitation (recruitment) and of difficilitation (negative recruitment or " disbandment ") are demonstrable at the site of stimulation of a fiber with induction shocks, and it is concluded that both facilitation and difficilitation result from the spike's action as an electrical stimulus to the post-fiber. This holds not only with regard to the artificial synapse in the nerve fiber but, by inference, with regard to the actual synapse, as well.

The protraction of difficilitation which seems to be determined by continued tetanic stimulation of the pre-fiber is discussed, but no conclusion is reached regarding processes that might be determining it. (Authors' abstr.)

A Human Cortical Area Producing Repetitive Phenomena when Stimulated.

During the electrical exploration of a human cortex, an area was found which when stimulated produced perseveration of speech. The area (area X) lay on the mesial side of the left hemisphere, in area 6, probably just above the junction of that area with the posterior part of area 32.

The patient, under local anaesthesia, said the alphabet. At each application of the stimulus, and throughout the period of stimulation, the letter the patient was saying was repeated over and over again. The perseveration ceased instantly when the stimulus was stopped.

Area X is far from any known part of the speech zone. It influenced the function of distant neurons, and in such a way that these neurons were thrown into action again and again, as though the impulse were imprisoned in a given cell group, able to activate that group only, but unable to pass to another.

(Author's abstr.)

Effects of Eserine, Acetylcholine and Atropine on the Electrocorticogram.

1. The changes in the electrocorticogram in the cat and rabbit, induced by the local application of minimal amounts of 1 per cent. eserine, 1 : 10^5, 0·2–1 per cent. acetylcholine (ACh) and 0·2 per cent. atropine, were recorded by one or two cathode ray oscillographs.

2. Application to the cortex of 1 per cent. eserine causes a reduction in amplitude of the slow waves and of the large fast waves; these changes indicate cortical stimulation, since they are associated with motor effects.

3. Application to the non-eserinized cortex of 1 : 10^5–1 per cent. ACh evokes potential changes comparable to, though weaker than, those from 1 per cent. eserine. ACh in 0·2–1 per cent. solution applied to the previously eserinized cortex evokes the Es–ACh spikes; associated motor effects show that the spikes indicate

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cortical stimulation. For the causation of these effects eserine must precede ACh, the reverse order being ineffective.

4. Atropinization of the animal precludes induction of the Es-ACh spikes and motor effects.

5. Pilocarpine locally is inert towards the electrocorticogram; further, it does not sensitize the cortex for ACh. The drug effects are not due to pH changes.

6. Eserine and ACh are believed to stimulate or facilitate synapses; eserine a synaptic sensitizer for ACh. The synaptic action of eserine may be partly direct and partly due to its inhibition of cholinesterase, with lessened destruction of effective (natural) ACh. Potential changes from eserine are believed due to unequal stimulation of synapses with consequent asynchronous firing of neurones. The Es-ACh spikes are believed due to powerful synaptic stimulation with synchronization of many neurones; the cells with short axons may be involved in this synchronization.

7. The hypothesis is proposed that, in consequence of stimulation of synapses by eserine and ACh, repetitive electrical impulses are initiated or accelerated across these junctions. (Authors' abstr.)

Cord Potentials in Spinal Shock: Single Volleys.

In cats, dogs and monkeys cord potentials and reflex responses to single afferent volleys have been recorded at intervals after spinal transection ranging from a few seconds to two months.

The latency of the cord potential is independent of the strength of the stimulus and long enough to indicate an internuncial origin.

The effect of transection upon the cord potentials is to reduce the amplitude and spread of the negative components and to abolish or almost abolish the positive components. These effects are far more severe and prolonged in the monkey than in the cat or the dog.

In the cat and the dog the threshold for cord potential and ipsilateral flexor reflex sampled in semitendinosus are equal and fall progressively during the first hour after transection, at the end of which they approximate that of the afferent nerve. In the monkey, on the other hand, though the cord potential threshold approximates that of the nerve within six hours, the reflex threshold for semitendinosus requires twelve days or longer to attain that level. Reflex responses from this muscle have never been observed even to maximal stimulation in an acutely spinal monkey. On the other hand, stimulation of dorsal roots has given feeble toe flexion and slight tail movement at thresholds approximating those of cord potential and afferent nerve in an acute experiment.

Hence, in the cat and the dog, spinal shock has been demonstrated only at the internuncial level. In the monkey, on the other hand, in addition to more severe internuncial depression, there is evidence of deep and prolonged shock to the motoneurones. (Authors' abstr.)

Cord Potentials in Spinal Shock: Multiple Stimuli.

In the spinal *Macaca mulatta* monkey, inhibition of the internuncial response to the second of two volleys to an afferent nerve is contingent upon the presence of a positive wave in the preceding cord potential. In the absence of such positivity, internuncial recovery from refractoriness is complete in 20 to 25 m/sec. Repetitive stimulation gives a series of internuncial potentials in which little positivity is added to that incident to the initial volley. Such a pattern contrasts sharply with that obtained from peripheral nerve, and hence suggests a perikaryal origin and different units for the sources of negativity and positivity respectively.

The acutely spinal monkey gives no contraction of semitendinosus in response to afferent stimulation by either single or multiple volleys. The chronic monkey yields a large contraction to single volleys to which little is added by further stimulation even at frequencies at which the cord potentials are but slightly reduced.

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The view is advanced that in even the chronic monkey there persists a considerable degree of depression downstream from the internuncials recorded, presumably, at the motoneurones. (Authors' abstr.)

Cord Potentials in Spinal Shock : Crossed Effects in Monkey, Macaca mulatta.

In the spinal *Macaca mulatta* monkey the contralateral component of the intermediary cord potential is scarcely detectable in the acute preparation, is small at 12 days after transection, but has attained the magnitude of the ipsilateral component within two months.

In the chronically hemisected, acutely transected animal, the ipsilateral potential spreads farther up the cord when the stimulus is applied to afferents of the chronic side than when to those of the acute side. When the chronic side is stimulated, the threshold for the crossed cord potential is far higher and its latency far longer than that for the potential on the side of stimulation. When afferents of the acute side are stimulated, the thresholds for ipsilateral and contralateral potentials may be identical and the latter potential may approximate the magnitude of the former. From these data the following conclusions are drawn :

1. The contralateral cord potential is associated with the activity of perikarya or dendrites and not merely with that of axons.

2. Block of the crossed cord potential is due to a high threshold of the cells of the contralateral dorsal horn and not to lack of impulses playing upon them.

3. The above data yield evidence of the internuncial origin of the cord potential.

In the cat crossed inhibition of the internuncial potential parallels that of the flexor reflex, though usually it is somewhat less intense. In the chronic monkey, on the other hand, crossed inhibition of the reflex may occur without reduction of the corresponding cord potential. This indicates a locus of inhibition downstream from the internuncials recorded—presumably at the cells of the anterior horn. (Authors' abstr.)

An Attempt to Produce Sleep by Diencephalic Stimulation.

1. Destructive and stimulating electric currents were applied to the hypothalamus, thalamus, junction of the hypothalamus and thalamus, head of the caudate nucleus, septum pellucidum and region of the anterior commissure in waking cats.

2. Somnolence was produced by destructive action of currents when applied to the lateral hypothalamic area. Catalepsy tended to develop when the lesions involved the medial and caudal parts of the hypothalamus.

3. Somnolence was produced by destructive electric currents when applied to the lateral group of thalamic nuclei, but the strength and duration of the current was much greater than that in the hypothalamic experiments. It is possible that the effects were not solely thalamic.

4. Extensive lesions of the head of the caudate nucleus did not cause somnolence.

5. Stimulation of the structures mentioned above did not yield somnolence.

6. No evidence was obtained to support the theory that sleep is a phenomenon of active inhibition. (Author's abstr.)

Relayed Impulses in Ascending Branches of Dorsal Root Fibres.

This investigation was designed to describe in further detail the properties of the dorsal root reflex response recently reported by Toennies. Since the dorsal root fibres divide and send long branches up the dorsal columns to the nuclei of Goll and Burdach, it should follow that simultaneous with the passage of the reflex response outward toward the periphery, a relayed impulse should likewise pass up the dorsal columns. Cats were anaesthetized with dial and the cord was exposed. Stimulating electrodes were placed on the sixth or seventh lumbar dorsal root, and a recording needle electrode was placed in the homolateral dorsal column some distance cranial to the site of the stimulated root. In accord with the expectation

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a relayed response was recorded following the direct afferent volley. The properties of the relayed response were found to be similar to the properties of the dorsal root reflex. Evidence was accumulated to show that the relayed response was carried by the ascending branches of the dorsal root fibres. (Author's abstr.)

Observations upon Diaphragmatic Sensation.

In the cat and dog these experiments show that nociceptive sensibility produced by stimulation of the central portion of the diaphragmatic peritoneum depends upon afferent conduction in sensory fibres in the phrenic nerve, independent of afferent fibres in the vagus and intercostal nerves and of efferent sympathetic pathways. Observations made on man by Dr. W. K. Livingston are presented to show that pain may be referred on stimulation of the central diaphragmatic peritoneum to a completely anaesthetized area of skin in the shoulder-tip region. Viscero-cutaneous reflexes are not essential for nociceptive sensation when the central diaphragmatic peritoneum is stimulated in the experimental animal or in man. (Authors' abstr.)

The Phasic Response to Cortical Stimulation.

Two types of response may be elicited in cats on cortical stimulation, depending on the depth of ether anaesthesia, etc. In one a new posture is assumed and held; in the other a pendular movement results. These are designated tonic and phasic responses respectively. The mechanism of the latter type was the subject of this study. This was investigated in the fore limb by determining the effect of (1) cutting the dorsal roots of the brachial plexus; (2) completely denervating the limb except for the twig to a single muscle, e.g. the biceps; (3) making a series of lesions in the dorsal and lateral funiculi of the spinal cord.

The results of these experimental procedures showed that, in so far as the peripheral nervous system is concerned, the phasic response was dependent upon inhibitory proprioceptive impulses set up in the contracting muscles themselves and conveyed to the cord by the dorsal roots. The central part of the mechanism was found to involve an uncrossed ascending path which corresponded in position to the ventral spinocerebellar tract. The complete mechanism responsible for the phasic character of the response would therefore appear to include the cerebellum. (Authors' abstr.)

J. NEUROL. AND PSYCHIAT.

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*The Emotional and Somatic Response of Schizophrenic Patients and Normal Controls to Adrenaline and Doryl. *Dynes, J. B., and Tod, H.* . . 1
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*Degeneration of the Papillo-macular Bundle in Apes and its Significance in Human Neuro-pathology. *Scherer, H. J.* 37
Critical Review: The Treatment of Mental Disorders by Induced Convulsions. *Kennedy, A.* 49

The Emotional and Somatic Response of Schizophrenic Patients and Normal Controls to Adrenaline and Doryl.

Emotional and somatic reactions of schizophrenic patients and normal controls are compared following intramuscular injection of adrenaline and doryl.

No significant difference was noted in the somatic response of the two groups,

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although the schizophrenic group exhibited more variability of response to both adrenaline and doryl, tending to bear out the findings of others to the effect that the adaptive mechanisms of the schizophrenic to preserve the " steady state " are defective under stress.

Doryl injected intramuscularly produced an excellent peripheral autonomic response in both the schizophrenic and normal groups, but no emotional disturbance (anxiety or fear) in either group.

The clear-cut and definite failure of adrenaline to arouse anxiety or fear response in the schizophrenic as compared with the normal control group is significant, and points to a disordered emotional mechanism at a physiological level. We present experimental data which only indirectly localize this break in the chain of physiological response, and all explanations are highly speculative.

No claim is made of the efficacy of using adrenaline to differentiate schizophrenics from other mental disorders by means of their emotional response, although the findings reported would suggest possibilities for investigation in an effort to understand better the central emotional mechanism. (Authors' abstr.)

The Distribution of Commissural Fibres in the Corpus Callosum in the Macaque Monkey.

The presence and situation of commissural fibres in the corpus callosum, as shown by a study of degenerating fibres following cortical lesions, are described.

Areas studied in the frontal, parietal, occipital and temporal lobes were all found to contribute to the callosal system.

The position occupied by the fibres is discussed, with the general conclusion that the frontal fibres are spread over chiefly the genu and anterior third of the body, with some occupying the middle third, the occipital over the splenium and posterior third of the body, and the parietal and temporal over the posterior two-thirds of the body with those from the temporal occupying a position anterior to those coming from the parietal. The existence of commissural fibres from the temporal lobe crossing by way of the anterior commissure is confirmed. The amount of the Marchi deposit recorded suggests that, from areas of equal extent, the parietal cortex contributes relatively the greatest number of commissural fibres, and then the cortex of the frontal, temporal and occipital lobes in that order.

(Author's abstr.)

Behaviour and Mood Cycles Apparently Related to Parathyroid Deficiency.

Three parathyroidectomized monkeys kept on a low-calcium diet drank large amounts of a 2·4 per cent. calcium lactate solution, thereby alleviating their symptoms of insufficiency. Their intake of calcium lactate solution showed fairly regular cycles averaging 40 days in length.

A woman aged 56 suffering from a parathyroid deficiency showed quite regular cyclic variations in mood and behaviour with a duration of approximately 40 days. For the first half of each cycle she was depressed and slow, and for the second half she was fairly normal. After calcium therapy these cycles disappeared.

(Authors' abstr.)

Hypoglycaemic Shock and the Grasp-reflex. The Effect of Insulin Shock on Bulbocapnine Catalepsy in Monkeys.

1. Hypoglycaemic shock was induced in six monkeys. The phenomena observed are essentially similar to those seen in therapeutic hypoglycaemia in man.

2. The hypoglycaemia was accompanied by a reappearance of the neonatal grasp-reflex, which disappeared when coma became deep and reappeared briefly during the phase of recovery.

3. When bulbocapnine is given at different periods during the action of insulin, the general effects and those in regard to the hanging-response are a summation of the individual effects of the two drugs, except when the peak of action of both drugs coincides, when new phenomena appear.

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4. These consist of disappearance of the tremors caused by the bulbocapnine and the appearance of spontaneous grasping, together with a grasp-reflex obtainable on light stimulation of the palm.

5. Hypoglycaemic shock has no effect on the cataleptic manifestations induced by bulbocapnine, nor does it itself produce catalepsy in the monkey.

6. Theoretical reasons are adduced from the experiments for the supposition that the action of insulin is predominantly a depressant one on the cerebral cortex. (Author's abstr.)

Degeneration of the Papillo-macular Bundle in Apes and its Significance in Human Neuro-pathology.

A spontaneous systemic degeneration of the papillo-macular bundle is frequently found in captive monkeys dying from different general diseases. In routine optic nerve examinations it has been observed in 8 out of 27 cases; most of these were of recent onset.

The optic nerve lesions which accompany most cases of spontaneous "encephalosis" and "myelosis" in monkeys (cerebral and spinal form of subacute combined degeneration) are also systemic degenerations of the papillo-macular bundle. They may be complicated by the appearance in the peripheral optic pathways of the same circumscribed, later confluent, patches of demyelinization which characterize the disease in the spinal cord and centrum ovale.

The frequency of the optic lesion and its often terminal character in different general diseases (generalized tuberculosis, gastro-intestinal troubles, cachexia, meningitis, etc.) suggests that its origin may be in a nutritional deficiency, and that this may also account for the lesions of subacute combined degeneration in monkeys.

Our actual knowledge of human papillo-macular bundle degeneration seems to support this hypothesis. (Author's abstr.)

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Some Relationships Between the Urinary Excretion of Male Hormone by Maturing Boys and Their Expressed Interests and Attitudes.

Ten boys between the ages of 13 and 16 were observed over a period of six months. Rank-order correlations between the behaviour rating, scores on the questionnaires and male hormone activity indicated that only one of the questionnaires correlated high with both the observed behaviour and the hormone activity of the subject, and correlated low with the chronological age of the subjects. In a second group of 23 it was found that the degree of maturity of the expressed interests and attitudes of the boys correlated higher with hormone activity than they did with chronological age. Ten boys with a high hormone content showed a greater proportion expressing interest in heterosexual activities, personal adornment and strenuous competitive sports than did 13 boys with a low hormone content.

G. W. T. H. FLEMING.

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Observations on the Blood Sugar During Insulin Coma. *Yahn, M.* . . . 215
The Technique and Practice of Sakel's Method of Treatment. *Ribeiro, R.* . 229

A Contribution to the Study of the Early Manifestations of Schizophrenia.

The author has made a study of the early signs and symptoms of schizophrenia, and divides these factors into (1) those observed by the friends, (2) those observed by the physician.

In the first group he includes abandoning of occupation, idleness and inactivity, solitariness, silence, indifference to and lack of interest in other members of the family. The tendency to remain stationary, at times displays of extravagant actions without finality, the meaningless tears and laughter; the peculiar attitudes, the strange and pathetic gestures, negativisms, soliloquies, hallucinations, ideas and delusions of auto-reference, grandeur and persecution; the sexual indifference, fugues and attempts at suicide, the sum total of factors contributing to the physical appearance of the victim.

In the second group are included the following: The recognizing of a state of illness, amnesias, the transportation of personality, possession by strange bodily sensations, feelings of automatism and enforced movements, delirious ideas of influence, possession and auto-reference, the realization of impulsive movements without any reason, disturbance of perception (probably due to the change in the quality of reality), alterations of verbal expression with embarrassment, interruptions of thought, indifference and inactivity. These factors indicate a picture of depersonalization. J. R. BEITH ROBB.

DECEMBER.

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Physical Debility and Malnutrition in Colleges. *Ferraz, A.* . . . 317
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The Affective Dynamics of the Spoilt Child.

The author indicates the importance of the study of "emotion-belated" persons, i.e. individuals who he states are confined to an "infantile affective fixation."

In children the psycho-analytic method is used to investigate the child's sexual life. He remarks on the influence of the parents and family constellation on the character of the spoilt child. Types of spoilt children are found among the following: the only child, the first born, the last born, and the widow's child.

As a result of child spoiling affective fixations may persist into adult life.

With adults a comprehension of the psycho-analytical situation may be all that is necessary in treatment of slight cases.

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In more severe cases a proper psycho-analytic examination is necessary, not only of the patient, but also of the parents, while environmental complications should be adjusted. J. R. BEITH ROBB.

Contraceptive Manoeuvres, Neurosis and Adultery.

Discussing etiology the author endeavours to establish a relationship between frustrate practices and the adultery which would be one expression of sex dissatisfaction, another being the neurosis resulting from the repression of adulterous impulses and impulses just hostile to the other sex mate.

He indicates that there are theoretical and practical difficulties in treating cases of this nature at a clinic. Further, where there is anxiety he stresses the difficulty in distinguishing between the anxiety of neurosis and that of hysteria, and of reconciling this syndrome with the divergent opinions of Freud, Stekel and Bleuler.

J. R. BEITH ROBB.

The Modern Treatment of Schizophrenia Compared with Routine Methods.

The author recalls that in the employment of the Meduna and Sakel methods for the treatment of schizophrenia one can undoubtedly make mistakes which on the whole cannot be avoided. He raises the issue of the different theories concerning schizophrenia, the possibility of spontaneous remission of these cases and the effect of previous medical treatment.

Since 1932 he had used routine methods in the Hospital of Juquery, S. Paulo, Brazil, in the treatment of 240 schizophrenics, of which 200 were his own personal cases. Of these selected cases 18 patients were fully recovered and 15 were improved, showing a percentage of 16·5 per cent. improved cases. Only where the usual methods were found to be unworkable did the author adopt the new methods. Out of the 200, 40 were thus treated—35 with convulsive therapy and 5 with insulin therapy. The total reported remissions following these methods numbered 14, and the improvements 11. Lasting improvement was obtained in 25 of the 40 cases, which is more than four times that obtained by the usual method.

The conclusion is that the newer methods give better results.

J. R. BEITH ROBB.

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Clinico-pathologic Study of a Case of Pick's Disease.

The authors describe a case of Pick's disease with the usual distribution of atrophy in the brain. The basal portion of the frontal lobe was more severely affected than the convexity. The orbital area was particularly shrunken. According to Spatz in this region is to be found the primary area of atrophy, and from a lesion of this area results impairment of the higher and more complicated psychic functions. Histologically the authors found the usual changes, but in addition there were large amounts of lipoid within the nerve cells. The staining reactions of these granules placed them in the lipochrome group, a group characteristic of senile nerve-cells. The extensive pigmentary deposit in the cells in the third and fifth layers of the cortex, the severe involvement of the dentate nucleus and the inferior olives agree well with the findings of Gellerstedt in senile brains. The authors conclude that Pick's disease represents a senile process limited to a determined zone of the brain. Angiospasm may play a role in the pathogenesis of the process. G. W. T. H. FLEMING.

The Effect of Metrazol Injections on the Electro-encephalogram.

1. On the basis of a comparison of potentials recorded from leads taken at various locations on the head, with electromyograms and with the movements as shown by ultra-high-speed motion pictures, an attempt has been made to separate the brain potentials from potentials caused by movement and muscle action currents.

2. The overt seizure shows in all stages, from the latent period to the end of the second clonic stage, an activity of 30 cycles per second in the motor region. An activity of 10 cycles per second was recorded from occipital leads during the latent period and the tonic stage. Motor-occipital leads recorded in the latent period showed some activity of 15 to 16 and 3 to 5 cycles per second.

3. The relaxation period shows low-voltage random activity.

4. If no seizure follows the metrazol injection the following changes in the EEG may occur:

(*a*) Drop in percent.-time alpha without appearance of abnormal potentials and return to normal activity within a minute.

(*b*) Appearance of random abnormal potentials with a slow return to normal activity after more than 45 minutes.

(*c*) Larval seizure, after which the activity returns to normal in less than 15 minutes. (Authors' abstr.)

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The Hormonal Induction of Homosexual Behaviour in the Spayed Female Guinea-pig.

The induction of homosexual activity in spayed female guinea-pigs was attempted by means of injections of estrogens alone, estrogens and progesterone, and androgens alone or in combination with estrogens and progesterone.

Estrogen followed by progesterone was more effective than any single hormone or any other combination of hormones. It is postulated, therefore, that these hormones acting synergistically are responsible for mounting activity as well as heat in the normal animal.

Estrogen-conditioned animals were not stimulated to mount by animals which were mounting actively; and display of mounting in excess of that normally induced by estrogens depended on the injection of progesterone.

The highest percentage of animals was induced to mount when progesterone was injected 36 hours after the conditioning injection of estrogen. A diminishing percentage remained conditioned as long as seven days.

The extent to which mounting activity was displayed varied, but tended to be relatively consistent in individuals given repeated series of injections.

Animals which were refractory to the quantity of hormones which induced mounting in most animals remained refractory when given increased dosages.

In spayed immature animals the heat response was induced at an earlier age than mounting activity.

The similarities and differences between mounting activity and the heat response are enumerated. They suggest the working hypothesis that the two parts of overt behaviour are mediated by two effector systems, that both are stimulated by the synergistic action of estrogen and progesterone, but that each has its threshold, which varies independently from animal to animal. (Authors' abstr.)

The Correlations between Ovarian Activity and Psychodynamic Processes. II. The Menstrual Phase.

1. The simultaneous use of day-by-day study of vaginal smears and basal body temperatures on the one hand, and of the analysis of the recorded psychoanalytic material on the other hand, provided clear correlations between the physiological and psychological processes.

2. The investigation confirms the probability that in the adult woman, instinctual drives are related to specific hormone functions of the ovaries.

3. The premenstrual-menstrual phase of the sex cycle is one of diminishing progesterone and low, but variable estrone production. The metabolic gradient is generally downward.

4. Corresponding with the hormone levels, the instinctual tendencies are on the genital level when hormone production is relatively high; on the pregenital level when hormone production is very low.

5. Upon extinction of progesterone, eliminative tendencies appeared in the psychological material. This was most common in the late premenstrual period.

6. There is a semi-quantitative correlation between hormone production and psychic tension. (Authors' abstr.)

The Hypothalamus as a Thermostat Regulating Body Temperature.

As a result of experiments on cats the author concludes that the basal centre for the control of body temperature is composed of two parts. One is a heat-sensitive region located chiefly in the preoptic and supraoptic regions and connected through a descending pathway in the lateral hypothalamus with a motor centre for panting located somewhere behind the hypothalamus. The other part which reduces heat loss appears to be coextensive with the sympathetic centre in the hypothalamus. Its descending pathway enters the brain-stem dorsolateral to the mamillary bodies.

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In the monkey, lesions in the anterior part of the lateral hypothalamus cause hyperthermia. It appears to be reasonable to conclude that the same part of the hypothalamus protects the body against chilling in carnivores and in primates.

G. W. T. H. FLEMING.

Alterations in the Hypothalamus in Mental Deficiency.

A histologic study was made of the diencephalon in 16 cases of mental deficiency, cases which did not show evidence of disease or injury to the cerebral cortex, and most of which at least could be classified as " primary amentia."

Pathological involvement of the third ventricle region was evident in all but two cases. Ependymitis and meningitis and distortion of the walls of the third ventricle were the most common findings.

The nucleus tubero-mammillaris was the only cell group in the hypothalamus which did not show a marked reduction in the number of cells. There was an average cell reduction of 27 per cent. for the paraventricular nucleus. In 15 cases the supra-optic nucleus showed an average cell loss of 35 per cent. The nucleus tuberis lateralis showed an average cell loss of 52 per cent. The average amount of cell reduction for the substantia grisea was 33 per cent.

The normal appearance of the cells in the hypothalamic nuclei suggests that the cell reduction occurred at an earlier period in the history of the patients.

Through its influence upon the hypophysis and the parasympathetic nervous system the anterior hypothalamus is probably concerned with the mobilization and discharge of energy. Hence it is believed that the alteration in the hypothalamus may play a role in the widespread physiological inadequacy and the abnormalities of growth and development, which are so common in mental deficiency.

(Author's abstr.)

Rorschach Manifestations of Improvement in Insulin-treated Schizophrenics.

There was, before treatment, a marked difference between the recovered and the unimproved patients with respect to their approach to the task of interpreting the ink-blots, a difference which disappeared after treatment. The recovered patient had been very inefficient before treatment; he became efficient after treatment. The unimproved patient had already been efficient before treatment; he remained so after treatment. The recovered patient's pre-treatment inefficient approach, or the great discrepancy between his potential and his actual functioning, can be recognized in his Rorschach record by the following signs: the lack of concentration upon the task and the making of numerous side remarks; the presence of good percepts accompanied by uncontrolled, extensive associations and by a great unevenness of performance; the abnormal distribution of colour interpretations, implying a disturbing influence of the emotions upon the reasoning processes. All these signs disappeared after successful insulin therapy. As regards the unimproved patient, on the other hand, his mental efficiency, or the lack of a noticeable disproportion between his potential and his actual functioning, can be recognized in his Rorschach record by the following: The earnest attempt on the part of the patient to do his best, his elaborations aiming at the completion and clarification of his ideas; the presence of poor percepts combined with controlled elaboration and with an even performance level; the presence of a colour response which implies that emotional factors did not interfere noticeably with the functioning of the patient's intellect. (Author's abstr.)

REV. DE NEURO-PSIQUIATRIA.

VOL. I. NO. 3. SEPTEMBER, 1938.

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Concerning the Origin and Mechanism of Cardiazol Convulsions in Decerebrate Cats. *Gutierrez-Noriega, C.* 373
The Neurological Aspect of Cardiazol-provoked Attacks in Schizophrenics. *Quintana, P. A.* 420

The Cardiazol Test in the Diagnosis of Epilepsy.

The authors subjected epileptics and normal persons to injections of cardiazol. The administration of 2–3 c.c. 10 per cent. cardiazol produced an epileptiform convulsion in epileptics, but not in the normal controls except in a few cases. Further investigation, however, revealed that where a normal subject had had a convulsion a meal had been consumed prior to the test. In the same test cases when the stomach was empty the convulsion did not occur. It is recommended that the test subject should not take a meal on the day of test. It was also observed that there was a close relationship between the dose and the weight and sex of the subject.

The opinion is expressed that cardiazol is helpful in the diagnosis of epilepsy, but the author will not go so far as to recommend the test for medico-legal purposes.

J. R. BEITH ROBB.

DECEMBER.

*Contribution to the Treatment of Schizophrenia with Insulin. *Delgado, H., Valega, C., Gutierrez-Noriega* 463
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*Psychiatry and Mental Hygiene in Brazil. *Peres, H.* 516
*Treatment of the Neuroses with Cardiazol. *Rosas, F. S. y* 533
Schizophrenic Iconography. *Borja, A. J.* 551

Contribution to the Treatment of Schizophrenia with Insulin.

The authors treated 76 cases of schizophrenia with insulin. Results: 54 remissions, of which 45 were complete while 9 are described as social remissions. Five patients died, but in these cases the psychosis was of long standing. In another series of 41 cases, where the duration of the illness was less than six months, 36 complete and 3 social remissions were obtained.

The method of treatment was classical, but in cases with agitation or stupor, a modification in technique as proposed by Sakel was adopted. The "zigzag" technique of von Braunmühl and the method of minimal doses was also tried, the latter method receiving favourable comment.

During treatment observations were made relative to such factors as sex, form and evolution of the psychosis before treatment, total days of treatment, quantity of insulin used to produce the first coma, the average daily dose to produce shock, the frequency of coma, the total hours of coma and the number of epileptiform attacks, remissions and relapses.

With regard to the influence of the shock on mentation, will, perception, emotions, instinctive action, psychomotor activity, the opinion is submitted that there was no evidence to justify the hypothesis that during shock the psychosis regressed to an earlier phase of the illness.

Epileptiform attacks during treatment appeared to be associated with muscular states of hypotonus, and frequently in the pyknic type of subject. The suggestion is also advanced that insulin coma is more liable to be associated with states of muscular hypertonus.

In 32 cases during treatment a study of the vegetative system was made, and the authors indicate that insulin therapy will not only cause a remission in the psychosis, but will also stabilize the vegetative tonus. J. R. BEITH ROBB.

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Psychiatric and Mental Hygiene in Brazil.

The author discusses the history of the mental services in Brazil. The following classification of the División de Asistencia a los Psicópatas is given :

Psychiatric Classification of the D.A.P.

1. Psychosis, infective.
2. Psychosis, auto-toxic.
3. Psychosis, hetero-toxic.
4. Schizophrenia.
5. Paraphrenia with chronic hallucinosis.
6. Paranoia.
7. Psychosis manic-depressive.
8. Psychosis, degenerative (senile and pre-senile).
9. Psychosis of organic brain disease.
10. Neuro-syphilis (cerebral syphilis, tabes psychosis).
11. General paralysis.
12. Epilepsies.
13. Psycho-neurosis.
14. Psychopathic personalities.
15. Oligophrenia.
16. Other types unclassified.

J. R. BEITH ROBB.

The Treatment of the Neuroses with Cardiazol.

The author reports on ten cases of hysteria treated with convulsant doses of cardiazol. The symptoms of hysteria in some of the cases, however, were not severe. Eight cases showed complete remission of the illness. No relationship could be observed between the efficacy of the treatment and the duration of the disease.

During treatment such symptoms as cephalalgia, asthenia and debility disappeared, while in one case chronic rhinitis was cured. In other cases there was modification of the personality, the individual becoming more adaptable socially. Results are claimed even when the cardiazol failed to produce a convulsion. The opinion is expressed that the factors responsible for a favourable result are outside the centres producing epileptiform convulsions.

Epileptics appeared to be more susceptible to the convulsant action of cardiazol than cases of hysteria, but cardiazol could not yet be used as a means of differential diagnosis.

In epileptics cardiazol did not intensify the spontaneous crisis, neither did it appear to awake latent epilepsy, but epileptics so treated became less irritable and the period between the fits lengthened. The paradoxical suggestion is made that epilepsy might be treated by inducing " epileptiform shocks."

J. R. BEITH ROBB.

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SEPTEMBER.

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Clinical Results of One Hundred Cases of Mental Illness Treated with Electroshock.

Of 56 schizophrenics treated with electroshock 10·7 per cent. were cured and 50 per cent. improved. Of 11 paranoid cases 54·5 per cent. were improved but none were cured. Of 24 manic-depressives 50 per cent. were cured, 41·6 per cent. were improved. G. W. T. H. FLEMING.

TOKIO Z. PSYCHO-ANAL.

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1. Pathology, Biochemistry, etc..*

Further Investigations on the Mechanism of the Formation and Destruction of the Chemical Factors of Nervous Stimulation. Koshtoyants, Kh. S., and Mitropolitanskaya, R. L. [*Compt. rend. acad. Sci. U.R.S.S.*, **23**, 955–7 (1939) (*in English*); *cf. C.A.*, **33**, 5492[4].]

Investigations on the transmission of stimuli from the nerve of the cardiac muscle under conditions of carbohydrate metabolism, inhibited by the effect of glyceraldehyde on the heart of a frog, showed that after treatment of the heart with glyceraldehyde (0·02 M. solution) the typical response (stopping) to the excitation of n. vagus is absent. This is explained by the assumption that the disturbance of the normal glyceraldehyde led to the disturbance of the normal process of formation of acetylcholine-like substances. A. H. KRAPPE (Chem. Abstr.).

Cerebral Metabolism During Fever. Himwich, Harold E., Bowman, Karl M., Goldfarb, W., and Fazekas, Joseph F. [*Science*, **90**, 398 (1939).]

The brain metabolism of patients with general paresis was studied before and during fever produced by injections of typhoid vaccine or inductotherm therapy. Samples of arterial blood and of the return flow of the brain obtained from the internal jugular vein were analysed for O, CO_2, glucose and lactic acid. In every instance an increase of cerebral metabolism during fever was indicated.

FELIX SAUNDERS (Chem. Abstr.).

The Occurrence of Ovulation in the Rabbit as a Result of Stimulation of the Central Nervous System by Drugs. Marshall, F. H. A., Verney, E. B., and Vogt, Martha. [*J. Physiol.*, **97**, 128–32 (1939).]

Picrotoxin in a dose of 0·9–1·1 mg./kg. was injected intravenously into rabbits in heat. Follicle growth, development of batches of cystic and haemorrhagic follicles or ovulation ensued in a large number of animals so treated. No ovarian responses were obtained to the injection of a series of other substances, most of which were stimulants of the central nervous system.

E. D. WALTER (Chem. Abstr.).

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The Duration of Life After Cerebrovascular Accidents. Newbill, H. P. [*J. Amer. Med. Assoc.*, **114**, 236 (1940).]

Sudden death (within two hours) from cerebrovascular accidents is the exception rather than the rule. The average survival period after thrombosis is approximately fifteen times as long as after haemorrhage or embolism. There was a marked difference in the survival period of the white (105 days) and the negro races (65 days), mainly confined to the thrombotic patients. Equally so between males (57 days) and females (129 days). G. W. T. H. FLEMING.

Nicotinic Acid Deficiency Encephalopathy. Joliffe, N., et. al. [*J. Amer. Med. Assoc.*, **114**, 307 (1940).]

The authors describe 150 cases of an encephalopathic condition distinguished by clouding of consciousness, cogwheel rigidities and uncontrollable grasping and sucking reflexes which may or may not be associated with polyneuritis, pellagra, or with the oculomotor signs of central neuritis.

Patients treated with nicotinic acid plus hydration showed a marked reduction in mortality. The authors consider the condition to be a nicotinic acid encephalopathy. G. W. T. H. FLEMING.

The Effect of Extracts of the Adrenal Glands on the Respiration of Isolated Brain and Liver Slices. Tipton, S. R. [*Amer. J. Physiol.*, **127**, 710–15 (1939).]

Extracts of the adrenal whole gland and cortex depressed the O consumption of brain and liver slices of normal and of three adrenalectomized rats. The R.Q. of the brain slices was not affected by the extract. An extract of beef brain also showed depressing effects on the respiration. Crystallized corticosterone in concentrations of the same magnitude as the solid matter of the adrenal extracts also showed marked depressing action. E. D. WALTER (Chem. Abstr.).

Sugar Tolerance of Alcoholic Patients. Bowman, Karl M., Wortis, Joseph, Orenstein, Leo L., and Goldfarb, Walter. [*Proc. Soc. Exptl. Biol. Med.*, **42**, 37–40 (1939); *cf. C.A.*, **33**, 7385[8].]

On admission there was a marked decrease in the sugar tolerance of a group of 18 alcoholic patients, probably because of undernutrition. After one week in the hospital on a normal diet the sugar tolerance was improved.

L. E. GILSON (Chem. Abstr.).

Encephalopathy Produced by Manganese. Grewel, Fr., and Sassen, E. [*Nederland. Tijdschr. Geneeskunde*, **83**, iv, 5464–71 (1939).]

Mn poisoning leads to simultaneous cerebral and liver disturbances.

E. BEUTNER (Chem. Abstr.).

Morphology of Glycogen Distribution and Transformation. III. Cytology of Glycogen Accumulation in the Motor Cells of the Normal Nervous System. Shabadash, A. L. [*Bull. biol. med. exptl. U.R.S.S.*, **7**, 353–7 (1939) (*in English*); *cf. C.A.*, **33**, 6373[5].]

The normal resting or recently recovered nerve cell contains glycogen (I), although variations in carbohydrate metabolism from one kind of nerve cell to another give rise to many types of I accumulation. All the motor cells of a definite level of the motor nucleus show the same typical degree of I accumulation at the same time. The granules of " normal " I are characteristic and readily distinguished from pathological I inclusions, which appear as large coarse structureless deposits which distort the shape of the cells. I is found as a normal component of the Nissl tigroid, where it is probably combined with protein.

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IV. Glycogen in the Cells of the Gasserian and Spinal Ganglions of Normal Animals. Reentovich, R. V., and Shabadash, A. L. [*Ibid.*, **8**, 29–31.]

The normal pseudo-unipolar nerve cells of the Gasserian and spinal ganglions of mammals in a relatively quiescent state and under proper conditions of nutrition contain glycogen. S. A. KARJALA (Chem. Abstr.).

The Influence of Brain Metabolites on the Oxidation Process of Animal Tissues. Govorovich, E., and Tikhaya, M. [*Bull. biol. med. epxtl. U.R.S.S.*, **7**, 39–43 (1939) (*in French*).]

There are no differences in the action of brain metabolites isolated during rest or during induction coil excitation on the respiration of the brain, kidney, liver or muscles of cats. S. A. KARJALA (Chem. Abstr.).

The Influence of Brain Metabolites on the Secretory and Motor Functions of the Stomach. Guerchikova, K. A. [*Bull. biol. med. Explt. U.R.S.S.*, **7**, 315–18 (1939) (*in French*).]

The intravenous injection of small concentrations of the protein-free ultrafiltrates of brain metabolites into dogs causes an increase in gastric juice secretion, an increase in total acidity and free HCl, and a decrease in digestive capacity. Large doses decrease the secretion of gastric juice but have no effect on total acidity, free HCl or digestive capacity. In all cases gastric secretion was obtained only with the simultaneous administration of milk as a stimulant. Depending upon the functional state of the motor appearance of the stomach, injection of brain metabolite solutions may increase or decrease motor activity. If the stomach is in a state of relative rest the injections increase the activity, but if it is at maximum activity they decrease activity. S. A. KARJALA (Chem. Abstr.).

The Method of Direct Action on the Central Nervous System, and more Particularly on the Vegetative Cerebral Centres. Shtern, L. S. [*Bull. biol. med. exptl. U.R.S.S.*, **7**, 267–70 (1939) (*in French*).]

One of the determining factors of the functional state of the vegetative nervous centres of the brain is the K/Ca ratio. Increase of the ratio by direct injection of an extract of the posterior lobe of the hypophysis, adrenaline or K salts into the cerebral ventricles results in excitation of the nervous centres, while decrease of the ratio by the injection of kidney extract or Ca salts results in inhibition. Shock is accompanied by a decrease in K and inorganic P and an increase in Ca, and can be relieved by direct injection of K and P salts. Injection of the salts into the blood stream is not always effective because of the resistance of the haemato-encephalic barrier. S. A. KARJALA (Chem. Abstr.).

Calcium Ions Necessary to Synaptic Transmission in Parasympathetic, not in Sympathetic, Ganglia. Schafer, Geo. D. [*J. Pharmacol.*, **67**, 341–52 (1939).]

The parasympathetic paths to the sphincter pupillae of the cat are temporarily paralysed by proper injections of Na citrate, but the sympathetic pathways to the constrictor musculature of the visceral blood vessels, to the chromaffin cells of the adrenal medulla, to the dilator pupillae or to the retractor smooth muscle of the nictitating membrane are not. Perhaps the synapses in cholinergic ganglia are of two classes, Ca-cholinergic and K-cholinergic.

L. E. GILSON (Chem. Abstr.).

Cholesterolysis in the Blood Plasma of Individuals with Mental Disorders. Schube, Purcell, G., Raskin, Naomi, and Campbell, Eleanor. [*J. Lab. Clin. Med.*, **25**, 142–9 (1939).]

The rate of change of the total cholesterol concentration of the blood plasma of 26 male patients who were normal physically but mentally ill was studied over a period of 24 hours at room and ice-box temperatures. The results were similar to

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those obtained on normal individuals (*C.A.*, 33, 1378[9]) but on a lower plane. The rate at which cholesterol aggregates are able to free themselves from the meshes of protein molecules is discussed as an important factor in cholesterolysis.

HOWARD W. ROBINSON (Chem. Abstr.).

The Influence on the Animal of Thyroid Metabolites Introduced into the Cerebral Ventricles. I. Their Influence on the Composition of the Blood and Cerebrospinal Fluid. Kassil, G. N., Plotitsina, T. G., and Volkoviskaya, Ch. [*Bull. biol. med. exptl. U.R.S.S.*, **8**, 51–5 (1939) (*in French*).]

The injection of thyroid metabolites and thyroxine (I) into the cerebral ventricles of dogs results in a reduction in the K/Ca ratio and a decrease in P in the cerebrospinal fluid and blood. I also lowers the concentration of reducing substances in the fluid and blood serum. The injection of diiodotyrosine (II) causes a lowering in K, Ca, P and K/Ca in the blood and a lowering in K and Ca, with an increase in P and a slight increase in K/Ca in the cerebrospinal fluid. The injection of small doses of metabolites, I or II directly into the blood stream results in an increase in reducing substances, P and K/Ca. S. A. KARJALA (Chem. Abstr.).

The Protein Fractions in Blood and Spinal Fluid After Poisoning of the Nervous System with Carbon Monoxide. Bakhtiyarov, V. A. [*Klin. Med.* (*U.S.S.R.*), **16**, 726–9 (1939).]

Chronic CO poisoning decreases blood and spinal fluid albumin, increases blood and spinal fluid globulin, and decreases the permeability of the haematoencephalic barrier. S. A. KARJALA (Chem. Abstr.).

The Effect of Monosaccharides on Water Absorption from the Sub-arachnoid Space. Bedford, T. H. B. [*J. Physiol.*, **96**, 392–6 (1939); *cf. C.A.*, **32**, 9297[9].]

Isotonic solutions of glucose, xylose and mannose were without influence on absorption when introduced into the subarachnoid space for one hour. Solutions twice the isotonic concentration caused a marked reduction in absorption after 30 minutes. These sugars have a similar action on water absorption and they are in all probability absorbed by a common process. No evidence was obtained of a specific absorption of glucose such as occurs in the intestine.

E. D. WALTER (Chem. Abstr.).

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2. Pharmacology and Treatment.

The Relationship of the Insulin Hypoglucaemic Reaction to Shock. Corwin, Warren C. [*J. Lab. Clin. Med.*, **25**, 169–74 (1939).]

Hypoglucaemic manifestations (" insulin shock ") were produced in dogs and rabbits by the injections of fatal and non-fatal doses of insulin. Determinations of the haemoglobin content and the number and volume of erythrocytes in the blood indicate that haemo-concentration does not occur incident to such hypoglucemic reactions. Visceral evidences of capillo-venous congestion and increased capillary permeability were not seen in the animals after death. The mechanism of death in " insulin shock " is not the same as that of shock (Moon, *Arch. Path.*, **24**, 642, 794 [1937]. HOWARD W. ROBINSON (Chem. Abstr.).

Neuro-Histopathology of Metrazole and Insulin Shock Therapy. Experimental Study in the Cat. Winkelman, N. W., and Moore, Matthew T. [*Trans. Am. Neurol. Assoc.*, 214–16 (1939).]

Insulin (I) caused severe damage of the neurones, while metrazole (II) produced practically no morphologically demonstrable change in the central nervous system

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of the cat. These results may indicate the need for greater caution in the use of I in human subjects; II may be considered the safer drug.

J. PINCHACK (Chem. Abstr.).

Mechanism of Insulin Convulsions. III. Effects of Varying Partial Pressures of Atmospheric Gases After Adrenalectomy. McQuarrie, Irvine, Ziegler, M. R., Stone, W. E., Wangensteen, O. H., and Dennis, C. [*Proc. Soc. Exptl. Biol. Med.*, **42**, 513–14 (1939); *cf. C.A.*, **33**, 7385[5].]

Breathing a mixture of 5 per cent. O_2 and 95 per cent. N_2 causes hypoglucemia in adrenalectomized dogs without insulin, and hypoglucemia in normal dogs. Insulin convulsions are prevented by anoxia of this degree even when the blood sugar falls to 9–14 mg. per cent. Breathing a mixture of 15 per cent. CO_2, 20 per cent. O_2 and 65 per cent. N_2 also tends to prevent insulin convulsions.

L. E. GILSON (Chem. Abstr.).

Action of Insulin on the Chronaxie of the Foot of the Snail. Cahen, Raymond. [*Compt. Rend.*, **209**, 447–8 (1939).]

Insulin, in relation to its hypoglucaemic action, stimulates the isolated heart and depresses the isolated intestines. Its effect on the isolated foot muscle of the snail was noted by measuring the chronaxie. Insulin increases the chronaxie, but the effect is not persistent, in spite of the maintenance of the preparation in contact with hormone. The rheobase was increased equally with the chronaxie. There is spontaneous cessation of the action of insulin after prolonged contact. It diminishes after 35 to 50 minutes, and tends to regain its initial value after 45 to 65 minutes. It is not due to a change in insulin, as a new amount of insulin added to the old again raises the chronaxie. In its effect on muscle, insulin acts as a potential poison.

DOROTHY A. MEYER (Chem. Abstr.).

Biochemistry of Hypoglucaemic Shock. I. The Chlorides in Plasma and Corpuscles. Romeo Filippo. [*Biochem. terap. sper.*, **26**, 325–37 (1939).]

The Cl in total blood as well as in the plasma is conspicuously increased, especially in cases with lethal prognosis. An increase of Cl in the erythrocytes persists to the end of shock in non-serious cases whereas there is a final decrease in grave cases. A theoretical discussion is given.

A. E. MEYER (Chem. Abstr.)

Physicochemical Equivalents in Shock. II. Surface Tension of Serum in Insulin Shock. Scimone, I. [*Arch. sci. Biol. (Italy)*, **24**, 303–10 (1938).]

No appreciable difference in static and dynamic surface tension was found in the serum of schizophrenic patients subjected to insulin shock except a slight diminution when the serum was diluted ten times. P. F. METILDI (Chem. Abstr.).

The Effect of Metrazole by Perlingual and Enteral Administration. Kuschel, H. [*Klin. Wochenschr.*, **18**, 1131 (1939).]

Metrazole is readily absorbed by the mucosa of the tongue and gastro-intestinal tract. The duration of the effect is about three times that following intravenous injection. H. L. MASON (Chem. Abstr.).

Physiological Observations Following Induced Convulsions. Orenstein, Leo L. [*N.Y. State J. Med.*, **39**, 1921–3 (1939).]

A study was made of circulatory changes in 15 schizophrenic patients given intravenous injections of metrazole. After a mild metrazole convulsion the electrocardiagram also showed rapid rate, arrhythmia, T-wave elevation and depression of the S-T segment. After a severe convulsion the electrocardiogram also showed sinus arrest, shifting of the pace-maker, auricular and ventricular

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premature contractions, coupling of beats, nodal escapes, and rarely a marked bradycardia. The blood pressure showed a rise in systolic and diastolic levels at the beginning of the injection, and generally a fall in the diastolic and an elevation in the systolic level after a convulsion. The cerebrospinal fluid after a metrazole convulsion showed a marked rise in pressure and no change in content. When the metrazole was given too slowly to cause a convulsion no notable effects were produced other than an increase in heart rate. E. J. C. (Chem. Abstr.).

Treatment of Multiple Sclerosis with Nicotinic Acid and Vitamin B_1. *Moore, M. T.* [*Arch. Int. Med.*, **65**, 1 (1940).]

Five cases of advanced multiple sclerosis in which many forms of treatment had been used without appreciably halting the progress of the disease and in which the patients were treated with nicotinic acid and vitamin B_1 are reported.

Nicotinic acid produces vasodilatation not only of the skin but also of the brain and spinal cord.

Nicotinic acid and vitamin B_1 (thiamin chloride) may be given parenterally in considerable doses (nicotinic acid, 120 mg.; thiamin chloride, 33·2 mg.) for prolonged periods without apparent harmful effects.

Subjective and objective evidence of continued improvement has followed the parenteral use of nicotinic acid and vitamin B_1 in the cases of multiple sclerosis here reported. (Author's Abstr.).

Effect of Analeptic Drugs on Hibernation in the Thirteen-Lined Ground Squirrel (Citellus Tridecemlineatus). *Pfeiffer, Carl, Foster, Mark A., and Slight, David.* [*J. Pharmacol.*, **67**, 307–12 (1939).]

The sympathicomimetic amines are the most potent analeptics against the hibernating state. During hibernation clonic convulsions are well tolerated and may not awaken the animal; spinal convulsions are poorly tolerated and sensitivity to spinal convulsions is greatly increased. Metrazole, picrotoxin and cocaine have high analeptic indexes in hibernation. Caffeine sensitizes the hibernator so that handling produces a tetanic convulsion which may be immediately fatal. Coramine is twice as toxic in hibernation and produces a sensitization lasting several days during which the animal, if touched, goes into clonic convulsions, which may continue two to three days (" marathon convulsions ") and kill the animal by exhaustion, but which can be stopped by ephedrine, which awakens the animal. Strychnine is ten times as toxic in the hibernating as in the awake animal. The hibernating animal is a good test animal for the study of acidosis and the effects of vaso-constricting and metabolism-stimulating drugs. L. E. GILSON (Chem. Abstr.).

Electrical Studies on the Pharmacology of Autonomic Synapses. III. Action of Ephedrine Analysed by a Study of its Sympathetic Central and Ganglionic Effects. *Marrazzi, Amedeo S.* [*J. Pharmacol.*, **67**, 321–9 (1939); *cf. C.A.*, **33**, 4674[4].]

Increased preganglionic potentials show that ephedrine activates sympathetic cells within the central nervous system, while decreased postganglionic potentials show that it blocks sympathetic stimulation. The possible mechanism of the action is discussed. L. E. GILSON (Chem. Abstr.).

Effect of Cyanide on Cerebral Metabolism. *Fazekas, J. F., Colyer, Harriet, and Himwich, H. E.* [*Proc. Soc. Exptl. Biol. Med.*, **42**, 496–8 (1939).]

In dogs the intravenous or intracarotid injection of KCN causes a decrease in cerebral O consumption proportional to the KCN concentration. Concentrations which inhibit cerebral respiration cause no significant decrease in the O consumption of skeletal muscles. L. E. GILSON (Chem. Abstr.).

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Consequences of Narcosis or of Asphyxia? Experimental Data on the Influence of Nitrous Oxide and of Oxygen-Lack on the Central Nervous System. van der Molen, H. R. [*Nederland. Tijdschr. Geneeskunde*, **83**, iv, 4921–9 (1939).]

Inhalation of a N_2O+O_2 mixture with less than 8 per cent. O_2 for several hours causes serious degeneration of the ganglion cells of the cerebrum. The same holds for a 100-hour-narcosis with a mixture containing 20 per cent. O_2.

R. BEUTNER (Chem. Abstr.).

Effect of Phenyilsopropylamine (Benzedrine) on the Metabolism of the Non-anaesthetized Dog. Delaunois, A. L., and Marri, R. [*Acta Brevia Neerland. Physiol., Pharmacol., Microbiol.*, **9**, 242–3 (1939).]

Five fasting dogs were intramuscularly injected with 0·5–1·0 mg. benzedrine per kg. Ten minutes after injection both O_2 consumption and CO_2 output had increased markedly and R.Q. had fallen an average of 0·042. In about 45 minutes the values were back to normal. E. CURZON (Chem. Abstr.).

The Pharmacological Action of Deuterium Oxide. VIII. Action on the Central Nervous System. Herrmann, Julian B. [*J. Pharmacol.*, **67**, 265–75 (1939); *cf. C.A.*, **33**, 3884[4].]

Application of D_2O to the cerebral cortex produces a marked state of catalepsy in cats and monkeys. Injected D_2O disappears from the cerebrospinal fluid within 30 minutes. Encephalographic determinations parallel the objective findings of cerebral depression. Application of D_2O to the spinal centres of cats and frogs has no apparent effect on nerve impulse transmission. Application of D_2O to nerve or muscle or nerve-muscle has no obvious effect on nerve-impulse transmission or muscle contraction. L. E. GILSON (Chem. Abstr.).

The Effect of Sodium Bromide on the Nutrition and the Gastro-Intestinal Tract of Epileptic Patients. Arieff, Alex J. [*J. Lab. Clin. Med.*, **25**, 19–24 (1939).]

Few toxic cases were observed in these patients with blood bromide concentrations around 200 mg. per 100 c.c. When there was no anorexia or bromide toxicosis producing an inadequate caloric intake this blood level caused no weight loss, had no effect on nutrition and produced no abnormal change in the basal metabolic rate. Gastric analyses showed that the chloride ion was displaced by bromide from 25 to 50 per cent. In experiments in vitro HBr slightly retarded peptic digestion, but not enough to produce clinical symptoms and had no effect on trypic digestion.

HOWARD W. ROBINSON (Chem. Abstr.).

A New Method of Treatment of Alkalcid Addicts by Tetrodotoxin. Hsiang, Nai Shi. [*J. Oriental Med.*, **30**, 639–47 (*German abstr.* 179) (1939).]

From 1 to 2 c.c. of tetrodotoxin ($C_{10}H_{32}O_{16}$) mixed in 20 c.c. 20 per cent. glucose solution is given intravenously or orally to 18 subjects of opium and heroine habits, the number of dosages depending upon the severity of the symptoms, and oral treatment requiring a greater amount of the drug. Detailed data are given as to various symptoms before and after the treatment, confirming the authors' previous success with 1,500 patients. T. SASHIRO (Chem. Abstr.).

The Synergism of Phenobarbital, Dilantin Sodium and other Drugs. Cohen, B., et al. [*J. Amer. Med. Assoc.*, **114**, 480 (1940).]

The authors found that the increase of phenobarbital dosage up to an average of 3 gr. a day, with due regard to individual effect, was followed by a great reduction in the incidence of seizures amounting to about 68 per cent. as compared with treatment by phenobarbital alone given in a routine way. Dilantin sodium was not as effective as adequate phenobarbital usage. Benzedrine has a favourable

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effect on toxic symptoms of luminal and also on those of dilantin. The combination of luminal and dilantin is far more efficient than either drug alone ; the reduction in fit incidence is at least 50 per cent. over the most favourable results obtained without combining the drugs. G. W. T. H. FLEMING.

The Local Anticonvulsive Action of Calcium Salts. Beutner, R. [*Proc. Soc. Exptl. Biol. Med.*, **42**, 547–9 (1939).]

In guinea-pigs the intramuscular injection of 100–200 mg./kg. of procaine-HCl caused clonic and tonic convulsions. Mixing $CaCl_2$ with the procaine-HCl greatly decreased the incidence of convulsions. Other Ca salts acted like $CaCl_2$, except Ca gluconate, which does not ionize. $MgCl_2$ counteracts the action of $CaCl_2$, probably by altering membrane permeability, and in the absence of Ca increases the convulsive action of procaine. L. E. GILSON (Chem. Abstr.).

Alcohol and Sedatives. Peter, Helmut. [*Deut. Z. ges. gerichtl. Med.*, **31**, 113–53 (1939).]

Impairment of attentiveness and concentration power paralleled the limits of motor performance and blood alcoholic level. Phenobarbital, 0·3 gm., had the same effects as alcohol, 1 g./kg. body-weight, when the subject was tested objectively. Sedormid impaired the motor ability of one case slightly. Cibalgin was effective only after exercise. Subjective tests showed that the effects of phenobarbital and alcohol can be differentiated. Together with alcohol even the relatively ineffective cibalgin produced a real narcosis ; pyramidone produced a sense of well-being with no improvement in motor performance. FRANCES KRASNOW (Chem. Abstr.).

The Action of Some Indifferent Narcotics on the Acetylcholine Sensitivity of the Rectus Muscle of the Frog. Emmelin, Nils. [*Skand. Arch. Physiol.*, **83**, 69–76 (1939).]

Various alcohols (Me, Et, Pr, Bu, Am) increase the action of acetylcholine on the frog rectus muscle proportionally to their number of C atoms. Experiments with 3 isomeric Bu-alcohol show that the tertiary alcohol has a weak action while normal primary BuOH and isobutyl alcohol have a strong action. Neither glycerol nor ethylene glycol has any effect. The sensitiveness toward acetylcholine is also increased by Me, Et, Pr esters of carbamic acid, methylurethan having the weakest and propylure than the strongest action. Certain narcotics increase the sensitivity to acetylcholine, and their effect persists even after the complete paralysis of the choline esterase by physostigmine. S. MORGULIS (Chem. Abstr.).

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