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Child Art as Aid in the Diagnosis of Juvenile Neurosis.

Child art is diagnostically important as it often expresses inner content which the child cannot express in words. Methods in art diagnosis are : (1) the exercise of abstraction, in which the child is asked to express different words by lines of different quality ; (2) the opening of the emotions, by means of drawing a picture to correspond to a word selected by the child from a list of words with strong emotional content ; and (3) the face test, in which the child is asked to draw in a realistic way things he likes best, etc. The author gives many illustrations, together with descriptions of his method of interpretation. R. E. PERL (Psychol. Abstr.).

Use of Serial Sevens in Psychiatric Examination.

The serial subtraction of 7 from 100 is one of the most widely used tests for the determination of the available intellectual resources of a patient with mental disorder. Using school children and normal adults as subjects the author has standardized this test and correlated it with intelligence level. Then the test was applied to 430 patients on the admission service of a large mental hospital. Types of performance were related to condition of patients.

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* A number of abstracts in this section are reproduced from *Chemical Abstracts* and *Psychological Abstracts*. To the Editors of these two Journals we extend our grateful thanks.

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One Hundred Schizophrenic Cases of Late Hospitalization.

Schizophrenic cases of late onset or late hospitalization were collected up to the number 100, each patient being over 45 when first admitted to a mental hospital. Thirty patients were upwards of 50 years when mental symptoms were first observed.

Although there was no selection of cases with reference to sex, the group includes 85 females and only 15 males.

Classification according to type shows 66 cases of the paranoid form, 24 of the catatonic form, and 10 cases of "other types."

Most of the patients had been self-supporting up to the depression years. Including married women who took care of their homes, satisfactory occupational adjustment can be claimed for 81 persons. Only 9 were wholly dependent.

The group includes 47 unmarried persons, about three times as heavy a proportion of single persons as the 1930 census shows for the Massachusetts population of approximately the same age. Among the married persons of the group, 70 per cent. made satisfactory marital adjustment up to the onset of the psychosis.

Most of the patients were in relatively good physical health. Less than half of them appear to have shown definitely schizoid trends prior to the onset of psychosis, but it is observed that none occupied a position of leadership in the community.

Regression of extreme degree is noted in only a few cases. Forty of the patients have been returned to the community and were doing well when last heard from. Among the 37 patients who are still in the hospital, 20 are good institutional workers and are in condition to have parole privileges for a considerable part of the time. (Authors' abstr.)

EEG Studies of Nine Cases with Major Psychoses Receiving Metrazol.

1. The EEG tracings taken during metrazol treatment of nine psychotic patients are reported.

2. Four of the nine cases showed no temporary or permanent change in the quality of the EEG tracings other than those changes appearing during and immediately following each metrazol injection. These four cases received six or less injections each, with one exception, which received 11 injections.

3. Changes of a temporary nature lasting days or weeks appeared in three of the nine cases, the three cases receiving 9 to 14 injections.

4. The two cases who received the greatest number of shocks, 18 and 20 injections respectively, show permanent abnormal changes in the character of the brain potentials.

5. It is concluded that temporary changes in the brain potentials lasting days or weeks may occur in cases receiving in the neighbourhood of 10 injections, and changes of a permanent character may be expected in those cases receiving 20 or more injections. (Authors' abstr.)

Amphetamine Sulphate (Benzedrine) as a Corrective for the Depression of Sedative Medication in Epilepsy.

Amphetamine sulphate (benzedrine) (5–30 mgm.) was given to 58 epileptic patients with toxic manifestations as a result of increased anticonvulsant medication, the latter consisting mainly or in part of phenobarbital in all but one case (receiving mebaral alone).

The toxic effects of the anti-convulsant medication consisted of drowsiness, ataxia, irritability, aggressiveness, anorexia, vertigo, nystagmus and tremor.

Benzedrine was notably of value in combating the drowsiness (64·2 per cent. of cases); and secondarily of value in relieving ataxia, irritability, aggressiveness and anorexia, associated with the drowsiness.

Amphetamine was effective in 39 cases, ineffective in 18 cases. When effective, amphetamine was constantly necessary in 18 patients, and only temporarily necessary (seven days to two months) in 21 patients.

In itself benzedrine did not affect the incidence of epileptic seizures.

By counteracting toxic effects benzedrine made it possible, in many cases, to reduce seizures by giving adequate anticonvulsant medication, and in this respect proved of appreciable importance as an adjunct in the therapy of epilepsy. (Author's abstr.)

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Disturbances of Behavior in Patients with Disseminated Sclerosis.

Sixteen of 199 cases of disseminated sclerosis which have been the subject of detailed study were admitted to psychiatric hospitals some time during the course of their illness. The early transient attacks of numbness or palsy are often considered to be hysterical manifestations. Sclerotic plaques often occur in the white matter of the fore-brain and may produce mental symptoms. It is important also to take into consideration the fundamental behavior pattern of the individual and the personal reactions to the illness. Emotional instability was the basis for the difficulties which caused many of the individuals to consult a psychiatrist. Often overt sexual activity, sometimes associated with impotency, caused difficulties of adjustment. All patterns of maladjustment have been seen. (Authors' abstr.)

The Electroencephalogram of Normal Children.

1. The electroencephalograms of 100 normal children were studied.

2. Alpha frequency increased and the incidence of slow activity diminished with advancing age, with a critical level being reached at the age of 9½.

3. There was a marked tendency toward the development of a dysrhythmia during hyperventilation in the younger children, which diminished with advancing age. (Authors' abstr.)

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PHILADELPHIA NEUROLOGICAL SOCIETY.

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Corpus Striatum and Thalamus of a Partially Decorticate Monkey.

It is well established that nuclei of the thalamus undergo degeneration when the areas of cortex to which they project their fibres are removed. On this basis the degeneration of the nucleus ventralis posterior was to have been expected after the removal of the cortex from the dorsolateral surface of the greater part of the hemisphere and the interruption of all the fibres from the internal capsule to the cortex medial of the denuded area.

It is not so easy to understand the partial degeneration of the nucleus ventralis anterior, which, according to Walker, probably sends its fibres to the striatum rather than to the cerebral cortex. No part of the striatum was directly injured in this monkey, but the dorsal border of the caudate nucleus and the lateral border of the putamen show partial degeneration. It is possible that the degeneration in the nucleus ventralis may have resulted from this slight damage to the striatum, but one must also consider the possibility that this nucleus may send some of its fibres to the cortex. It is interesting in this connection to note that many fibres cross the degenerated internal capsule between this nucleus and the globus pallidus. Fibres from the thalamic fasciculus terminate among the surviving cells of the nucleus. Since the fibres of the thalamic fasciculus are derived from the globus pallidus by way of the fasciculus lenticularis and the field H of Forel, and since the fibres which cross the degenerated internal capsule obliquely probably arise in the nucleus ventralis anterior and end in the globus pallidus, it would seem that important reciprocal connections exist between these two structures.

It is believed that the nucleus medialis dorsalis sends its fibres to the granular layer of the cortex in the anterior part of the frontal lobe. The fact that in this case only the lateral part of this nucleus is degenerated would indicate that the intact medial part of the nucleus projects to the tip and the ventral surface of the frontal lobe, which were not decorticated. Walker has recently shown that the cortex on the ventral surface of the frontal lobe receives projection fibres from the medial part of the dorsomedial nucleus.

The integrity of the nucleus of the centrum medianum is in line with the generally accepted view that it does not have cortical connections.

In view of the extensive decortication, it is difficult to account for the integrity of the nucleus lateralis dorsalis, and for the failure of considerable parts of the nucleus lateralis posterior and of the pulvinar to undergo degeneration. The drawing and photograph made before the brain was embedded indicate that all the cortex on both sides of the fissure of Sylvius had been removed. In view of the fact that sections were not made through the posterior part of the decorticated area, the possibility cannot be excluded that some cortex near the posterior end of the fissure of Sylvius may have been left. If this were the case it might explain the preservation of cells in the two parts of the nucleus lateralis and in the pulvinar.

The pale, lightly staining fibres which join the corpus striatum with the substantia nigra, and which can be recognized by careful study of properly stained sections of the normal brain of man and the monkey, have been described and illustrated from sections of the brain of a decorticate monkey, in which these strionigral fibres have been rendered conspicuous by the degeneration of fibres of cortical origin.

Papez' description of these fibres as they lie in the basis pedunculi of the monkey's brain is in full agreement with our own observations, but we cannot accept without reserve his statement that they arise in the caudate nucleus and putamen and his description of their course through the globus pallidus. Papez described the strionigral fibres in a hemi-decorticate dog, and Papez and Rundles saw them in a dog without a cerebral hemisphere.

As far as can be judged from his various papers dealing with this subject, Papez seems to

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have based his opinion that these fibres arise in the caudate nucleus and putamen on two lines of evidence: 1. The fibres are similar in size and staining reaction to the striopallidal or radial fibres, and he expressed the belief that some of these fibres pass entirely through the globus pallidus in the strionigral bundles. 2. In a case of arteriosclerotic softening of the cortex, caudate nucleus, and putamen, studied in sections stained by the Pal-Weigert method, Rundles and Papez concluded that the strionigral fibres were degenerated. Had they really been degenerated it is hard to see how they could have been recognized in the basis pedunculi, in which the fibres of cortical origin were also degenerated. It seems more probable that the lightly staining strionigral fibres, which might readily be mistaken for degenerated fibres, were rendered conspicuous by the degeneration of the fibres of cortical origin.

Riese had previously described fine, lightly staining fibres, which he asserted he could trace from the caudate nucleus into the striatum intermedium of the substantia nigra in the *Delphinus delphis*, dog and man. In the dog he claimed to have followed them from the caudate nucleus in Marchi preparations, but the evidence as presented is not convincing. In man he found the striatum intermedium missing in a brain with degenerated striatum (caudate nucleus and putamen).

The authors have seen no evidence of degeneration of these fibres in Marchi preparations of the brains of monkeys following lesions in the caudate nucleus, the putamen and the globus pallidus. But the possibility must be admitted that the degeneration of such delicate myelin sheaths might not be recognizable in Marchi preparations. The question of the origin of these fibres must be left open. It is possible that they may come from the striatum or from the globus pallidus, or it may be that they take origin in the substantia nigra and end in some part of the corpus striatum. The possibility that the fibres under consideration are of cortical origin is eliminated by their presence in the internal capsule and basis pedunculi from which fibres of cortical origin had been removed by degeneration. In spite of the uncertainty as to the source of these fibres, it seems best to continue to call them strionigral fibres unless and until it is demonstrated that this term is incompatible with their true origin and termination.

(Authors' abstr.)

Multiple Meningioma.

Cushing and Eisenhardt observe that more than one meningioma may be found in occasional cases of Recklinghausen's disease. They stated that "unilateral acoustic tumors occasionally, bilateral acoustic tumors more commonly, and bilateral acoustic tumors with centralized neurofibromatosis (neurinomatosis ?), almost invariably are accompanied by tumors of the meninges." Accordingly, they reserved the term "multiple meningioma" for those conditions in which there is no recognizable trace of Recklinghausen's disease. This explains the occurrence of only three cases of multiple meningioma among 295 cases of intracranial meningeal growths in Cushing's series. According to this strict definition, a number of cases referred to in the opening paragraph would not be classified as instances of "multiple meningioma" because stigmata of neurofibromatosis were present. Since the patient presented in this paper showed neither acoustic nor cutaneous manifestations of Recklinghausen's disease, the case can be classified temporarily as one of multiple meningioma, as Cushing and Eisenhardt have defined it.

(Author's abstr.)

Peripheral Neuropathy: Evaluation of Sensory Findings.

1. Sensory dissociation is a characteristic feature of the peripheral neuropathy complicating alcoholism and other conditions associated with disturbed nutrition. Light touch, vibration and position senses and "first" pain sense are affected earliest and most severely. These sensations are carried by the large, myelinated A and B fibres, which are affected earliest and most severely in such conditions. "Second" pain sense, which is conveyed along the slow, unmyelinated C fibres, is spared.

2. Immediate dysesthesia represents a stage of injury of the peripheral nerve at which some of the myelinated (A and B) fibres are still functioning, while others have been blocked.

3. Delayed dysesthesia represents the stage at which practically all of the myelinated (A and B) fibres have been blocked, only small, unmyelinated fibres continuing to function. The delay in perception results from the very slow transmission along the C fibres.

4. The sensory dissociation and dysesthesia of peripheral neuropathy may be duplicated experimentally by producing ischaemia of an extremity. As the ischaemia progresses, the loss of function of the peripheral nerve becomes more severe and the dysesthesia changes from the immediate to the delayed type.

5. In peripheral neuropathy of this type, the large, myelinated (A and B) fibres are primarily affected. This indicates that these fibres have greater metabolic needs, and are therefore most susceptible to nutritional deficiency. (Authors' abstr.)

Tabes Dorsalis: Evaluation of the Sensory Findings.

1. Sensory dissociation and dysesthesia were noted in 18 patients with tabes dorsalis. In 11 of these patients the dysesthesia was delayed, and in each of these there was marked delay in pain perception.

2. The delay in pain perception and the dysesthesia have been related to blocking of fast conducting impulses, allowing more slowly conducted impulses to be perceived at a later time and in uninhibited fashion.

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3. It is suggested that the physiologic mechanism of the delayed pain perception and dysesthesia associated with tabes dorsalis is analogous to that previously noted with disorders of the peripheral nerve. (Authors' abstr.)

Changes in the Brain in Pertussis with Convulsions.

The changes in the brain in pertussis are apparently non-infectious. They are more likely of circulatory origin and consist of oedema, ischaemic cellular degeneration, multiple haemorrhage (usually small) and lymphoctyic plugs in veins and capillaries. On rare occasions a secondary "encephalitic reaction" may be observed in addition to the aforementioned changes.

It seems that the term "pertussis encephalopathy," proposed by Jochims, covers most adequately these conceptions and, in the present state of knowledge about the pathogenesis of lesions of the brain in pertussis, should be the term of choice for the cerebral complications in that disease. (Author's abstr.)

Observations on Monkeys' Bilateral Lesions of the Globus Pallidus.

Three monkeys with large bilateral lesions in the globus pallidus showed none of the signs which point to striatal disease in man. None of the animals showed cogwheel resistance to passive movement or any trace of a Parkinsonian tremor. Choreiform and athetoid movement did not occur.

None showed the mask-like face, the slowness of movement and the deficient initiative observed in monkeys with hypothalamic lesions which also damaged or destroyed the ansa and the fasciculus lenticularis. Since the mask-like face and slowness and poverty of movement were not caused by large pallidal lesions, it seems likely that in the earlier experiments these symptoms were caused by the hypothalamic lesions or by the combined damage to the hypothalamus and destruction of the ansa and fasciculus lenticularis. This raises the question whether damage to the hypothalamus may not play a part in producing the Parkinsonian syndrome in man. (Authors' abstr.)

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The Wernicke Syndrome.

Twenty-seven cases of Wernicke's syndrome (three of which occurred in non-alcoholic patients) are analysed and the following conclusions reached :

1. The syndrome as originally described by Wernicke is probably a combination of several nutritional deficiencies affecting the nervous system and need not necessarily be complete in any case. It is of course possible that the exact syndrome which Alexander has reproduced experimentally in pigeons may on occasion occur in uncomplicated fashion in man, but except for ophthalmoplegia, the other symptoms would be difficult to evaluate from a purely clinico-pathologic point of view.

2. The authors' results indicate that (*a*) the ophthalmoplegia is a thiamine deficiency ; (*b*) the clouding of consciousness may be related to anything which interferes with proper cerebral metabolism, some of the known offenders being lack of carbohydrate, lack of oxygen, lack of thiamine or nicotinic acid or riboflavin or of all three, and probably a lack of many other substances now under investigation ; and (*c*) the ataxia is difficult to evaluate and its response to therapy has not as yet been worked out.

3. Other deficiency syndromes may and do superimpose themselves on the more usua Wernicke picture, and these require specific treatment.

4. The ophthalmoplegia is invariably preceded or accompanied by peripheral neuropathy. This tends to confirm Alexander's thesis that smaller amounts of thiamine are necessary to prevent the polioencephalopathic changes than are necessary for antineuritic action.

5. Delirium, with its marked increase in psychomotor activity, and hence in total metabolism, frequently precedes the development of this syndrome.

6. In the recovered patients, the development of a Korsakoff syndrome is the rule. This does not show a consistent response to thiamine hydrochloride, as has frequently been claimed.

7. The use of such terms as the Wernicke syndrome and encephalopathia alcoholica for the encephalopathic state which complicates alcoholism and other conditions leading to disturbed nutrition, while justified, has certain limitations. The authors believe that in each case of such disorder the clinical signs of syndromes presented, the response of these phenomena to specific therapeutic agents recorded, and finally, the metabolic and pathologic changes correlated with the clinical picture found during life, should be indicated. Bender and Schilder were able to correlate the clinical picture seen in the Wernicke syndrome with the post-mortem observations. Alexander, utilizing the experimental approach, has focused attention on the essential nutritional disturbances. The authors have presented certain nutritional and metabolic aspects of the problem. Similar correlated studies will undoubtedly lead to a much better understanding of the nutritional and metabolic disorders which interfere with the functional economy of the nervous system. (Authors' abstr.)

The Electroencephalograph as an Aid in the Study of Narcolepsy.

The electroencephalographic studies on this group of narcoleptic patients confirm certain clinical views. Sixteen of the 22 patients had narcoleptic spells during the period of electroencephalographic recording. During these periods the brain potentials became modified to resemble those observed in physiologic sleep. This confirms the clinical observation that a narcoleptic spell is due to a physiologic disturbance resulting in the facilitation of sleep. As Wilson has stated, and as is generally recognized, the narcoleptic conditions are a heterogeneous group of disorders. It is not surprising to find that brain potentials do not always show a uniformity of pattern. In 17 of the 22 cases normal waking patterns occurred. In the remaining 5 cases abnormal waking patterns were present. In none of these five cases did the authors obtain patterns characteristic of physiologic sleep, although the clinical history led them to believe these patients had narcolepsy. The electroencephalogram being a measure of the electrical activity of the cerebrum, it is fair to assume that the basic neurophysiologic disturbances in each of these five cases differed. In addition these five cases differed from the first 17. In those cases in which there was facilitation of the sleep electrical potential activity in an otherwise normal pattern (Cases 1 to 17), the cerebral disturbance would appear to be limited to the neurophysiologic sleep mechanism. In the remaining five cases, in which abnormal records were present, the electroencephalographic studies give evidence that the neurophysiologic disturbance was more widespread. The fact that the abnormal patterns differed in these five cases suggests that the location or character of the lesion also differed in each case.

While electroencephalographic studies in these 22 cases indicate that patients with abnormal records are less troubled with facilitation of sleep, the authors do not feel justified, from the small number of cases, in concluding that this is the rule. It is evident from the table that the first 17 patients, with one exception, suffered from cataplectic attacks of greater or less severity, while the remaining five patients did not suffer from this symptom. The first 17 patients, with one exception, did not show neurologic symptoms and signs, while the remaining five patients did manifest such symptoms and signs.

Some clinicians have found it convenient to divide the narcolepsies into the " symptomatic " and the " idiopathic " type, recognizing that there are objections to such a classification, and realizing that in the individual case it may not be possible to make the distinction. If one cares to use this clinical distinction, one might say that those patients showing normal waking electroencephalographic records fall into the " idiopathic " group, while those showing abnormal waking records are more likely to fit into the " symptomatic" group. (Authors' abstr.)

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The Cortical Frequency Spectrum in Epilepsy.

The Grass method of frequency analysis has been used to obtain the cortical frequency spectrum of epileptic patients, of the parents of epileptic patients and of normal persons.

1. Study of records made during seizures discloses the following: (*a*) In *petit mal* attacks a disproportionately high peak appears in the 2 to 3 per second region; (*b*) in a psychomotor seizure an abnormally high peak appears in the 4 to 7 per second region, and (*c*) in *grand mal* attacks an abnormally high peak is evident in the 20 to 29 per second region.

2. The average spectrum of epileptic patients made in the intervals between seizures discloses a disproportionately large amount of energy at frequencies below 9 per second. However, the subgroup of patients subject only to *grand mal* have an abnormally great amount of energy in the 20 to 29 per second region.

3. Patients having periodic *grand mal* attacks show an increase in energy in the faster frequencies as the day or hour of the convulsion approaches.

4. The average spectrums of a group of parents of epileptic patients show abnormalities similar to those seen in the average spectrums of epileptic patients, but these abnormalities are less extreme. (Authors' abstr.)

Characteristics of After-discharge following Cortical Stimulation in the Monkey.

The character of the tonic and clonic after-discharges which follow direct cortical stimulation has been investigated in primates, and the following conclusions have been drawn:

1. The primary response to stimulation is independent of the after discharge: Either may be produced alone by appropriate stimuli; the primary response is specific for specific areas stimulated, whereas the after-discharge is not; the nature and strength needed differ in the two instances.

2. After-discharges may be followed by a reversal of direction (flexion or extension) of movement on repeated stimulation of a given point.

3. After-discharge may follow stimulation of the motor area, the pre-motor area or the post-central gyrus.

4. Ablation of, or injury to the anterior lip of the central sulcus of the arm area makes it impossible to produce clonic seizures from stimulation of any other part of the cortex. Ablation of any other part of the cortex is without such effect.

5. Injury or ablation of the following subcortical structure did not significantly alter the amplitude and duration of after-discharge: posterior roots to the affected extremity, the cerebellum, the corpus callosum, the thalamus, the head of the caudate nucleus, the putamen and the globus pallidus.

6. Prolonged after-discharge follows stimulation of the premotor cortex, but a superficial lesion between the motor and the premotor area abolishes this response.

7. The prolonged clonic seizures are the result of a reverberating circuit from the anterior lip of the central sulcus. Its possible pathways are discussed. (Author's abstr.)

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Metrazol Convulsions in the Treatment of the Psychosis of Dementia Paralytica.

Metrazol treatment was administered to a group of 16 patients with the psychosis of dementia paralytica. Twelve of these patients had previously received hyperpyrexia; four had no such treatment. Of the group which had previously received hyperpyrexia, two were sufficiently improved to be subsequently paroled and to maintain, after a lapse of twelve months, adequate social adjustment. Three patients showed some degree of improvement for periods ranging from six weeks to six months. Three patients showed definite changes in the clinical picture; at first these changes were unfavourable, but in two cases they were followed by moderate but lasting improvement. The condition of the remaining four patients showed practically no change. Of the group of four patients who had received no previous hyperpyrexia, two showed striking improvement and were paroled after the subsequent administration of hyperpyrexia; one patient exhibited improvement to a limited degree, and the condition of one was not changed.

Tabulations of the results of clinical, laboratory and psychologic tests, as well as data concerning the metrazol convulsions, are presented and discussed.

The justification for and the practical applicability and the theoretic significance of the use of metrazol in the treatment of the psychosis of dementia paralytica are discussed. The following conclusions are drawn:

1. There appears to be no particular danger in inducing convulsions in patients with dementia paralytica.

2. Patients with dementia paralytica appear to react to metrazol in a way similar to that of patients with functional psychoses.

3. As the psychosis of dementia paralytica was found to react to metrazol in much the same way as do the functional psychoses, the result may be interpreted as supporting theories which maintain that the psychosis of dementia paralytica is a response of the psyche to the organic damage.

4. The use of shock therapy appears to be warranted in those cases of dementia paralytica in which the psychosis does not respond to the usual methods of hyperpyrexia. However, further studies are needed to determine its ultimate place in the therapeutic management of dementia paralytica. (Authors' abstr.)

Dilantin Hyperplastic Gingivitis.

The important changes produced by dilantin sodium are marked hyperplasia of both the connective tissue and the epithelium, the hyperplasia being most pronounced in the corium. The connective tissue proliferates, growing out from the under surface of the free margin of the gum and covering wholly or in part the crown of the tooth. The proliferative tissue becomes covered with epithelium. This new tissue is hard and firm and takes on the appearance of normal gingiva which is greatly enlarged.

This hyperplasia has but slight resemblance to that of scurvy and is not significantly altered by the administration of ascorbic acid. Microscopically the two diseases are entirely dissimilar.

Surgical removal of the hypertrophied tissue is inadequate. Surgical intervention, plus massage and hygienic care, is advisable in instances in which growth of the gums has advanced to such an extent that prophylactic measures cannot be employed without first reducing the size of the gums.

The best response is obtained by routine home care, including interdental massage.

Because of the apparent therapeutic value of this method in minimizing, and possibly preventing the condition, gingival treatment should be begun early, preferably when dilantin therapy is started. Medication with the drug need not be discontinued because of the gingival hyperplasia. (Authors' abstr.)

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Is there a General Factor of Perseveration?

Spearman's hypothesis of a general factor of perseveration equivalent to mental inertia is not upheld by the investigations of the London school nor by other studies. Spearman restricts the original meaning and significance of perseveration. The principal experiments do not adequately discriminate between repetition, continuation, and interference. In creative effort situations, if pure alternation effects are measured in distinction from interference effects, the general factor otherwise obtained disappears. Previous studies are reviewed, and new studies, including one made with 205 cases, are cited. H. D. SPOERL (Psychol. Abstr.).

BRIT. J. EDUC. PSYCHOL.

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*Will a Conception of Imputability be of Practical Use in a Penal System Founded on Empirical Psychology? *Kinberg, O.* 124

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Clinical Notes on a Case Diagnosed as Epilepsy.

A case is presented in which the principal symptom is epileptiform fits, indistinguishable from those of idiopathic epilepsy (i.e., without cerebral injury or toxic condition), though starting in adult life.

By analytic technique unconscious sources of nervous tension were freed from repression. In the course of analysis the fits also became conscious and subject to conscious control. In other words, they changed their typical epileptic character, were replaced by hysterical fits, being therefore amenable to cure by psychotherapy. S. M. COLEMAN.

The Couvade in Modern England.

As a result of the author's investigations into the emotional origin of styes and cysts, he is of the opinion that something like the mechanism of the Couvade is often at work in determining apparently simple eye lesions in males. S. M. COLEMAN.

Study of a Dream.

Analysis of the dreams and drawings of a schizophrenic borderline personality along Jungian lines. There is stated to be a split in the personality between the sphere of differentiated intellect and that of primitive feelings. The series of drawings is said to symbolize the integration of the disruptive tendencies during recovery under analysis. S. M. COLEMAN.

Three Cases of Anxiety and Failure in Examinations.

The three cases presented support the view expressed by Flugel that examinations may have the unconscious significance of an initiation rite. It is pointed out that many features of the examination system in its present forms are retained to gratify the aggression of the fathers towards the sons rather than to improve its function. S. M. COLEMAN.

The Psychology of Propaganda.

It is suggested that people's susceptibility to propaganda depends upon their degree of maturity and independence of character. Suggestibility also depends to some extent upon the source of the propaganda. Lastly for propaganda to be effective it must correspond with, or symbolize, unconscious fantasies that are already there. S. M. COLEMAN.

The Aetiology and Mechanism of Dementia Praecox.

The views of Kraepelin, Clouston, Bleuler, Kretschmer, Jung and the psycho-analysts having been dismissed in less than two pages, the author puts forward the theory that dementia praecox is a flight from reality to fantasy and that it results from prolonged mental stress in childhood, with the addition of later mental exciting factors in many cases. S. M. COLEMAN.

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Conception of Imputability.

It is concluded that the conception of imputability is a false abstraction, an inanimate conception, incapable of development, which should be cancelled. Since it is of no use whatever but on the other hand, works a lot of harm in the shape of confusion in theory and forensic mistakes in practice, it is desirable that it should be removed from jurisprudential philosophy, penal laws, and the administration of the law. S. M. COLEMAN.

CHARACTER AND PER.

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Teleonomic Description in the Study of Behaviour. *Musgrave, R. S., and Allport, F. H.* 326

The Prepsychotic Personality and the Concept of Mental Disorder.

The author had previously shown by the tetrad technique that a group of 40 symptoms gave evidence of group factors basic to 4 Kraepelinian types: catatonic and paranoid dementia praecox, and manic and depressive anxiety psychoses. The present study is concerned with the relationship between the psychosis of the patient and his prepsychotic history. By means of Yule's technique, the coefficient of association between each of some 50 symptoms and each psychosis was obtained. The result showed that "emotional trends have a psychosomatic basis, and a psychosis is more likely to develop in individuals in which this psychosomatic basis of emotional experience exists from early years in a condition of abnormal lability." Numerous references are cited. M. O. WILSON (Psychol. Abstr.).

An Analysis of the Conception of Morale.

Definitions of morale were studied and evaluated. Seventeen qualities discovered in these definitions were scaled graphically for rating purposes. Raters were psychologists or psychology majors. Half of the ratees were either acquaintances of the raters or the raters themselves. The other half were persons unknown to the raters but had been interviewed by trained interviewers; ratings for these subjects were based on their interview records. The ratings were analysed factorially by the Thurstone technique. Although the number of cases did not justify removal of more than one factor, extraction of three was attempted. Factor 1 is rather general and includes stability, optimism, trustfulness, cheerfulness, adaptability to hardship, and enthusiasm. Factor 2, a group factor, represents a rational, liberal, altrocentric outlook. Factor 3, a nebulous group factor, embodies a stubborn, "bull-dog," healthy, self-confident outlook, with negative saturations of tolerance and trustfulness. However, other qualities have loadings at variance with this characterization. In the order given, these factors conform roughly to three of Spranger's types, namely, the social, the theoretical and the political.
M. O. WILSON (Psychol. Abstr.).

A Study of Personal Patterns in an Intellectual Performance.

Since in such a unified whole as personality no part is isolated from another part, it is assumed that qualitative differences in one sphere, such as an intellectual performance, reflect differences in personality. The procedure of this study called for the classification of blocks of different sizes, shapes and colour (Vigotsky test) on the basis of size of top area and height. Results show that the subjects could be grouped according to whether their approach was of a conceptual (thinking), or of a perceptual nature. Furthermore, they could be grouped as to whether the two approaches, when the two were used, worked together (were concordant) or were antagonistic (discordant). Women tended to fall into the perceptual and men into the conceptual group. Subjects with the Ph.D. or M.D. degree tended more to use the conceptual, those with the M.A. degree, the perceptual approach. In neither of these groupings by sex or by level of higher degree, however, was there any association with the concordance-discordance variable. Several outstanding research workers among the subjects fell almost wholly within the conceptual-concordant subgroup. M. O. WILSON (Psychol. Abstr.).

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DIS. NERV. SYST.

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The Effect of Cold on Mental Disorders. A Study of Ten Patients Suffering from Schizophrenia and Treated with Hypothermia.

The history and technique of hypothermia is outlined, together with preliminary data obtained from ten patients suffering from frank schizophrenia. Body temperatures were consistently lowered to between 75° and 85° F. with no untoward effects. It is probable that younger patients, and those ill for a short period, are most benefited by the treatments. Certain patients exhibited episodic periods of clarity with no permanent improvement. "The clinical results would seem to be at least equally as promising as insulin and metrazol in the treatment of schizophrenia." C. E. HENRY (Psychol. Abstr.).

DEUTSCHE ZTSCHR. F. NERVENH.

VOL. CLII. 1941.

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*Electroencephalographic Investigations in Idiopathic Epilepsy. *Kornmüller, A. E., and Janzen, R.* 78

Interpretation of the Electroencephalogram.

Ohm's theory, derived partly from his work on miner's nystagmus, is that psychic life and activity depend largely on discharge frequency. The greater the frequency, the higher the performance. In all diseases frequency sinks, and it is also affected by weather and light. The frequencies of gifted persons demand special study. Different types of ganglion cells have different frequencies, and the same frequency probably occurs in widely separated regions. The same frequency may produce light sensation in the visual cortex and initiate movement in the motor cortex. Frequency is essential brain function; differences in effect are of anatomical nature. This theory reconciles anatomical differentiation of the brain with physiological unification of its performance. M. E. MORSE (Psychol. Abstr.).

Electroencephalographic Investigations in Idiopathic Epilepsy.

This is an analysis of the EEG's of 43 cases of idiopathic epilepsy and of three cases of pyknolepsy. The authors are chiefly concerned with the question of epileptogenic focus, using the same criteria as in animal experiments. A distinction must be made between the starting-point of the irritation and secondary effects on cerebral activity conditioned by nerve conduction. Bio-electric studies of idiopathic epilepsy give no proof, as yet, of a primary cortical focus. Some *grand mal* cases (24 hours' continuous record, including convulsions) showed no abnormalities. In *petit mal* the findings are varied. If cortical tension is unchanged, the stimulus from the primary focus may be too weak or too brief to affect the cortex. The fact that symptoms and cortical electrical changes during an attack are not quite synchronous also speaks against a primary cortical focus. The only difference between interval phenomena, detected only in the EEG, and certain minor attacks may lie in the site of the primary focus.

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

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Experimental Investigations of the Dynamics of Hypnotic Sleep in Man.

(1) The motor chronaxie undergoes an increase with the development of hypnotic sleep and a reduction with its regression. (2) No considerable increase in chronaxie occurs, nor do there

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appear phases of equalization or reversed relations between chronaxie of antagonists on a fairly elevated level as is usually observed in natural sleep. (3) In certain cases of hypnotic sleep there occur divergences of the chronaxies of antagonists on a low level. (4) The motor chronaxie, increased during the intervals between the single hypnotic suggestions, undergoes a relative decrease simultaneously with the time of suggestion, which points to a certain increase of cortical excitability during suggestion owing to the maintenance of rapport.

D. MILLER (Psychol. Abstr.).

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Effects of Benzedrine Sulphate on Performance in Two Tests of High Mental Functions. *Hecht, R., and Sargent, S. S.* 528
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Conditioned Extinction of a Reflex in the Spinal Dog.

Complete and permanent conditioned extinction of a spinal reflex was demonstrated in the spinal dog. In some spinal animals a reflex response of the semitendinosus muscle was found to be inherently present on one side and absent on the other. When shock or mechanical stimuation to the tail was combined with shock to the hind paw of the side showing no reflex to tail shock, a CR of the semitendinosus muscle on that side could be established. As the conditioning procedure was continued and the CR became more firmly established, the CS-reflex of the contra-lateral muscle weakened and then disappeared. The reflex did not reappear when the CS-intensity was increased, when extraneous stimuli were applied, nor when periods were interpolated in the conditioning process. The hypothesis is advanced that the permanent extinction of the spinal reflex is somehow dependent upon an inhibitory interaction between the contra-lateral CR and the CS-reflex mechanisms. Additional data are presented which indicate that the response system which has a shorter latency enjoys a functional superiority in the bilateral interactions which may underlie conditioned extinction.

H. W. KARN (Psychol. Abstr.).

Experimental Extinction of an Hallucination Produced by Sensory Conditioning.

Thirty subjects were given training by means of a procedure developed in a previous experiment (see **15** : 1632) in order to produce an auditory hallucination of a 1,000-cycle tone. The sixteen subjects who gave hallucinatory responses were given twenty test trials in which the cue stimulus (light) was presented, but the tone was omitted. No indication of experimental extinction was found in either frequency, latency, or duration of response. Instructing the subjects that the tone would be omitted resulted in reliably reduced frequency and duration, and increased latency in the following ten test trials. Results of a questionnaire suggested that the instructions were less effective for those subjects who did not believe them and continued to expect the tone. None of the evidence obtained indicates functional relationships different from those to be expected on the basis of results of previous conditioning experiments.

H. W. KARN (Psychol. Abstr.).

Conditioning of the Occipital Alpha Rhythm in Man.

By means of the classical Pavlovian technique the disappearance of the occipital alpha rhythm in man was conditioned to auditory stimuli. Simple, cyclic, delayed, trace, differential, differential delayed, and backward types of conditioned response were established. After several trials with the backward conditioning technique a sound stimulus re-established the alpha rhythm if introduced during its depression by light. With further conditioning, the sound alone produced blocking of the alpha rhythm. This suggests simultaneous facilitation and inhibition processes during conditioning. A state resembling sleep was produced during conditioning of long delay and trace intervals, that is, slow waves appeared in the electroencephalogram, and the subjects failed to give the usual manual response. The relation of the electroencephalographic studies to general problems of conditioning is discussed.

H. W. KARN (Psychol. Abstr.).

Conscious Time Judgments Related to Conditioned Time Intervals and Voluntary Control of the Alpha Rhythm.

The time interval in delayed, trace, and cyclic CR's of the occipital alpha rhythm is more accurate than and not related to conscious estimations of the same interval. An involuntary time mechanism is operating in this response. CR of the occipital alpha rhythm was established to a voluntary stimulus, subvocal repetition of the word " block " with voluntary manual response. In this way voluntary control of the alpha rhythm was established. The same response, blocking of the alpha rhythm, was conditioned in one way independent of voluntary control and in another way under voluntary control. The differentiating factor was the type of stimulus to which the CR was established. H. W. KARN (Psychol. Abstr.).

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VOL. XXIX. 1941.
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*Cortical Origin and Distribution of Corpus Callosum and Anterior Commissure in Chimpanzee (*Pan satyrus*). *Bailey, P., Garol, H. W., and McCulloch, W. S.* 564
Potassium and Water Changes in Excised Nerve on Stimulation. *Arnett, V., and Wilde, W. S.* 572

Hyperactivity in Monkeys Following Lesions of the Frontal Lobes.

1. In monkeys and chimpanzees ablations from the frontal association areas (areas 8–12 of Brodmann) result in increased total activity which is beyond that ever seen in the normal animal.

2. This hyperactivity is characterized by purposelessness and by repetitive continuation. It is permanent.

3. Partial ablations, if bilateral, produce some increase in activity (bilateral area 8, bilateral area 9, or bilateral areas 10–12), but none of these cause as great increase as does removal of all of the frontal association areas.

4. The increased activity has not been found to be related to increased hunger or metabolism; or to changes in the autonomic system.

5. Hyperactivity is markedly affected by visual stimuli. It disappears in the dark, or when the animals have been deprived of vision either by enucleation of the eyes or occipital lobectomy. Absence of auditory stimuli has not the same effect.

5. Hypomotility in monkeys and chimpanzees is related to lesions of the rostral portions of area 6 and to area 8. (Authors' abstr.).

Cortical Origin and Distribution of Corpus Callosum and Anterior Commissure in the Monkey (Macaca mulatta).

Based on local strychninization of one hemisphere and electrical records of the other, i.e. by physiological neuronography, a new map of the convexity of the cerebral hemisphere of *Macaca mulatta* has been prepared to show the origins of the corpus callosum and anterior commissure, and to indicate (i) those origins whose interhemispherical projections are dispersed to many areas of the convexity of the other hemisphere, and (ii) those whose projections are restricted to symmetrical foci.

The former spring from a part of area 9 above the sulcus principalis and from areas 5 and 6 of the leg and arm-subdivisions. The latter have been found to arise from many parts of the frontal pole, from face 6, from the trunk and face portions of area 4 and from areas 18 and 21.

The last of these restrictedly symmetrical projections, i.e. that between the areas 18 and 21, is unique, for it alone remains after section of the corpus callosum, provided the anterior commissure is intact.

Suppression of electrical activity of the cortex by strychninization of 8s, 4s, 2s or 19s has been found to be always bilateral, even after section of the corpus callosum, to which these areas contribute few or no axones. (Authors' abstr.)

Cortical Origin and Distribution of Corpus Callosum and Anterior Commissure in Chimpanzee (Pan satyrus).

By local strychninizations of one hemisphere and recording electrical activity of both, a new schematic map of the convexity of the hemisphere of *Pan satyrus* has been made to indicate the principal origins of the corpus callosum and anterior commissure. It shows (i) those origins of commissural fibres which project to many areas on the convexity of the other hemisphere, and (ii) those which project only to symmetrical foci. The former arise from all subdivisions of Band II and from two small areas, one above the superior parietal sulcus and the other below

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and behind the inferior extremity of the interparietal sulcus. The latter come from many regions of the frontal pole, from scattered parts of Band II, from the trunk, neck and lower face regions of Bands IV and V, from Band IX and from a region adjacent to the sulcus lunatus (presumably area 18), and from the central and posterior thirds of the second temporal convolution (probably area 21).

The last of these origins is unique in that strychnine spikes continue to be propagated (although at reduced amplitude) to the symmetrical focus following section of the corpus callosum, and, hence, it must give rise to axones which are to be sought in the anterior commissure.

Suppression of electrical activity of the cortex by strychninization of Band I, III, VII or XI has been found to be bilateral even after section of the corpus callosum, to which these bands contribute either no axones or too few to yield a recognizable strychnine spike.

(Authors' abstr.)

J. NERV. MENT. DIS.

VOL. XCIV. JULY, 1941.

The Paralysing Effect of Fright. *Reaser, E. F.* 1
*Insulin Hypoglycaemia and the Electrocardiogram. *Goodrich, B. E., and Smith, F. J.* 10
*The Chronic Alcoholic as a Neurotic and a Dreamer. *Karpman, B.* 17
The Innervation of the Limbs. *Abbott, J. A., and Moore, M.* 41
*Hypnotic Suggestion : Its Dynamics, Indications and Limitations in the Treatment of Neurosis. *Lorand, S.* 64
*Psychopathological Disorders of the Mother. *Huschka, M.* 76

Insulin Hypoglycaemia and the Electrocardiogram.

The most frequent electrocardiographic change associated with prolonged insulin hypoglycaemia is a lengthening of electrical systole. Important electrocardiographic changes do not occur during severe hypoglycaemic coma. Repeated periods of insulin hypoglycaemia do not produce persisting changes in the electrocardiogram. S. M. COLEMAN.

Alcoholics as Neurotics and Dreamers.

The case presented is a white male suffering from a deep-seated anxiety neurosis flowing out of homosexual and bisexual difficulties, alcohol being resorted to to still the anxiety. It is submitted that alcoholism is often no more than the surface expression of an underlying neurosis, the treatment of which must be directed towards the neurosis and not the alcoholism *per se.*

S. M. COLEMAN.

Hypnotic Suggestion.

Fundamentally hypnotic suggestion is based on the revival of early childhood dependence of the child on his parents. Therefore the therapist's results are due to the transference situation. The emotional state of the therapist has much influence on the attitude of the patient, upon which, in turn, depends the therapeutic achievement.

The limitations of hypnotic treatment should be recognized. For therapeutic reasons a superficial state in hypnosis is preferable. It is important that after the hypnotic treatment, follow-up therapy on a conscious level should be continued. There are some persons who may develop the faculty of being easily hypnotized. In them the "masochistic yielding" is very strong and they are the ones usually referred to as "good mediums." Hypnotic suggestion should only be practised by physicians who are aware of all its psychological implications.

S. M. COLEMAN.

Psychopathological Disorders in the Mother.

In a group of 488 problem children, 203 of the mothers, or 41·6 per cent., were found to be suffering from psychopathological conditions. Of these mothers, the 30 who were examined or treated suffered primarily from various psychoneurotic disorders. The pathology which they presented was complex, and in each case the mother's pathological state was an essential factor in the problems of the child who had been referred for psychiatric help. S. M. COLEMAN.

AUGUST, 1941.

*Blood Phosphorus in Mental Diseases. *del Roncal, F. P.* 133
*The Etiology of the Psychosis of Dementia Paralytica, with a Preliminary Report of the Treatment of a Case of this Psychosis with Metrazol. *Kenyon, V. B., and Rapaport, D.* 147
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Music—An Aid in Management of the Psychotic Patient. *Altshuler, I. M., and Shebesta, B. H.* 179
A Case of Infantilism in a Male, Cured with Hormones. *Koster, S.* 184

Blood Phosphorus in Mental Diseases.

Phosphoraemia is generally increased in epilepsy, the increase seeming to have a direct connection with the clinical state of the patient. Epileptic attacks are associated with increased phosphorus—mineral or organic—in the blood.

In neurasthenia there is a decrease in blood phosphorus, while it has a tendency to be raised in the alcoholic psychoses. S. M. COLEMAN.

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The Psychosis of Dementia Paralytica.

A case of general paresis treated with metrazol is presented. The patient had failed to respond favourably to the usual forms of specific treatment. The serological, psychiatric and psychological findings presented evidence against the interpretation of this case as one of functional psychosis with concomitant neuro-syphilis. It is concluded that the improvement in this case as a result of treatment tends to support the theory of Ferenczi and Hollos on the aetiology of general paresis. S. M. COLEMAN.

Menstruation and Seizure Incidence.

Twenty-seven, or 10 per cent. of the 269 epileptic patients in this study show a relation between menstruation and seizure incidence, both in the number of patients experiencing seizures and in the number of seizures per patient. Thirty-three, or 12·3 per cent. experienced no seizures during their menstrual periods. In the remaining group of 209, or 79·4 per cent., no relation between menstruation and seizure incidence can be demonstrated.

S. M. COLEMAN.

The Post-Concussion Syndrome.

It is concluded that the post-concussion syndrome is a clinical entity, the chief symptoms being headache, dizziness and nervousness. Certain cases showing personality changes, anti-social behaviour and narcolepsy belong to this syndrome. In differentiating this from the post-concussion neurosis, anamnesis is more important than symptoms.

The majority of cases can be cured by one or more pneumo-encephalograms, although it may be necessary to remove the adhesions in some cases by open operation. Xanthrochromic fluid obtained during the operation indicates that a cyst has been drained. The pathology is cystic arachnoiditis serosa. S. M. COLEMAN.

SEPTEMBER, 1941.

*Estrogen Therapy in the Psychoses. *Burlingame, C. C., and Patterson, M. B.* . . 265
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*Asymptomatic Vertebral Fracture in Epilepsy. *Moore, M. T., Winkelman, N. W., and Solis-Cohen, L.* 309
The Deforming Dystony: Its Kinesiologic Analysis. *Burman, M. S.* 324
A Syndrome of Time-Agnosia. *Davidson, G. M.* 336

Estrogen Therapy in the Psychoses.

Estrogen therapy has been employed as a part of the treatment programme in 139 psychoses. The most favourable results have been obtained in the depressions of the climacterium. 59 per cent. of 63 involutional psychoses and 52 per cent. of 27 manic-depressive psychotics in the depressed phase showed definite improvement, and in some cases recovery coincident with therapy. Miscellaneous psychoses and the schizophrenia of the involutional period showed no fundamental change associated with this form of therapy. S. M. COLEMAN.

Motility in Children.

A study of the motility patterns of over 200 children is reported. Typical healthy and organic patterns are indicated. It is concluded that experience with motility patterns will furnish the clinician with a simple, readily available diagnostic tool which may give definite clues even when the usual neurological examinations are essentially negative.

S. M. COLEMAN.

Asymptomatic Vertebral Fractures in Epilepsy.

Twelve epileptic patients who had severe *grand mal* seizures at some time in their past history were examined by X-ray for evidence of vertebral injury. Approximately 92 per cent. showed some form of vertebral injury, and 66 per cent. showed definite compression fractures of the thoracic and lumbar vertebrae. There have been no complaints, with one exception, which could be attributed to the vertebral injury, and no orthopaedic or neurological disturbances have eventuated from the vertebral defects.

A procedure for preventing vertebral fractures in the treatment of the psychoses by the metrazol shock method is described. In view of the apparently benign course, over many years, of epileptics who have sustained vertebral injuries during one or more convulsive bouts, the plea is made for tolerance and reserved judgment regarding the vertebral complications incident to the metrazol shock treatment. S. M. COLEMAN.

OCTOBER, 1941.

*Acute Demyelinizing Processes in the Nervous System. *Akelaitis, A. J. E., and Garvey, P. H.* 405
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*Intracranial Lesions as a Cause of Sudden Death. *Swift, E. V., and Moersch, F. P.* . 452
A Rorschach Study of Psychotic Personality in Uniovular Twins. *Kisker, G. W., and Michael, N.* 461

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Acute Demyelinizing Processes.

A clinico-pathologic study of two cases of an acute demyelinizing condition are presented. Case 1 presented the clinical picture and course of an acute encephalomyelitis with optic neuritis. Case 2 showed diffuse involvement of the C.N.S. characterized predominantly by a transverse myelitis and cranial nerve involvement. The symptoms and course were like that of neuroptico-myelitis.

The patho-anatomic study of Case 1 revealed the presence of three types of lesions in the white matter which are suggestive of the various stages in the development of a myelinoclastic plaque. In Case 2 similar patho-anatomical changes were seen, but in addition necroses were present. These are of two types: anaemic infarcts in which the arterioles and arteries are occluded, and haemorrhagic infarcts in which the lumina of the arterioles and arteries are frequently occluded.

It is concluded that in the same brain lesions characteristic of various nosological entities of a demyelinizing nature can be found. The predominance of any type of lesion depends upon the stage of the disorder at death. S. M. COLEMAN.

Toxic Psychosis due to Thiocyanate.

Thiocyanates in the treatment of hypertension having, in recent years, come into prominent use, the possibility of thiocyanates as the aetiological agent in a toxic psychosis of unknown origin should be borne in mind. It is advised that thiocyanate as well as bromide determinations should be carried out as routine in mental hospitals. S. M. COLEMAN.

Intracranial Lesions as a Cause of Sudden Death.

In a study of 22 cases in which sudden death was due to intracranial lesions it was found that 20 per cent. of all the sudden deaths in the district were due to cerebral causes. Cerebral haemorrhage was the cause in 18 cases. S. M. COLEMAN.

J. PHARMACOL.

VOL. LXXII. 1941.

*The Influence of Metrazol on the "Neurotic Pattern" in Rats. *Sacks, J., Maier, N. R. F., and Glaser, N. M.* 33

The Influence of Metrazol on the "Neurotic Pattern" in Rats.

The neurotic pattern consists of a period of violent aimless running, which may be followed by a convulsion. Several investigators have produced it by auditory stimuli. The incidence of reactors varies from 20–60 per cent. in different strains, and some refractory rats can be made to react by introduction of other psychological stimuli. The purpose of the present experiments was to determine whether the reaction is a hereditary trait present only in certain strains, or is latent in all. This was done by exposing refractory animals to auditory stimuli after a sub-convulsive dose of metrazol. The reaction can be thus produced in the majority of non-reactors. The behaviour resembles that after auditory or other psychological stimuli and differs from convulsions produced by larger doses of metrazol. The percentage of reactors is increased much more by metrazol than by purely psychological measures. The neurotic pattern evidently cannot be completely accounted for on the basis of heredity.

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

J. PSIHOTEH.

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J. SPEECH DISORDERS.

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Phenomena Resembling Aphasia, Agnosia, and Apraxia in Mentally Defective Children and Adolescents. *Jellinek, A.* 51

The Etiology of Stammering; An Examination into Certain Recent Studies, with a Glance into the Future.

Stammering is not a result of psychologic, psychiatric, or emotional disturbances, but rather the cause. The impediment itself is caused by a specific disordered action of the larynx in voice production. The employment of methods based upon the author's theory has been "attended with no failures to bring about complete and permanent eradication of the disorder at certain ages—9, 10, 11 and 12—during the past six years."

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

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KRIMINALISTIK.

VOL. XV. 1941.

Stabbing Animals as a Sexual Expression during Drunkenness. *Stein* 25

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NEUROBIOLOGICA.

VOL. III. 1940.

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NERVENARZT.

VOL. XIV. 1941.

"Sturm und Drang" in German Psychology. *Leibbrand, W.* 1
*The EEG and its Clinical Application. *Jung, R.* . . . . . 57 and 104

The EEG and its Clinical Application.

This discussion of the variations and changes of the EEG of normal persons and their bearing on the abnormal EEG is based on the literature and a personal series of 1,800 tracings. Individual variations are normal, relatively constant, and apparently inheritable. The ergotropic and trophotropic types seem to be related to physiological and formal psychological characteristics. Changes of consciousness and attention are closely related to changes in the EEG, and there are possible connections with forms of psychic experience. Correlation between personality types and individual characteristics of the EEG are not yet possible, although there seem to be connections. The pathological EEG is not sharply delimited; its criteria are dysrhythmia, localized differences in symmetrical regions, slowing of occipital rhythm, and displacement of the chief rhythm oral to the parietal region. The similarity of normal changes in fatigue and sleep with the EEG in generalized pathological brain changes (epilepsy, head trauma, and psychoses) is significant and may perhaps be due to the same mechanisms. Many abnormalities in adults resemble the child's EEG and may be regarded as undevelopment or reduction of a mature organization.

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

PROC. SOC. EX. BIOL., N.Y.

VOL. XLVII. 1941.

*Spontaneous and Reflex Emotional Responses Differentiated by Lesions in the Diencephalon. *Kessler, M. M.* 225

Spontaneous and Reflex Emotional Responses Differentiated by Lesions in the Diencephalon.

Monkeys and cats were employed in these studies. In one operation the hypothalamus was totally destroyed; in a second, this same region was ablated along with involvement of the ventromedian portion of the thalamus; in a third, unilateral destruction of the hypothalamus was accomplished; and in a fourth, unilateral destruction of the ventro-median portion of the thalamus. Where the hypothalamus is not functioning, there can be no spontaneous emotional display and stupor intervenes. In such preparations the thalamus is intact, and is able to mediate pain stimuli and to effect demonstrations of emotions on painful stimulation. As the stupor deepens, the thalamic functions are impaired and reflex emotional reactions may no longer be elicited. The ventro-median nuclei of the thalamus play an important part in the elaboration of reflex emotional responses. Partial lesions of the hypothalamus or the ventral portion of the thalamus seem to produce an unusual lability of the subject's emotional display.

H. Peak (Psychol. Abstr.).

PSYCHIAT. NEUROL. BL., AMST.

VOL. XLIII. 1939.

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PSYCHIAT. ET NEUROL. JAPONICA.

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A Critical Analysis of Insulin Therapy at Rochester State Hospital.

1. One hundred and sixty-five schizophrenics who received insulin treatment were studied. As time passed the initial total improvement rate of 62·4 per cent. levelled off to 40 per cent.

2. This corresponds very closely to the result achieved in a most unfavourable "control" group.

3. There is further correspondence between the result achieved in both of these groups and in some large non-insulin-treated groups abstracted from the literature.

4. Some criticisms of the method of recording results are offered and brief case-histories are included to explain the criticisms.

5. Insulin-treated patients whose psychoses were of less than six months' duration are compared to a non-insulin-treated group. The two groups showed a very marked resemblance to each other. Furthermore, both groups resemble larger groups abstracted from the literature.

6. The value of insulin treatment at the Rochester State Hospital has not been proven. On the contrary, considerable doubt is raised as to its value. (Author's abstr.)

The Electrocardiogram in Metrazol Therapy.

1. The writers have demonstrated that the repeated administration of metrazol does not produce any important change in the ventricular complex. There is a transient change in the S-T segment which is the result of the increase in the heart rate and which usually disappears when the rate falls to a more basic level.

2. There are no changes of any clinical importance which follow the injection of metrazol where no convulsion occurs.

3. In patients in whom metrazol has produced a convulsion there are three distinct types of arrhythmias which may be produced: (*a*) The most usual type is the phasic sinus arrhythmia. This may or may not be accompanied by periods of sinus block. (*b*) A gross irregularity in rhythm produced by the alternation of the control of the rhythm of the heart by the normal sinus pace-maker and the auriculo-ventricular nodal pacemaker. This A-V nodal rhythm follows sinus arrest. (*c*) Rarely, heart block follows the convulsion induced by this drug.

4. These arrhythmias are all manifestations of increased vagal influence, and can be reproduced in susceptible humans by the application of carotid sinus pressure, by the administration of digitalis, or by inducing changes in intracranial pressure.

5. These changes are transient, when produced by the convulsion following the administration of metrazol and have proved to be of no clinical importance in the writers' series.

6. There is no contraindication to the use of metrazol from the cardiovascular aspect in a patient with a normal heart or in a patient whose heart is slightly damaged.

7. These observations definitely show that sinu-auricular block or sinus arrest or sinus arrhythmia or auriculo-ventricular A-V nodal rhythm and, occasionally, heart block may be the results of changes in the central nervous system rather than changes in the heart muscle. (Authors' abstr.)

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A Report on a Subconvulsive Reaction to Electric Shock and its Sequelae in a Normal Subject.

An electric shock, with subconvulsive reaction, was given to a 25-year-old normal white man. His behavior and experience during the period of recovery, in which especially the Rorschach test was employed, are reported. Absence of somatic and mental complaints and presence of amnesia and of disorientation are described as the outstanding features and are briefly discussed. (Authors' abstr.)

Artificial Fever Therapy in General Paresis with Electroencephalographic Studies.

In four cases of early acute general paresis, the electroencephalogram was abnormal and was distinguished by diffuse marked involvement of the alpha rhythm and the appearance of many slow potentials.

Three cases studied before and after treatment, in which clinical remissions were obtained, showed return to near-normal electroencephalograms immediately following treatment.

In a series of ten consecutive cases which failed to obtain remissions, eight showed definitely abnormal electroencephalograms and one a borderline normal, after one to three years following treatment. In seven of the 15 cases studied, the disturbance of electrocortical function appeared to be most marked in the frontal leads. (Authors' abstr.)

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PSYCHOL. REC.

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A Factor Analysis of Verbal Ability. *Johnson, D. M., and Reynolds, F.* 183
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**Ibid.* Part II. *Wulfeck, W. H.* 326

Motor Function in the Mentally Disordered. Part I: A Comparative Investigation of Motor Function in Psychotics, Psychoneurotics and Normals.

Twenty-five adult psychoneurotics, 23 schizophrenics and 25 manic-depressives were equated as nearly as possible with a control group of 20 normal subjects. Seven different tests of motor function were used. Results were: (1) Schizophrenics showed wider differences of level of attainment than the other groups, especially in tests involving speed of movement. (2) Manics performed at higher speed levels and tended to make more errors than others. (3) Unlike the manics, the depressives did not show high perseverational tendencies; they reflected general psychomotor retardation. (4) The performances of the psychoneurotics were similar to those of the normals. (5) The speed of adjustment of the schizophrenics was most markedly affected. For experimental purposes the manic phase should be classified separately from the depressive one, and motor tests of the type used in this investigation be used to distinguish between the types here studied whenever the diagnosis is difficult.

P. S. DE Q. CABOT (Psychol. Abstr.).

Motor Function in the Mentally Disordered. Part II: The Relation of Muscle Tension to the Performance of Motor Tasks.

Tension measures taken from groups of manic-depressives, schizophrenics, psychoneurotics, and normal adults were studied with the following result: (1) All groups showed greater tension with the more difficult motor co-ordinations; (2) the patterns of the manics and the depressives were similar; (3) manic-depressives showed more tension than normals but less than the schizophrenics; (4) schizophrenics recorded a more constant increase in tension from one experimental session to another than did all other groups; (5) psychoneurotics were no different from the normals in expressed tension; (6) tension appears to be a function of the complexity of the responses demanded by the environment. P. S. DE Q. CABOT (Psychol. Abstr.).

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PSYCHOMETR. MONOGR.

1941.
*Factorial Studies of Intelligence. *Thurston, L. L., and Thurstone, T. G.* . No. 2.

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Factorial Studies of Intelligence.

The purpose of this investigation was to determine whether primary mental abilities can be isolated for children at the 14-year age level. Sixty tests, described in the second part of the monograph, were administered in 11 one-hour sessions to each of 710 subjects. Correlations of the individual tests with the several primary factors seem to lend justification for dividing the composite measure of mental endowment into separate functions. Thus each child can be described by a mental profile of six indices; these are verbal comprehension, word-fluency, space, number, memorizing, and reasoning. The reasoning or induction factor has the largest number of significant correlations, while the most independent factor seems to be memorizing, which has the smallest number of significant correlations with the separate tests. The earlier interpretation of the word-fluency factor is sustained. A psychological examination drawn from the material of the test battery is now being prepared for general use.

N. R. BARTLETT (Psychol. Abstr.).

PSYCHOSOM. MED.

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The Measurement of Individual Differences in Autonomic Balance. *Wenger, M. A.* . 427
Origin of a Whealing Response to Cold. *Abramson, H. A.* 435
Pregnancy Following the Decision to Adopt. *Orr, D. W.* 441

Brain Potentials and Morphine Addiction.

Brain potential records have been taken on a series of fifty men during maintained addiction to morphine, and on a second series of fifty men whose addiction had been terminated for at least one year.

Neither group shows alpha percentage distribution curves in agreement with those found by other workers for normal groups.

The addiction state is characterized by an abnormally high alpha output.

In some cases the high alpha index is maintained following withdrawal, while in others there is a sharp drop.

Abnormal rhythms were found in severely addicted patients and these were greatly reduced following withdrawal.

In general, a single dose of morphine in a non-addict had no appreciable effect on the cortical potentials. In one case, however, sleep rhythms were recorded when the patient was definitely not asleep.

The high alpha output was maintained during the active phase of withdrawal, in spite of a high degree of emotional tension, a factor which usually abolishes the alpha rhythm.

(Author's abstr.)

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QUART. J. STUD. ALCOHOL.

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" Adaptation " of the Central Nervous System to Varying Concentrations of Alcohol in the Blood. *Mirsky, I. A., et al.* 35
*Alcohol Addiction and its Treatment. *Bowman, K. M., and Jellinek, E. M.* . . . 98

Alcohol Addiction and its Treatment.

Chronic alcoholism and alcoholic addiction are distinguished. Reasons for drinking are reviewed and studies of the personality of the drinker redacted. A diagrammatic presentation of a classificatory system of abnormal drinkers is given. Steady drinkers are classified as primary addicts (decadent, discordant, compensating, or poverty-stricken), as stupid drinkers, and as symptomatic drinkers (schizoids, schizophrenics, or early general paretics). Intermittent drinkers are classified as irregular or periodic, with the irregular being exuberant, occupational, or of the *Stammtisch* kind (social compensating, easy-going, or promotional), and the periodic being the epileptic and epileptoid, the manic-depressive, and the hypothetical true dipsomaniacal. Treatments are reviewed, with major emphasis on psychotherapies.

W. L. WILKINS (Psychol. Abstr.).

REV. DI NEUR. E. PSYCHIAT., S. PAOLO.

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What is the Psychological Value of Descartes' Assertion that the Mind is Easier to Know than the Body. *Ferraz Alvim, J.* 65

Acoustic Agnosia.

Verbal and musical deafness are varieties of partial central deafness, the highest functions being the first affected. Pure verbal deafness depends on bilateral lesions. The left hemisphere appears to control the integration, synchronization, and symbolic use of auditory data, impressions from the right being utilizable only through the left, across the corpus callosum. The formation of verbal or musical figures depends on rapid selection of auditory impressions, which involves differential inhibitions. This is confirmed by the EEG's of aphasics, which show deficient inhibition of Berger's waves during sensory stimulation. Psychologically speaking, the result of the lesions is decreased attention (neurologically, deficient inhibition) and neuropsychic viscosity. Perception, differentiation, and holding of impressions (evanescent oral signs especially) are difficult, and the patient loses the connection. He cannot grasp wholes or condense long developments in an almost instantaneous intuition. He laboriously gathers the pieces, and by the time he gets one, the others are lost again.

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

REV. NEUROL. DI BUENOS-AIRES.

VOL. V. 1940.
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The Rorschach Method as a Means for the Determination of the Impairment of Abstract Behavior.

By asking the patient to shift his concepts, in the Rorschach test, the author finds that certain patients cannot think on an abstract level. This impairment is found in most patients with organic intracranial lesions and in some cases of dementia praecox. Rorschach records a complete inability to improve original concepts, and that such patients are unable to see new forms even when they are suggested, and are unable to change the forms which they have previously seen even when new ones are outlined to them.

R. E. HOROWITZ (Psychol. Abstr.).

SEGUNDA REUNION DI LAS JORNADAS NEURO-PSIQUIATRICAS PANAMERICANAS, LIMA.

MARCH 20–25, 1939.

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Guanidin as a Sympathetico-mimetic Suvstance.

Guanidin was found to increase the vasoconstrictor and pressor effects of adrenaline. It abolishes the vasodilative hypotensive action of small doses of adrenaline, and the oculocardiac reflex. From these facts it is considered that guanidin is a sympathetico-mimetic substance. Since the destruction of guanidin is regulated by the parathyroids, and since in cases of parathyroid insufficiency guanidin appears in blood and urine, its appearance coincides with the increase of sympathetic tone and of katabolic processes. It must, however, be remembered that this increase of sympathetic tone is in part conditioned by hypocalcaemia.

Tyramine as a Sympathetico-mimetic Substance.

Tyramine exhibits its vasoconstrictor and hypertensor properties injected into a yohimbinized dog. The sympathetico-mimetic power of tyramine in restoring the action of adrenaline may be exhibited as long as thirty minutes after a preliminary injection of adrenaline.

The Vegetative Nervous System of the Human Inhabitants of the Andes.

Electrocardiographic studies of inhabitants of high altitudes show: (1) The frequent occurrence of spontaneous brachycardia and tachycardia; (2) a paradoxical brachycardia after effort; (3) sinus arrhythmia in 70 per cent. of the cases.

The Symptomatology of the Interparoxysmal Periods in Migraine.

The author—an ophthalmic surgeon—claims that every case of migraine that he has examined has been astigmatic, and that every such case has shown in the interparoxysmal periods a vago-sympathetic syndrome characteristic of astigmatism. These disturbances of the vegetative nervous system may be summarized under the following headings: Firstly, asthenopia, photophobia, asthenia, and headaches and backaches radiating to the limbs. These symptoms are present in 90 per cent. of the cases. Secondly, in 80 to 90 per cent. of the cases, nausea and vertigo point to ear, nose and throat disturbances. Thirdly, 70 to 80 per cent. suffer from phonophobia, acroparaesthesia, and a cardiovascular syndrome. Fourthly, about 50 per cent. suffer from gastric nausea and gastro-intestinal symptoms. Fifthly, about 30 per cent. suffer from plantar causalgia, cramp, and ocular irritability. The author claims to effect a perfect cure with appropriate cylindrical lenses to correct the astigmatism.

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The Significance of Photophobia and Asthenopia.

Photophobia and asthenopia acquire their semeiological importance from the constancy with which these symptoms form part of the disturbance of the vegetative nervous system in astigmatism.

Contribution to the Study of Tachyphylaxis due to Pituitrin.

Tachyphylaxis occurs in the intact animal when successive doses of pituitrin follow one another at shorter intervals than forty minutes. It does not occur in the vagotomized dog with denervated carotid sinus. It is due to a cardiac reflex which, acting on the bulbar vasomotor centre, suppresses the hypertension that should follow a second injection.

The Mechanism of Adrenaline Apnoea.

The intensity and duration of adrenaline apnoea is directly proportional to the dose injected. It is fundamentally of reflex origin, being proportional to the increase of blood pressure. The afferent vasosensory nerves transmit the impulses aroused by the increased pressure to the respiratory centre. Denervation of the intercarotid zones suppresses the reflex.

Cerebral Changes Caused by Cardiazol Therapy.

The epileptic attacks evoked by intravenous injection of cardiazol in the rabbit cause a cerebral reaction which is manifested histologically as hyperaemia. The degree of hyperaemia appears to be proportional to the number of fits.

The Mechanisms Involved in the Production of Cardiazol Fits in Birds.

The experiments were made on both intact and decerebrated birds. Two types of fit were distinguished, characterized by the predominance of either clonic or tonic discharges. Birds depending entirely on flight for locomotion have predominantly clonic fits. The centres for the clonic and tonic movements are localized in the pontobulbar region.

Pharmacological Studies of Decerebrate Rigidity.

A study of the drugs exciting or depressing the tonic centres of the medulla in decerebrate cats and dogs.

Among excitatory drugs are considered caffein, harmin, cardiazol, coramin, and codein. In the depressor group morphine and some barbiturates are studied. The action of morphia is of special interest owing to its being transformed from a depressant to a stimulant when the tonic centres have been previously sensitized with cardiazol or caffein.

Leiasthenia and Hypochondria.

By leiasthenia is understood a general asthenia of the autonomic musculature, manifesting itself chiefly as gastro-intestinal and vascular hypotonia. The concomitant psychical symptoms are those of hypochondria. Mydriasis is a characteristic objective symptom of leiasthenia.

The Convulsive Treatment of Hysteria and Psychasthenia.

Fourteen cases of hysteria treated by cardiazol convulsions showed a complete remission in seven cases, incomplete in six, and one case was refractory. The results in cases of psychasthenia were less satisfactory. A remission was only obtained in two out of seven cases.

Diffuse Juvenile Psychotic Encephalosis.

The author claims to have isolated in schizophrenia a morbid entity that he calls diffuse juvenile psychotic encephalosis. It is claimed that the histopathology of the cortex obtained by biopsy gives support to this thesis.

SOVET. PSICHONEVROL.

VOL. XVII. 1941.
Some Neuropathological Problems in the Light of Contemporary Neurological Theory. *Rontchevski, S.* 2
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Tendencies and Prospects of a Heredo-psychological Personality Study and its Relations to the Theory of Types.

Each gene may determine the development of several characteristics, and each characteristic may result from the interaction of several genes. Individual traits develop as products of the mutual reactions between genes and plasm under unique conditions, so that the question of material carriers of heredity loses in importance. Three approaches are used to analyse the structure of personality: (1) The theory of functions, tracing the appearance of traits from the mental events which result from psycho-physical dynamics; (2) typology, which studies the general regulatory functions which together determine the relations of persons belonging to different natural groups, to their environment; (3) the theory of character structure which explains the development of individual traits irrespective of the individual's ontological type. Lenz's study uses the second approach. The author reviews numerous previous studies.

H. BEAUMONT (Psychol. Abstr.).

Heredo-Psychological Group Studies Using the Method of Integrational Typology.

The author examined 368 persons from 11 different regions in Germany with a test battery consisting of (1) a rotating disc containing a spiral to test perceptual reactions and after-images; (2) a metronome which (*a*) beats at a rate different from the natural tempo maintained by the subject in tapping and (*b*) indicates the rate at which the subject is to tap; (3) a tracing test in which the sides of a question mark cut in a metal plate may not be touched; (4) a scissor-like apparatus which the subject is required to open up as far as possible repeatedly while holding it against his chest; (5) an association test; (6) a cancellation test; (7) the Rorschach test. Results were correlated with the ontological types to which the subjects belonged (Jaensch). The author concludes that adjustment to society, social feeling and leadership qualities are determined by the organic structure. Stability of structure determines the volitional capacity and ability to follow directions. All types showed some measure of egocentricity and vanity, but these traits were differentially motivated.

H. BEAUMONT (Psychol. Abstr.).

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1. Pharmacology and Treatment.

Action of Bulbocapnine on Extrapyramidal Tract. III. Uehara, Taro. [*Japan. J. Med. Sci., 4, Pharmacol.*, 12, *Nos.* **2**, **3**, *Proc. Japan. Pharmacol. Soc.*, **13**, 86–7 (1939). (*Pub.* 1940) (*in German*).]

Injection into the brain of rabbits produces convulsions first on one side and later over the whole body. Subcutaneous injection of 100 mgm. per kg. into rabbits after extirpation of half of the cerebrum produces tremor and clonic convulsions of the whole body. Injection of 200 mgm. per kg. into decerebrate rabbits produces convulsions, increase of urine flow and defaecation. Hypokinesis, increased tendon reflexes and catalepsy occur in cats after injection of the extract into the brain. B. C. P. A. (Chem. Abstr.).

Pellagra and Glossitis; Sodium and Potassium Values in the Blood; Treatment with Sodium Chloride. Gilsanz, V., and Larregla, N. [*Z. Vitaminforsch.*, **10**, 223–8 (1940).]

In six pellagrins the blood was characterized by low values (av. 0·185 per cent.) for Na and high values (av. 0·32 per cent.) for K. Approximately the same condition existed in nine patients with deficiency glossitis. Two of the six pellagrins improved when treated with 6 gm. NaCl daily plus yeast and liver extract. Joseph S. Hepburn (Chem. Abstr.).

Effect of Nicotinic Acid on the Blood-sugar Level and its Relationship to Adrenaline Hyperglucaemia. Cherkes, L. A., and Rozenfeld, E. L. [*Biokhimiya*, **6**, 58–65 (*in English*, 66) (1941).]

Large doses (1 gm.) of nicotinic acid injected into rats cause hypoglucaemia and inhibit the course of adrenaline-induced hyperglucaemia. Small doses do not affect the blood-sugar level. T. Laanes (Chem. Abstr.).

"Adaption" of the Central Nervous System to Varying Concentrations of Alcohol in the Blood. I. Mirsky, A. Piker, P. Rosenbaum, M., and Lederer, H. [*Quart. J. Studies Alc.*, **2**, 35–45 (1941).]

In eight human subjects who had long been addicted to alcohol repeated doses of alcohol (0·25–1 gm./kgm. in 30–50 per cent. solution) were given at intervals of one or more hours. Gross signs of intoxication appeared when the blood-alcohol level reached approximately 200 mgm. per cent. The intoxication symptoms disappeared within 4–10 hours, despite the fact that the blood-alcohol level had been maintained or increased by the repeated doses of alcohol. This suggests that the central nervous system may be capable of becoming "adapted" to alcohol. The results also reflect doubt on the validity of use of blood alcohol concerned as a criterion of intoxication. Metrazole, previously recommended for treatment of alcohol coma, has been found to induce disappearance of intoxication symptoms at a blood-alcohol level higher than that from which the subject would have made a spontaneous recovery.
Marion Horn (Chem. Abstr.).

The Action Mechanism of Morphine and Heroin on Respiration with Special Consideration of Our Knowledge of the Respiratory Centre. Matumoto, Hirosi. [*Folia Pharmacol. Japon.*, **32**, 11–38 (*Breviaria* 2–4) (1941).]

In rabbits after the brain was exposed various drugs were applied locally at different levels. Sections were made to determine nerve paths. The respiratory centre was found to lie in the pons and medulla. Small doses of heroin and morphine depressed it, whereas large doses accelerated respiration. This latter effect was due to increased reflexes.
G. H. W. Lucas (Chem. Abstr.).

Gastro-intestinal Motility in the Albino Rat after Administration of Amphetamine Sulphate. Smith, Erma, and Penrod, K. E. [*Proc. Soc. Exptl. Biol. Med.*, **47**, 418–19 (1941).]

Amphetamine sulphate relaxes the stomach and small intestine, constricts the pylorus and delays the passage of material along the gastro-intestinal tract. Isolated segments of colon are stimulated by small doses and inhibited by larger doses. L. E. Gilson (Chem. Abstr.).

Antagonism of Benzedrine to the Central Depressant Effects of Morphine. Handley, Carroll A., and Abreu, Benedict E. [*Anaesthesia and Analgesia*, **20**, 212–15 (1941).]

A study of the antagonism of ephedrine sulphate, caffeine sodio-benzoate and benzedrine sulphate to the cortical and respiratory depression of morphine in rabbits showed that benzedrine was more effective than the other two in counteracting the morphine.
G. H. W. Lucas (Chem. Abstr.).

A Pharmacologic and Clinical Re-evaluation of Amphetamine Sulphate (Benzedrine). Cameron, Wm. M., and Kasanin, J. [*New Engl. J. Med.*, **224**, 544–50 (1941).]

The possible correlations between structure and action of amphetamine (1) and related compounds are discussed. (1) is less potent than adrenaline, arterenol and tyramine. Since increased length of side-chain and absence of OH groups are associated with increased toxicity, (1) may have relatively high toxicity and, until further studies have been made, other amines should be used for peripheral effects on the cardiovascular, gastro-intestinal and other systems. (1) is not sympathicotropic and should not be equated with other amines.
E. R. Main (Chem. Abstr.).

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The Site of Action of Narcotics in Respiratory Processes. Michaelis, M., and Quastel, J. H. [*Biochem. J.*, **35**, 518–33 (1941).]

The effects of chloretone (I) on the oxidations of glucose (II), Na lactate (III) and Na pyruvate (IV) in the presence of brain tissue were studied. Concentrations of (I) which effected large inhibitions of aerobic oxidations had little effect upon the anaerobic oxidations. Anaerobic glycolysis by brain was not inhibited by high concentrations of (I). Anaerobic oxidations of (II), (III) and (IV) in the presence of brain tissue and of a carrier such as pyocyanine could be followed by the ferricyanide technique. Anaerobic oxidation of (III) by ferricyanide, in the presence of crushed yeast, was followed manometrically in the absence of added carriers and was only slightly inhibited by (I). The addition of crushed yeast to skeletal muscle extract containing glycerophosphate (V) produced a narcotic-sensitive respiratory system. The following systems became highly narcotic-sensitive when a cytochrome oxidase preparation was added: liver glucose dehydrogenase, cozymase and glucose; dialyzed skeletal muscle extract, cozymase and (V). (I) did not inhibit the reduction of heart flavoprotein by reduced cozymase or the reduction of methylene blue by reduced flavoprotein. It exercised strong inhibition of the O uptake of a system composed of skeletal muscle extract, cozymase, flavoprotein, cytochrome oxidase and (III). The results suggest that (I) affects largely either a special flavoprotein or some component of the tissue respiratory system which plays an intermediate role between flavoprotein and cytochrome oxidase. E. W. Scott (Chem. Abstr.)

Studies on the Neuromuscular Junction. XXIV. The Repetitive Discharge of Mammalian Motor Nerve Endings after Treatment with Veratrine, Barium and Guanidine. Feng, T. P., and Li, T. H. [*Chinese J. Physiol.*, **16**, 143–56 (1941); *cf. ibid.*, **15**, 405, 433 (1940).]

Mammalian motor nerve endings give more or less prolonged repetitive discharges after treatment with veratrine (I), Ba or guanidine, essentially like the motor nerve endings of amphibian muscle. After intravenous injection of suitable amounts of (I) the nerve fibre in the sciatic nerve trunk also gives a prolonged, repetitive response. The ability of the motor nerve endings and nerve fibres to give repetitive discharges after (I) is entirely unaffected by additional treatment with curare; this constitutes a fundamental difference between the after-discharge produced by (I) and that caused by eserine (II). Another difference from (II) is that (I) as a rule does not produce any spontaneous discharges as (II) does, although it usually produces more abundant and prolonged after-discharges than (II). On one exceptional occasion (I) produced very intense and continuous spontaneous discharges at the motor nerve endings. These discharges were greatly increased by curare. Leonard Karel (Chem. Abstr.).

Insulin Hypoglucaemia, Especially the Metabolism and Sugar Tolerance. Nisino, Ryoiti. [*Mitt. med. Akad. Kioto*, **31**, 297–362 (*in German*), (*in Japanese*, 378–81) (1941).]

In normal adult male rabbits, which had been fastened on a restraining board, the blood sugar (I) increased from an initial value (before restraining) of 111 mgm./dl. to 146 mgm./dl. after 30 min., reached a maximum after about 2 or 3 hrs., and then gradually diminished; at the end of 5 hrs. (I) was 164 mgm./dl. The aqueous humour sugar (II) was 127 mgm./dl. after 30 min. of restraining and rose to 187 mgm./dl. after 5 hrs. The cerebrospinal fluid sugar (III) was 86 mgm./dl. after 30 min. of restraining, attained a maximum of 112 mgm./dl. and after 5 hrs. was 106 mgm./dl. The body temperature fell gradually from 38·6 to 37·3°. If the rabbits, which were fastened on the restraining board, were made as hypoglucaemic as possible by repeated injections of old insulin (Minigrin, Takeda) (total of 29 units) (acute transitory insulin hypoglucaemia), (I) fell from 149 to 55 mgm./dl., (II) from 123 to 57 mgm./dl. and (III) from 88 to 44 mgm./dl.; the body temperature fell from 38·9 to 36·9°. In chronic protracted hypoglucaemia produced by the repeated injection of protamine-Zn-insulin (Squibb) (total of 26 units) (animals not restrained), (I) fell from 156 to 29 mgm./dl., (II) from 128 to 31 mgm./dl., and (III) from 72 to 19 mgm./dl. In half the cases the body temperature fell below normal, while in the remaining animals, because of violent convulsions, it remained rather high until the sudden death of the animal. The shift in (II) and (III) upon restraining and injecting insulin was principally a secondary effect resulting from the shift in (I) and was much slower. At the end of the experiment, therefore, (II) was higher than (I), while the reverse was true at the beginning of the experiment. In insulin hypoglucaemia the metabolism was lowered very strikingly in the brain tissue and moderately so in the adrenal glands and lungs, but was slightly accelerated in the kidney cortex and was not especially changed in the liver. Chiefly the lowered metabolism of the brain (and adrenal glands) must be considered as a clinical symptom in insulin-shock therapy. During the recovery from the coma by the administration of sugar the metabolism of the organs increased in the order: (1) brain, (2) adrenal glands and lungs, (3) kidney cortex, liver and others, until the organs could again function. The optimum concentration of added glucose for the tissue respiration of the cerebral cortex, diencephalon, adrenal glands, liver, lungs and kidney cortex, was: (a) controls (normal blood sugar), 0·2, 0·2, 0·3, 0·2, 0·3, 0·2 per cent.; (*b*) acute transitory insulin hypoglucaemia, 0·3, 0·2, 0·2, 0·1, 0·2, 0·2 per cent.; (*c*) chronic protracted insulin hypoglucaemia, 0·3, 0·3, 0·3, 0·1, 0·2, 0·2 per cent. respectively. The statement of Iizuka (*J. Japan. Internal Med. Soc.*, **20**, 141 (1932); **21**, 478 (1933); **22**, 613 (1934)), that glucose is not injurious to tissue if used in concentrations up to 0·3 per cent. is confirmed. The toxic concentrations of glucose must exceed 0·5 per cent. with the exception of the liver and, in the experiments on chronic hypoglucaemia, of the lungs. During the change

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from the normal state to insulin hypoglucaemia the sugar tolerance of the cerebral tissue increases while in the adrenals (only in transitory hypoglucaemia), lungs and liver it becomes lower and in the kidney cortex it is not noticeably changed. R. BERGGREN (Chem. Abstr.).

The Effect of β-erythroidine on Metrazole Convulsions. Brown, J. R., Essex, H. E., and Moersch, F. P. [*Proc. Staff Meetings Mayo Clinic*, **16**, 264–9 (1941).]

β-Erythroidine (I) produces a curare-like flaccid paralysis when given intravenously to rabbits and dogs. In over-doses (I) produces respiratory paralysis and death. For any particular dose its effects are more consistent in dogs than in rabbits and the danger of respiratory paralysis is less. (I) can be used effectively and with reasonable safety to reduce markedly the severity, of metrazole convulsions in rabbits and dogs. The effects of (I) are counteracted by moderate doses of prostigmine; the effect begins in 30–60 secs. RUTH BERGGREN (Chem. Abstr.).

The Use of β-erythroidine Hydrochloride in Metrazole Therapy: A Preliminary Report. Williams, Jonathan M. [*Ohio State Med. J.*, **37**, 849–54 (1941).]

Erythroidine (I) is a drug with marked curare-like effects. The intravenous administration of (I) to human subjects is attended by peripheral relaxation of the skeletal muscles. The muscles innervated by cranial nerves are most susceptible; the diaphragm is least susceptible. (I) diminishes the intensity of metrazole convulsions and thus prevents vertebral compression fractures. (I) has definite toxic properties. When given too rapidly and in too concentrated a dosage (I) may seriously interfere with the conduction mechanism of the heart and cause death. Some individuals may show marked cardiac susceptibility to (I) even when it is given under carefully standardized conditions. Further study of the properties of (I) is necessary before it can be recommended unqualifiedly for general use.

R. BERGGREN (Chem. Abstr.).

The Influence of Various Pharmaceutical Agents on Metrazole Convulsions. Sibata, K. [*Hukuoka Acta Med.*, **33**, 107–16 (*in Japanese*), (*in German*, 6–7) (1940).]

In rabbits the narcotic dose (in gm./kgm.), the dose (in gm./kgm.) necessary to inhibit the convulsion produced by the subsequent injection of the minimum convulsive dose of metrazole (I) (0·025 gm./kgm.) and the duration of the convulsion-inhibiting action were: Phenobarbital (intravenous) 0·07, 0·02, 27 hrs.; pernocton (intravenous) 0·02, 0·007, 40 min.; barbital (intravenous) 0·04, 0·03, 40 min.; chloral hydrate (subcutaneous) 0·2, 0·1, 5 hrs.; and KBr (subcutaneous) 0·03, 0·015, 35 min., respectively. Scopolamine-HBr did not inhibit the (I) convulsions; it can, therefore, be used during treatment with (I). Strychnine nitrate intensified the (I) convulsions. Adrenaline-HCl and atropine sulphate intensified the (1) convulsion slightly, while pilocarpine exerted an inhibitory effect. The (I) convulsions are intensified by substances which stimulate the sympathetic system and inhibited by those which stimulate the parasympathetic system. RUTH BERGGREN (Chem. Abstr.).

A Pharmacological Study of Some New Synthetic Hypnotics. Nelson, John W., Lyster, Stanley C., and Cartland, George F. [*J. Am. Pharm. Assoc.*, **30**, 180–2 (1941).]

Eighty-seven compounds (76 described by Blicke and Centolella (*C.A.*, **33**, 1274^{5,8}), 10 preparations by Blicke and Centolella but not published, and carbromal U.S.P. (α-bromodiethylacetylurea, used as reference standard), were studied by intraperitoneal injection in rats for estimation of the therapeutic ratio (min. lethal dose/min. hypnotic dose). Six of the most promising compounds of this group were studied further by oral administration in rabbits. Only one compound (ethyl-n-butylacetamide) was found to be more active than carbromal by both tests. A. P. C. (Chem. Abstr.).

Metrazole in the Treatment of Poisoning by Barbituric Acid Derivatives. Kalliner, S., and Rudberg, T. [*Nord. Med.*, **4**, 3006–7 (1939); *Chem. Zentr.*, **1**, 1228 (1940).]

A case poisoned with 46 c.c. of somnifen completely recovered after treatment with 237 c.c. of metrazole. H. E. WIRTH (Chem. Abstr.).

The Central Origin of the Cardiotonic Action. Hukuda, T. [*Sitzber freien ärztl. Ver. med. Fakultät Kaiserl. Kyūsyū-Univ. Hukuoka* (265 *Sitzung Nov.* 22, 1938); *Hukuoka Acta Med.*, **32**, 86–7 (1939) (*in German*).]

The number and amplitude of the heart-beats decreased somewhat in most dogs (under urethan-morphine narcosis) immediately after the intravenous injection of 2·5 mgm. camphor (I) (dissolved in physiological NaCl solution) per kgm.; after a few minutes they rose to normal or above normal values. In rare cases the primary cardiac inhibition was minimal and the secondary stimulation appeared immediately after the injection of (I). (I) produced stimulation without inhibition in the arrhythmic heart observed on exposure. The effect of (I) in strengthening and regulating the action of the heart poisoned with digitalis was especially striking. (I), therefore, can exert an inhibiting or an accelerating action on the normal innervated heart. In order to investigate the central and peripheral action of (I) separately a 2-dog preparation was used, in which the head of dog B was cut from the trunk, exclusive of the spinal cord and vagus nerves, and transfused with the carotid blood of dog A. In most of the cases in which

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(I) was injected into the anastomosed carotid artery the number and amplitude of the beats increased. Occasionally, however, they decreased. In such cases the injection of (I) produced an increase in the number and amplitude of the beats after section of the vagi. The blood pressure also increased. The (I) injected into the carotid artery in this 2-dog preparation passed exclusively to the brain; here, the accelerans fibres formed the only connection between the brain and heart. The increase in cardiac action with the central use of (I) must, therefore, be connected with the stimulation of the accelerans centre (in the hypothalamus ?). Since the accelerans action of (I) is diminished if the vagus nerves remain intact, it is clear that (I) also stimulates the vagus centre and can thus cause a central cardiac inhibition. If (I) was injected into the femoral vein of the trunk isolated from the head, the amplitude of the beats always diminished. (I) exerted this same action on the isolated heart of the dog. The heart separated from the accelerans centre is, therefore, inhibited by (I). (I) evidently has a cardiotonic action only if the heart is connected with the brain, and since the increase in number and amplitude of beats appears as a result of the accelerans stimulation of the cerebral accelerans centre. Vitacamphor, cornidine (coramine), metrazole and caffeine likewise produce a cerebral promotion of the cardiac action. This, however, is influenced with varying intensity by the central vagus stimulation. With vitacamphor the vagocentral inhibition is absent, so that the cardiac stimulation appears more readily. Cornidine and caffeine produce marked vagocentral inhibition, while the central promotion of the cardiac action is not striking. Caffeine and metrazole can reinforce the normal dog heart entirely independently of the centre. The above analeptics stimulate the vasoconstrictor centre and the centre of the accelerans nerve which is functionally identical with the vasoconstrictor. The clinically established fact that the analeptics in therapeutic doses restore consciousness, strengthen the respiration and relieve hiccups indicates that their seat of action is localized chiefly in the brain. The cardiotonic action can, therefore, be considered as a local sign of the central stimulation. RUTH BERGGREN (Chem. Abstr.).

2. Biochemistry, Pathology and Physiology.

Lead Encephalopathy. Two Cases with a Hypothesis of the Biochemical Pathogenesis. Kowaloff, Irving. [*Am. J. Diseases of Children*, **61**, 547–56 (1941); *cf. C.A.*, **33**, 6959^{7}.]

No correlations were found between the degree of toxic injury and the level of Pb in the blood or degree of structural deterioration of the brain. A direct correspondence was between the Pb content of the brain and the extent of degenerative changes. The primary pathological change in the brain appeared to be a chemical disturbance induced by Pb, acting in accordance with the solubility product principle with respect to $Pb_3(PO_4)_2$, inhibits phosphorylation of dextrose, thereby interfering with the metabolism of the brain. Intravenous administration of dextrose phosphate, thiamine hydrochloride and nicotinic acid is suggested as a means of controlling the convulsions of Pb encephalopathy. E. R. MAIN (Chem. Abstr.).

Creatinine-creatine Excretion in Schizophrenics. Horvath, S. M., and Corwin, W. [*Am. J. Physiol.*, **133**, 679–85 (1941).]

Creatine is present in the urine of adult schizophrenic males. When they were on a meat-free diet, creatine was still observed in 86 per cent. of the urines examined. Creatine was found in the urine of female schizophrenics at all times. In both sexes creatinine excretion varies considerably and differs from day to day more than 20 per cent.

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

Alcohol and Epilepsy. Lennox, Wm. G. [*Quart. J. Studies Alc.*, **2**, 1–11 (*June*, 1941).]

Of 1,254 patients with epilepsy who were 15 years old or over, 26 per cent. used alcohol moderately and 6 per cent. used it to excess. These figures are not greater than for a control group of non-epileptics. Alcohol was observed to be a factor in producing seizures in 6 per cent. of the 1,254 patients, and in 21 per cent. of those who used alcohol. In the group of frequent users, 57 per cent. reported that seizures sometimes or frequently followed indulgence, especially during the "sobering-up" period. The physiological or chemical mechanism whereby alcohol produces seizures in predisposed persons in the "sobering-up" period is not clear.

MARION HORN (Chem. Abstr.).

X-Ray Diffraction Studies of Nerve Lipides. Bear, Richard S., Palmer, Kenneth J., and Schmitt, Francis O. [*J. Cellular Comp. Physiol.*, **17**, 355–67 (1941); *cf. C.A.*, **34**, 1752.]

X-ray diffraction data were obtained for individual nerve lipides, including lecithin, cephalin, sphingomyelin, kerasin, phrenosin and cholesterol, and from mixtures of these in various combinations and relative concentrations. These were investigated in the dry state and as 33 per cent. emulsions in water. Both in the dry and in the wet condition these molecules occur as bimolecular leaflets. Dry mixtures of the various lipides show limited ability to form a mixed homogeneous phase, although this tendency is increased remarkably on wetting. Cephalin-containing enulsions show particularly large identity periods. The data are useful in identifying lipides in mixtures, such as in total lipide extract of brain and in dried medullated nerve, and also in detecting impurities in preparations of pure lipides.

FELIX SAUNDERS (Chem. Abstr.).

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The Effect of Rickets and of Ergosterol on the Brain and Liver Calcium of Young Rats. Linder, Geoffry C. [*Biochem. J.*, **34**, 1574–9 (1940).]

The mean concentration of Ca in the brains of normal white rats was 4·7 mgm./100 gm. of fresh tissue. In liver it was 3·3 mgm. The brain Ca was decreased and the liver Ca unchanged in rickets produced by a high-Ca low-P diet. The brain Ca was increased in acute ergosterol poisoning. The liver Ca was also increased, partly as a result of lessened food consumption.

E. W. Scott (Chem. Abstr.).

The Local Activity Around the Skeletal Neuromuscular Junctions Produced by Nerve Impulses. Feng, T. P. [*Biol. Symposia*, **3**, 121–52 (1941); *cf. C.A.*, **32**, 6316[1], [4].]

Chiefly a discussion of the group of closely related local phenomena associated with the neuromuscular block occurring during high-frequency tetanic stimulation, i.e. with Wedensky inhibition (W.I.). W.I. can be greatly intensified and made to develop at abnormally low frequencies of stimulation by many drugs, as curare, procaine, atropine, eserine and guanidine, and many cations, of which Ca and Ba are especially interesting. There is at present no convincing ground for supposing that acetylcholine is not involved in the essential transmitting mechanism, but has merely a regulatory function. If the spike potential and the liberation of acetylcholine in the nerve endings are intimately coupled concomitant events, the least arbitrary view at present is perhaps that which allows the actions of acetylcholine and of the spike to be mutually reinforcing, forming together an exciting complex which might even include other elements, e.g., K ions.

Ruth Berggren (Chem. Abstr.).

The Metabolism of the Brain and the Humorally Active Substances of the Central Nervous System. Rubel, V. M., Frid, A. I., and Kislinskii, A. N. [*J. Physiol.* (*U.S.S.R.*), **27**, 58–69 (1939); *Chem. Zentr.*, **1**, 2497 (1940); *cf. C.A.*, **34**, 5136[1].]

Trepanned dogs were subjected to acoustic, alimentary and electrical stimulation, after which the arterial and venous blood (from the sinus sagittalis) were examined to determine the content in residual and lipoid N, the final NH_3 value and the content in NH_3-forming substances (in mgm. per cent. N). The absorption spectra in the ultraviolet region were determined and the physiological action on isolated frog hearts was studied. The results are discussed at length.

M. G. Moore (Chem. Abstr.).

Influence of Fever on the Vago-insulin and Sympathetico-adrenal Systems. Feldman, J., and Gellhorn, E. [*Endocrinology*, **29**, 141–3 (1941).]

Typhoid-paratyphoid vaccine causes a hyperglucaemia in the normal, a hypoglucaemia in the adreno-demedullated, and no change in blood sugar in the adreno-demedullated-vagotomized rat. The vaccine causes a discharge over both sympathetico-adrenal and vago-insulin systems, the effect of the former predominating. This interpretation is supported by the fact that hyperglucaemia is more marked and prolonged in the vagotomized rat when compared with the normal animal. Similar relations appear in the study of the body temperature of these animals. Whereas normal and vagotomized rats react with hyperthermia, the adreno-demedullated rats show a hypothermia in response to the vaccine. The excitation of the autonomic centres is not the result of fever but, on the contrary, variations in body temperature result from the injection of vaccine by means of its effects on the vago-insulin and sympathetico-adrenal systems.

Felix Saunders (Chem. Abstr.).

The Action of Acetylcholine on the Spinal Cord. Beritov, I. S., and Bakuradtse, A. [*Acta Med. U.R.S.S.*, **2**, 371–83 (1939); *Chem. Zentr.*, **1**, 2028 (1940); *cf. C.A.*, **34**, 8052[9].]

In spinal cats local application of acetylcholine on lateral and dorsal portions of the spinal cord produced the same effect as stimulation of the corresponding dorsal roots. However, the effect was more pronounced in the region of segments VIII–VI than in that of segments III–V, although both regions are equally sensitive to electrical stimulation. Direct stimulation of the anterior horn cells was not possible, and stimulation of the dorsolateral portion of the cord could not be successfully repeated at the same short intervals as the stimulation of the anterior roots. Moreover, a series of inhibiting effects could be detected after application of acetylcholine, which indicates that its point of attack had been transferred to the intercalated neurons. Conclusion: Acetylcholine is not to be considered as a chemical carrier of the stimulus in the spinal cord, but it only plays a role as a product of metabolism.

M. G. Moore (Chem. Abstr.).

The Distribution of Acetylcholine in the Peripheral and the Central Nervous System. MacIntosh, F. C. [*J. Physiol.*, **99**, 436–42 (1941).]

In the peripheral nervous system of the cat, the distribution of acetylcholine (I) is the same as that of cholinergic fibres. In the spinal cord of the dog (I) occurs in the grey matter, and in those parts of the white matter containing efferent axons, but not in those parts of the white matter containing only afferent axons. In the cat brain the distribution of (I) does not run parallel to that of cell bodies or synapses. The cerebral cortex, and some nuclei and tracts, are relatively rich in (I); other nuclei and tracts, relatively poor.

E. D. Walters (Chem. Abstr.).

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Pseudokalk in the Diencephalon. *Kasuga, Y.* [*Hukuoka Acta Med.*, **32**, 1789–1813 (*in Japanese*), (*in German*, 110–13) (1939).]

Pseudokalk (I) was found in 88 of 120 brains of persons 2–81 years old who had died of various diseases; in 57 cases (I) was found in the vessel walls, almost exclusively in the media of the arteries; in 80 cases (I) occurred free in the tissues. The (I) in the vessel walls occurred more frequently in the medial than in the lateral portion of the pallidum. (I) occurred most frequently in the pallidum, relatively frequently in the corpus striatum, and rarely in the cerebellum, cornu ammonis, internal capsule and thalamus. (I) was found in the cerebellum and cornu ammonis in 8 cases each of the 75 cases studied. Deposition of (I) in the vessel walls in the globus pallidus was rare in childhood, but increased in intensity and frequency with age. The free (I) in the tissues appeared to bear no relation to the age. (I) in the vessel walls was found more frequently in cancer and paralysis than in pulmonary tuberculosis, schizophrenia and summer encephalitis. The age of the patient in paralysis and the disease itself in cancer appeared to have the greater influence in the deposition of (I). The free (I) in the tissues occurred more frequently in pulmonary tuberculosis and schizophrenia than in the other three diseases. The $CaSO_4$ reaction was frequently distinctly positive in the (I). HCl caused no evolution of gas. The Kossa reaction was negative in one case, frequently partly positive and rarely wholly positive; a positive Kossa reaction was found in 36 out of 57 cases with (I) in the vessel walls and in 42 out of 80 cases with free (I). The purpurin reaction was indefinite, but an intense purpurin red coloration always appeared in cases with a strongly positive Kossa reaction. The Fe test was always positive except in cases under four years of age. In control sections (two brains with Ca deposition in the focus of softening in Japanese summer encephalitis, highly sclerosed aorta with calcification, and sublimate kidneys with distinct calcification) the Ca disappeared completely after decalcification (5–10 per cent. HNO_3 solution) for 10 min., while after prolongated decalcification (up to two weeks) (I) remained almost unchanged in colour and form in the haematoxylin preparations. After chemical removal of Ca and Fe the (I) in the haematoxylin preparation also showed the same form and colour as before treatment. Histochemically (I) is quite different from the true lime. The fat reaction (Sudan III) was positive in only one case of the ten studied. The colloid reaction of Russel and Pappenheim was indefinite. The xanthoprotein reaction was not electively distinct. The (I) and glycogen reaction and staining with mucicarmine and methyl violet were negative. At the sites of deposition of the free (I) previous changes in the ganglion cells and other histopathological changes were absent. Progressive degeneration and necrosis of the vessel wall or tissue were absent in (I) deposition in the vessel walls. (I) was found most frequently in the pallidum, in which the Fe reaction was always positive and free fat was found in the tissue. (I) is considered to be a product of the metabolism of this specific region. (I) is probably a kind of protein material of the tissue fluid. The occurrence of free (I) can be considered physiological. Certain discrepancies between these results and those of Ostertag (*Arch. path. Anat.* (*Virchow's*), **275**, 828–59 (1929)) are attributed to racial differences. RUTH BERGGREN (Chem. Abstr.).

The Oxidation of Various Sugars by Brain Tissue. *Bernheim, Frederick, and Bernheim, Mary L. C.* [*J. Biol. Chem.*, **140**, 441–4 (1941); *cf. C.A.*, **35**, 3694[6].]

The molar concentrations at which half the maximum velocity is obtained for the oxidation of glucose, mannose, maltose and fructose by washed rat brain suspension are, respectively, $1{\cdot}4 \times 10^{-4}$, $1{\cdot}4 \times 10^{-4}$, $5{\cdot}6 \times 10^{-3}$, $1{\cdot}7 \times 10^{-2}$ M. The oxidation of these sugars is inhibited by iodacetate, 2, 3, 5-triiodobenzoate and fluoride. Glucose and mannose are oxidized more slowly at pH 6·7 than at 7·8. The reverse is true for maltose and more so for fructose. Glucose and mannose can inhibit the oxidation of maltose and fructose. Arabinose, raffinose, rhamnose, galactose, xylose, trehalose, sucrose and glucosamine are not oxidized.

A. P. LOTHROP (Chem. Abstr.).

Actions of Eserine-like Compounds upon Frog Nerve-muscle Preparations, and the Blocking of Neuromuscular Conduction. *Cowan, S. L.* [*Proc. Roy. Soc.* (*London*), B, **129**, 392–411 (1940).]

In frog nerve-muscle preparations kept in Ringer solution at a temperature of 14–18° for several days, the minimum interval, at which two successive shocks produce a summated muscular response, is prolonged by eserine and eserine-like compounds and decreased by atropine and curarine. When Ringer solution of half the usual Ca content is used, the response is not decreased by an interpolated extra shock even in the presence of an eserine-like compound. Prostigmine influences but little the recovery of excitability in the nerve at the point of stimulation, but prolongs the slower peripheral recovery; this prolongation is reversed by curarine. In block of neuromuscular transmission, owing to rapidly repeated nerve stimulation, a decrease occurs in the response to direct stimulation of muscle in Ringer-soaked preparations. In transmission-block owing to curarine, muscular response to direct stimulation is not decreased by nerve-stimulation. JOSEPH S. HEPBURN (Chem. Abstr.).

Cholinesterase and the Vegetative System. *Gal. L.* [*Budap. Orv. Ujság*, **17** (1939); *Med. Klin.*, **36**, 385 (1940).]

In order to test his hypothesis on the relation between vagotony and various alterations in the functions of the organs, Gal has devised a new method of determining easily and rapidly

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the activity of the serum cholinesterase. Gal proceeds from the fact that acetylcholine affects the synaptic transmission of the impulse from the preganglionic path to the post-ganglionic organs. Acetylcholine is broken down by cholinesterase to much weaker cleavage products. Vagotony is believed to be a cholinesterase deficiency disease. Various reactions on enzyme activity have been carried out to test the functional activity of cholinesterase. The cholinesterase activity was tested qualitatively and quantitatively by means of the opalescence reaction using a Leitz nephelometer. The opalescence is caused by the formation of larger conglomerates as a result of the action of AcOH. The Tyndall effect is greatest if the magnitude of the particles and the length of the visible rays are the same. RUTH BERGGREN (Chem. Abstr.).

Influence of the Vegetative Nervous System on the Biological Properties of the Brain Metabolites. Lokshina, E. S. [*Bull. biol. méd. exptl. U.R.S.S.*, **9**, 272–4 (1940) (*in French*); *cf. C.A.*, **34**, 2449⁴.]

The tonus of the parasympathetic nervous system of dogs was elevated by injection of insulin (I) and arecoline (II). The biological activities of the blood and cerebrospinal fluid were evaluated by means of isolated frog hearts. The injection of 0·25–1 unit/kgm. body wt. of (I) into the general circulation was followed by removal of blood and cerebrospinal fluid in 1, 1·5 and 2 hrs. In 31 out of 40 cases the cerebrospinal fluid and blood issuing from the brain caused a decrease in the activity and an acceleration of the circulation of the isolated hearts. The concentrations of sugar and K+ decreased and that of Ca++ increased slightly in the blood and fluid in all cases. The injection of a total of 0·03–0·05 mgm./kgm. of (II) in 2–3 injections gave similar results in 23 out of 25 cases. Exclusion of the parasympathetic nervous system by means of a drop of 1 : 1000–1 : 10,000 atropine, followed by injection of (II), causes a disappearance of the negative ionotropic effect, and exclusion of the sympathetic nervous system by means of 1 : 200,000 ergotamine, followed by injection of adrenaline (III), causes the disappearance of the positive ionotropic effect previously obtained, and in some cases leads to a negative ionotropic effect. This biological activity is a result of more than one substance, the parasympathicomimetic substances prevailing and masking the sympathicomimetic substances which appear when the vagus is excluded by means of atropine. Boiling of the serum or cerebrospinal fluid under reflux for 5–10 min. reinforces the negative ionotropic effect, particularly in the case of the fluid. The fact that prolonged boiling in part destroys the parasympathicomimetic substances gives rise to a positive ionotropic effect which does not disappear on exclusion of the sympathetic nervous system. Ultrafiltration destroys the positive ionotropic effect. The fact that the dry residue is only slightly active indicates that the mineral constituents are not responsible for the activity. Since the substances have no effect on the dorsal muscle of the leech, they are not identical with acetylcholine. The tonus of the sympathetic nervous system of dogs was elevated by the use of thyroidin (IV), thyroxine (V) and (III). The injection of 0·025 c.c./kgm. body wt. of (IV) into the general circulation of dogs caused little effect. Doses of 0·5–1 c.c./kgm. were followed by removal of blood and cerebrospinal fluid in 4·5 and 24 hrs. Both stimulated the activity and reduced the circulation of isolated frog hearts. The concentration of sugar and Ca++ increased in the cerebrospinal fluid, while K+ decreased in the effluent blood from the brain. Similar results were obtained with 0·03–1 mgm./kgm. of (V), although 0·001–0·1 mgm./kgm. caused a weakening of heart activity, with the metabolites of the thyroid glands, and with a total of 0·02–0·05 mgm./kgm. of (III) given in three doses. Alternate exclusion of the parasympathetic and sympathetic nervous systems gave similar results as before, except that now the sympathicomimetic substances mask the activity of the parasympathicomimetic substances. After boiling for 5–10 min. the cerebrospinal fluid gave a negative ionotropic effect, while the blood serum gave first a negative and finally a positive ionotropic effect. In this case also the dry substance of the serum and cerebrospinal fluid was only slightly active. S. A. KARJALA (Chem. Abstr.).

The Relation between the Metabolism of the Brain and the Condition of the Haemato-encephalic Barrier. IV. Nitrogen Metabolism of the Brain. Kassil, G. N. [*Bull. biol. méd. exptl. U.R.S.S.*, **4**, 217–22 (1937); *Chem. Zentr.*, **1**, 419 (1940); *cf. C.A.*, **32**, 7547².]

In narcotized dogs the total N in the cerebrospinal fluid was increased. This was probably the result of the increased permeability of the haemato-encephalic barrier produced by the narcosis. Electrical stimulation of the central nervous system increased the accumulation of nitrogenous substances in the blood flowing away from the brain.

M. G. MOORE (Chem. Abstr.).

The Effect of the Products of Metabolism of the Brain on the Tone of the Smooth Muscles. Gerchikova, K. A. [*Bull. biol. méd. exptl. U.R.S.S.*, **4** (1937); *Chem. Zentr.*, **1**, 419 (1940).]

The products of metabolism in the venous blood from the brain of cats and hares, taken with the central nervous system in a condition of rest, produced a greater increase in the tone and peristalsis of the smooth intestinal musculature than was produced either by arterial blood drawn simultaneously or by the products of metabolism of the still-living brain tissue. The products of metabolism of the brain differed from acetylcholine in their manner of action.

M. G. MOORE (Chem. Abstr.).

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Biologically Active Substances of the Metabolism of the Brain. II. Gerchikova, K. A. [*Bull. biol. méd. exptl. U.R.S.S.*, **5**, 234–6 (1938); *Chem. Zentr.*, **1**, 418–19 (1940); *cf. C.A.*, **35**, 5174.]

The products of metabolism of the brain which strengthen the tone of the isolated small intestine of mammals are substances having relatively small molecules which are thermostable and are soluble in ether and in acetone. M. G. MOORE (Chem. Abstr.).

The Influence of the Neuro-vegetative System on the Character of the Brain Metabolites. Rosin, Ya. A., and Krichevskaya, E. [*Bull. biol. méd. exptl. U.R.S.S.*, **9**, 267–71 (1940) (*in French*).]

Excitation of the sinus carotid of dogs by means of an induction coil caused a sharp decrease in K ion and an increase in Ca ion in the cerebrospinal fluid. In most cases the sinusal and arterial blood also showed a decrease in K ion, but in about one-third of the cases it increased. In all cases blood Ca decreased. After development of hypertension by denervation of the reflexogenic vascular zones, K decreased in venous and arterial blood and in the cerebrospinal fluid, while in all cases Ca increased. Large increases in P in the cerebrospinal fluid were also observed. The excitation of the centres of the sympathetic nervous system causes a general excitation of the peripheal sympathetic system and the production of sympathicomimetic metabolites. The latter enter the blood stream and traverse the disturbed haematoencephalic barrier, as is indicated by the presence of a sympathicomimetic substance in the cerebrospinal fluid and a considerable increase in the Ca/P ratio.

S. A. KARJALA (Chem. Abstr.).

The Influence on the Animal of Thyroid Metabolites Injected into the Cerebral Ventricle. II. Kassil, G. N., Berkovich, E. M., and Plotitsina, T. G. [*Bull. biol. méd, exptl. U.R.S.S.*, **9**, 263–6 (1940) (*in French*); *cf. C.A.*, **34**, 523[1].]

The intraventricular injection of 0·1 c.c. of thyroid metabolites (corresponding to 3 mgm. of thyroid tissue) or 0·5 mgm. of thyroxine (I) into dogs causes an increase of 30–40 per cent. in the R.Q. in 1–1·5 hrs., which returns to normal in 24 hrs. The same effect can be obtained by intravenous injection only by the use of 9·2 c.c. (275 mgm. of tissue) of thyroid metabolites or 20 mgm. of (I). The intraventricular injection of 0·1 mgm./kgm. of (I) causes a decrease in sugar in the cerebrospinal fluid and finally in the blood in both normal and pancreatectomized dogs. This indicates that insulin plays a minor role in causing a sugar decrease in this case. Removal of the cerebrospinal fluid after (I) injection, followed by the injection of the former into rabbits, causes a reduction in blood sugar in 40 out of 50 cases. The effect is equivalent to that obtained with $\frac{1}{2}$–$\frac{3}{4}$ unit of insulin. Conclusion: The intraventricular injection of (I) causes the formation in the central nervous system of a biologically active substance, different from insulin, which causes a decrease in sugar in the cerebrospinal fluid and in the blood.

S. A. KARJALA (Chem. Abstr.).

The Direct Action of Chemical Agents on the Central Nervous System. Shtern, L. S., Cherechnev, I. A., Gromakovskaya, M. M., and Kaplan, L. E. [*Bull. biol. méd. exptl. U.R.S.S.*, **9**, 260–2 (1940) (*in French*); *cf. C.A.*, **34**, 494[1].]

The injection of 50γ of acetylcholine (I) into the lateral ventricle of dogs caused a decrease in blood K from 17 to 13 mgm. per cent. and an increase in blood sugar from 89 to 109 mgm. per cent. Blood Ca showed either no change or a slight decrease. There was an increase in the sympathicomimetic action of the blood when perfused through the isolated heart of the frog. Under the same conditions the injection of (I) into the general circulation caused a slight increase in blood K, with a slight diminution in Ca and sugar. The sympathicomimetic action of the arterial blood decreased considerably or even gave place to a parasympathicomimetic effect.

S. A. KARJALA (Chem. Abstr.).

The Production of Prolonged After-discharge in Nerve by Veratrine. Feng, T. P. [*Chinese J. Physiol.*, **16**, 207–28 (1941); *cf. preceding abstr.*]

The production of prolonged after-discharge (I) in the common amphibian sciatic nerve by veratrine is demonstrated both with the muscle as the indicator and by direct recording with the cathode ray oscillograph. In an ordinary nerve-muscle preparation a portion of whose nerve alone has been soaked in 1 : 100,000 veratrine for about 1 hr., a single shock applied to the nerve always calls forth a more or less prolonged tetanic contraction of the muscle. With oscillograph recording it is shown that the (I) can be produced in the whole range of concentration from 1 : 1,000 to 1 : 1,000,000 provided that the duration of soaking is suitably adjusted. The probable reasons for the failure of previous workers to observe the very striking (I) are indicated. The most usual duration of the (I) is about $\frac{1}{4}$ sec., but not infrequently it has been found to last as long as 40–60 sec. The frequency of the (I) at about 19° is around 100 per sec. and appears to have a high temperature coefficient of about 3. The effects on the (I) of electrolytes and pH of asphyxiation and subsequent recovery and of previous tetanic stimulation are studied. The latter two conditions are especially interesting in that while they greatly exaggerate the negative after-potential in veratrinized nerve, they diminish the (I); this demonstrates the lack of any simple relation between the (I) and the after-potential. LEONARD KAREL (Chem. Abstr.).

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Lactic Acid Oxidation Quotient of Normal Avitaminotic (B_1) Pigeon Brain. *Galvão, P. E., and Pereira, J.* [*Arquivos inst. biol. (São Paulo)*, **11**, 139–46 (1940).]

The lactic acid oxidation quotient: lactate used/lactate oxidized (lactate used, as determined chemically; lactate oxidized = O_2 uptake of ground tissue + added lactate $-O_2$ uptake of tissue × 1·34) of the brain of normal hens was about 4·0; of the brain isthmus, 4·61. The brain of avitaminotic hens had a quotient of 6·17 owing to a lowered lactate oxidation and normal lactate utilization; the oxidation quotient of the brain isthmus was 6·13.

E. S. G. Barron (Chem. Abstr.).

Cholesterol Content of Brain in Nutritional Encephalomalacia of Vitamin E-deficient Chicks. *Adamstone, F. B.* [*Arch. Path.*, **31**, 711–16 (1941); *cf. C.A.*, **35**, 5164⁵.]

In vitamin E-deficient chicks with nutritional encephalomalacia, the cholesterol content of the brain decreases markedly during the third week of life, while that of the controls increases.

M. L. C. Bernheim (Chem. Abstr.).

Blood Pantothenic Acid Values in Multiple Sclerosis. *Siegel, Louis, Putnam, Tracy J., and Lynn, John G.* [*Proc. Soc. Exptl. Biol. Med.*, **47**, 362–4 (1941).]

In six patients with advanced multiple sclerosis blood pantothenic acid was within the normal range, 19–34γ per cent. Lack of this factor is probably not involved in the etiology of the disease.

L. E. Gilson (Chem. Abstr.).

Differences in the Changes of the Peripheral Nerves and Nerve Endings in Experimental Avitaminosis. A, B, or C. II. The Change in the Peripheral Nerves. *Sekizima, Kiyosi.* [*Mitt. med. Akad. Kioto*, **31**, 475–510 (*in Japanese*) (*in German*, 681–4) (1941); *cf. C.A.*, **35**, 2181⁹.]

Neurokeratin, Schmidt-Lantermann's incisures and cylindrôconical segments are believed to form supporting apparatus in the normal medullary sheath and are not considered artificial products. In avitaminosis A, B or C the degenerative change in the nerve fibres begins in the medullary sheath and is followed by a change in the axis cylinder. The intense pathological changes of the peripheral nerves and nerve endings are most severe in avitaminosis B, less so in avitaminosis C and least severe in avitaminosis A. The changes described are an important local sign of the general nutritional or metabolic disturbance caused by avitaminosis A, B or C.

Ruth Berggren (Chem. Abstr.).

Neuropathological Findings in the Brain and Spinal Cord of Chronic Alcoholic Patients. (Relation to Avitaminosis.) *Alexander, Leo.* [*Quart. J. Studies Alc.*, **2**, 260–2 (1941).]

Most of the pathological conditions encountered in the nervous system of alcoholic patients are attributed to deficiencies of vitamins, particularly thiamine, nicotinic acid and ascorbic acid. Thus the subdural haemorrhage frequently found is probably due to vitamin C deficiency with major or minor trauma as a contributing cause or eliciting factor. The neuronitis predominantly of peripheral nerve fibres is identical with beriberi neuritis and is due to thiamine deficiency, while the neuronitis predominantly of nerve cells is identical with the central neuritis seen in pellagra and is due to nicotinic acid deficiency. The cerebellar degeneration is similar to the cerebellar degeneration seen in chicks deficient in vitamin E, but identity is not definitely established.

Marion Horn (Chem. Abstr.).

Urinary Excretion of Nicotinic Acid in Pellagrins. *Naganna, B., Giri, K. V., and Venkatesan, P.* [*Indian Med. Gaz.*, **76**, 208–10 (1941).]

By the use of a modification of the method of Harris and Raymond (*C.A.*, **34**, 3781⁶) the daily excretion of nicotinic acid (I) and nicotinamide was found to be a very low or zero as compared with a normal daily output of 3–10 mgm. of both substances combined. Normal excretion was restored after daily administration of 50 mgm. (I) when the principal pellagrous symptoms had disappeared.

Erich Kaufmann (Chem. Abstr.).

Nicotinamide, Cozymase and Tissue Metabolism. *Mann, P. J. G., and Quastel, J. H.* [*Biochem. J.*, **35**, 502–17 (1941).]

Rat brain contained an enzyme, cozymase nucleotidase (I) which destroyed the cozymase in lactic dehydrogenase-cozymase or malic dehydrogenase-cozymase systems of mammalian tissues, thereby reducing their activtiy. It was also present in rat liver and kidney. (I) was destroyed by 5 min. heating at 70°. Nicotinamide (II) greatly inhibited the action of (I) aerobically and anaerobically. (II) stimulated the lactic and malic dehydrogenase activities of tissues in the presence of (I) by competing with cozymase for the nucleotidase. The inhibition of succinic dehydrogenase of pig heart by cozymase was offset by the addition of a ground brain suspension to the system. The effect of the brain was eliminated by adding (II), which prevented the breakdown of the cozymase. The action of cobra venom in inhibiting a lactic dehydrogenase-cozymase system by destruction of the cozymase was retarded by (II). An equilibrium probably existed between the (II) and a nucleotidase in the venom. The protective action of (II) on cozymase breakdown was not shown by nicotinic acid, coramine, propionamide,

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NaF or $Na_4P_2O_7$. Muscle and yeast adenylic acid had a feeble protective action. Also in *Nature*, **147**, 326–7 (1941). E. W. Scott (Chem. Abstr.).

Mechanism of Glycolysis in the Brain of Animals in Different Stages of Ontogenesis. I. Glycolysis and Phosphoric Compounds in Poisoning with Sodium Fluoride. Khaikina, B. I. [*Biochem. J. (Ukraine)*, **16**, No. 2, 247–70 (*in Russian*, 270–2 ; *in English*, 273–5) (1940).]

There is a large amount of acid-soluble P compounds in the brain tissues of vertebrates in the embryonic and the post-natal stages ; the glycolytic activity is considerably higher than in adults. On adding glucose the lactic acid formation reaches 3,500 mgm. per cent. against 1,780 (in adults) ; with glycogen it is less, but is increased in the embryo stage. NaF retards glycolysis in all stages ; there is esterification of inorganic P into labile and difficultly hydrolyzable P compounds (I) ; the process is considerably less intense with glycogen, but in the accumulation of (I) glycogen equals glucose. NaF increases the amount of adenylpyrophosphoric acid. The experiments were made on rabbits and chickens under anaerobic conditions.

II. Effect of Monoiodoacetic Acid on Glycolysis and on the Transformation of Phosphoric Compounds. [*Ibid.*, 277–90 (*in Russian*, 290–3 ; *in English*, 293–5) (1940).]

Monoiodoacetic acid (0·005 M) strongly retards the formation of lactic acid in adult rabbits, with glucose, and in autoglycolysis ; it does not change the inorganic compounds and the labile P compounds show a tendency to rise. The same changes are observed in the embryo and in the first month of the post-natal period ; the increase of difficultly hydrolyzable P is irregular. The inhibition is related to a blocking action of the oxidation-reduction processes, causing variations of the acid-soluble P fractions. B. Gutoff (Chem. Abstr.).

Changes in the Metabolic Processes in Brain Tissues in Bromocamphor Epilepsy. Szörenyi, E. T., Kucherova, L. L., and Fuks, K. M. [*Biochem. J. (Ukraine)*, **16**, No. 2, 297–320 (*in Russian*, 320–4 ; *in German*, 324–8) (1940).]

In vitro, monobromocamphor (I) strongly retards the respiration of the brain tissue ; the effect is immediate in aqueous solution and gradual in oil (sunflower seed) ; the effect is the same on the cerebellum and on the grey and white matter of the cerebral hemispheres ; there is no effect in the absence of glucose. Succinic acid is not affected by (I). The mechanism is regarded as affecting that part of the enzyme system which oxidizes glucose. *In vivo* or *in vitro* (I) does not affect the anaerobic glycolysis ; there is no contradiction in the observed increases of lactic acid after an attack of epilepsy, since (I) also retards the Pasteur reaction. Respiration of brain section of normal and epileptic mice (*in vivo*) is the same in the presence of glucose, but is lower for epileptics in its absence, possibly because of the consumpton of the insignificant carbohydrate reserves during the attack. The NH_3 content of the finely cut-up brain is a constant magnitude, but is increased after an attack, from 10–12 mgm. per cent. to 12–17 (the individual fluctuations increase). There is a tendency to NH_3 formation in the epileptic brain from the added adenosinetriphosphoric acid ; the disturbance of the chemical functions continues even after the elimination of (I). This might be of some significance in the convulsion therapy of schizophrenia. Three widely differing poisons of the central nervous system : the catatonics, bulbocapnine and mescaline, the narcotic urethan, and (I) have the same effect on the anaerobic metabolism of the brain ; the possibility of anatomic localization appears to be excluded, but finer technique, difficult on the small animals, might give more positive results. There is also a possibility that the poisons interrupt certain stages of the oxidation, or that the specific action is not due to the inhibition of respiration, but to some other, uninvestigated processes of metabolism. Bromocamphor epilepsy is not identical with real epilepsy, but there are indications that the disturbances are similar. *In vivo*, the experiments were performed after the violent attacks which followed the intraperitoneal injections of 150–250 mgm. of 0·03 per cent. solutions of (I).

B. Gutoff (Chem. Abstr.).

The Influence of Acidosis and Alkalosis on the Physicochemical Properties of Cerebrospinal Fluid and Serum. Utevskaya, L., and Rutberg, R. [*Bull. biol. méd. exptl. U.R.S.S.*, **9**, 321–5 (1940) (*in French*) ; *cf. C.A.*, **34**, 2449[4].]

The injection of 15 c.c./kgm. body wt. of 0·5 M NaH_2PO_4 into dogs, or the inhalation of air containing a higher concentration of CO_2 than normal, causes a decrease in the pH and surface tension, and an increase in K, Ca and the K/Ca ratio in both serum and cerebrospinal fluid. Acidosis due to CO_2 causes a slight increase in the E_H of the serum, which is not changed in NaH_2PO_4 acidosis. CO_2 acidosis increases the permeability coefficient slightly, while NaH_2PO_4 acidosis decreases it sharply. Alkalosis produced by intravenous injection of 6–7 per cent. Na_2CO_3 causes an increase in electrical conductivity and permeability coefficient and a decrease in Ca in both the serum and cerebrospinal fluid. The pH increases in the serum and decreases in the cerebrospinal fluid, the E_H, K and the K/Ca ratio decrease in the serum and increase in the fluid, and the surface tension decreases in the fluid, with no change in the serum.

S. A. Karjala (Chem. Abstr.).

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Vitamin C Content of Blood and Cerebrospinal Fluid. *Booy, J.* [*Rec. trav. chim.*, **59**, 713–19 (1940) (*in English*).]

The disturbance of the distribution of the vitamin C (I) content of the body fluids may result in definite metabolic disturbances with resultant possibilities of pathological conditions. Simultaneous determinations of the (I) content of the blood and cerebrospinal fluid of 80 patients of all ages up to 80 years were made by an improved Tillmans' method. Blood determinations showed values for (I) ranging from 0·30 to 1·44 mgm. per cent. The cerebrospinal fluid values were variable (0·30–3·80 mgm. per cent.) and higher than those found in the blood. It is not believed that the (I) content of the spinal fluid decreases with age, but that it is controlled by the diminished intake of food by older people. C. R. ADDINALL (Chem. Abstr.).

Inorganic Phosphorus of Blood and Cerebrospinal Fluid of Newborn. *Okuda, S.* [*J. Oriental Med.*, **29**, 80 (1938).]

Average serum inorganic P. of 29 healthy infants was 5 mgm. per cent., that of cerebrospinal fluid 3 mgm. per cent. during the first days of life, but decreased, gradually becoming constant (1·7 mgm. per cent.) after 2–3 months. B. C. P. A. (Chem. Abstr.).

Blood Chloride and Cerebrospinal Fluid Chloride of Newborn Infants. *Okuda, S.* [*J. Oriental Med.*, **29**, 81 (1938).]

Serum Cl of 32 healthy newborn infants was 540–600 mgm. per cent.; cerebrospinal fluid Cl was 700–40 mgm. per cent. The ratio of serum Cl/cerebrospinal fluid Cl is 100 : 125.
B. C. P. A. (Chem. Abstr.).

The Theory and Practical Value of the Gold-sol Reaction. *Duensing, Friedrich.* [*Z. ges. Neurol. Psychiat.*, **169**, 471–521 (1940).]

Gold sol (I) is not precipitated by protein-free ultrafiltrates from active cerebrospinal fluids (C.S.F.) obtained from patients with paralysis, multiple sclerosis, meningitis, encephalomyelitis, tumours of the brain and spinal cord, and cerebral sclerosis. Normal C.S.F. was not activated by variation of pH. A solution of proteins from normal C.S.F. in ultrafiltrates from active C.S.F. did not precipitate (I). The addition of lipides from schizophrenic brain to normal C.S.F. did not activate it. The active principle is not thrombin or prothrombin, since inactive and active C.S.Fs. did not differ in the ability to coagulate blood. Duensing concludes from these findings that the factor with the ability to precipitate (I) in C.S.F. is in the protein fraction. Partial separation of albumin (A) from globulin (G) by selective ultrafiltration of active C.S.F. showed that activity goes with the (G) fraction. The activity is not due to higher concentrations of protein, since normal C.S.F. concerned by ultrafiltration was inactive. To avoid possible effects of salts (G) was isolated by electrophoresis (details of procedure are given) of concentrates obtained from C.S.F. by ultrafiltration. G from normal C.S.F. was inactive, but (G) from active C.S.F. was active. Active C.S.Fs. differ markedly in the type and intensity of (I) reaction; in general the most intense reaction is given in paralysis and multiple sclerosis and the least in cerebral sclerosis or tabes, with meningitis intermediate. The reaction is not of differential diagnostic value, since the same type of reaction may be obtained in diseases of different etiology. The type and intensity of response is not related to G concentration as shown by comparison of active C.S.Fs. with the same (G) and (A) concentration. The variation in response is not due to protective action of A as shown by comparison of C.S.Fs. with the same (G) but variable (A) concentration. The effect of variable dilutions on the precipitation curve is considered in detail. The concentration of protein in the C.S.F. affects the position of the (I) curve on the ordinate of dilutions but does not affect its magnitude or form. Duensing concludes that the primary factor in the precipitation of (I) by C.S.F. is the "quality" of (G) present. Coarsely dispersed (G) probably has a greater precipitating action than finely dispersed. The source of protein in C.S.F. is considered in detail. The presence of (I) precipitating (G) in normal blood serum (II) and not in C.S.F. would indicate that the source is not II, but (D) shows that a (G) fraction which does not precipitate (I) is present in (II) and believes that there is a selective secretion of this fraction in normal C.S.F. From this and other evidence Duensing believes that proteins of C.S.F are secreted from the blood both in health and in diseases of the nervous system and do not originate in nervous tissue.

WARREN M. SPERRY (Chem. Abstr.).

The Non-protein Nitrogen Content of Cerebrospinal Fluid. *Kurth, Wolfram.* [*Z. ges. Neurol. Psychiat.*, **169**, 459–70 (1940).]

The nonprotein N (N.P.N.) of the cerebrospinal fluid was determined after deproteinization with Na tungstate in 146 patients, of whom 104 had various organic diseases involving the nervous system, and 42 had mental disturbances without a recognizable organic cause. The average values found in the different diseases were between 13 and 21 mgm. per cent., i.e., the range reported by other authors as normal. Occasional values well outside this range were obtained (maximum 67·2 mgm. per cent. in cerebral arteriosclerosis), but Kurth concludes that the determination of N.P.N. in cerebrospinal fluid is of little diagnostic value.

WARREN M. SPERRY (Chem. Abstr.).

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