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Non-Convulsive Electric (Faradic) Shock Therapy of Psychoses Associated with Alcoholism, Drug Intoxication and Syphilis.

Psyche and soma, inter-related, contribute to the "reaction of delirium" in toxic-organic psychoses. Delirious behavior is determined more by the type of personality of the individual than by the somatic changes in the brain.

Since the psychogenic psychoses showing delirious behavior appear to respond best to shock therapy, this method was employed in the treatment of acute toxic-organic psychoses. Non-convulsive electric (faradic) shock therapy, a safe, simple and inexpensive procedure, was given daily in conjunction with psychotherapy and the usual routine therapeutic measures. Thus "reaction of delirium" and the underlying organic disturbances were treated concurrently.

In 67 cases of psychoses associated with alcohol and other drug intoxications, the duration of "reaction of delirium" was definitely shortened.

In five cases of psychoses associated with syphilis of the central nervous system (general paresis), the acute delirious reactions responded favorably to this type of treatment. One patient showed complete remission. Subsequent malarial therapy given to the other four patients failed to produce further striking clinical or serological improvement.

This preliminary study indicates that in "reaction of delirium" (toxic-organic psychoses) more effective results can be obtained by administering non-convulsive electric (faradic) shock therapy in conjunction with the customary routine medical procedures. Further investigations are being made. (Author's abstr.)

Subconvulsive Electric Shock Treatment of the Psychoses.

Subconvulsive electric shock treatment by faradic current may be recommended for those patients who are disturbed, destructive, combative or otherwise difficult to manage. It has been used only in chronic cases, but the author believes if used early in the course of the disease it will aid in preventing development of these bad habits. The beneficial effects appear to be on a reality basis and due to the associated discomfort. It must not be used as punishment, and careful watch against employment of it as such is to be guarded against. It aids in eliminating restraint, reducing destruction and preventing accidents.

(Author's abstr.)

Investigation of the Effect of Inhalation of 9 per cent. Oxygen for 20 Minutes in Non-psychotic and Schizophrenic Male Subjects.

Twelve non-psychotic and 13 schizophrenic subjects were given 9 per cent. oxygen in 91 per cent. nitrogen for 20 minutes without any rebreathing of expired gases. Neurologic examinations were made at 5-minute intervals during a preliminary control period, the anoxemic period and during the recovery phase. EEG and EKG tracings were recorded and observations made of the pulse rate, respiratory rate, volume of expired air and psychological state at least once each 5 minutes.

(1) In one patient and one control subject unilateral equivocal plantar responses became definitely dorsiflexor under the administration of 9 per cent. oxygen.

2. The pupils of the schizophrenic group were smaller than those of control subjects, showed a smaller decrease in size under 9 per cent. oxygen, and had a smaller excursion in response to light when tested under anoxemic conditions.

3. Consciousness was only slightly affected in any of the 13 schizophrenic patients, but was markedly altered in 3 of the 12 control subjects. (Author's abstr.)

Psychiatric Uses of Intravenous Sodium Amytal.

1. As a sedative, sodium amytal is indicated in control of many disturbed and unco-operative patients and in *status epilepticus*.

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2. In the narcosis technique it is valuable in ameliorating catatonic excitements and in terminating manic episodes.

3. In stimulating doses it may permit accurate differential diagnosis:

(*a*) Between manic stupor and catatonic stupor.

(*b*) Between schizophrenic mutism and hysterical amnesia and aphonia.

(*c*) Cases with a good prognosis if given insulin shock therapy.

(*d*) Between organic psychosis, which requires more of the drug for stimulating or narcotic effect, and functional psychosis.

4. In stimulating doses, with or without supplemental doses of cortical stimulants (caffein, metrazol, amphetamine) it affords a means of establishing rapport with mute, resistive, retarded, aphonic, amnestic and unco-operative patients of many diagnostic types; and in activating catatonic patients so that they will eat rather than require tube-feeding.

5. In hypnotic doses it can be used to assist in inducing hypnosis in patients who do not respond to ordinary psychotherapeutic hypnosis. (Author's abstr.)

Prefrontal Lobotomy in Chronic Psychoses.

Of the 29 operated on in 1941, 6 have returned home. Four of these are adjusting socially, while 2 get along under slight supervision. A seventh has improved to such an extent that he could get along well at home provided the family was willing to accept him. Seventeen additional cases were operated on less than a month ago; it is too early to make any statement as to the outcome of these cases.

While these results are not spectacular, it must be remembered that they were formed from clay rejected by the potters. These people have passed through the hands of the private practitioner, the hospital for acute cases, and the receiving state hospital before they gravitated to the state hospital for chronic patients. Here many of them were relegated to the so-called back wards. It is fair to assume that most of them had been exposed to psychiatric study somewhere along the way. The records show that many of them had received various forms of treatment, including shock therapy. Since the majority had been hospitalized for years, spontaneous remission becomes a negligible factor. Hence we may conclude that the results are due to the operation. Therefore we consider prefrontal lobotomy a valuable method of treatment in certain chronic psychoses. (Authors' abstr.)

Symmetrical Bilateral Granular Atrophy of the Cerebral Cortex of Vascular Origin.

A case of symmetrical, bilateral granular atrophy of the cerebral cortex is described. Topographically, the atrophy is limited mainly to those areas lying at the juncture of the vascular supply of the anterior, middle and posterior cerebral arteries.

The primary involvement of the gray matter differentiates this form of atrophy from Binswanger's chronic subcortical encephalopathy. In the granular type of atrophy of the cerebral cortex those pial arteries supplying the cortex are mainly involved, while in Binswanger's encephalopathy the arteries supplying the medullary layer are primarily affected.

(Author's abstr.)

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Methods for Estimating Capacity for Recovery in Patients with Manic-Depressive and Schizophrenic Psychoses.

Methods of evaluating capacity for recovery, including conventional psychiatric procedures and determination of serum lipoids, have been investigated in 142 patients with manic-depressive and schizophrenic psychoses.

The conventional clinical psychiatric method yielded relatively dependable results in patients presenting clearcut symptoms of manic-depressive psychosis provided all patients with catatonic symptoms and other schizophrenic symptoms were excluded. Eighty-one per cent. of 90 patients so selected were doing well five to ten years after the onset of their illnesses.

In the case of the schizophrenics the results were little better than chance when patients with catatonic symptoms were included. This was also true of the patients presenting mixtures of symptoms of both syndromes.

Exclusion of patients with catatonic symptoms and queer states of excitement, however, yielded a group of schizophrenics in which 74 per cent. were showing no signs of capacity for recovery five or more years after the onset of their illnesses.

The serum lipoids, fatty acids and cholesterol were found to be associated in some way with subsequent capacity for recovery. High lipoids occurred in most patients who subsequently recovered, while low lipoids were found in those who did not.

Serum lipoid determinations, therefore, when considered in conjunction with other historical and clinical data, offer a promising supplement to methods of estimating the capacity for recovery of patients with schizophrenic and manic-depressive symptoms. (Authors' abstr.)

Comparative Electrocncephalographic Observations following Electroshock Therapy Using Raw 60 Cycle Alternating and Unidirectional Fluctuating Current.

Electroencephalographic observations have been made on 30 patients, 15 of whom received convulsions by means of raw a.c., 15 by means of unidirectional fluctuating current; and it is suggested that there is a significant increase in the occurrence of slow wave formations in that group receiving raw a.c. when compared to the group receiving unidirectional fluctuating current. Five of the 30 cases have been found to show clinical abnormalities coinciding with electroencephalographic abnormalities, and it is suggested that there is a relationship between these two phenomena. There is a possibility that cerebral dysrhythmia is more easily brought about following electroshock therapy in those patients who do not recover to the point of being well enough for discharge from a mental institution.

The above findings are submitted as a preliminary report, and the authors do not intend to infer that the series of patients observed is large enough to do more than suggest the relationships discussed in this paper. (Authors' abstr.)

The Treatment of Involutional Psychoses with Diethyl Stilbestrol.

1. Large doses of diethyl stilbestrol were administered to 45 women with involutional psychoses.

2. Twenty-seven (60 per cent.) were improved, while in a control series of 128 women only 54 (42 per cent.) were improved.

3. (*a*) The simple cases of involutional psychosis responded well to estrogenic therapy. (*b*) The cases of moderate severity and those of the mixed type reacted favorably, particularly when adjuvant therapy was employed, but relapses occurred and the degree of improvement was not as marked. (*c*) The psychotic manifestations in the severe cases were not materially affected. These cases may represent a different clinical entity than the mild cases. (*d*) Therefore, a therapeutic test with estrogenic substance may possess some diagnostic value in involutional psychoses.

4. Cases of dementia praecox, manic-depressive psychosis, and chronic psychoneurosis occurring during the involutional period were not favorably influenced by estrogenic therapy.

5. Diethyl stilbestrol administered orally was about as effective as alpha estradiol injected intramuscularly. About half of those who were given the former preparation exhibited some form of toxic reaction, which for the most part did not seriously interfere with the treatment régime. Both substances produced similar psychologic effects.

6. It is concluded that adequate estrogenic therapy has a definite value in the treatment of cases of involutional psychosis of the simple type. (Authors' abstr.)

An Alcohol Detoxication Mechanism in the Central Nervous System.

(1) An alcohol oxidation mechanism has been found to be present in brain. The extraction and analysis of the system has been described.

(2) Two members of the vitamin B complex, namely nicotinic acid and riboflavin, are components, i.e. they are essential for brain to metabolize alcohol.

(3) The possible role of the mechanism in the economy of the central nervous system has been discussed. It has been suggested that it may function as a detoxicating or protective device when alcohol is used in narcotic concentrations.

Investigations are being carried out to determine the chemical steps in the metabolism of alcohol by brain. (Author's abstr.)

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Disappointing Results with Bilateral Prefrontal Lobotomy in Chronic Schizophrenia.

Bilateral prefrontal lobotomy was performed on ten chronically disturbed schizophrenics and one mentally deficient patient. Insignificant amelioration of symptoms was noted in two and no improvement in all the other patients. One patient became decidedly worse and developed convulsive seizures two months following the operation. On the basis of their experience, therefore, frontal leucotomy is not recommended by the authors as a therapeutic procedure in chronic schizophrenia. (Authors' abstr.)

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Experimental Neuroses and Psychotherapy.

Artificially induced motivational conflicts in animals induce "experimental neuroses" characterized by anxiety reactions, persistent inhibitions, sensory hyperesthesias, phobias, compulsions and other aberrant behaviour patterns that correspond to those in human psychopathology. These neurotic manifestations are diminished or abolished by various therapeutic technics which (1) mitigate the intensity of the motivational conflict, (2) decrease the resultant anxiety, (3) force a solution by environmental pressure, (4) furnish a "social example" of more satisfactory behavior, or (5) provide the animal with manipulative means to "work through" the emotionally conflictful reality situation. These observations are consistent with certain psychobiologic principles applicable alike to comparative dynamic psychology, to semeiotic psychiatry and to clinical psychotherapeutic technics. (Author's abstr.)

Constitutional Differences between Deteriorated and Non-deteriorated Patients with Epilepsy.

1. The so-called normal, or simple hairpin-shaped, capillary loop occurs more frequently in the nail-folds of non-deteriorated subjects than in those of the mentally deteriorated ones.

2. Rudimentary or poorly developed capillary loops are found in a larger proportion of institutional patients than of non-deteriorated ones.

3. Tortuous and bizarre capillaries are significantly more frequent among deteriorated subjects than among non-deteriorated ones.

4. In the mentally deteriorated epileptic patients the incidence of capillary loops in which one limb is much more fully developed than the other is greater than in the mentally normal epileptic patients.

From these observations it is concluded that further evidence has been adduced to support the view that there are constitutional, or inborn, differences between the deteriorated and the non-deteriorated patient with epilepsy. (Authors' abstr.)

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Amyotrophic Lateral Sclerosis and Related Conditions: A Clinical Analysis.

The records of 197 patients with amyotrophic lateral sclerosis, primary lateral sclerosis or progressive muscular atrophy (various types) are analyzed and classified on the basis of their chief clinical manifestations, namely, lateral sclerosis, amyotrophy and muscular fascicular twitchings.

The cases of amyotrophic lateral sclerosis were broken down into three chief types: the Charcot, or completely developed, the atypical, and the incompletely developed. The large majority of the cases were of the first type. They were the typical cases and were characterized by well-developed amyotrophy, muscular fasciculations and pyramidal tract signs. The second, or atypical, type included the so-called monoplegic, hemiplegic, lumbar and proximal forms. Each of these terms refers primarily to the distribution of the amyotrophy, degeneration of the pyramidal tracts being essentially the same in all. In most of the cases of the atypical type the amyotrophy eventually developed in other extremities and the clinical picture became complete.

The cases of incompletely developed amyotrophic lateral sclerosis were characterized by predominance of lateral sclerosis, amyotrophy or bulbar palsy. The patients with lateral sclerosis presented rapidly developing pyramidal tract disease with urgency of urination and muscular fibrillations (but no atrophy). The patients with amyotrophy alone presented rapidly developing muscular atrophy with many muscular fibrillations, and the patients with bulbar palsy showed little besides the bulbar amyotrophy.

In cases of amyotrophic lateral sclerosis there appeared to be a close correlation of the number of muscular fibrillations and the speed of progress of the disease. It should be remembered, however, that the fibrillations may vary from time to time. Elevation of the cerebrospinal fluid proteins seemed to accompany severe amyotrophy, but did not necessarily indicate its rapid progression. Urgency of urination reflected rapid advancement of the pyramidal tract involvement.

Degeneration of the pyramidal tracts was indicated first by hyper-reflexia in the legs and later in the arms, then by a Babinski sign and, finally, by absence of abdominal reflexes. Bulbar involvement was usually indicated by amyotrophy first of the muscles supplied by the twelfth cranial nerve, then of the muscles supplied by the ninth and tenth nerves and the lower part of the seventh nerve, and, finally, of the muscles innervated by the masticator division of the fifth nerve. Pains of varying character were common and were often an early symptom, but objective sensory changes were rarely observed.

Primary lateral sclerosis and progressive muscular atrophy, both without muscular fibrillations, ran a course similar in many ways to that of amyotrophic lateral sclerosis, except that it was more slowly progressive. It is suggested that the patients with slowly progressive muscular atrophy without muscular fasciculations were suffering from an arrested or a slowly progressive type of amyotrophic lateral sclerosis, approximately 10 per cent. of the cases falling

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into this group. The reasons for and against this concept are presented, but the absence of suitable pathologic data precludes settlement of the problem at present. Data are also presented which suggest that an occasional patient with the clinical picture of amyotrophic lateral sclerosis recovers. (Authors' abstr.)

Histogenesis of the Early Lesions of Multiple Sclerosis: (1) Significance of Vascular Changes.

This study has demonstrated rather strikingly the frequent association of the early lesions of multiple sclerosis and vascular disturbances. The latter consisted of thrombosis of small veins and dilatation, engorgement and stasis of the capillaries and veins. The great majority of small lesions have been observed to be oriented about small veins. The question inevitably arises why vascular disturbances, which can be considered as of frequent occurrence in small and recent plaques, are relatively infrequent in the large and older lesions.

Two factors appear to be of importance: (1) In elongated lesions containing central veins the patches never tend to follow the entire course of the blood vessel. In the great majority of instances only one circumscribed area of the plaque is connected with the blood vessel. The foci usually envelop the central vein for a short and limited distance. As the lesion becomes larger the relation with the primary blood vessel becomes less evident. The demyelinated area tends to progress diffusely into the nerve parenchyma in different directions independent of the distribution of the primary blood vessel. It is not surprising, therefore, that in many sections from a large lesion the primary blood vessel will not be found. (2) The presence or absence of vascular changes in lesions may depend on the duration of the morbid process. Alexander and Putnam suggested that thrombi of the small veins in the older lesions of multiple sclerosis may disappear without a trace. Certainly, in older sclerotic plaques it is more difficult to trace them than in the recent lesions. (Author's abstr.)

Effect on the Electroencephalogram of Changing the Blood-sugar Level.

Electroencephalograms were recorded on 40 healthy college students, (*a*) during a routine rest period, (*b*) for 45 minutes after intravenous injection of insulin (0·05 unit per kilogram of insulin containing 40 units per cubic centimeter), (*c*) for 15 minutes thereafter after oral ingestion of 50 c.c. of Karo corn syrup and, finally, (*d*) for three minutes of voluntary hyperventilation. The blood-sugar level, the pulse rate and the blood pressure were determined systematically.

No consistent relation appeared between the electroencephalographic changes and the pulse rate or the blood pressure.

As the blood-sugar level fell (to a minimum of 53 to 85 mgm. per 100 c.c.), the normal alpha activity of the electroencephalogram was increasingly replaced by slower waves, chiefly in the 6 to 8 cycle range. The electroencephalogram returned to normal with the restoration of the blood-sugar level, but electroencephalographic changes lagged ten minutes or more behind the changes in the blood sugar.

" Slow swings " of two to five seconds' duration often appeared in the frontal record during the height of the insulin reaction. These potential changes apparently originate in the skin of the forehead.

The appearance of conspicuous electroencephalographic changes during the insulin test correlates fairly closely with the appearance of prominent slow waves during hyperventilation and with the presence of (much less prominent) slow waves in the routine electroencephalogram. Marked electroencephalographic changes during both tests were common in the mixed and the mixed slow type of electroencephalogram, less common in the regular alpha type, and rare in the low voltage and the mixed fast types.

The relative advantages of the insulin and the hyperventilation test for revealing latent electroencephalographic characteristics are considered. (Author's abstr.)

Results of Insulin and Epinephrine Tolerance Tests in Schizophrenic Patients and in Normal Subjects.

An investigation was made of the glycemic and autonomic reactions of 32 schizophrenic and 20 normal men. Forty-one per cent. of the patients showed some degree of resistance to insulin. The reactions to hypoglycemia were the same in the two groups. A lessened reactivity in blood sugar following the injection of epinephrine was noted in the patients. In general, the normal subjects showed greater changes in the blood pressure and pulse rate, paralleling the differences in the blood sugar between the two groups. (Authors' abstr.)

Cerebral Dysrhythmia in Relation to Eclampsia.

Thirteen, or 65 per cent., of 20 patients with eclampsia had electroencephalograms indicative of cerebral dysrhythmia, as compared with 2, or 10 per cent., of 20 patients with pre-eclampsia.

Twelve, or 60 per cent. of patients with eclampsia had a family and personal history of convulsive disorders, while only 2, or 10 per cent., of the pre-eclamptic patients had a similar history.

It is suggested that a primary cerebral dysrhythmia may be present in those patients having the syndrome of eclampsia, and that the associated toxemia may be the " trigger mechanism " that exaggerates the inherent dysrhythmia to the degree that convulsions appear.

A careful history, together with an electroencephalogram, might be of aid in predicting in whom eclampsia may develop.

The prophylactic therapy of eclampsia may include the use of anticonvulsant drugs. (Authors' abstr.)

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Atypical Seizures Elicited by Electrical Stimulation of the Cerebrum in the Cat.

An unusual type of seizure following electrical stimulation of the cerebral cortex of the unanesthetized cat is described. The seizure is slow and strikingly similar to that elicited from the cerebellar cortex of the unanesthetized cat. Its mechanism is yet to be determined. It is a distinct entity, quite separate from the usual " Jacksonian seizure " also elicited from the cerebral cortex. (Authors' abstr.)

Treatment of Schizophrenia: Follow-up Results in Cases of Insulin Shock Therapy and in Control Cases.

Sixty-six patients suffering from schizophrenia were given insulin shock therapy, and the results were compared with those for a group of 132 patients treated by conservative methods. Analysis of the subsequent courses for the two groups showed similar remission rates. Insulin shock therapy by the method described does not increase the remission rate of schizophrenia over that with more conservative methods of treatment. (Authors' abstr.)

Statistical Control Studies in Neurology: (1) *The Babinski Sign.*

The incidence of the Babinski sign was studied in three groups of subjects: (*a*) 2,500 patients with non-neurologic conditions admitted to a general hospital; (*b*) 1,000 patients with head injuries; and (*c*) 704 inductees into the Army.

Four and three-tenths per cent. of patients in the first and second group had a positive Babinski sign.

The Babinski sign was found in 1·15 per cent. of the hospital control series, who were between the ages of 21 and 35 years, and in 1·27 per cent. of the inductees of the same age distribution.

In the hospital series the Babinski sign was nearly twice as frequent in persons over 50 as in those under 50 years of age.

Various factors which may produce a transitory Babinski sign are listed.

(Authors' abstr.)

MARCH.

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Experimental Studies on Headache: Analysis of the Headache Associated with Changes in Intracranial Pressure.

Headache was regularly induced in normal erect human subjects by the free drainage of approximately 20 c.c. of cerebrospinal fluid, the estimated vertex pressure falling to between —220 and 290 mm. from a normal of approximately —150 mm. Moreover, (*a*) drainage headache was reduced in intensity by the intrathecal injection of physiologic solution of sodium chloride and the restoration of the cerebrospinal fluid volume; (*b*) drainage headache was reduced in intensity by tilting the body toward the horizontal or simply by flexion or extension of the head; (*c*) in its response to postural changes drainage headache was shown to be independent of the estimated intracranial pressure; (*d*) drainage headache was usually augmented in intensity during distension of intracranial veins secondary to bilateral jugular compression; (*e*) in a subject

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who had previously had section of the roots of the fifth and ninth cranial and the upper four cervical nerves, all on one side, induced drainage headache was absent over the homolateral frontotemporal area. This indicates that the afferent impulses from the frontal portion of the area of drainage headache traverse the fifth cranial nerve.

It is thus inferred that drainage headache is caused primarily by traction by the brain on various pain-sensitive structures which anchor it to the cranium; dilatation of some of these structures, the intracranial veins, and increase in brain volume are suggested as joint factors in the augmented traction which follows drainage of fluid and leads to headache.

The headache which often follows lumbar puncture has predictable and unique features, all of which indicate its similarity to drainage headache. Like drainage headache (*a*) postpuncture headache was associated with a decrease in cerebrospinal fluid volume, as evidenced by a fall in cerebrospinal fluid pressure; (*b*) it was completely eliminated by the intrathecal injection of saline solution and by the elevation of the intracranial pressure to normal; (*c*) its intensity was reduced by change from the erect to the horizontal position or by flexion or extension of the head; and (*d*) its intensity was increased by bilateral jugular compression.

The usual variety of postpuncture headache is therefore similar in type and mechanism to the headache induced by drainage of cerebrospinal fluid; i.e. it is caused by dilatation of and traction on pain-sensitive intracranial vascular structures. It is probably secondary to a prolonged leakage of fluid through the dural hole in the lumbar sac produced by the operator's needle.

Uncommonly, postpuncture headache results from sterile "meningitis."

The headache so often associated with increased intracranial pressure has generally been assumed, but never proved, to be related to the increased pressure. Yet (*a*) elevation of intracranial pressure in normal human subjects to abnormally high levels failed to cause headache; (*b*) in a series of 72 patients with tumor of the brain, headache occurred almost as frequently with normal as with increased pressure; (*c*) headache homolateral to the lesion in a patient with a tumor of the brain was induced by lowering the intracranial pressure, but could not be induced by elevation of the pressure to a high level of 550 mm.

Hence, in the production of headache, increased intracranial pressure is neither a prime nor an essential factor.

From these data it is concluded that the headache associated with either decreased or increased intracranial pressure results from traction on or displacement of pain-sensitive intracranial structures and is independent of generalized intracranial pressure changes *per se*.

(Authors' abstr.)

Predisposing Factors in Bromide Intoxication.

Twenty-one consecutive patients admitted to the Worcester State Hospital during a five-year period with a condition diagnosed as psychosis due to bromides were studied from the point of view of underlying gross predisposing factors.

The patients belonged to an age-group ranging from 28 to 75 years, with an average of 49·5 years. There was a distinct prevalence of women in the group (15 women, 6 men).

The average level of bromides in the blood serum was 201 mgm. per 100 c.c., with a range of 60 to 400 mgm. per 100 c.c. Attention is called to the fact that this level, as well as the toxic levels given by the various authors in the literature, are in general considerably below the actual peak. The time elapsing since the cessation of bromide intake and the rate of elimination have to be considered in order to estimate the true height of the bromide level in the blood serum.

Of the mental symptoms, clouding of consciousness was found to be the most constant. Hallucinations and delusions were present in the majority of the patients. The delusional ideas referred almost invariably to some threat to the patient's life. The emotional reaction was that of fear, and occasionally that of excitement. There were no typical neurologic changes except thickened speech and ataxic phenomena. Pronounced "bromide rash" was considerably less frequent than most authors have reported.

In 17 of the 21 patients severe and etiologically significant predisposing factors were present. These were: advanced arterio-sclerosis, 5 patients; severe alcoholism, 4 patients; untreated syphilis, 1 patient; necrosis of the brain, 1 patient; physical debility (infection, dehydration), 2 patients; and involutional complications, 4 patients. The organic lesions in all patients were in a rather advanced stage. Several of these patients showed signs of a beginning organic psychosis previous to the use of bromides.

The hypothesis is advanced that there is a synergistic relationship between the phenomena referable to bromide intoxication and the underlying organic lesions.

It is concluded that in the great majority of the cases a distinct etiologic significance is to be ascribed to the pre-existing pathologic conditions. (Author's abstr.)

Attempts at Treatment of Schizophrenia and other Non-epileptic Psychoses with Dilantin.

Sixty psychotic patients, chosen as representing clear and typical instances of the more important major psychoses, were treated with dilantin in doses increased up to the point of tolerance. Improvement occurred in over half the patients during the period of treatment. It consisted usually of diminution of excitement and irritability, almost irrespective of the type of the psychosis. The patients tended to relapse when the drug was withdrawn. These results seem to justify a further study of the use of dilantin for psychotic states.

(Authors' abstr.)

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Effect of Autonomic Drugs on Cerebrospinal Fluid Pressure in Schizophrenic and Other Psychoses: (1) Effect of Histamine.

A method of studying the reactivity of the cerebrospinal fluid pressure to autonomic drugs is described. This method was employed in comparing the cerebrovascular responses of 63 schizophrenic patients and those of 68 patients with non-schizophrenic psychoses. Histamine was used in this first study because of its well-known somatic action.

Significantly smaller response of the cerebrospinal fluid pressure to subcutaneous injections of histamine was noted in the schizophrenic patients. This was associated with another observation, namely, that the schizophrenic patients tended to show less decrease of cerebrospinal fluid pressure after withdrawal of 10 c.c. of fluid.

This study indicated that schizophrenia may be characterized by a relatively limited cerebrovascular reactivity to administration of histamine. (Authors' abstr.)

APRIL.

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Grouping Behavior of Normal Persons and of Persons with Lesions of the Brain: Further Analysis.

Further analysis has been made of the grouping behavior of normal subjects and of persons with lesions of the brain from the series previously reported by one of us (W. C. H.). Groups of geometric test figures having certain characteristics in common were presented by means of a special apparatus. Both qualitative and quantitative evidences of deviation from normal performance were found in some of the experimental subjects. This evidence is in line with the earlier observations of Halstead obtained on these subjects. Various factors bearing on interpretation of the present results are discussed. (Authors' abstr.)

Calcification of the Cerebral Cortex Associated with a Meningotheliomatous Meningioma: Pathologic Study with Comment on Incomplete Types of the Neurocutaneous Syndrome.

The clinical and pathologic features of a case of Alzheimer's disease complicated by the presence of a large meningioma of the olfactory groove are presented.

The suggestion is made that the association of calcification of the cerebral cortex with the meningothelioma is part of a pathologic complex and not a mere coincidence.

The association of the Dimitri-Weber calcifications in the brain with pathologic conditions other than vascular nevi in the region of distribution of the trigeminal nerve (Sturge-Weber syndrome) is reviewed. (Authors' abstr.)

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Neurogenic Hyperthermia and its Treatment with Soluble Pentobarbital in the Monkey.

Bilateral injury to the rostral region of the hypothalamus in a series of monkeys results in an acute post-operative rise in body temperature, which if untreated proceeds to a fatal level.

This experimental hyperthermia is the result of central paralysis of the heat loss mechanism, associated with maintained or exaggerated activity of the central mechanism for heat production and heat conservation.

Intravenous administration of soluble pentobarbital (pentobarbital sodium) during the course of the hyperthermia suppresses the activity of the mechanism for heat conservation and heat production and reduces body temperature to the normal level. When administered subcutaneously, pentobarbital is relatively ineffective.

The striking efficacy of pentobarbital in reducing experimental hyperthermia in the monkey warrants its trial in the treatment of neurogenic hyperthermia following acute injury to the brain in man. (Authors' abstr.)

Treatment of Post-Lumbar-Puncture Headache with Ergotamine Tartrate.

Ergotamine tartrate was administered by the intravenous route to 8 patients. Each person received 1 c.c. of physiologic solution of sodium chloride by vein about two hours before ergotamine tartrate was administered, and in no instance was relief afforded by the injection of the saline solution. After injection of 0·25–0·50 mgm. of ergotamine tartrate by vein the patients reported beginning relief from the headache in 15 to 30 minutes. These patients were usually made to sit up each five to ten minutes, and by the end of a half-hour the headache was entirely gone or greatly diminished in intensity. This method was employed to demonstrate the precise response to intravenous administration, and it may be used in treating patients with severe headache, or as a final measure in attempting to treat that group who do not seem to respond to ergotamine tartrate.

Ergotamine tartrate, at least according to these data, is of value in relieving post-lumbar puncture headache in eight to nine-tenths of the patients only when the drug is administered according to the tolerance of the particular patient for the drug. Each person differs in this respect, and one must administer the drug as carefully as one rapidly digitalizes a patient or as one administers morphine sulfate to a patient with acute myocardial infarction. The dose for a particular patient is that amount of the drug which gives the desired therapeutic effect. Once the dose for a patient is determined it is advisable and practical to employ this quantity or to reduce it to the minimal therapeutic dose. (Author's abstr.)

Comparison of Metrazol Convulsive Therapy with Electric Shock in Treatment of Schizophrenia, Evaluation of Results Obtained in Treatment of One Hundred Schizophrenic Patients with Electric Shock.

Approximately the same results were obtained in 100 schizophrenic patients treated with electric shock as in a similar group of patients treated with metrazol. Two to eighteen months after treatment was completed, 32 patients were improved and 68 were unimproved.

There is a pronounced tendency to relapse in schizophrenic patients treated with convulsive shock therapy.

While amelioration of psychotic symptoms and behavior occurs in many patients, the essential schizophrenic pattern remains unchanged.

Convulsive shock therapy helps to achieve remissions earlier than routine institutional treatment and therefore diminishes the duration of hospitalization.

Electric shock therapy is preferable to metrazol therapy, as has been pointed out by many workers, because there are amnesia for the treatment, less fear and anxiety, painless shock and avoidance of repeated intravenous injections in resistive patients.

Its greatest value consists in aiding in the preparation of unco-operative patients for other therapeutic measures, such as psychotherapy, occupational and recreational therapy and general psychiatric management. (Author's abstr.)

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Studies of Neuro-muscular Disorders: The Myogram, Blood Cholinesterase and Effect of Prostigmine in Myasthenia Gravis and Progressive Muscular Atrophy.

(1) Myograms from patients with myasthenia gravis show a characteristic abnormality at high rates of stimulation of the motor nerve.

(2) The myogram becomes normal within 45 minutes after intramuscular injection of prostigmine, and almost at once in the injected limb when the drug is given intra-arterially. The action of prostigmine is peripheral.

(3) In a limb which has been injected intra-arterially with prostigmine the myogram remains normal after the cholinesterase of circulating blood has risen to the pre-injection level or above it. The persisting benefit in the limb must therefore be due to the lowering of muscle cholinesterase.

(4) The cholinesterase of serum and of defibrinated blood was not abnormal in patients with myasthenia gravis or progressive muscular atrophy. In each individual studied prostigmine caused a fall of serum cholinesterase which paralleled the dose. The effect of defibrinated blood was more variable.

(5) In three cases of progressive muscular atrophy fasciculation persisted in muscles after the motor nerve fibres had been blocked with novocain. The fasciculation was therefore of peripheral origin and not due to aberrant impulses from anterior horn cells. It is suggested that degeneration of the motor neurone sensitizes the muscle to normal amounts of acetylcholine, or that in some instances there may be an excess of the chemical transmitter.

(6) In patients with progressive muscular atrophy a small dose of prostigmine (0·5 to 1 c.c.) brings on or intensifies fasciculation. Normal individuals and myasthenics do not fasciculate with such doses.

(7) Mention is made of prostigmine fasciculation in animals and man. This is of peripheral origin. In animals this fasciculation disappeared after doses of curare which did not seem to affect muscle power or activity. (Authors' abstr.)

On the So-called "Laryngeal Epilepsy."

It seems reasonable to postulate a small group of cases of epilepsy in which the epileptic attack immediately follows on coughing. In this group there is usually an associated chronic laryngitis or bronchitis. In four cases, seen personally, all were of a pyknic bodily habitus. In all four cases there was no past or family record of epilepsy.

Of the aetiological theories proposed to account for laryngeal epilepsy, some may be dismissed as improbable. Thus the idea that forced expiration with the closed glottis will produce asystole and convulsions is not borne out by the four cases investigated above, and in Armstrong's (1890) case also this manoeuvre failed to produce either asystole or an attack. Weber's original observations in this connection (quoted by McBride, 1884) were made on animals and under conditions unlikely to be reproduced clinically. That cerebral venous congestion and anoxaemia due to coughing is a cause, without any other cerebral abnormality, is also unlikely; for venous constriction—with engorgement greater than that produced by violent coughing—failed to produce an attack in the man W. O—, in whom forced coughing did actually produce an aura. Moreover, in another, H. B—, in whom venous obstruction did produce an aura, the attacks occurred at times independently of coughing.

The majority of cases would appear to be primarily neurogenic—either a true reflex laryngeal epilepsy, as in W. O— or Sommerbrodt's case and in four of Charcot's, or epilepsy with a laryngeal aura as in J. L—, or finally venous congestion caused by violent coughing but in a patient with a cerebral cortex predisposed, whether by vascular degeneration or other factors, to epilepsy. (Author's abstr.)

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Current Problems in General Paralysis.

Orlando discusses the contributions to the paresis problem by depth psychology and the newer mental tests. The basic psychological characteristic is the attack on the central nucleus of the personality. The role of the organic lesion is limited to initiating a nonspecific regression to primitive levels. Paresis should be interpreted as two psychological processes: dementia, a necessary preliminary, and a latent functional psychosis precipitated by it. Their interrelationship gives the various clinical pictures. When dementia is marked, the simple form of paresis develops; when it is milder, the psychotic aspects predominate. The analytic interpretations are reviewed. The Rorschach, Babcock and Szondi tests do not demonstrate much improvement after treatment or during remissions. Mira's decortication test, specific for dementia in general, but not for paresis, is one of the most sensitive methods for demonstrating mild cortical lesions and separating the dementia from the psychosis. Studies on conditioned reflexes in paresis are promising. None of these tests are yet routine, although they are entirely practicable and are necessary for determining the quantitative aspect of remissions—a still unsolved problem, but especially important in estimating social behavior.

M. E. Morse (Psychol. Abstr.).

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Lipofuscin Distribution in the Basal Ganglia.

1. The accuracy of the view that lipofuscin of nerve cells is merely a waste product is questioned.

2. A classification of grisea based on their lipofuscin content was undertaken by Muhlmann, has already been elaborated by others to a certain extent and is applied in the present research to the so-called basal ganglia. Much emphasis is given to technic, since the various staining methods may show different chemical constituents of the pigment and thus help further in differentiating the various cell categories.

In this way a reaction is found which is characteristic of the nerve cells of the globus pallidus. The reticulate zone of the substantia nigra, the substantia innominata and the corpus subthalamicum are also characterized by the appearance and histochemical reaction of their lipofuscin. The nerve cells of the putamen, caudatum and amygdaloid nucleus show less typical reactions, except the frequently encountered peripheral arrangement of the pigment granules.

3. The lipofuscin content of neuroglia cells is very small in the basal ganglia, larger only in the reticulate zone of the substantia nigra. (Author's abstr.)

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A Quantitative and Qualitative Analysis of the Electroencephalograms of Stutterers and Non-Stutterers.

(1) A study was made to determine whether stutterers can be differentiated from normal speakers by electroencephalographic techniques. Electroencephalograms were recorded from the left occipital, motor and frontal areas of the brain from 20 stutterers and 20 normal speakers. Two records, 15 minutes long, run at least a week apart, were secured from each individual. Two 30 seconds samples were selected for quantitative measurement from each record. Measurement was made in terms of the number of waves per second. The records were also analyzed qualitatively for the presence of the abnormalities known to be related to neuropathologica activity.

(2) There were no statistically significant group differences in mean number of waves per second for any of the three areas. These results were the same for the first run records, the second run records and the two runs combined.

(3) A comparison of the mean standard deviation of the mean number of waves per second for the two groups showed no statistically significant differences for any of the three areas. These results were the same for the first run, the second run, and the combined runs.

(4) There were no significant differences in the values of correlations obtained between the two groups for first run versus second run records, or first sample versus second sample of the

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same records, indicating that stutterers were not more variable from sample to sample (ten minutes apart) and from record to record (one week apart) than the normal speakers.

(5) Qualitative abnormalities were frequent in neither group. Although three stutterers did show definite abnormalities, as opposed to only one normal speaker, 17 other stutterers did not. A much larger percentage difference would be necessary to make any conclusions meaningful. (Author's abstr.)

MARCH.

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*A Study of Bilaterally Recorded Electroencephalograms of Adult Stutterers.

Bilateral occipital and motor area electroencephalograms were recorded from 20 stutterers and 20 non-stutterers during conditions of silence and speech. The subjects were observed during speech, and stuttering and non-stuttering were defined as temporal agreement of two judges as to whether stuttering or non-stuttering occurred. The records of each subject were examined for evidences of bilateral and unilateral blocking of the alpha rhythm. The per cent time of such blocking was computed for each subject for each of the three conditions in the experiment.

The data were then analyzed by the methods of analysis of variance and covariance in order to evaluate intergroup and intragroup differences. Variability was evaluated by computing ratios of variance in all pertinent relations.

Intergroup comparisons showed that the stutterers and the normals could not be differentiated on the basis of the mean per cent time unilateral blocking of the alpha rhythm, either in silence or in speech. There was, however, a greater bilateral blocking of the rhythm in the occipital areas in stutterers during speech than in the non-stutterers during speech.

Intragroup comparisons indicated no significant differences in the group of normals between silence and speech, but in the stutterers bilateral occipital blocking was significantly greater during speech than during silence. It may be that this intragroup increase in bilateral blocking (as well as the greater amount of bilateral blocking in stutterers than in normals during speech) may be attributed to a greater "attention" value of speech for stutterers than for normals. This hypothesis is put forth as being more acceptable than one postulating a basic physiological difference between stutterers and non-stutterers in this respect.

Interhemisphere relations indicate significant differences between stutterers and normals in the unilateral occipital alpha blocking of the two hemispheres during silence. Stutterers tended to show more blocking in the left occipital area during silence, and non-stutterers a greater amount of blocking in the right. That this interhemisphere differentiation of the two groups is lost during speech is interpreted as being in keeping with the findings of Henry that individuals with differing amounts of alpha activity during the resting state become significantly more similar when they engage in psychologically similar activities.

The interhemisphere differences in unilateral blocking during silence which distinguish the group of stutterers from the group of non-stutterers seem to point to the existence of a physiological difference between the two classes of speakers, and in so doing they invite further investigation. (Author's abstr.)

APRIL.

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*Bilateral Electroencephalograms from Normal Speakers and Stutterers. *Knoll, J. R., and Tjossen, T. D.* 357

Problem Solution by Monkeys following Bilateral Removal of the Prefrontal Areas. I. *The Discrimination and Discrimination-Reversal Problems.*

(1) Six normal monkeys and four monkeys with bilateral prefrontal lobectomies learned a series of 10 discrimination problems and 10 discrimination reversal problems.

(2) The normal monkeys learned both problems with fewer errors than the operated animals and the differences approached statistical significance. (Authors' abstr.)

Bilateral Electroencephalograms from Normal Speakers and Stutterers.

(1) Douglass has recently reported data which might be interpreted as offering support to the lateral dominance theory of stuttering.

(2) This study endeavoured to confirm the Douglass study. The procedure followed involved the addition of two new groups of stutterers to Douglass's data in order to further test his conclusion that with regard to the bilateral distribution of the alpha rhythm, stutterers form a homogeneous distribution different from that formed by normal speakers.

(3) The results indicate that when these comparisons are made, the stutterers form a homogeneous distribution with respect to differences in alpha index in the left and right occipital areas (L minus R), and that when compared with the non-stutterers, the L minus R scores are significantly lower (more positive) than those scores for non-stutterers. No such differences appeared in the data from the motor area.

(4) These findings may be tentatively evaluated in terms of Jasper's hypothesis of cortical excitatory state. Such an evaluation would lead to the conclusion that stutterers tend to have a different lateral (hemispheric) excitability than do non-stutterers; this is powerful support for that theory of stuttering based on the concept of lateral cerebral dominance.

(5) There is a difference, however, between the statistical average of stutterers (or non-stutterers) and any given stutterer (or non-stutterer). The overlap in the distribution of L minus R occipital per cent time alpha will not permit generalization to the effect that a difference in cortical excitatory state is the only etiological factor related to stuttering.

(Authors' abstr.)

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A Direction-orientation Study with Visitors at the New York World's Fair. *Yoshioka, J. G.* 3
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The Frequency with which a Group of Unselected College Students Experience Colored Dreaming and Colored Hearing. *Middleton, W. C.* 221

Personality Patterns in Adolescence as Portrayed by the Rorschach Ink-blot Method. I. *The Movement Factors.*

There is a detailed discussion of the interpretation and significance of movement responses in Rorschach records, relevant literature being reviewed. 76 children were given Rorschach tests at 12 and at 15 years of age; this report deals with the human and animal movement responses elicited. In Tables 1 and 3 norms for M and C patterns are presented, and Table 2 gives norms for similar ages (12 and 15) reported by other investigators. Extensive statistical analyses of the data are presented and discussed, and related to data in the literature. The results are summarized in terms of normality of distributions, norms, age differences, sex differences, variability of the groups, correlated patterns. "While children at 12 and 15 years of age exhibit many individual differences in their introversive capacities, older children are characteristically more introversive and more concerned with their inner urges and subjective experiences. Older children are more mature emotionally. Girls show these traits more than boys."

C. N. COFER (Psychol. Abstr.).

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Relation of Imagination to Certain Other Factors. *Dexter, E. S.* 139
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An Exploratory Study of Personality Characteristics in Schizophrenia and Manic-depressive Psychoses.

A test was used which measured (1) things considered wrong ; (2) worries, fears, and anxieties ; (3) likes and interests ; (4) kinds of people liked or admired. Data are presented for 35 schizophrenics, 35 manic-depressives, and 70 adult controls. Parts 2 and 3 elicited many more responses from the psychotics than from the controls, with greatest responsiveness among the schizophrenics. Several methods of analysis were used. Item analysis, based on two methods of determining proportional responsiveness of the groups to items, was conducted, and two lists of items which differentiated between the schizophrenics and controls and two which differentiated between the manic-depressives and the controls are presented. Various interpretative problems are raised. C. N. COFER (Psychol. Abstr.).

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*The Sign of Babinski in *Macaca mulatta*. *Forster, F. M., and Campbell, J. B.* . . 493
*Electrical Shock Treatment of Psychoses. *Furst, W., and Stouffer, J. F.* . . . 499
*Encephalo-Myelo-Radiculitis. *Polan, C. G., and Baker, A. B.* 508
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*Acute Cardio-vascular Collapse after Insulin Shock Treatment. *Weil, A. A.* . . 556
Megasigmoid in Catatonic Stupor. *Kerschbaumer, L.* 562

Babinski Sign in Macaca mulatta.

Macaca mulatta presents a degree of cortical encephalization which is greater than had been previously suspected. The sign of Babinski can be elicited, but extensive bilateral cortical lesions are required. No specific area has been found responsible for the production of the sign.

S. M. COLEMAN.

Electrical Shock for Psychoses.

Having treated 250 cases with electrical shock the authors conclude that it is a simple, safe and effective method of inducing convulsions. They find that the complications are less than those occurring during metrazol convulsions. In their series 73 per cent. of the affective psychoses and 24 per cent. of the schizophrenic group were able to leave hospital in an average hospitalization of 45 days in the former and three months in the latter. S. M. COLEMAN.

Encephalo-Myelo-Radiculitis.

Eight cases of an unusual involvement of the nervous system are reported. The writers call this symptom-complex " Encephalo-myelo-radiculitis," since it most adequately describes the distribution of the clinical symptoms. The clinical picture may be most variable since any or all parts of the nervous system may be damaged. Certain features, however, aid in the diagnosis, namely: a cell-protein dissociation in the spinal fluid; a normal or only slightly raised temperature and leukocyte count; and a favourable prognosis with almost complete recovery in spite of the apparent severity of the illness. S. M. COLEMAN.

Cardio-vascular Collapse after Insulin.

From the case described and a few similar cases reported in the literature, it is concluded that the immediate post-hypoglycaemic state is especially prone to show acute circulatory disturbances. The intra-cardiac injection of adrenalin in acute heart failure in insulin shock has proved to be of definite value. S. M. COLEMAN.

DECEMBER.

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*A Suggested Treatment of Spinal Block Caused by Spinal Adhesive Arachnoiditis by Means of Repeated Spinal Air Injection. *McIntyre, H. D.* 668
*On the Use of Curare in Modifying Convulsive Shock. *Woolley, F., Jarvis, J. R., and Ingalls, G. S.* 680

Assault Injuries in a State Hospital.

Assault injuries at the Rockland State Hospital were analyzed for the period 1931 to 1940. Of 16,337 admissions, 287 patients made 857 assaults. Males predominated (60·3 per cent.). The greatest number of assaultive patients were paranoid schizophrenics. Epileptics were the most assaultive in proportion to their numbers, with the schizophrenics and paretics second and third. 14 patients (1·6 per cent.) died as the result of injuries. Most of these deaths resulted indirectly from other complicating factors. S. M. COLEMAN.

Neurological Complications after Pregnancy.

A case of massive encephalomalacia occurring suddenly on the tenth day of an otherwise healthy puerperium is described. The only neurological findings during the patient's subsequent 18 years of life were a right hemiplegia and a motor aphasia. The aetiology and mechanism of the cerebral damage are critically reviewed. The possible mechanism is that of air embolism, the air entering the circulatory system through patent uterine sinuses. S. M. COLEMAN.

Post-encephalitic Parkinsonism.

This study is based on observation of 27 patients, who were followed for one and a half years. It was found that large doses of a single alkaloid of the atropine group are an effective method

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of decreasing the tremor and improving the locomotion of the post-encephalitic Parkinsonian. Large doses are relatively well tolerated. Psychological factors are prominent in this disease and cannot be neglected in evaluating any medication. Unusually satisfactory adjustment to the disease is common. All the patients showed a reduction of intellectual efficiency.

S. M. COLEMAN.

Treatment of Spinal Block.

Localized adhesions of the spinal arachnoid may cause complete spinal block identical with that produced by cord tumour. The cause in the cases observed was infection of the nervous system, probably virus in origin. Laminectomy is usually advocated, yielding negative results in the author's cases.

A case is presented in which spinal air injection was effective in relieving the block produced by localized spinal adhesive arachnoiditis. The writer would suggest that his method of air injection be first used and, if this does not suffice, laminectomy should then be undertaken.

S. M. COLEMAN.

Curare in Convulsive Shock.

The writers find that curare in the form of intocostrin (Squibb) is an effective agent in preventing physical injuries to patients subjected to convulsive shock therapy either by means of metrazol or electricity. The advantages and hazards of curare medication are discussed.

S. M. COLEMAN.

VOL. XCVII. JANUARY, 1943.

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*An Analysis of the Disturbances of the Higher Cortical Functions, Agnosia, Apraxia and Aphasia. *Teitelbaum, H. A.* 44
*A Comparative Study of the Combined Metrazol-Hypoglycaemic Shock Treatment and Spontaneous Improvements in Schizophrenia. *Notkins, J.* 62

The Neurological Effects of Syphilis.

In this paper the various forms of neurosyphilis, the prognosis and treatment are reviewed. Many classifications have been offered. Anatomically neurosyphilis may be divided into syphilis of the brain and syphilis of the spinal cord. Pathologically there are meningeal or inflammatory and parenchymatous or degenerative types; in the former the changes are typical of syphilitic changes elsewhere in the body; in the latter the changes are degenerative and in no way related to the tertiary manifestations histologically. Regarding immunity and allergy, it is probable that at least two factors contribute to the development of parenchymatous neurosyphilis: first, a state of hyperallergy of neurones and neuroglia, and second, an exceedingly virulent strain of neurotropic spirochaete. It is thought that the high degree of virulence may have been attained by the spirochete in resisting antibodies.

For the therapist, a classification may be made on a combined clinical and anatomical basis, as follows: (1) More or less purely meningeal syphilis, including acute syphilitic meningitis, the neuro-recurrences and early asymptomatic neurosyphilis. (2) More or less purely vascular neurosyphilis, including localized or widespread cerebral endarteritis. (3) Diffuse meningo-vascular neurosyphilis, including brain gumma, syphilitic epilepsy, cerebrospinal syphilis and late asymptomatic neurosyphilis. (4) More or less purely parenchymatous neurosyphilis, including tabes dorsalis, dementia paralytica and primary optic atrophy. In the first three groups the inflammatory element predominates, in the last the degenerative element.

S. M. COLEMAN.

Rorschach Examinations.

The Rorschach method has been successfully applied in the diagnosis of acute psychiatric admissions. Even in mildly disturbed cases an accurate picture of the personality, as validated clinically, is obtained. The statistics obtained are comparable, in most respects, with previous studies. Studies of the kinaesthetic and colour determinants uphold the general interpretations of these factors, and substantiate the general psychiatric picture of a psychotic and neurotic personality derived by Rorschach experiments. Significant differences are found in the protocols of functional cases and organic disturbances of the C.N.S., and the signs outlined by Piotrowski are applied here with success.

S. M. COLEMAN.

Disturbances of Higher Cortical Function.

The author divides cortical function into six categories according to the degree of complexity of the integrative processes. If these functions are divided into sensory and motor, three modalities can be differentiated for each of these. In the sensory sphere, in order of increasing complexity these modalities are: (1) Primary sensation, which, if defective, gives rise to anaesthesia; (2) recognition, which, if defective, gives rise to agnosia; (3) understanding, which, if

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defective, gives rise to sensory aphasia. In the motor sphere these modalities are: (1) Voluntary contraction, disturbance giving rise to paralysis; (2) purposeful movement, disturbance giving rise to apraxia; (3) meaningful speech, disturbance giving rise to motor aphasia. The remainder of the paper is concerned with more precise definition of agnosia, apraxia and aphasia, and their causal disturbances. S. M. COLEMAN.

Metrazol-Hypoglycaemic Shock Treatment.

These writers find that the combined hypoglycaemic shock and metrazol method yield better therapeutic results (37 per cent. improved) than metrazol or insulin alone. The combined method reduces the incidence of vertebral fractures, and tends to prevent the occurrence of fractures of long bones and dislocations. Hypoglycaemic coma tends to decrease slightly the percentage of effective metrazol injections and also to decrease the convulsive threshold of metrazol. S. M. COLEMAN.

FEBRUARY.

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*The Role of Hostility in Affective Psychoses. *Oltman, J. E., and Friedman, S.* . . . 170
Innervation and "Tonus" of Striated Muscle in Man. *Jacobson, E.* 197

A New Pyramidal Sign.

The leg should be entirely relaxed and the foot should be in slight plantar flexion. The second toe is flicked sharply upwards with the finger applied to the ball of the toe. After a short pause the big toe and frequently the lesser toes respond by dorsiflexion. Of 72 cases, 41 showed this sign, 20 a positive Rossolimo and only 7 a positive Babinski. It is suggested that the new sign may be a more sensitive indication of pyramidal damage than the older signs. It is admitted that the presence of the new sign in several cases of schizophrenia and in hysteria gives rise to speculation. S. M. COLEMAN.

Refrigeration Therapy in Mental Disease.

Sixteen patients with mental disease were subjected to the refrigeration treatment of Fay and Smith. Briefly the method consists in placing the patient in a suitable cabinet, where he is kept at a temperature below 85° F. up to 49 hours. The maximum number of cold treatments was 8. No mental improvement was noted. Two patients died from pneumonia and there were frequent non-fatal respiratory complications. The use of the treatment has been suspended. S. M. COLEMAN.

Hostility in Affective Psychoses.

Analytical technique has demonstrated the importance of repressed hostility, sadism, hatred and aggressivity towards the love-object in the pathogenesis of melancholia. In this paper it is shown that well crystallized evidence of hostility is also observable, or can be elicited, by ordinary psychiatric measures. It is found that during the manic phase these impulses are allowed free expression; while, in melancholia, they only escape in disguised, projected form, or are directed inwards against the ego. S. M. COLEMAN.

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*Cortical Origin and Distribution of Corpus Callosum and Anterior Commissures in the Cat: III. *Garol, H. W.* 422

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The Functional Organization of the Sensory Cortex of the Cat: II.

The method of physiological neuronography, or the plotting of areas of electrocortical response resulting from local strychninization of the cortex, has been used to determine the limits and organization of the sensory cortex of the cat. Dusser de Barenne's earlier findings with respect to the extent of the sensory cortex were confirmed, but not his conclusions concerning the somatotopic organization of the sensory cortex into complete subdivisions for arm, leg, and face areas. With but one exception all electrocortical responses induced by local strychninization within the sensory area were confined to the sensory cortex; similarly stimulation outside the sensory cortex did not produce responses within the sensory area boundaries. The exception to the above occurred in the case of occipital areas 18 and 19 and frontal area 3; a reciprocal "firing" between these areas without and within the sensory cortex was demonstrated. The mediation of the discharges was via the long antero-posterior bundle connecting occipital and frontal areas. D. B. LINDSLEY (Psychol. Abstr.).

Experimental Lesions of the Pyramidal Tracts in Primates, Accompanied by a New Reflex.

A new reflex previously described by the author in human subjects and consisting of "prompt dorsiflexion of the big toe . . . when snapping the distal phalanx of the firmly grasped second toe" was tested in a chimpanzee and a monkey after experimental lesions. In the case of the former with ablations of areas 4 and 6 on the left, the new reflex (dorsiflexion of big toe) could be elicited readily on the right by snapping any of the four outer toes. The new reflex was clearly present, despite absence of Chaddock, Oppenheim, Gordon or Schaefer signs and difficulty of elicitation of the Babinski. In the case of the monkey, after the left hemisphere was removed the new reflex persisted in spite of the absence of a Babinski response. The author believes the new reflex is more easily elicited and interpreted in the case of pyramidal tract lesions than are other reflex signs, and that it may be of use in studies of representation in the motor cortex and in the evaluation of cortical dominance.

D. B. LINDSLEY (Psychol. Abstr.).

Cortical Origin and Distribution of Corpus Callosum and Anterior Commissures in the Cat: III.

After local strychninization in one hemisphere electrocortical responses were recorded in the other hemisphere of the cat's brain, before and after sectioning of the corpus callosum and anterior commissure. Sectioning of the corpus callosum abolished all responses in the contralateral hemisphere except those of area 21, and they were obliterated by section of the anterior commissure. It was found that certain areas "fire" only symmetrical points of the contralateral hemisphere; certain other areas "fire" symmetrical plus additional areas. Strynchninization of some delimited areas suppresses activity bilaterally, and the stimulation of a few areas has no detectable contralateral effect. D. B. LINDSLEY (Psychol. Abstr.).

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Cortical Response of the Anaesthetized Cat to Gross Photic and Electrical Afferent Stimulation.

1. A brief photic stimulus evokes, under several types and stages of anesthesia, one or more (multiple) cortical responses. A single electrical stimulus applied to the optic nerve does not evoke a multiple response of the type which follows photic stimulus.

2. The responses are usually predominantly surface positive, positive phase first. In light anesthesia negative components are prominent.

3. Application of 0·1 per cent. picrotoxin to the pia enhances the positive component about 25 per cent., and either initiates a large negative component or greatly enhances one already present. The positive and negative components are obviously due to separate neural processes. The positive component is associated with ascending cortical processes. The negative component is associated with descending neural processes. With picrotoxin it can be demonstrated that the negative wave is associated with activation of association areas and tectal regions. Application of nembutal to the same pial surfaces abolishes the negative wave and the projected reaction.

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4. The separateness of the positive and negative processes can also be shown by cross conditioning of the cortical mechanisms, wherein a photic stimulus applied to one eye is succeeded by an electric shock applied to the opposite optic nerve. The positive components evoked by the latter reaction are subnormal, but the negative component may be greatly facilitated.

5. Facilitation of the negative-wave-producing mechanisms may build up over a period of several hundred m.sec. This is strikingly shown by the multiple response, with or without picrotoxin. The third or fourth component of a positive multiple response may be followed by a definite negative wave. If the excitability of the negative wave mechanisms is raised by picrotoxin, or by decreasing anesthesia, the negative wave moves by steps to the first primary response.

6. Electrical shocks applied to the optic nerve evoke in the cortex three positive spikes of axon dimensions. These are followed by a slow positive wave, which in turn is typically followed by a negative wave. The amplitude of the negative wave is subject to the factors discussed above.

7. The first two spikes in the cortical record are very resistant to depression by chemicals or subnormality due to repeated activation at frequencies above 10 per second.

8. Both photic excitation of the retina and electrical excitation of the optic nerve evoke primary responses over both striate and extra-striate (or peristriate) regions.

9. The extra-striate reactions in the suprasylvian are of two types. One type is obviously due to activation of association pathways from the striate. The other exhibits characteristics of the primary projection reactions and appears to be relayed from the lateral geniculate or nuclei close to the latter.

10. It is possible to assign to particular cortical layers the components of the response to electrical stimulation of the optic nerve.

11. The predominant negativity of the photic cortical response in some cats cannot yet be adequately explained. (Authors' abstr.)

The Effect of Skeletal Fixation on Skeletal Muscle.

Skeletal fixation in rats was found to produce atrophy and hypersensitivity to intra-arterially injected acetylcholine in the involved gastrocnemius-soleus group of muscles. The atrophy was initially as marked, but did not progress as far as that seen in muscles paralyzed by the loss of their motor nerve supply. The atrophy produced was sustained for the duration of the experiment in all animals in which the fixation was maintained. (Authors' abstr.)

Intravenous Potassium, Calcium and Magnesium and the Cortical Electrogram of the Cat.

1. The cortical electrogram and the simultaneous electrocardiogram of the cat were followed continuously during the intravenous injection of salts of potassium, calcium and magnesium.

2. Potassium and calcium produced no changes in the cortical electrogram until the development of intraventricular block or of cardiac arrest. Subsequently slowing of the cortical electrogram developed.

3. Magnesium produced transient periods of slowing before pathological changes appeared in the electrocardiogram. A secondary slowing of frequency, much like that following cardiac arrest due to potassium or calcium, appeared after the development of intraventricular block.

4. Brain potentials persisted for at least fifteen minutes after complete respiratory and cardiac failure.

5. In concentrations tolerated by the intact cat, potassium and calcium are without demonstrable effect on the cortical electrogram while magnesium does have some effects.
(Authors' abstr.)

Thermo-regulatory Pathways in the Cat Brain Stem.

The brain stem pathways subserving temperature regulation in the cat have been investigated by examining the animal's regulation to a hot or cold environment, two to five weeks after producing bilateral lesions at anterior and caudal midbrain and at pontile levels.

Pathways subserving heat-loss functions appear to be concentrated in the intermediate and lateral part of the dorsal tegmentum at each of the levels studied.

Pathways subserving heat-conservation activities appear to display some concentration in the lateral as opposed to the central portion of the caudal midbrain and pons.

Following appropriately situated lesions, heat-loss activities were in some cases abolished while heat-conservation activities were maintained. This dissociation clearly indicated the existence of dual heat-regulating mechanisms, whose efferent pathways are sufficiently independent to be destroyed separately.

In the case of both heat loss and heat conservation, the component autonomic and somatic activities, sweating and facio-respiratory alteration, and piloerection and shivering, have been observed to be dissociated following appropriate lesions. Apparently these different activities are mediated by distinct anatomical connections rather than by collaterals from single pathways.

In general the results present additional evidence for the greater importance of descending tegmental as compared with descending periventricular connections in efferent conduction from the hypothalamus. (Authors' abstr.)

Spinal Distribution of Thermoregulatory Pathways in the Monkey.

In the monkey, thermoregulatory pathways for sweatings are located in the lateral and anterolateral columns of the spinal cord and exert a completely or almost completely crossed influence. The crossing is a spinal one, located close to the level of preganglionic outflow.

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Little evidence was encountered for the presence of pathways for pilo-erection and shivering in the lateral column of the spinal cord. These pathways appear to be situated in the anterior column, and are both crossed and uncrossed, the uncrossed component being the greater.

(Authors' abstr.)

The Response of Single Auditory-Nerve Fibers to Acoustic Stimulation.

The activity in single fibers of the auditory nerve in cats has been studied with the aid of micro-electrodes. The fibers were excited by delivering acoustic stimulation to the ear. Each auditory-nerve fiber responds only to a narrow band of sound frequencies when the sound intensity is just sufficient to excite it at all. Fibers were found which were specifically sensitive to narrow bands of frequencies in the frequency range between 420 c.p.s. and 25,000 c.p.s.

The auditory fiber exhibits no unusually brief refractory phenomena. It may discharge spontaneously in the absence of any apparent sound stimulus. After a period of marked activity during sound stimulation, the spontaneous activity may be temporarily depressed (silent period), then accelerated (after-discharge).

The auditory fiber typically responds to a continuous adequate sound stimulus by a train of impulses initially high, but gradually declining in rate. Within a few tenths of a second after the tone goes on this rate-adaptation is complete and the amplitude of the action potentials is somewhat diminished as well. It is concluded that auditory fibers behave in every important respect like other sensory fibers.

At constant frequency an increase in sound intensity causes an increase in rate of discharge by the single fiber. Most fibers reach a maximum of 450 discharges per second after an intensity increase of about 30 db.

The frequency band capable of exciting a given fiber increases markedly as the intensity level is raised. At levels about 100 db. above threshold tones as far away as 3 octaves below and ½ octave above may be adequate.

The auditory-nerve fiber discharges in synchronism with a definite part of the stimulating sound-wave cycle.

The results are held to support a place theory of hearing according to which pitch is a function of where, and loudness a function of how much of, the basilar membrane is disturbed.

(Authors' abstr.)

The Pseudaffective State and Decerebrate Rigidity in the Sloth.

1. Shock which follows transection of the brain in the sloth is profound for about 5 minutes, and usually disappears in 10–15 minutes.

2. Considerable activity, apparently spontaneous, is shown by sloths which have been deprived of large cortical areas, including those dominating motor reactions in higher forms.

3. A pseudo-affective state, not significantly different from that observed in higher mammals, appears following removal of the upper parts of the tardigrade cortex. This condition may persist even after brain section has been made to low levels.

4. Decerebrate rigidity in the sloth may be either flexor or extensor in type; the former is somewhat more frequent. Extensor rigidity is usually more evident during the latter part of the post-operative survival period, and is classical in type.

5. Temperature, pulse and respiratory rates were well maintained in the decerebrate sloth.

(Authors' abstr.)

MARCH.

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Investigation of Epileptiform Attacks Produced by Sudden Cooling of Frog Spinal Cord.

1. In North American frogs, *Rana pipiens*, an epileptiform attack by quick chilling of the isolated spinal cord was not produced at temperatures below 0° C.; on the contrary they have been observed in South American frogs (*Leptodactylus ocellatus*).

2. However, the attack can be obtained at 0° C. or a little below if the vertebral canal is opened and the cord directly exposed to the action of cold. In these conditions, the phenomenon, although frequent, was not constant.

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3. The attack could be induced by cooling the cord below 0° C., by the application of ether, ethyl chloride, dry ice, or by utilizing freezing baths of liquids with low freezing points.

4. The characteristics of the attack depended on the method employed. When the attack was complete, it was prolonged and presented clonic and tonic phases. The feeble attacks were exclusively clonic.

5. The preliminary injection of caffeine in the frog made attacks possible up to temperatures of 3·5°.

6. In many cases the preliminary warming of the cord for several minutes at a temperature from 28 to 36° inclusive made it possible to induce an attack at 0° or at least a little below 0°.

7. The direct application of a concentrated solution of sodium chloride on the spinal cord produced in the North American frogs a convulsive attack perfectly resembling that observed under the same conditions in the Brazilian frogs.

8. At 0° or below, *Rana catesbyana* in North America does not on chilling of the spinal cord have an attack.

9. This compared with the fact that frogs of the same species adapted to a warm climate (Cuba) for more than 20 years frequently with attacks at 1° below zero demonstrate that this convulsive reaction of the nervous system changes slowly and progressively under the action of the surrounding temperature. (Author's abstr.)

Effect of Hypothalamic Lesions on Electrical Activity of Cerebral Cortex.

A lesion limited to the hypothalamus and basal region of the brain abolishes the spontaneous electrical activity of the cerebral cortex.

After lesions of the thalamus or its thalamo-cortical pathways, the cortical activity also disappears.

On the basis of different kinds of evidence it is suggested that the hypothalamus may influence cortical activity through its thalamic connections.

Section through the midbrain does not entirely abolish cortical activity.

(Author's abstr.)

Electrical Polarization of Pacemaker Neurons.

(1) The isolated heart and cardiac ganglion of *Limulus* has been used as a test of the hypothesis that the frequency of firing of nerve cell bodies depends upon the DC electrical field in which they lie.

(2) It is shown that a direct current passed through the intact heart results in an abrupt, sustained, reversible increase in frequency of heart beat and in changes in wave form of the electrogram.

(3) The effect apparently is exerted locally, at the point of contact of the electrodes and the tissue, where the current density is highest. It is usually confined to the cathode in preparations of the intact heart. The anode and the gross orientation of the field appear to be uncritical. In preparations of the isolated or partially isolated ganglion the cathode was not consistently more effective.

(4) The effect has been obtained only in the direction of an increase in the normal frequency. A possible explanation of this is offered.

(5) It is concluded from the abrupt non-adapting, non-accumulating and promptly reversible character of the effect that it is a direct effect of the DC field.

(6) The site of action is apparently the ganglion, more specifically the region of the pacemaking cell bodies. (Authors' abstr.)

Specific Excitability of the Endplate Region in Normal and Denervated Muscle.

Properties of the endplate and endplate-free regions were investigated in single nerve-muscle fiber preparation of the M. adductor longus and in isolated sartorius muscles of Australian frogs (*Hyla aurea*).

(1) Acetylcholine, nicotine and caffeine set up impulses by depolarizing the muscle membrane at the endplate region. None of the drugs appreciably depolarizes endplate free parts of muscle, or sets up impulses there.

(2) Potassium initiates impulses at the endplate region only, but no striking difference could be detected between the depolarizing action at or off the endplate.

(3) Curarine opposes the depolarization and excitation caused by the drugs, except potassium.

(4) The sensitivity at the endplates to acetylcholine, nicotine and caffeine in chronically denervated muscles (3–11 weeks) is increased from 1,000 to 100,000 times and is diminished by curarine. The selective depolarization of the endplate region and the lack of depolarization at the endplate-free regions pertains also to denervated muscle.

(5) No appreciable potential differences are found in normal uninjured muscle along the outside of isolated fibres. No evidence was obtained of potential gradients around the neuromuscular junction. (Author's abstr.)

Reflex Action in Relation to Pattern and Peripheral Source of Afferent Stimulation.

Two-neuron-arc reflex discharges in the dorsal root-ventral root reflex are secured by stimulation of the lowest threshold fibers of the dorsal root. Stimulation of the higher threshold fibers is primarily responsible for the multineuron-arc reflex discharges.

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The fibers mediating direct excitation and direct inhibition to the motoneurons are functionally indistinguishable in the dorsal root.

Afferent fibers of the size range having direct connection with the motoneurons are found in significant numbers only in muscle nerves. The group of afferent fibers which accounts heavily for connections to interneurons is prominent in cutaneous nerves, but poorly represented among the muscle afferent fibers (2–5, 10, 13). Utilizing this information it is possible to effect a high degree of separation of the two-neuron-arc and multineuron-arc reflex discharges by employing a muscle nerve and a cutaneous nerve respectively for afferent stimulation.

(Author's abstr.)

Functional Organization of Temporal Lobe of Monkey (Macaca mulatta) and Chimpanzee (Pan satyrus).

The temporal lobes of macaque and chimpanzee show the same functional organization. The lobe may be divided into two sectors: (1) An acoustic sector, consisting of the primary acoustic or auditosensory area 41, a small area 42 surrounding it, and area 22, mutually spiking each other, and (2) a temporal sector, comprising areas 21, 20 and 38, each of which fires only locally. In the primary acoustic area of the chimpanzee tones of low frequency arrive in its antero-lateral part, tones of high frequency in its postero-medial part. Within the temporal sector the existence of a temporopolar area has been demonstrated in the macaque. Commissural connections between the two temporal sectors are restricted to area 21, and take their course probably through the anterior commissure. (Authors' abstr.)

Long Association Fibers in Cerebral Hemispheres of Monkey and Chimpanzee.

By applying strychnine locally to the cerebral cortex of the monkey and chimpanzee, and recording the electrical activity, the origin and termination of homologues of three of the well-defined long association bundles of the human cerebral cortex have been disclosed. From area 8, the frontal suppressor area, there arises a tract leading to area 18, the parastriate area; this is probably part of the superior longitudinal fasciculus of Burdach. From area 18 there arises a tract leading to area 20, on the inferior temporal convolution; it is usually called the fasciculus longitudinalis inferior, and may comprise also what anatomically has been called the vertical occipital fasciculus of Wernicke. There is a tract arising from the area orbitalis granularis (called area 47 in the human brain) passing to the tip of the temporal lobe (called area 38 in the human brain); it is ordinarily called the fasciculus uncinatus. Each of these pathways normally conducts in one direction only. (Authors' abstr.)

The Effect of Oxygen Tension on the Metabolism of Cerebral Cortex, Medulla and Spinal Cord.

The rates of oxygen uptake of cortex, medulla and spinal cord were in the ratio 100 : 34 : 12, whereas the ratio for anaerobic lactic acid production was 100 : 17 : 5.

The oxygen uptake of all three tissues was sensitive to oxygen tension. The shape of the oxygen uptake-oxygen tension curve was essentially the same for the three tissues.

The anerobic lactic acid production was twice as great in cortex as in medulla per unit of oxygen uptake in oxygen. Lactic acid production was sensitive to oxygen tension in cortex and medulla but not in cord. These differences in lactic acid production are offered in partial explanation for the variations in resistance to anoxia from one region to another within the central nervous system.

In cortex, lactic acid production and oxygen uptake varied inversely when the oxygen tension was altered.

In medulla, surprisingly enough, lactic acid production was maximal at 2 to 3 volumes per cent. oxygen. The possible relationship of this to a previously described respiratory phenomenon was mentioned. (Authors' abstr.)

The Interaction of Antidromic and Orthodromic Volleys in a Segmental Spinal Motor Nucleus.

A maximal antidromic volley backfired into a segmental spinal pool of motoneurons fails to block a reflex volley completely unless the opposed volleys clash in the motor axons. This is apparently due to the failure of the antidromic volley to conduct from the axon into the soma in some of the motoneurons. In consequence the recovery curves obtained by the use of synaptic stimulation reveal two stages, the first rise being referable to axonal recovery of their motoneurons, the somata of which are not activated by the antidromic volley, the second to recovery of synaptic transmission through the motoneurons in which the antidromic volley does occupy the somata.

The prominence of the initial stage depends upon the number of motoneurons in which the antidromic volley fails to evoke a soma response.

Conduction in the neuron soma is accompanied by refractoriness. (Author's abstr.)

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The Place of Mania among the Depressions from a Biological Standpoint.

In reviewing studies of the biological distinctions between mania and depression, the following conclusions are reached: There seems to be no relation between blood pressure, basal metabolism, blood-pressure reaction to adrenaline, blood-sugar level after administration of ephedrine, sugar-tolerance curves, rate of blood flow, and mood. Differences appear with regard to rate of evacuation of bariumized residue, rate of parotid gland secretion, gastric acidity, and a few blood chemistry measures. No significant differences appear between manic attacks and depressions at biological levels comparing with the gross behavioral differences. Agitated and anxious depressions are apparently much closer biologically to mania than they are to the retarded or deeply preoccupied depressions. Biological contrasts are associated with differences in kind and degree of action rather than mood differences. R. B. AMMONS (Psychol. Abstr.).

Factors Influencing Electrically Induced Convulsions in Rats.

A control group of 12 rats, 7 sex-hormone deficient rats, and 6 vitamin B-complex deficient rats were subjected to electric shock from a floor grid in a small compartment during two experimental periods a day. The first experimental period consisted of 20 shocks at one-second intervals, with the number of shocks being increased by 20 at each succeeding period until coma or breakdown was produced. Both deficiency groups showed more indiscriminate reactions and squealing before onset of coma than did the controls. Coma was produced much more quickly in the sex-hormone deficient and the vitamin B-complex deficient animals than in the control group. R. B. AMMONS (Psychol. Abstr.).

Rorschach Reactions at High Altitudes.

Thirteen male college students were given the Rorschach test under oxygen conditions of sea-level and of 16,000 ft. Sea-level results were also obtained from five other students who were unable to tolerate altitude. Without changing the basic Rorschach pattern, altitude brought decreases in movement and increases in color responses. Changes in three Rorschach ratios, due to altitude, were interpreted as indicating (1) increased responsiveness to external environment, (2) possibly partial loss of resources necessary to cope with stress conditions, (3) increased susceptibility to dangers of outside contacts, (4) attempts at the resolution of conflicts created by the altitude conditions. Rorschach signs, and adjustment ratings by three judges, indicated that the five subjects who failed to adjust to altitude were more maladjusted than the remainder of the subjects. R. B. AMMONS (Psychol. Abstr.).

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Preliminary Report of Electroencephalographic Recordings in Relation to Behavior Modifications. In seeking " to establish evidence of a biological norm that primarily governs the reactions of man," the author's " interest centered specifically upon the physiological reactions associated with the process of attention." He considers cotention to be the organism's primary or total balance of function, as opposed to ditension, the secondary affective deviations of behavior attaching to the symbolic function. Cotention was produced by inducing a kinesthetic awareness of the eyes through the consistent maintenance of balance in oculomotor tensions. Electroencephalographic records from three subjects showed a drop in energy output in the 2–40 frequency range, and a much more pronounced drop in the 8–12 or alpha range, which drop was most marked in the motor regions. Bilateral differences not found in ditention were often found in cotention. Controlled experiments showed the above changes to be specific to cotention and not found under other psychological conditions. R. B. AMMONS (Psychol. Abstr.).

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A Study of the Relationship between Stuttering Occurrence and Phonetic Factors in Oral Reading.

Fifty-two adult stutterers were tested to determine whether or not certain sounds and their positions in syllables are more difficult than others for stutterers. Each subject was tested by having him read a 550-word prose selection while a concealed observer marked the stuttering occurrences. Results show that it is possible to arrange speech sounds in an order of difficulty according to median and mean percent. of stuttering spasms experienced in relation to each sound. The five sounds giving the greatest trouble were g, d, l, th (unvoiced), and ch. Physical factors in the sounds themselves do not influence the ranking. Consonants give greater difficulty than vowels. Wide individual differences were observed.

C. V. HUDGINS (Psychol. Abstr.).

The Frequency of Stuttering in Relation to Word Length during Oral Reading.

Longer words (in terms of letters and of syllables) were found more difficult for stutterers than shorter ones. Phonetic difficulty alone does not explain this fact. "A possible explanation for this is found in terms of the greater prominence of longer words and the stutterer's consequent greater desire to avoid stuttering at those points." Thirty-two stutterers served as subjects.

C. V. HUDGINS (Psychol. Abstr.).

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*The Outcome of Electric-Shock Therapy in the New York Civil State Hospitals. *Malzberg, B.* 154
*An Evaluation of the Factor of Depression of Brain Metabolism in the Treatment of Schizophrenia. *Bellinger, C. H., et al.* 164

Preliminary Curarization in Electric Convulsive Shock Therapy.

1. The treatment of affective disorders, particularly the depressions, by the induction of *grand mal* seizures is an established, highly-effective procedure.

2. The introduction of the electric shock method has been a material improvement over previous methods.

3. Trauma is still an important but neglected factor in convulsive shock therapy, and the traumatic hazards have not been eliminated by the adoption of electric shock.

4. The traumatic complications are not confined to the vertebrae and the long bones; and sufficient attention has not been given to visceral complications in the form of petechial hemorrhages, increased incidence of tuberculosis, etc.

5. The writers believe that a direct, safe and effective means of eliminating trauma incident to convulsive shock therapy is available in curare, and that straight, unmodified electric shock is unjustified.

6. Preliminary curarization increases the scope of usefulness of convulsive therapy, and makes the treatment available in cases where it might otherwise be contraindicated.

7. Results obtained in 139 cases treated by the combined curare-electric shock method are reported. The best results were seen in the depressions with an increased percentage of complete recoveries in the older age-groups.

8. One death incident to electric shock therapy is reported. (Authors' abstr.)

Diagnosis of Psychogenic Factors in Disease by Means of the Rorschach Method.

If the patient's condition merits the suspicion that psychogenic factors may play an important part in it, have we a tool by which to confirm that suspicion and to estimate the degree of his

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psychological maladjustment? The writer has attempted in this study to show that certain Rorschach criteria, or quantitative signs, may provide such a diagnostic aid.

Five or more of these nine "neurotic signs" (which may easily be determined without the full Rorschach interpretation) were found in the records of 80 per cent. of a group of 74 clinically diagnosed neurotics, and were found in only 15 per cent. of the records of 385 control subjects. It must be emphasized, however, that there is nothing pathognomonic of the record of a neurotic patient in any one of these signs taken alone. Moreover, various groups of maladjusted persons other than clinically diagnosed neurotics may show a higher incidence of these signs than did the normals in this study. Nonetheless, the fact remains that these signs have proved of real value in differentiating those maladjusted patients whose physical conditions were mainly or entirely due to psychological factors, and conversely to point to the basic psychological adjustment of other patients in whom organic lesions responsible for their symptoms were later found.

(Author's abstr.)

Results with Electric Convulsive Therapy in 200 Cases of Schizophrenia.

1. Results in 200 schizophrenics treated with a full course of electric convulsive treatment are reported.

2. Figures on a mixed material being without meaning, the material was broken down according to duration of illness. The rate of remissions (recovered and much improved) is 67·4 per cent. for cases of less than six months' duration, 43·1 per cent. between six months and two years' duration, and 9·2 per cent. in those of more than two years' duration. Older cases with previous remissions have a fair prognosis for the new attack.

3. To facilitate comparison with other statistics, the remission-rate in cases up to one year in duration (56·8 per cent.) and figures for the parole rates of the various groups are also given.

4. The rapid decline of favorable results in cases with longer duration of illness makes early treatment in schizophrenia imperative.

5. Twenty convulsions are the minimum number required in schizophrenia. Discontinuation after ten treatments in patients who are symptom-free at this time leads to relapse in most cases. An insufficient number of treatments is one of the explanations for failures in convulsive therapy.

6. Another factor responsible for apparent differences in results is seen in differences of material. One of the authors (Kalinowsky) obtained poor results in a group of voluntary patients with less acute symptoms in one hospital, and very satisfactory results in institutional material, the subject of this study.

7. A follow-up after one year or more shows a low rate of relapses if full remissions had been obtained.

8. The similarity of results in schizophrenia when using the various shock methods adequately is stressed, and will be more closely examined in comparative studies which are under way.

(Authors' abstr.)

The Outcome of Electric Shock Therapy in the New York Civil State Hospitals.

This review of the results of electric shock therapy permits the following conclusions:

1. The results of such treatment of patients with dementia praecox, measured in terms of recovery and much improvement, are not so good as corresponding results with groups of patients treated with insulin.

2. The results are more favorable than those produced by metrazol.

3. Rates of recovery and of improvement among patients with dementia praecox following electric shock therapy are superior to those shown by control series.

4. Electric shock is especially efficacious among patients with manic-depressive psychoses and involutional disorders.

(Author's abstr.)

An Evaluation of the Factor of Depression of Brain Metabolism in the Treatment of Schizophrenia.

This investigation was undertaken to determine the effect of depression of brain metabolism in the course of schizophrenia. To evaluate the effect of depression of brain metabolism without any direct stimulatory effects on the brain, patients with schizophrenia were subjected to the nitrogen inhalation therapy. Sixty-five patients ill less than one year and 34 ill for more than one year were treated. Of the patients ill less than one year, 46 per cent. were improved and 34 per cent. paroled. Of those ill longer than a year, 34 per cent. were improved and 9 per cent. were paroled.

From an analysis of these results and a comparison of those obtained with other treatments it may be concluded: (1) That the depression of brain metabolism exerts a desirable effect on the course of schizophrenia. (2) That the duration of depression is of importance. In the treatment of schizophrenia, the longer periods of depression produced by insulin hypoglycemia are more valuable than the shorter ones caused by nitrogen inhalation or metrazol.

(Authors' abstr.)

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*The Development of Paranoic Thinking. *Cameron, N.* 219
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The Bottleneck in Psychology as Illustrated by the Terman Vocabulary Test. *Babcock, H.* 244

The Development of Paranoic Thinking.

1. Current theories of paranoic developments attempt to localize the disorder either in the nervous system or in a "psyche" and assume the opposition of a real and an unreal world. An approach is outlined here that differentiates only between social and individual behaviour, and ascribes delusion to defective socialization.

2. One's attitudes towards one's own conduct get organized through the reactions of others; and the ability to take and shift perspective depends upon how well habits of role-taking are developed in the individual.

3. Ability to shift and to share perspectives is a form of social skill in which individuals vary greatly; under conditions of personal stress, perspectives that are relatively fixed and one-tracked constitute a grave handicap to adjustment. This is especially true among socially taboo matters or those of personal sensitiveness.

4. Surroundings and happenings are organized into an effective environment by one's own responses; and personal sensitiveness here means readiness or ease of response in some direction that operates selectively, in the manner of an anticipatory set.

5. Hypotheses and deductions in the asocial individual lead only to further hypotheses, without being exposed to the modifications which the opinions and perspectives of other persons might otherwise have brought about.

6. Eventually a *pseudo-community* is built up by the paranoic person's reactions to his own preoccupations; individuals around him and fragments of their behavior get organized into an expanding system of delusion. The person begins operations in the social field that have validity only within his own individualistic thinking. Then his measures and counter-measures, in relation to the supposed action of others, bring him into conflict with his environment. The final outcome of such a development is usually that the community isolates him in some way from its active life. (Author's abstr.)

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A Brain-wave Interpretation of Stuttering.

Brain-wave records of 20 adult normal speakers and 20 adult stutterers were made. Comparison of records of 14 separate brain areas for each individual resulted in 44 significant differences (CR = 2·7 or above) between stutterers and normals. In addition, 37 "trend" differences (CR = 2·0 to 2·7) were found. The 81 differences reported indicate that stutterers have larger and more similar alpha waves than normals. This is interpreted to mean that stuttering accompanies reduced consciousness, and to support the cerebral dominance theory of stuttering. W. H. WILKE (Psychol. Abstr.).

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The Value and Limitations of the So-called " Neurotic Signs."

Rorschach protocols of 385 normal subjects and 100 patients referred to a neuropsychiatric clinic were examined from the point of view of the relative incidence of nine previously isolated neurotic signs. All of the patients were referred to the psychologist because of suspicion of psychogenic symptom-formation, but no psychiatric diagnoses were available at the time the test was given. Employing as a criterion of neurosis the presence of five or more signs, the Rorschach correctly selected 80 per cent. of the later psychiatrically-diagnosed neurotics and 85 per cent. of the normals. In a control group of 108 male college students, the 5 per cent. having five or more signs later proved to be maladjusted in some respect. No single sign proved to be unequivocally characteristic. Intensive individual analysis of the case-records suggests the value of a weighting system whereby three points should be given to failure to respond, FC, and shading shock; two points to M and C; one point to F per cent., A per cent. and R; and ·5 point to FM greater than M. E. M. L. BURCHARD (Psychol. Abstr.).

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1. Pharmacology and Treatment.

Intestinal Motility as Influenced through Extrinsic Nerves as a Result of Central Stimulation by Bulbocapnine. Oppenheimer, M. J., Glyer, N. M., and Hamilton, R. H. [*Proc. Soc. Exptl. Biol. Med.*, **51**, 79–80 (1942).]

Bulbocapnine acts centrally and stimulates both sympathetic and parasympathetic systems. It usually elevates blood sugar. It may increase or decrease the amplitude of intestinal contractions, but does not change the rate of contraction. L. E. Gilson (Chem. Abstr.).

The Action of Vitamin B_1 on an Extremity Paralyzed by Experimental Nerve Injury. Musch, H. J., and Rossel, W. [*Klin. Wochschr.*, **20**, 599–600 (1941).]

Vitamin B_1 prevents distinctly the formation of ulcers which usually appear after traumatic nerve injury (nerve crushing) if the guinea-pigs are kept under mechanically unfavorable conditions. Ruth Berggren (Chem. Abstr.).

"Shock-delaying" Action of the Barbiturates with a Consideration of the Failure of Oxygen-rich Atmospheres to Delay the Onset of Experimental Shock during Anesthesia. Beecher, Henry K., McCarrell, Jane D., and Evans, Everett I. [*Ann. Surg.*, **116**, 658–67 (1942).]

In experiments with dogs the barbiturates appeared to delay shock in comparison with ether, only when the chief shocking trauma was dehydration or plasma loss from wound surfaces. The administration of approximately 100 per cent. O did not significantly delay, in comparison with room air, the onset of shock due to bleeding under either a barbiturate or ether.
Rachel Brown (Chem. Abstr.).

Anticonvulsant Action of Diphenylhydantoin and Some Related Compounds. Knoefel, P. K., and Lehmann, G. [*J. Pharmacol.*, **76**, 194–201 (1942).]

Diphenylhydantoin (I) raises the threshold of electrically produced convulsions in intact cats, but not in decerebrate cats. It does not prevent the production of convulsions by strychnine or cocaine. (I) does not appear as such in the urine of rabbits and dogs receiving large doses of it. Diphenylacetylurea and diphenylthiohydantoin are devoid of anticonvulsant activity. Diphenylbarbituric acid and diphenylenehydantoin have 25–50 per cent. of the anticonvulsant activity of (I), and an equal or somewhat lesser toxicity compared to (I). Large oral doses of fluorenone have a slowly developing anticonvulsant activity.
L. E. Gilson (Chem. Abstr.).

Relationship between the Chemical Structure and Hypnotic Action of Some Aromatic Ketones. Cahen, Raymond. [*Rev. Can. Biol.* **1**, 753–6 (1942).]

The aromatic ketones studied (acetophenone, benzyl ketone, benzophenone, α-hydrindone and β-hydrindone) are not strongly hypnotic on account of their low water-solubility. The

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hypnotic power is increased by cyclization of the side chain. In the ring, the order of the hypnotic power is the same as in the side chain. The proximity of the ketonic group and of the ring increases the hypnotic activity. Among the aliphatic radicals studied, the Et group confers a greater hypnotic activity than the Me group. A. PAPINEAU-COUTURE (Chem. Abstr.).

The Effect of Various Sympathetic-nerve Poisons on the Cerebrospinal Fluid and Blood Pressures. Niimoto, Isao. [*Okayama Igakkai Zassi (Mitt. med. Ges., Okayama)*, **51**, 1550–63 (*in German*, 1563–4) (1939).]

The site of puncture for the cerebrospinal fluid in urethanized rabbits was chosen between the first cervical vertebra and the occipital bone. The cerebrospinal fluid pressure (I) in the horizontal position averaged 62·6 mm. H_2O and the blood pressure (II) (carotid pressure) 106 mm. Hg. If the (I) is artificially raised, (II) also increases, but if (I) is artificially lowered, (II) undergoes almost no change. Small doses of yohimbine and ergotamine, intravenously administered, raise (II), while large doses lower it. These substances cause an increase in (I) at all the dosages studied. The recovery period is considerably longer for (I) than for (II). The change in (I) produced by adrenaline or adrenalone is proportional to that of (II); adrenaline raises (I), while small doses of adrenalone lower it and large doses raise it. After pre-treatment with ergotamine or yohimbine in certain proportions the (I) raising action of adrenaline and adrenalone is inhibited or reversed. (I) is increased by atropine, while (II) is decreased. Acetylcholine produces an increase in (I) and a distinct decrease in (II). Pilocarpine always lowers (II), but tends to raise (I). In general, the change in (I) appears somewhat later, and also returns to normal somewhat later than is the case with (II). RUTH BERGGREN (Chem. Abstr.).

Action of Benzedrine Sulfate on the Excitability of Nerve, Muscle and Heart in the Frog, Calyptocephalus gayi. Günther, B. [*J. Pharmacol.*, **76**, 369–74 (1942).]

In all cases benzedrine sulfate caused a decrease in excitability through an increase in chronaxia or rheobase, an effect sometimes preceded by a brief period of increased excitability.

Toxicity of Benzedrine Sulfate in the White Mouse and in the Frog, Calyptocephalus gayi. Ibid., 375–7.

For mice the median lethal subcutaneous dose is 270 mgm./kgm. Injected into the ventral lymph sac of the Chilean frog the lethal dose is 280 mgm./kgm. In mice benzedrine poisoning produced signs of nervous hyperexcitability, while in frogs there was immediate diminution and eventual disappearance of all reflexes. L. E. GILSON (Chem. Abstr.).

The Effect of Cholinergic Drugs on Recovery of Function following Lesions of the Central Nervous System in Monkeys. Ward, Arthur A., jun., and Kennard, Margaret A. [*Yale J. Biol. Med.*, **15**, 189–228 (1943).]

In monkeys following the unilateral ablation of areas 4 and 6 of the cerebral cortex, strychnine and thiamine increased the rate of recovery of motor functions. Doryl alone or doryl and thiamine were even more effective. Atropine had no inhibitory action on the recovery under doryl and thiamine. Thiamine has a definite role in the recovery process, but is not entirely responsible. The doryl effect appears, even if doryl medication is not begun for several weeks after the injury. G. H. W. LUCAS (Chem. Abstr.).

2. Biochemistry, Pathology, Physiology, etc.

Liberation of Potassium by Dog Brain during Electrical Excitation. Cicardo, V. H., and Torino, A. [*Rev. inst. Bacteriol. "Carlos G. Malbran,"* **11**, 77–82 (1942).]

See *C.A.*, **36**, 5231[8]. L. E. GILSON (Chem. Abstr.).

The Nitrogen Metabolism of Normal and Decerebrate Pigeons under Conditions of Insomnia. Lemkul, R. A. [*J. Physiol. U.S.S.R.*, **30**, 626–41 (*in English*, 641) (1941); *cf. C.A.*, **36**, 1109[8].

Insomnia produced by keeping the birds under strong artificial, uninterrupted light did not change the general condition of the birds even when continued for two months. Normal pigeons ate less than under normal light, but the N balance remained positive when peas were given as the chief food; corn may lead to a negative N balance. Decerebrate pigeons ate about the same amounts of food under normal and increased light. Their N balance remained unchanged as long as their food had the same N content. The rate of tissue catabolism under the condition of prolonged insomnia was unchanged even if the food contained no N.

C. S. SHAPIRO (Chem. Abstr.).

Nutritional Degeneration of the Optic Nerve in Rats: Its Relation to Tryparsamide Amblyopia. McDermott, Walsh, Webster, Bruce, Baker, Richard, Lockhart, James, and Tomsett, Ralph. [*J. Pharmacol.*, **77**, 24–39 (1943).]

Rats on a diet deficient in vitamin A develop degeneration of the optic nerves. This degeneration is not increased by tryparsamide. Rats given a diet containing all the vitamins except the B group also show degeneration of the optic nerves, and this degeneration is intensified by concurrent administration of tryparsamide. L. E. GILSON (Chem. Abstr.).

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A General Method for the Determination of α-Keto Acids and Its Application to α-Keto Acid Metabolism in Pigeon Brain. Long, Cyril. [*Biochem. J.*, **36**, 807–14 (1942).]

Certain modifications of Lu's method (*C. A.*, **33**, 6896[3]) make it suitable for the accurate determination of 0·1–1·0μ molecule of α-keto acids. The method consists in condensing the keto-acid with 2,4-dinitrophenylhydrazine in acid solution and intensifying the resulting red-brown color by treatment with excess NaOH. Different keto acids show variable absorption intensities. Pyruvic and α-ketobutyric acids are shown to be equally well utilized by washed, minced pigeon brain. S. MORGULIS (Chem. Abstr.).

Experimental Demyelination of the Central Nervous System. III. Poisoning with Potassium Cyanide, Sodium Azide, Hydroxylamine, Narcotics, Carbon Monoxide, etc., with Some Consideration of Bilateral Necrosis Occurring in the Basal Nuclei. Hurst, E. Weston. [*Australian J. Exptl. Biol. Med. Sci.*, **20**, Pt. 4, 297–312 (1942); *cf. C. A.*, **36**, 6646[9]].

Repeated administration of KCN to monkeys led to progressive demyelination, without necrosis, of the cerebral white matter. In distribution the lesions resembled those of Schilder's disease. The encephalopathy did not favor the development of post-vaccinal encephalitis. Repeated massive doses of KCN followed by resuscitation caused widespread necrosis of the cerebral and cerebellar cortex rather than damage of the basal nuclei or white matter. Methylene blue injected intravenously penetrated the damaged brain and remained fixed and unreduced therein for days. In sheep and rabbits the response to KCN was erratic. In monkeys the effects of a single dose of NaN_3 were more lasting than with KCN. Repeated doses of NaN_3 produced necrosis or demyelination in the optic nerves and tracts and necrosis in the caudate nucleus and putamen of the lenticular nucleus. Lesions in other parts of the brain were much less frequent and not severe. In sheep repeated administration of $NH_2OH.HCl$ in amounts compatible with survival for weeks or months did not cause demyelination within periods up to 184 days. Barbiturate poisoning in monkeys caused changes in the white matter of the brain. Sufficient exposure to CO can cause demyelination in the white matter and necrosis of the basal nuclei. In all the above cases the demyelination is probably the result of repeated periods of anoxia, each insufficient to produce lesions in the gray matter. L. E. GILSON (Chem. Abstr.).

Effect of Ablating the Pyriform-amygdaloid Areas and Hippocampi on Positive and Negative Olfactory Conditioned Reflexes and on Conditioned Olfactory Differentiation. Allen, W. F. [*Amer. J. Physiol.*, **132**, 81–92 (1941).]

Four tests were made after and before and after temporal lobe lesions were performed on dogs: (1) Conditioning foreleg reflex to clove vapor, (2) transference of this reflex from one foreleg to the other, (3) establishment of a negative conditioned reflex for asafetida and conditioned differentiation, and (4) differentiation by smell of food from no food. Unilateral extirpation of the pyriform-amygdaloid areas produced little or no effect on these four responses. Bilateral extirpation abolished the third, but none of the others. No effect on taste responses was noted. R. L. SOLOMON (Psychol. Abstr.).

Effects of Lesions of the Periaqueductal Gray Matter in the Cat. Bailey, P., and Davis, E. W. [*Proc. Soc. Exp. Biol., N.Y.*, **51**, 305–6 (1942).]

After developing an electrode that could be inserted into the periaqueductal gray matter of cats by an opening in the occipito-atlantoid ligament through the fourth ventricle, the effects of lesions in this area were demonstrated. The mere insertion of the electrode left behavior unchanged. If the lesion was outside the aqueductal gray matter, only alterations in motor performance were noted. Following slight lesion in this region the cats became very wild, neglecting objects in the environment and acting "as though they saw imaginary menaces." If the lesion was more destructive, this phase was transitory and passed into a state of inert flaccidity in which animals showed no interest in food, no spontaneous activity. There was on occasion some revival of movement after a few days with slow walking on stimulation and placing reactions. H. PEAK (Psychol. Abstr.).

Conditioned Reflexes in Dogs Deprived of the Cortex of One Hemisphere. IV. Examples of Difficult Conditioned-reflex Activity. Rosenthal, J. S. [*Arkh. Biol. Nauk.*, **60**, 114–22 (1940).]

In order to determine the relationship between the excitatory and inhibitory processes, alternating positive and negative tactile stimuli were applied to a dog seven years after the cortex of his right hemisphere had been extirpated. In another experiment the author followed up the overstraining of the excitatory and inhibitory processes by applying the positive stimulus alone, or by changing suddenly all the conditioned stimuli from the 30-seconds trained isolated action to a 3-minutes action. The concentration of the inhibitory process was found to be somewhat decreased, but only temporarily. No other changes were noted. The author concludes that the almost normal level of nervous activity in the partially decorticated dog is probably a stationary phenomenon, and that the substitution function of the hemisphere is preserved for a long time. R. R. HILKEVITCH (Psychol. Abstr.).

Partial Degeneration of the Optic Nerve Associated with Vitamin Deficiency. Verma, O. P. [*Indian Med. Gaz.*, **77**, 646–50 (1942).]

The paper describes cases of "temporal pallor" caused by partial degeneration of the optic

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nerve. In many cases serious impairment of vision occurs. It was revealed that a large percentage of patients were suffering from deficiency diseases (vitamin B_1, riboflavin). The patients were given yeast in doses of 7 gm. daily and shark-liver oil in doses of 60,000 to 80,000 I.U. of vitamin A. Improvement was most satisfactory in cases where the degeneration of the nerve was not too advanced. Conclusion: The condition is due to dietary deficiency.

GERTRUDE E. PERLMANN (Chem. Abstr.).

Nicotinic Acid and Experimental Pellagra in the Guinea-pig. Giorgio, Giovanni, and Solimini, Onofrio. [*Atti Accad. Italia, Rend. Classe Sci. Fis., Mat Nat.* (1), 782–9 (1940).]

Guinea-pigs on a pellagra-producing diet show the same symptoms and survival period whether untreated or treated with nicotinic acid. It is possible that experimental pellagra in this species is different from human pellagra and black-tongue in dogs. Should trigonelline be the pellagra-preventing compound, these experiments indicate that the guinea-pig is unable to methylate nicotinic acid. GIANFRANCO RUFFONI, B. J. JANDORF (Chem. Abstr.).

Multiple Deficiency Features of Pellagra. Sydenstricker, V. P. [*Proc. 8th Am. Sci. Congr.*, **6**, *Pub. Health and Med.*, 65–72 (1942).]

The factors which contribute to the clinical picture of pellagra are discussed and the function of vitamins is explained. Protein deficiency with resulting nutritional edema was present in at east 15 per cent. of patients observed in Sydenstricker's clinic, while anemia caused by Fe deficiency was found in 35 per cent. It is inadvisable to treat symptoms with a single vitamin. When this is done frank manifestations of other deficiencies, hitherto latent, are almost certain to appear. Mixtures of vitamins in adequate therapeutic amounts may be used. An adequate diet supplemented with a single vitamin which is definitely indicated is much more satisfactory. Better still is the administration of yeast or yeast concentrate or the aqueous extract of liver, since these substances furnish the whole B complex of vitamins.

LEOPOLD SCHEFLAN (Chem. Abstr.).

The Nicotinic Acid Economy in Healthy Persons. Hüllstrung, H., and Steitz, F. [*Klin. Wochschr.*, **20**, 612–16 (1941).]

Nicotinic acid amide was determined by the method of Ritsert (*C. A.*, **33**, 8659[3]). The extinction values were lowered by exposure to light, e.g. from 1·155 in sunlight to 0·762 in fainter artificial illumination. The experiments were, therefore, carried out in reaction vessels protected against light. The standard curve obtained agreed practically with that of Ritsert up to 30γ, but at higher concentrations lower extinction values were found. Urine and blood contained 16–230 and 35–400γ nicotinic acid per 100 c.c. respectively. After five days on a diet low in nicotinic acid (tea, zwieback, butter) the urine contained 37–246γ per cent. (four experiments). After loading with 0·1 gm. nikrobion (nicotinic acid amide) the urinary concentration increased somewhat, although the amount excreted consisted of only a fraction (0·22–1·35 per cent.) of the dose administered. In most cases no increase in the blood content was noted after loading.

W. WILBRANDT, RUTH BERGGREN (Chem. Abstr.).

Procedure for Production of a Polyneuritis-like, Experimental (Avitaminosis B_1) Convulsive Condition by Intracerebral Injection of Lactic Acid or Pyruvic Acid. Nitzescu, I. I., and Angelescu, C. [*Z. Vitaminforsch.*, **12**, 82–5 (1942).]

Intracerebral injection of 0·1–0·2 c.c. of either lactic acid or pyruvic acid produced a typical convulsive condition. This confirms the hypothesis of the chemical interference of metabolic products of glucose upon the base of the brain.

T. GORDONOFF, JOSEPH S. HEPBURN (Chem. Abstr.).

Early and Late Neuromuscular Syndromes in Rats Suffering from Avitaminosis E. Differential Characteristics. Demole, V., and Pfaltz, H. [*Rev. Méd. Suisse Romande*, **60**, 464–76 (1940); *cf. C. A.*, **33**, 5042[9].]

RUTH BERGGREN (Chem. Abstr.).

The Behavior of Lipides during Autolysis of Liver and Brain. Sperry, Warren M., Brand, Florence C., and Copenhaver, Wilfred N. [*J. Biol. Chem.*, **144**, 297–306 (1942).]

Cholesterol (I) was neither synthesized nor destroyed during sterile incubation of slices or pieces of rat liver (II) for one to four days, either in saline solution or with nothing added. Although a large loss of tissue solids occurred during autolysis of (II), most or all of the (I) originally present was retained in the intact tissue, with a resulting marked increase in concentration. (I) was concentrated in the same way in severed pieces of (II) left free in the abdominal cavity. There was considerable decomposition of phospholipides (III) in autolyzing (II), but this was proportionally less than the decrease in dry weight of tissue, with the result that (III), like (I), were concentrated in the intact pieces of liver which survived autolysis. No significant changes in (I) or (III) occurred in brain during incubation for one day.

W. M. SPERRY (Chem. Abstr.).

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Disturbances in Lipoid Metabolism and the Central Nervous System. *Davison, Charles.* [*J. Mt. Sinai Hosp., N.Y.*, **9**, 389–406 (1942).]

RUTH BERGGREN (Chem. Abstr.).

Recent Studies in Epilepsy. *Palmer, Harold D., and Hughes, Joseph.* [*Penna. Med. J.*, **45**, 1173–7 (1942).] RUTH BERGGREN (Chem. Abstr.).

Cholinesterase and Monoamino-oxidase in Human Central Nervous System. *Birkhäuser, H.* [*Schweiz. med. Wochschr.*, **71**, 750–2 (1941).]

The following mgm. of acetylcholine were hydrolyzed by 100 mgm. of tissue in 60 minutes in normal cerebra: Thalamus 2·0 (±0·1), caudate nucleus 28·5 (±1·2), putamen 37·5 (±1·05), globus pallidus 9·3 (±0·4), cortex 1·0 (±0·07). The same values were obtained in eleven cerebra of schizophrenics. The mono-oxidase concentrations (c.c. of O used by 100 mgm. of tissue in two hours) were as follows: Thalamus 99 (±17), caudate nucleus 91 (± 16), putamen 91 (± 4), pallidus 97 (± 10), cortex 51 (± 13); the corresponding value in patients below 60 were 87 (± 7), 92 (± 10), 82 (± 5), 67 (± 4), 41 (± 7). The average CO_2 production of 0·5 c.c. of cerebrospinal fluid in 120 minutes (23 normal cases) was 14·0 c.c. (± 1·1); in 18 schizophrenics the figures were 19·4 c.c. (± 1·4). Cholinesterase activity *in vitro* is inhibited by methylene blue, neutral red and Congo red. B. C. P. A. (Chem. Abstr.).

Electrical Activity of Acetylcholine, Choline, Adrenaline and Benzedrine. *Beutner, R., and Barnes, T. Cunliffe.* [*Biodynamica*, **4**, 47–55 (1942); *cf. C. A.*, **35**, 7431[1].]

An arrangement was described for measuring the p.d. of diluting solutions of drugs in contact with oil layers. Acetylcholine (1 : 300 million) gave a p.d. of 1 mv. in contact with $PhNO_2$, but none in contact with triacetin. Adrenaline generated a negative variation in the same system. Benzedrine produced a variation of lower magnitude but more stability. It also showed a p.d. on triacetin. The negative p.d. produced by minute amounts of drugs may explain the origin of the negative variation on nerve fibers. C. E. P. JEFFREYS (Chem. Abstr.).

Distribution of Choline Substances in the Animal Organism. Choline and Choline Esters in Neoplasms of the Nervous System. *Vincent, D., Daum, S., and Bouchet, M.* [*Trav. Membres Soc. Chim. Biol.*, **23**, 1363–8 (1941).]

In malignant tumours of various parts of the human brain the choline and choline ester contents were usually considerably above the normal for the corresponding healthy tissues.

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

Occurrence of Brain Hemorrhages in Choline-deficient Rats. *Jervis, Geo. A.* [*Proc. Soc. Exptl. Biol. Med.*, **51**, 193–5 (1942).]

Hemorrhagic lesions of the cerebellum occurred in the young of mother rats maintained during pregnancy on a diet high in cystine and deficient in choline.

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

The Relation Between Blood Coagulation and the Central Nerves: Supplementary Report on the Center which Promotes Blood Coagulation. *Aoyama, Tutomu.* [*Okayama Igakkai Zassi (Mitt. med. Ges. Okayama)*, **51**, 2564–76 (*in German*, 2576–7) (1939).]

The coagulant action of central origin exerted by bulbocapnine, harmaline, harmine and cocaine is almost completely inhibited by barbital or phenobarbital and slightly diminished by chloral hydrate, but is not markedly affected by urethan. The coagulant action of these four poisons is more pronounced in rabbits in which the cerebral cortex has been removed than in normal rabbits. It can probably be assumed that the chief cause of the phenomena is a blood-coagulation-promotion center which exists as a part of the center for regulation of blood coagulation in the diencephalon, and that this centre is stimulated by bulbocapnine, harmaline, harmine and cocaine, but is paralyzed by barbital and phenobarbital. The cerebral cortex can inhibit this coagulation-promoting center; paralysis or removal of the cerebral cortex causes intensification of the excitability of this center and of the action of the above four poisons. In a certain part of the diencephalon there are apparently two regulatory centers of blood coagulation, one of which promotes and the other inhibits coagulation. These regulatory centers are inhibited by the cerebral cortex; they appear to control the regulatory function of the peripheral sympathetic nerves for the blood coagulation. RUTH BERGGREN (Chem. Abstr.).

Fatigue of Patients with Circulatory Insufficiency, Investigated by Means of Fusion Frequency of Flicker. *Enzer, N., Simonson, E., and Blankstein, S. S.* [*Ann. Intern. Med.*, **16**, 701–7 (1942).]

Of 22 cardiac or hypertensive patients all except two fully compensated valvular cases had values for fusion frequency lower than the lowest in 47 normal subjects, i.e. the fusion frequency of slightly decompensated patients during rest is as low as in some normal subjects in a state of pronounced fatigue. The decrease must be attributed to oxygen lack in the visual pathway and to a certain extent in the entire nervous system. It is a permanent fatigue of the nervous system, which explains the decreased capacity of cardiovascular patients even for work involving

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slight or no muscular effort. It also suggests the physiological background for fatigue of norma persons in these kinds of work. Practically, fusion frequency may be used to judge both the actual state of cardiovascular patients and their capacity for work.

M. E. MORSE (Psychol. Abstr.).

The Emotional Component of the Ulcer-susceptible Constitution. Draper, G. [*Ann. Intern. Med.*, **16**, 633–58 (1942).]

This study of 80 male peptic-ulcer patients shows that their psychological pattern is as characteristic as their morphological and physiological pattern. They are linear, vagotonic, androgynic, intelligent, and futilely dynamic. The essential emotional factors are chronic fear and guilt. The sense of security in males rests primarily on a sound and powerful body. The ulcer subject senses this implication keenly in reference to his puny frame and feminine component, and feels that security lies in an eager effort to recapture the maternal protectorate through the infant's life-line—food. Neither simple nor deep psychotherapy is especially successful. If the patient's emotional pattern is a correlate of his constitution, it cannot be radically changed, but his capacity to adjust to stress can be evaluated. The symbolism of bed rest and frequent small feedings of milk tendered by nurse hinders the establishment of self-reliance. There are reports of remarkable successes in feeding regular diets even in severe cases.

M. E. MORSE (Psychol. Abstr.).

The Frontal Lobes, the Prefrontal Lobotomy and the Psychoses. Wynegar, D. E. [*Delaware St. Med. J.*, **14**, 96–9 (1942).]

The operation, briefly described, separates the pre-rolandic from the post-rolandic cortex. The pre-rolandic area is concerned with the projection of the self into the future. After the operation the patient loses his self-critique, is more easily satisfied, and lacks the social sense. The superego completely vanishes, and nothing remains but an already patterned behaviour based upon the operations of the former superego. The frontal lobe no longer experiments and plans, and thus no longer is frustrated. The basis of conflict is gone. No possibility of psychosis exists. Two cases are cited illustrating changes in symptomatology following lobotomy.

M. W. KUENZEL (Psychol. Abstr.).

Neuropsychiatric Disturbances in Internal Disease; Metabolic Factors and Electroencephalographic Correlations. Engel, G. L., and Margolin, S. G. [*Arch. Intern. Med.*, **70**, 236–59 (1942).]

The oxygen and dextrose requirements of the brain form the basis for a report of cases of generalized disease in which neuropsychiatric symptoms were ascribable to these factors. The response to therapy directed toward the underlying metabolic defect suggests a rational approach to treatment of psychiatric complications in certain internal diseases. The value of the EEG in identifying these disturbances is demonstrated and its wider use in internal medicine indicated. In acute cerebral anemia bursts of slow potentials accompanied the symptoms. In chronic cerebral anemia due to impaired respiratory exchange the development of neuropsychiatric symptoms was accompanied by slowing and irregularity of the waves. The effects of disturbed carbohydrate metabolism in Addison's disease and various toxic and deficiency states were manifested by bursts of abnormally slow waves and unusual sensitivity to hyperventilation. Improvement of mental symptoms, carbohydrate metabolism and the EEG went hand in hand. The defect in carbohydrate metabolism in these cases suggested, not simple hypoglycemia, but a lowered threshold of cerebral reaction, possibly due to inefficient utilization of available sugar by the nervous system.

M. E. MORSE (Psychol. Abstr.).

Neuroses in Wartime, from Personal Experiences. Goldstein, K. [*Tufts med. J.*, **8**, 1–7 (1941).]

The actual statistical incidence of war neurosis cannot be determined, and little is known of the incidence except that it is high during a protracted war and that neurotic soldiers constitute a difficult problem for both the physician and for society. In the author's experience, 10 per cent. of war neuroses actually represent sequelae of brain injury. The true neuroses may be divided into three categories: (1) Those occupying a position half-way between organic disease and neurotic disorder, the somatic neuroses; (2) the abnormal fatigue and exhaustion neuroses; and (3) the neuroses proper, that is, the anxiety neurosis and the conversion hysteria. The author then proceeds to discuss in detail the clinical aspects of these conditions, concluding with a discussion of the problems of therapy, and with emphasis upon the need to eliminate from military service those mentally unsuitable as a measure of reducing the incidence of neuroses in wartime.

M. H. ERICKSON (Psychol. Abstr.).

The Role of Mild Cerebral Commotion in War Neurosis. Neustatter, W. L. [*Proc. R. Soc. Med.*, **35**, 549–52 (1942).]

The author compared three groups of 30 cases showing psychiatric disorders: (1) Soldiers unexposed to enemy action; (2) soldiers and civilians exposed to enemy action, although uninjured; and (3) cases suffering slight cerebral commotion. From the evidence obtained the following conclusions are made: (1) There is no evidence of a physiogenic cause for the psychoneurosis, although physiological causes may prevent the subsidence of anxiety symptoms. (2)

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Organic post-concussive symptoms may be co-existent with psychogenic symptoms where the latter are prominent, and may also be masked by them. J. E. ZERGA (Psychol. Abstr.).

Analysis of the Mental Defect in Chronic Korsakov's Psychosis by Means of the Conditioned Reflex Method. Gantt, W. H., and Muncie, W. [*Johns Hopk. Hosp. Bull.*, **70**, 467–87 (1942).]

There is no unanimity of explanation of the defect in Korsakov's psychosis, and analysis has seldom extended beyond bare statements and descriptions. The present authors' patients were tested for ability to react defensively to an anticipated unpleasant stimulus (electric shock). The results showed uniformly a disturbance of retention and memory in the presence of an intact sensorium; inability to form new responses, although old responses and verbal associations are retained; and complete inability to analyze and synthesize (due primarily to defect of the time factor), unaided by verbalization. A distinction must be drawn between spontaneous and verbally aided performance. Commands could be executed. The patient's verbal formulation sometimes determined performance, but frequently incompatible motor and verbal formulations betrayed thinking disorder. New experiental data was more difficult than impersonal data, either new or old. Rounding-out of experience by random activity and confabulation may be related to the patient's euphoria or previous personality. M. E. MORSE (Psychol. Abstr.).

The Electroencephalogram and Pneumoencephalogram in Non-focal Neurological Disorders. Trowbridge, E. H., jun., and Finley, K. H. [*Amer. J. Roentgenol.*, **47**, 699–702 (1942).]

With 68 patients suspected of neurological disorder, abnormal EEG's were as frequent in cases with normal as in cases with abnormal pneumoencephalograms. Slow activity was common in cases showing dilated ventricles. Normal EEG was found for some cases showing cortical atrophy, but never in cases with dilated ventricles, even without cortical atrophy. It is concluded that the EEG may be an adjunct to, but not a substitute for, pneumoencephalography. E. S. PRIMOFF (Psychol. Abstr.).

Electroencephalographic Studies: A Method for Differential Diagnosis of Abnormal Electroencephalograms. Strauss, H. [*J. Mt. Sinai Hosp., N.Y.*, **9**, 17–22 (1942).]

Irregular delta activity may be indicated by percent. delta-time and by an "abnormality index" in which time is multiplied by highest voltage and divided by lowest delta frequency. Eleven electrodes were used with a number of subjects; 6 types of record were noted on the basis of symmetry of readings from points on either side of head, and of abnormal delta times. Highly abnormal records were associated with active types of pathology, as fast growing tumours; asymmetrical records were found only with cerebral lesions. E. S. PRIMOFF (Psychol. Abstr.).

Blood-sugar Level and Influence of Hyperventilation on Slow Activity in Electroencephalogram. Rubin, M. A., and Turner, E. [*Proc. Soc. Exp. Biol., N.Y.*, **50**, 270–2 (1942).]

One physically healthy schizophrenic patient was observed on ten different occasions over a period of ten weeks, hyperventilation records at various blood-sugar levels being obtained. Lowering blood sugar below 120 mgm. per cent. may influence the response of the EEG to hyperventilation. Consequently it is advisable to keep blood sugar at a level of 120 mgm. per cent. when the EEG is recorded during over-ventilation. H. PEAK (Psychol. Abstr.).

Endocrine Aspects of Mongolism. Benda, Clemens E. [*J. Clin. Endocrinol.*, **2**, 737–48 (1942).]

On the basis of clinical and autopsy studies of 38 cases, Benda concludes that mongolism follows a pathological gestation which results in a poorly functioning pituitary. Hence thyrotropic, adrenotropic and gonadotropic stimulation is not adequate for the developmental needs of early infancy, and still less so for those of puberty. The desirability of early treatment is stressed, but therapy with present preparations is not considered feasible. KATHRYN KNOWLTON (Chem. Abstr.).

The Chemical Composition of the Spinal Fluid in Apes (Pavian and Makaki). Kaminskiĭ, S. D., Mintsev, A. I., and Lebedinskaya, G. A. [*J. Physiol. U.S.S.R.*, **30**, 535–6 (1941).]

The spinal fluid of apes 1·5 to 15 years old differs from human spinal fluid in that it is higher in Cl and more nearly constant in composition. C. S. SHAPIRO (Chem. Abstr.).

The Effect of Hexoses and Pentoses on the Formation in vitro of Phospholipide by Brain Tissue as Measured with Radioactive Phosphorus. Schachner, H., Fries, B. A., and Chaikoff, I. L. [*J. Biol. Chem.*, **146**, 95–103 (1942); *cf. C. A.*, **36**, 5528[8].]

The rate of conversion of inorganic P^{32} to phospholipide P^{32} in rat brain slices incubated in Ringer bicarbonate medium is increased approximately three times on addition of 0·02 M fructose, five times on addition of 0·02 M glucose, mannose or galactose. Addition of rhamnose or arabinose has no effect. The stimulation due to hexoses is not found with brain homogenate, or with slices under anaerobic conditions. Glucose increases the rate of penetration of inorganic P^{32} into the slices, though not sufficiently to explain the increase in recovered phospholipide P^{32}. Total and inorganic P of brain slices incubated for two hours is the same in presence as in absence of added glucose. B. J. JANDORF (Chem. Abstr.).

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Occurrence of Sphingomyelin in Tissues of the Cat. Hunter, F. Edmund. [*J. Biol. Chem.*, **144**, 439–45 (1942); *cf. C. A.*, **35**, 2977[5].]

Phospholipides (I) were extracted from eleven cat tissues. Total (I) were determined by P determination and sphingomyelin (II) by a modification of the preparation as reineckate. The tissues were found, on a wet weight basis, to fall into the following order of decreasing concentration of (II): Brain, lung, kidney, spleen, intestinal mucosa, liver, intestinal muscle, heart, blood corpuscles, skeletal muscle, plasma. No correlation could be found between the concentrations of total (I) and of (II) in individual tissues. B. J. JANDORF (Chem. Abstr.).

Studies on the Metabolism of Brain Suspensions. II. Carbohydrate Utilization. Elliott, K. A. C., Scott, D. B. McNair, and Libet, B. [*J. Biol. Chem.*, **146**, 251–69 (1942); *cf. C. A.*, **36**, 3268[1].]

The respiration and R.Q. of rat brain homogenates in Ringer solution containing Mg but no Ca is measured in the presence of glucose (I), pyruvic acid (II), lactic acid (III) or acetic acid (IV). Duplicates are analyzed for changes in the concentrations of these compounds. In absence of added substrate approximately 76 per cent. of the respiration is accounted for by combustion of non-carbohydrate material (R.Q. = 0·87). On addition of (I) or (II) (optimally 10 mgm. per cent.) oxidation of non-carbohydrate material is largely suppressed. Approximately 14 per cent. of the (II) utilized can be accounted for as (III) and an equivalent amount of (IV). In presence of both (I) and (II) more (II) disappears; the amount of (III) produced is greater than the sum of (III) produced from either (I) and (II) alone. (III) in normal brain homogenates does not suppress the oxidation of non-carbohydrate material as efficiently as do (I) or (II); in brain from insulinized rats, combustion of (III) accounts for 92 per cent. of the respiration as compared with 73 per cent. in normal homogenates. In presence of both (I) and (III) only (I) is oxidized. (IV) does not affect the respiration and is not metabolized.

B. J. JANDORF (Chem. Abstr.).

Isolation of Dihydrosphingosine from Brain and Spinal Cord. Carter, Herbert E., and Norris, William P. [*J. Biol. Chem.*, **145**, 709 (1942).]

This reduction product was isolated by acetylation and identified as triacetyldihydrosphingosine. It had not previously been found in nerve tissue.

E. L. GREEN (Chem. Abstr.).

Studies in the Phosphorus Compounds of Brain. III. Determination of Adenosine Triphosphate and its Decomposition Products in Fresh and Autolyzed Dog Brain. Kerr, Stanley E., with the technical assistance of Krikor Seraidarian. [*J. Biol. Chem.*, **145**, 647–56 (1942); *cf. C. A.*, **35**, 6639[6].]

Methods are not available for separating adenosine triphosphate and diphosphate, adenylic acid and inosinic acid, so attention was confined to amounts of nucleotide and nucleosides plus free purine, acid-hydrolyzable P combined with the nucleotide and adenine and hypoxanthine in both the nucleotide and nucleoside-free purine fractions. Methods are described for analysis of the purines and the acid-hydrolyzable P attached to the nucleotide after separation of the nucleotides from the trichloroacetic acid filtrate by preparation with mercuric acetate. Dog brain frozen *in situ* with liquid air contains 190 p.p.m. acid-soluble purine nucleotide, 20 p.p.m. nucleoside and free N. 83·5 per cent. of the nucleotide N represents adenine. Preliminary studies indicate that the remainder is guanine rather than hypoxanthine. The amount of acid-hydrolyzable P found attached to the nucleotide is close to that required for complete phosphorylation. During autolysis loss of acid-hydrolyzable P begins within five seconds, reaching a level corresponding to adenine diphosphate in about three minutes, after which the nucleotide N slowly decreases to half the normal level within an hour with a corresponding increase of nucleoside and free purine. No formation of inosinic acid is observed during one hour of autolysis. Adenine together with hypoxanthine and ribose is found in the nucleoside-free purine fraction, the adenine increasing during autolysis. The decomposition of nucleotide to nucleoside and free purine with a gradual decrease of adenine in the nucleoside fraction and no increase of inosinic acid suggests that adenlyic acid in brain is first decomposed by a phosphatase rather than a deaminase. E. L. BREEN (Chem. Abstr.).

Effects of Anoxia at Birth on Central Nervous System of Guinea-pig. Windle, W. F., and Becker, R. F. [*Proc. Soc. Exptl. Biol. Med.*, **51**, 213–15 (1942).]

Anoxia induced at birth invariably produced symptoms of neural damage. More than eight minutes of anoxia caused permanent inactivation of certain areas of the brain and spinal cord.

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

Serine as the Nitrogen-bearing Constituent of the Glycerophosphatide of Human Brain.: Preliminary Communication. Schuwirth, Karl. [*Z. Physiol. Chem.*, **270**, 1–111 (1941).]

Schuwirth can identify serine in the brain phosphatides of human beings (*cf.* Folch and Schneider, *C. A.*, **35**, 1107[1]; Chargaff, Ziff and Rittenberg, *C. A.*, **35**, 2951[4]; Folch, *C. A.*, **35**, 4787[9]) in the form of the β-naphthalenesulfonic acid complex. The glycerophosphatide is

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separated from the ether extract of brain with $Ba(OH)_2$ solution, freed from Ba, concentrated to a syrup in vacuum and extracted with alcohol. From the residue serine is isolated as the β-naphthalenesulfonate through recrystallization from hot H_2O, glacial AcOH and 20 per cent. alcohol. GOTTFRIED BECK, MORRIS B. JACOBS (Chem. Abstr.).

Action of Some Acids on the Frog Spinal Cord and Nerve-muscle Irritability. Lueken, B. [*Z. Biol.*, **100**, 535–53 (1941); *cf. ibid.*, **100**, 486–517.]

Tests were made with the gastrocnemius muscle preparations in acid, the nerve in Ringer solution. Effect of varying stimulation was registered on the kymograph. Valeric and caproic acids in concentrations of 0·01 N and 0·001 N and salicylic acid of 0·04 to 0·1 per cent. showed similar irreversible reactions of the spinal preparations. Shortly after treatment violent spasms occurred either spontaneously or as a result of reflected irritability, continuing for a while even when out of the acid solution. Symptoms of paralysis were also observed. The muscle-nerve preparations were treated with acid concentrations beginning at the same high point but reaching a dilution 20 to 40 times that used above. Though spontaneous contractions occurred in the more concentrated solutions, strong delayed activity of tetanic character was called forth by the medium concentration. Ca-ion withdrawal is considered responsible.

N. SCHEINFINKEL, FRANCES KRASNOW (Chem. Abstr.).

Metabolism of the Central Nervous System in Experimental Poliomyelitis. Racker, E., and Kabat, Herman. [*J. Exptl. Med.*, **76**, 579–85 (1942).]

During paralysis the brain of the mouse infected with poliomyelitis virus shows on test after mincing a decrease in anaerobic glycolysis with no significant change in O utilization; the decrease varies from 5 to 50 per cent. NaF produces a greater inhibition of anaerobic glycolysis in normal than in poliomyelitic brain. Dehydrogenase activity is higher for poliomyelitis-infected brain without added substrate. This difference from normal disappears when substrates are added. The ratio of anaerobic glycolysis/O utilization for the sliced motor cortex is higher than for sliced visual cortex of the dog and cat. The O consumption of the anterior horn of the sliced spinal cord of dog and cat is much less than that of the cerebral cortex. The findings are in keeping with the view that at a certain stage of the infection the nerve cells may be reversibly injured but not yet destroyed by the virus. C. J. WEST (Chem. Abstr.).

Crystallization of a Protein from Poliomyelitis-infected Mouse Brain. Racker, E. [*Science*, **96**, 364–5 (1942).]

The isolation and crystallization of the fraction are described. It is birefringent and is essentially protein in nature. It is highly infective for mice, producing typical symptoms of poliomyelitis 14–72 hours after intracerebral inoculation. L. E. GILSON (Chem. Abstr.).

The Influence of Bulbocapnine on the Blood Sugar of the Rabbit. (1) *The Influence on Hyperglucemia of Central Origin. Asakawa, Hisasi.* [*Okayama Igakkai Zassi (Mitt. med. Ges. Okayama)*, **51**, 792–804 (*in Japanese*) (*in German*, 804–5) (1939).]

Bulbocapnine (I), in doses of 10–20 mgm. per kgm., produces a moderate hyperglucemia in rabbits; the intensity and duration of the hyperglucemia parallel the dose injected. A similar hyperglucemia is produced upon repeated administration of (I), i.e. the sugar metabolism does not develop a tolerance for (I). The (I) hyperglucemia is inhibited by pretreatment with yohimbine, barbital (60 mgm./kgm.) and phenobarbital (30 mgm./kgm.) and by bilateral splanchnicotomy, and is intensified by urethan (0·8 gm./kgm.), chloral hydrate (0·2 gm./kgm.), antipyrine and $MgSO_4$; it is scarcely perceptibly affected by atropine. (I) stimulates the sugar center; the impulse reaches the adrenals, liver and other abdominal organs by way of the splanchnic nerve and results in liberation of adrenaline, splitting of glycogen in the liver and thus in hyperglucemia. The point of attack of (I) lies in the brain stem, especially in the so-called hypothalamus sugar center according to Aschner, *et al.* (*C. A.*, **27**, 3984) and in the corpus striatum sugar center according to Dresel and Lewy; the latter sugar center is more highly developed than the former. The parasympathetic nerves probably play no part in the appearance of this hyperglucemia.

(2) *The Relation Between Bulbocapnine Hyperglucemia and Experimental Hyperglucemia and Hypoglucemia and the Influence on the Adrenaline Content of the Adrenal Glands and the Glycogen Content of the Liver.* [*Ibid.*, 806–14 (*in Japanese*) (*in German*, 814–15).]

In general, morphine hyperglucemia is intensified by (I), i.e. this poison exerts an additive action; in individual experiments, however, this effect is not always distinct. (I) suppresses considerably diuretin hyperglucemia and distinctly inhibits the hyperglucemia produced by glucose infusion. (I) generally inhibits insulin hypoglucemia and under certain conditions can even produce hyperglucemia. (I) distinctly diminishes the adrenaline content of the adrenal glands; this action is inhibited by pretreatment with ergotamine. (I) produces a striking reduction in the glycogen content of the liver.

(3) *The Relation Between Bulbocapnine Hyperglucemia and the Adrenal and Thyroid Glands and the Detoxication of Bulbocapnine.* [*Ibid.*, 1007–19 (*in Japanese*) (*in German*, 1019–20).]

(I) hyperglucemia is considerably suppressed by one injection of interenin (a preparation

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of cattle adrenal glands); repeated subcutaneous injection of 1 c.c. interenin per kgm., however, has almost no effect on the action of (I) on the blood sugar. (I) hyperglucemia is distinctly intensified by one injection of adrenaline, but is considerably reduced by repeated injections. (I) hyperglucemia is slightly inhibited by one injection of thyroxine, and slightly intensified by repeated administration of thyroxine. (I) hyperglucemia is markedly intensified in the thyroidectomized rabbit; it is considerably diminished in the thyroidectomized rabbit by pretreatment with thyroxine. (I) hyperglucemia is attributed to a sympathetic action. The adrenal cortex and the thyroid play an essential role in the detoxication of (I).

RUTH BERGGREN (Chem. Abstr.).

The Effect of Anoxia on Brain Potentials of Hyperthyroid Animals. *Kessler, M., and Gellhorn, E.* [*Am. J. Physiol.*, **137**, 703–5 (1942).]

The administration of thyroid powder or of thyroxine increases the senstivity of unanesthetized rats to 7 per cent. O_2 or lowered barometric pressure as shown by the greatly accentuated effects of anoxia on the electroencephalogram. E. D. WALTER (Chem. Abstr.).

Distribution of Neuraminic Acid in the Brain. (*With a Micromethod for the Estimation of this Substance in Nerve Tissue.*) *Klenk, E., and Langerbeins, H.* [*Z. Physiol. Chem.*, **270**, 185–93 (1941).]

Neuraminic acid, *cf. C. A.*, **36**, 3204[3], is a characteristic cleavage product of a sugar-rich lipoid which occurs in small quantities in the normal brain but constitutes the chief constituent of the protagon fraction (*cf.* Savy, Etienne-Martin and Receveur, *C. A.*, **31**, 4391[3]; Blix, **33**, 713[1]) in infantile amaurotic idiocy (Tay-Sachs type). Neuraminic acid can be detected by the orcinol reaction. (Reagent: 40·7 c.c. concentrated HCl; 0·1 gm. orcinol; 1 c.c. 1 per cent. $FeCl_3$ solution diluted to 50 c.c.) About 30 mgm. of normal brain or correspondingly less of pathological tissue suffices for the reaction. Neuraminic acid is present only in the pure gray matter of the brain. One c.c. of the solution under investigation is heated with 1 c.c. of the reagent for five minutes in a paraffin bath at 142°, centrifuged and evaluated photometrically. A red to red-violet coloration is obtained. Galactose gives a green coloration and interferes only if in large excess. There are 36–38γ of neuraminic acid in 187·5 mgm. of fresh brain (gray matter of the cortex). GOTTFRIED BECK, MORRIS B. JACOBS (Chem. Abstr.).

The Changed Chemistry of Brain Tissue in the Psychotic. *Barondes, R. de R.* [*Med. Record*, **155**, 537–8 (1942).] RUTH BERGGREN (Chem. Abstr.).

Proteinase in Brain. *Kies, Marian W., Schwimmer, Sigmund, and Walden, M. K.* [*J. Biol. Chem.*, **145**, 685–91 (1942).]

Partially purified brain proteinase is of the catheptic type. Di- and tri-peptidases are present in brain tissue. Lipolytic enzyme is absent. Compared with muscle, a large amount of cathepsin (I) is present. The brain does not autolyze more rapidly than muscle. While (I) contributes to the deterioration of brain tissue put out for comparative purposes, an adequate explanation for the rapid spoilage is still lacking. T. LAANES (Chem. Abstr.).

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