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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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Results of Prefrontal Lobectomy on Acquired and on Acquiring Correct Conditioned Differential Responses with Auditory, General Cutaneous and Optic Stimuli.

Dogs were conditioned to respond differentially to pairs of stimuli in three modalities. The results were compared before and after prefrontal lobectomy on several of the dogs. In general the extirpation produced no permanent effects on the conditioned responses or the conditioning process. T. G. ANDREWS (Psychol. Abstr.).

Distribution of Cortical Potentials Resulting from Insufflation of Vapors into the Nostrils and from Stimulation of the Olfactory Bulbs and the Pyriform Lobe.

When trigeminal and vagal stimulation had been eliminated and single shock stimulations of the olfactory bulbs or insufflations of odors into the nostrils were performed, action potentials from the pyriform lobe were obtained in dogs. " Single shock stimulation of the pyriform lobe evoked potentials from the ventrolateral portion of the prefrontal area and antidromically from the olfactory bulbs, but not from other cortical areas." T. G. ANDREWS (Psychol. Abstr.).

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The Oxygen Content of Cerebral Blood in Patients with Acute Symptomatic Psychoses and Acute Destructive Brain Lesions.

The cerebral arterio-venous oxygen differences were determined on three patients with mental symptoms which appeared in the course of pernicious anemia, cardiac decompensation and luetic encephalopathy. In the two patients with an extracerebral origin of the mental disturbances the oxygen content of the venous blood was subnormal, while in the patient with an intracerebral process the venous oxygen content was above the normal value.

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

These observations suggest that a determination of the oxygen content of the venous cerebral blood may indicate whether the mental symptoms are produced by inadequate oxygen supply or result from changes in the brain, provided that alterations in the rate of blood-flow do not obscure these indications. (Authors' abstr.)

Variations in the Glucose Tolerance Observations in Schizophrenics before and after Shock Treatment.

1. The majority of schizophrenic patients who improved clinically showed a significant change in their oral glucose tolerance, this change being towards the normal.

2. In the occasional case, clinical improvement did occur without any significant change in the glucose tolerance.

3. Those who did not improve or deteriorated clinically showed no change in their abnormal tolerance or it became more abnormal.

4. This change could not be attributed to the administration of insulin *per se*, nor entirely to the change in absorption of the glucose in the gastro-intestinal tract.

5. The pre-treatment glucose tolerance curves in this series of schizophrenics seem to show an abnormally prolonged period before the return to fasting levels. (Authors' abstr.)

The Effect of Pleasant and Unpleasant Ideas on the Respiratory Pattern (Spirogram) in Psychoneurotic Patients.

1. The spirogram tracings were analyzed for irregularities in pattern in a series of 64 psychoneurotic patients and 24 normal control subjects during periods of induced ideational stimuli. During the second, third and fourth periods the subjects were directed to think of pleasant, unpleasant, and again of pleasant ideas. During the first period no direction was given, and during the last period the patients were asked to relax.

2. The respiratory tracings were analyzed for sighing respirations, minor fluctuations, major fluctuations, and points off an arbitrary line for the upper and lower border of the tracings.

3. The most consistent changes were observed on comparing the unpleasant period with its preceding pleasant period. Significant changes were found in all of the items in 43 patients (Group I) with diagnoses of hysteria, anxiety neurosis and reactive depression. In the remaining 21 patients (Group II) whose diagnoses were hypochondriasis, compulsion neurosis and questionable schizophrenia, a significant change was found in only two items on comparing the tracings for the unpleasant period and its preceding pleasant period.

4. Induced unpleasant ideas were associated with an increase in sighing respirations in both groups of patients and in the control subjects. These changes were significant for patients of Group I and for the control subjects.

5. Induced unpleasant ideas were associated with significant increases in patients of Group I in upper minor fluctuations, upper major fluctuations, points off the upper line, and lower minor fluctuations.

6. No significant changes were found during the unpleasant period in any of the items for Group II patients and for the control subjects. (Author's abstr.)

The Electroshock Convulsion Syndrome.

The evidence that the electroshock convulsion syndrome is the result of integrated activity of a cortical area near the fissure of Rolando and is essentially a pyramidal tract syndrome can be summarized as follows:

1. Electrical shocks given near the fissure of Rolando are the most efficient in producing convulsions.

2. The tonic pattern looks like the result of generalized excitation of the motor cortex.

3. Pyramidal tract impairment modifies the convulsive pattern.

4. Extrapyramidal tract disease does not modify the convulsive pattern.

5. Autonomic excitation appears to be a secondary phenomenon.

6. No simple medullary syndrome occurs. The medulla seems to be responding differentially to stimulation from above.

7. The " trigger zone " of the electroshock convulsion syndrome responds to various strengths and durations of iterative stimuli, with summation to the threshold convulsive dose typical of a strength-duration curve.

8. Anticonvulsant drugs such as sodium amytal act primarily on the higher cortical levels of integration. They also increase the convulsive threshold. Therefore, the " trigger zone " is probably at a fairly high level of cortical integration.

It is further suggested that the " trigger zone " plays a central role in all convulsions, epilepsy arising when there is an overflow of excess excitation from some other area to the " trigger zone " of the convulsive syndrome. The complex character of the convulsive patterns in epilepsy may result from the modifying influence of the cerebral dysrhythmias. Loss of consciousness may be due to interference with the normal integrative balance of the cortex, rather than due to the " knocking out " of any centers. (Author's abstr.)

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Brain Lesions Associated with Experimental " Epileptiform " Seizures in the Monkey.

By means of a single application to the cerebral motor cortex of certain chemical and immunologic agents, it has been possible to produce convulsive seizures in the rhesus monkey. Of more significance than the acute manifestations observed was the state of chronic convulsive reactivity induced.

A histopathologic examination of monkeys exhibiting recurrent convulsive seizures indicated a pathologic process which was essentially that of a chronic progressive meningo-cortical cicatrix. However, a similar type of lesion was produced by control preparations, which failed to induce convulsive seizures at any time during a long observation period.

From this study it must be concluded that the pathologic changes observed were insufficient to account by themselves for the convulsive manifestations. (Authors' abstr.)

The Electroencephalogram in Post-traumatic Epilepsy.

The electroencephalograms of 175 cases of post-traumatic epilepsy and of 215 cases of head injury without epilepsy were compared. The group of head injury patients without epilepsy was subdivided into 113 cases of mild injury and 102 cases of severe injury. In all cases the electroencephalogram was taken three months or more after the injury so that only the chronic post-traumatic state was considered.

Comparisons were made between the electroencephalograms of these three post-traumatic groups, a group of 1,161 unselected epileptics and a group of 1,000 normal control subjects.

On the basis of differences between the five groups, the following conclusions are drawn with regard to the electroencephalogram in the chronic post-traumatic state:

1. Among patients with severe head injuries but no seizures, the incidence of abnormal electroencephalograms continues to decrease from three months to two years after injury.

2. Among post-traumatic epileptics there is a relatively slight decrease in the incidence of abnormalities from three months to two years after injury.

3. Mild head injuries do not greatly increase the incidence of abnormal electroencephalograms above the level encountered in the normal control series.

4. In severe head injuries without seizures, the incidence of electroencephalographic abnormalities is more than twice as high as in the normal control group.

5. After head injury, children are slightly more likely to show abnormalities than adults. They are especially likely to show focal abnormalities.

6. Focal electroencephalographic abnormality is four times as common in post-traumatic epileptics as in unselected epileptics.

7. Focal electroencephalographic abnormality correlates with focal seizures. It strongly suggests localized brain damage.

8. Focal paroxysmal electroencephalograms, i.e., those manifesting focal seizure-discharges, are twenty-one times as common among post-traumatic epileptics as among head injury patients without seizures.

9. Subjective complaints after head injury do not correlate significantly with electroencephalographic abnormalities. (Authors' abstr.)

Rapid Changes in the O_2 Tension of Cerebral Cortex during Induced Convulsions.

A relative anoxia of the cerebral cortex occurs before, during and after convulsions induced

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

electrically or by a variety of drugs. This relative anoxia is believed to be caused by increased cerebral metabolism. (Authors' abstr.)

Clinical and EEG Studies in Obsessive-Compulsive States.

(1) A series of 31 patients presenting as a dominant feature in their clinical picture obsessive-compulsive phenomena were studied clinically and electroencephalographically. Twenty-four of these cases were classifiable as psychoneurotic, obsessive-compulsive type, two as epileptic and the remaining five as schizophrenia.

(2) Twenty of the total of 31 patients, or 64 per cent., exhibited patterns which were classifiable as abnormal. Of these 20 cases 14 showed serial 2–4 cps potentials of high amplitude either before or after a two minutes' period of hyperventilation. Approximately 29 per cent. of the obsessive-compulsive patients studied exhibited records which were classified as definitely normal.

(3) The greatest incidence of records exhibiting electrocortical dysfunction occurred in the age-group below 30 years of age.

(4) Approximately 35 per cent. of the entire group gave definite positive histories of psychopathy in the family. Of the cases showing electrocortical dysfunction 40 per cent. gave positive histories, while of the patients showing no EEG abnormalities 27 per cent. gave positive family histories. (Authors' abstr.)

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Electronarcosis in Animals and in Man.

1. In man, as in animals, a state of unconsciousness (electronarcosis) can be maintained by the passage of a current through the head. In man electronarcosis has been prolonged up to thirty minutes.

2. Two forms of electronarcosis have been observed in the dog—a narcotic form, which resembles chemical narcosis, and a hyperkinetic form, which is characterized by strong motor activity.

3. In man the symptoms of electronarcosis were a mixture of symptoms of the narcotic and the hyperkinetic type of electronarcosis.

4. All symptoms studied, occurring during and after electronarcosis, were found to be completely reversible. (Authors' abstr.)

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Dystonia. II. Clinical Classification.

1. Dystonic movements and dystonic postures are symptoms of an organic nervous disease. Their occurrence alone does not enable one to make the diagnosis of a disease entity.

2. On the basis of all the available clinical data, the clinician is able to separate cases which are classifiable under well-known diseases, such as chronic epidemic encephalitis, Wilson's disease and Huntington's chorea. Neither these cases nor other cases in which appear gross lesions of known character, such as tumor, vascular lesions and birth injuries, should be included with the dystonias.

3. The diagnosis of "dystonia" should be made only in cases with the following clinical characteristics: (*a*) Selective systemic symptoms in the form of dystonic movements and postures, and (*b*) gradual development, without recognizable etiologic factors at the onset.

4. The dystonias may be further classified into the early form, with an onset at or shortly after birth; the juvenile form, with an onset between the age of 5 and 15 years, and the late form, with an onset after the age of 15. (Author's abstr.)

Delirium: (I) Electroencephalographic Data.

Psychologic and electroencephalographic studies of 53 patients with delirium of varying cause, intensity and duration revealed electroencephalographic abnormalities in all patients who had disturbances in consciousness. These changes were found to be reversible to the extent to which the clinical delirium was reversible. The character of the electroencephalographic change appeared to be independent of the specific underlying disease process, but was directly related to the intensity, duration and reversibility of the noxious factors, as modified by the basic physiologic status of the body. A correlation was established between the electrical abnormality and the primary psychologic symptom in delirium, i.e., the disturbance of consciousness, but there was far less correlation with the more personal aspects of behavior, namely, the character and expression of anxiety, the content of thought and the nature of sense deceptions. (Authors' abstr.)

Delirium: (II) Reversibility of the Electroencephalogram with Experimental Procedures.

One hundred per cent. oxygen was administered in a total of 20 experiments to 9 delirious patients with congestive heart failure and to 4 delirious patients with pulmonary decompensation. The electroencephalogram showed definite improvement in 10 experiments, probable improvement in 7 experiments, and no significant change in 3 experiments.

Three patients with congestive heart failure showed more abnormalities in the electroencephalogram when they were in the recumbent than when they were in the sitting position.

Four of 6 patients with Cheyne-Stokes respiration showed phasic variations in the electroencephalogram corresponding to the phases of respiration. The electroencephalogram improved

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during the hyperpneic phase and showed more abnormalities during the apneic phase. For 2 patients with pronounced stage IV electroencephalograms no significant changes were demonstrable.

One patient with extreme anaemia of unknown cause had a more normal electroencephalogram after blood transfusion. The hemoglobin concentration rose from 2·5 to 5·8 gm. per 100 c.c.

Two patients with Addison's disease were studied during therapy with desoxycorticosterone acetate and adrenal cortex extract. Adequate treatment with the former resulted in improvement in the electroencephalogram, but not in complete restoration to normal. Large amounts of adrenal cortical extract, sufficient to produce a significant change in the dextrose tolerance curve, resulted in further improvement in the electroencephalogram, particularly during administration of dextrose.

In the treatment of delirium correction of reversible physiologic disturbances is important.

(Authors' abstr.)

Biochemical Aspects of Glutamic Acid Therapy for Epilepsy.

The administration of dl-glutamic acid hydrochloride in amounts which benefit patients suffering from attacks of *petit mal* does not result in a significant shift of the acid-base balance of the blood. Urinalysis showed the effect of a mildly acidifying agent'; d(—)-glutamic acid was isolated from the urine of the patients.

Administration of l (+)-glutamic acid is as effective as that of dl-glutamic acid hydrochloride. These results suggest that the therapeutic effects may be ascribed to the l (+)-glutamic acid.

(Authors' abstr.)

Fatalities Associated with Electric Shock Treatment of Psychoses: Report of Two Cases, with Autopsy Observations in One of Them.

Of two patients whose deaths were associated with electric shock treatment, the first died one week after her 14th treatment in a hyperpyretic state associated with status epilepticus. The second patient died two days after his second treatment. Autopsy in the second case disclosed evidence of cerebrovascular syphilis and other changes which were possibly due to the treatment itself. However, the alterations were not sufficient to account for death. A review of some of the pertinent literature indicates that the cause of death after electric shock treatment is still obscure. Selection of patients for treatment should not be indiscriminate, especially in the face of an unpromising prognosis. Electric treatment has attendant serious dangers, and should not be given to patients with a history of vascular or cerebral disease.

(Author's abstr.)

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Effect of Glutamic Acid and Other Amido Acids on Maze Learning in the White Rat.

1. Rats fed dl-pyrrolidine carboxylic acid and rats fed neutralized dl-pyrrolidine carboxylic acid made fewer errors, required fewer trials, and learned the linear maze pattern in less time than either the aminoacetic acid-fed rats or the control rats. The differences were statistically significant.

2. The rats fed dl-pyrrolidine carboxylic acid required approximately the same time and the

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

same number of trials and made about the same number of type A errors as did the rats fed neutralized dl-pyrrolidine carboxylic acid.

3. The rats fed l-glutamic acid learned the maze in fewer trials, with fewer errors and in a shorter time than did the control rats. The differences between the measures for the former and for the latter rats were all statistically significant.

From results 1 and 3 we conclude that l-pyrrolidine carboxylic acid and l-glutamic acid acted to enhance the learning of a simple maze.

This effect could not be related to inanition. The natural glutamic acid increases the rate of formation of acetylcholine *in vitro*. (Authors' abstr.)

Specific Treatment of Psychosis due to Estrogen Deficiency.

An analysis of the previously reported use of estrogens in treatment of psychoses indicates that the therapy is specific for patients properly selected in accordance with the clinical criteria given here.

In the absence of accurate evidence of disturbances in the climacteric immediately preceding the psychosis, the chances of recovery with estrogen therapy are not better than even, although the clinical picture may be that of involutional melancholia.

If such patients are given estrogen therapy, however, their chances of prompt improvement are much better than if they receive no special treatment.

The new cases described here illustrate the difficulty of the diagnosis and the importance of a corroborative menstrual history. Five women whose menstrual histories were vague or inadequate failed to improve under treatment with diethylstilboestrol. One woman who had an agitated depression soon after a surgically-induced menopause responded dramatically to administration of the substance.

It is suggested that the term " involutional melancholia " in the *Statistical Manual*, published by the National Association for Mental Hygiene, Inc., be replaced by that of " psychosis due to estrogen deficiency." (Author's abstr.)

Biochemical Studies on Patients with Schizophrenia. Dextrose, Oxygen and Carbon Dioxide Contents of Arterial and Venous Blood from the Cranial Cavity.

The relatively low sugar content of arterial (femoral) and venous (internal jugular) blood for certain schizophrenic patients suggests a lower intracranial carbohydrate metabolism in these particular patients than in normal subjects, as determined by Gibbs, Lennox, Nims and Gibbs. On the other hand, the higher differences in the sugar contents of arterial and venous blood for certain schizophrenic patients than for normal subjects suggest a more intense carbohydrate metabolism in the former than in the latter.

In certain schizophrenic patients the intracranial oxygen metabolism is lower than in normal subjects.

The lower average venous-arterial difference in carbon dioxide content for the authors' schizophrenic patients than for normal subjects lends support to the postulate of a lower carbohydrate metabolism in certain schizophrenic patients than in normal subjects.

Their conclusions are offered with reservations, for reasons pertaining both to the method of study and to their own material. (Authors' abstr.)

Cerebral Metabolism in Hypoxia.

Chemical changes in the brain were observed in morphinized dogs breathing mixtures low in oxygen for periods of 15 to 60 minutes.

Below a critical level of 11 to 13 per cent. of oxygen in the respired air, the cerebral lactic acid increased with a decreasing supply of oxygen to the brain. The oxygen saturation of the arterial blood at the critical level was 55 to 65 per cent., and that of the cerebral venous blood 28 to 43 per cent. The level of lactic acid in the brain was independent of that in the blood.

Decomposition of phosphocreatine occurred in the cerebrum below a critical level of 7 per cent. oxygen in the respired air. The oxygen saturation of the arterial blood at this point was 23 to 35 per cent., and that of the cerebral venous blood 15 to 22 per cent. The cerebral arteriovenous difference in oxygen began to decrease at approximately this level.

Prolongation of the period of hypoxia from 15 minutes to one hour did not modify the extent of the chemical changes noted.

No decomposition of cerebral adenosine triphosphate occurred with even the most severe degrees of hypoxia studied.

Resynthesis of phosphocreatine was complete within five minutes after readmission of room air in animals with the most severe degrees of hypoxia studied. The lactic acid decreased more slowly, approaching the normal level in ten minutes after a period of breathing 7·4 per cent. oxygen, and in 46 minutes after a period of breathing 4·2 per cent. oxygen.

The electrocorticogram showed an increase in amplitude on administration of 13 per cent. oxygen, i.e., at a degree of hypoxia too mild to produce an increase in cerebral lactic acid. With 11·6 per cent. oxygen a definite slowing of the waves and a decrease in amplitude became evident. This change, therefore, occurred at the critical level for the beginning of the rise in lactic acid. (Authors' abstr.)

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

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The Nature of Transient Outbursts in the Electroencephalogram of Epileptics.

In view of the conflicting opinions which exist upon the status of the EEG in the diagnosis of epilepsy, the relationship of paroxysmal outbursts in the EEG to the presence of overt fits has been studied. Emphasis has been placed upon the more evanescent disturbances seen in the EEG, the significance of which has not previously been fully demonstrated.

The methods employed were: (*a*) In a selected subject to study the forms of paroxysmal disturbance elicited by a highly specific stimulus which had been found to induce epileptic attacks. This might determine the relationship of the most transient disturbances to epilepsy.

(*b*) In 850 subjects, divided into groups of idiopathic epileptics, patients with head injuries, neurotics, and normals, to study the incidence of larval outbursts, other transient disturbances, and other less well defined abnormality in the EEG. This would determine the relationship of these transient disturbances to overt epilepsy.

(*c*) In a highly selected group of subjects with disorders usually associated with epilepsy, but in whom a fit had not occurred before the first EEG record, to observe the presence of paroxysmal outbursts in the EEG. This might indicate the relationship of these transient disturbances to a liability to epilepsy.

The results showed that: (*a*) Even minute and evanescent disturbances might represent epileptic activity.

(*b*) Fully developed larval disturbances were not found in normal non-epileptics, with the exception of the identical twin of an epileptic, but they occurred in 27 per cent. of epileptics. Other paroxysmal outbursts occurred in 0·5 per cent. of non-epileptics compared with 29 per cent. of epileptics. Thus paroxysmal disturbances of all kinds are over 100 times as common in epileptics as in others.

(*c*) Study of the specially selected cases suggests that in them the presence of paroxysmal outbursts in the EEG indicates an inborn or acquired tendency to epilepsy.

These results have been related to previous work and to that of other investigators. This has suggested that similar changes which have been described by others in the EEG of patients with different neurological disorders indicate that a secondary change, usually associated with epilepsy, has arisen in them. In these circumstances it seems that a liability to epilepsy should be suspected even in the absence of fits. When these changes occur in an epileptic or in a patient suspected of epilepsy, they should be considered to indicate epileptic activity, and when they occur in apparently normal subjects they may be similarly suspect. As intermittent disturbances have been described in patients with an active psychosis, none of whom were included in the present investigation, these observations are limited to non-psychotic patients. With this limitation, the results seem to show that an epileptic liability, either inborn or acquired, can be demonstrated by the EEG, although the presence of actual epileptic fits depends on many factors, the basis of which is not understood. The conception of "latent" and "active" epilepsy, which has for long had clinical support, is advanced on the evidence which has been obtained from correlating clinical and electroencephalographic data. It is held that the inclusion of all these subjects under the heading of "epileptics" is undesirable, and that the application

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

of established clinical terms in this growing field should be made cautiously. With further knowledge a new nomenclature will be essential. (Author's abstr.)

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Manic-depressive Disorder and Melancholia.

Melancholia and mania are reactive and not constitutional, though once there has been an attack there is a liability for recurrence. First attacks of melancholia are nearly always due to severe prolonged mental stress; a few are due to physical diseases. Mania is the result of a mental mechanism called "crowding out." This last consists in the keeping of unpleasant thoughts out of consciousness by occupying the mind continuously and completely with other matters. Mania is also due to recent severe mental stress, but of shorter duration than in melancholia. A few cases of mania may be of organic origin. S. M. COLEMAN.

Rationale of Convulsion Therapy.

A psycho-analytical explanation of the results achieved by convulsion therapy. The study of neurosis has revealed the potent and far-reaching effects in the psyche of danger situations. The sequence of events is: Traumatic situation—anxiety—repression. The writer believes that the repeated artificial induction of an actual traumatic situation in psychotics would produce identical reactions. S. M. COLEMAN.

Trade Training Failures in the W.A.A.F.

The writer summarizes: 55 cases (77 including those noted in the addendum) of W.A.A.F. airwomen withdrawn from trade training were investigated psychiatrically and the results analysed. Failure in training was found to be due to: (1) Mental dullness, (2) neurosis, and (3) psychopathic personality. Factors in predisposition to failure have been described; in the neurotic and psychopathic group as compared with a normal group, predisposition has been shown in the proportion of 4 : 1. Factors in precipitation of failure and breakdown have been described. Suggestions for the improvement of pre-selection in the W.A.A.F. have been made. S. M. COLEMAN.

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Delvinal Sodium (Vinobarbital) in the Treatment of Epileptic States.

(1) In early and mild cases observed in out-patient clinics such as those of the *petit mal* variety, it is more effective than phenobarbital in controlling the seizures. Delvinal sodium acts more rapidly and does not produce the degree of drowsiness which follows the continued administration of phenobarbital.

(2) Institutionalized patients who do not respond well to phenobarbital react better to delvinal sodium.

(3) Because of its effect on psychomotor activity it is a valuable adjunct to other anti-convulsant drugs such as dilantin in the treatment of *grand mal* or severe motor seizures.

(4) In institutionalized epileptics of the severe type, while the seizures are not greatly diminished, the most striking effect of delvinal sodium is on the mental status. A large percentage of patients were more alert, reacted better to hospital routine and did not manifest drowsiness. Except for the three patients mentioned, confusion and toxic effects were less evident after continued administration when delvinal sodium was employed.

(5) Because of its rapid action and relatively low toxicity, the oral administration of delvinal sodium is of definite value in the treatment of serial seizures and their mental sequelae.

(6) None of the barbiturate derivatives in themselves alleviate the total symptomatology in chronic epileptics except as an adjunct to other procedures. (Authors' abstr.)

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What Are the Personality Traits of the Successful Teacher?

A personality inventory was administered to 301 teachers. The teachers were divided, on the basis of supervisors' ratings, into a group of the more successful and a group of the less successful teachers. Analysis of the responses to inventory items revealed that the more successful teachers reported themselves to be (1) more at ease in social contacts, (2) more willing to assume responsibility, (3) less subject to fears and worries, (4) more sensitive to the opinions of others, (5) slower in making decisions than the less successful teachers. The 43 items which differentiated the more from the less successful teachers were re-scored according to their degree and direction of differentiation. The total scores thus obtained were found to differentiate also "as would be expected from the manner in which the scores . . . were derived."

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Of the 301 teachers, 62 were from a group that might be expected to be better teachers; these 62 obtained higher total scores on the average than did the other 239 teachers. Each teacher was asked to indicate the degree to which he liked teaching. A significant relationship was found between expressed liking for teaching and high scores on the 43 items.

G. R. THORNTON (Psychol. Abstr.).

A Practical Clinical Test for Organic Brain Damage.

The investigation sought to devise a practical method of detecting brain damage by testing intellectual deterioration. The test battery devised included one test, the 1937 Stanford-Binet Vocabulary Test, that is relatively insensitive to brain damage, 9 interpolated tests, and 6 tests sensitive to brain deterioration. The deterioration tests involve learning and retention of new associations in both visual and auditory spheres. The subjects used consisted principally of 25 institutional patients diagnosed as having cerebral damage (D group) and 25 control subjects, mostly institutional cases, without diagnosis of brain damage (C group), the two groups being matched for age and vocabulary scores. Scores on each deterioration test as well as total deterioration score discriminate significantly (the lowest C.R. being 6.8) between C and D groups. By means of a regression equation using age and vocabulary scores, a predicted score from predicted score, the result expressed in a modified T score, yielded a measure of deterioration. This measure separated C and D groups with an overlap of only 13.5 per cent. A short form of the battery (about 15 minutes) discriminated almost as well as the long form (about 30 minutes). The correlation between scores on short and long forms was ·99. The test battery has proved useful clinically.

G. R. THORNTON (Psychol. Abstr.).

Limitations in the Use of Intelligence Test Performance to Detect Mental Disturbance.

"The Wechsler-Bellevue scale was administered to 40 morons and 80 schizophrenics, aged 30–39, and scores were compared with those of 210 controls of the same age range. Comparisons were made in terms of deviation scores expressing the performance of a patient on the individual tests relative to his own general level of performance." On the basis of the results, three diagnostic signs are tentatively suggested: (1) Adult morons display relatively low performance on arithmetic reasoning. (2) Adult schizophrenics perform relatively poorly on picture arrangement tests, and also (3) make a relatively poor showing on comprehension tests. Doubt is cast upon four other signs frequently found in the literature: (1) Relatively high vocabulary scores do not distinguish schizophrenics from morons. (2) Relatively poor scores on block designs test do not distinguish schizophrenics from morons or controls. (3) Variability from test to test does not distinguish morons from schizophrenics, although both are more variable than controls. (4) Superiority of verbal over performance scores does not characterize schizophrenics as a group, nor is the opposite distinctive of feebleminded. Extreme caution in labelling patients on the basis of test results in indicated.

G. R. THORNTON (Psychol. Abstr.).

An Experimental Study of the Pl ("Plodding") Characteristics of Persistence.

Scores were obtained for two extreme groups of college students—one composed of 30 persons rated high, the other of 30 persons rated low on Pl (patient plodding)—on several tests intended to measure Pl, and on six parts of the Bernreuter inventory, the O.S.U. Psychological Test, and point-hour ratio. Two smaller extreme groups, each composed of 14 subjects, were selected from the original groups by matching subjects for sex and psychological test scores. Sigmas, means, coefficients of variation, and critical ratios are presented for scores obtained on the several measures for the original high, low, and total groups and for the smaller high and low groups. The results lead to the following conclusions: (1) These measures differentiate subjects with high and low degrees of Pl: Point-hour ratio, lines/time on Perceptual Ability Tests (I) and (II), per cent. of time spent on Perceptual Ability Test (II) after the story becomes nonsense, Verbal Recognition Time, and Study Time Test Score. (2) There is a positive relationship between an individual's ability to do a task and the time he is willing to spend on it. (3) There are no significant differences in Bernreuter scores between persons having high and low degrees of Pl.

G. R. THORNTON (Psychol. Abstr.).

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Non-production of Hypothalamic Obesity in the Rat by Lesions Rostral or Dorsal to the Ventromedial Hypothalamic Nuclei.

Bilateral electrolytic lesions of various sizes made with the Horsley-Clarke instrument have been placed in the ventral septal region, the olfactory tubercle, the diagonal band of Broca, the medial and lateral preoptic areas, and the anterior hypothalamic area of rats. In some animals only one of these regions was damaged; in others several in combination were destroyed; and in six the lesions were so large that the entire region between the anterior commissure and the rostral edge of the median eminence, between the base and the dorsal limits of the hypothalamus or the anterior commissure, and between the internal capsule on each side, was eliminated. In two of this third group the paraventricular nuclei also were destroyed. In addition, bilateral lesions of the dorsomedial hypothalamus at the rostrocaudal level of the ventromedial hypothalamic nucleus were made. None of these series of animals became obese.

It is, therefore, assumed that cell groups of the basal forebrain rostral to the ventromedial hypothalamic nucleus make little if any contribution to regulation of fat metabolism. Whatever the mechanism, it is destruction of the cells in or near that nucleus, or of their descending fibers in the brain-stem, which causes the syndrome.

The hypothalamic lesions of a large number of monkeys which have been operated in this laboratory over a period of years have been re-examined and compared with the protocols of the corresponding animals. It is believed that indications were found that the hypothalamic lesions which cause obesity in the monkey may be about the same as the effective lesions in the rat. (Author's abstr.)

The Oculomotor Nucleus in the Human Fetus.

The cell arrangement of the oculomotor nucleus in the human fetus is described. The main cell groups present in the adult brain are clearly shown in late fetal development. The cells making up the oculomotor nucleus are small, medium-sized and large multipolar neurons.

Three groups of small cells constitute the Edinger-Westphal nucleus. The medium-sized cells form an unpaired group in the midline. The large multipolar neurons form the lateral nucleus, which is divided into dorsal and ventral parts. The majority of the neurons in the lateral nucleus send their axons into the oculomotor nerve of the same side. The axons of many neurons in the caudal half of the oculomotor nucleus cross the midline and pass through the nucleus of the opposite side before entering the rootlets of the oculomotor nerve. The processes of the median nucleus and the Edinger-Westphal nucleus are much more difficult to follow.

Some of the fibers of the oculomotor nerve are in relation to cells of the reticular formation. Cells of the mesencephalic V type are related to the oculomotor nerve. A few of these cells occur in the oculomotor nucleus and others are located along the peripheral course of the third nerve. Certain cells of the mesencephalic nucleus at the level of the oculomotor nucleus send processes toward the oculomotor nerve. These observations suggest the possible sources of proprioceptive fibers in the oculomotor nerve. (Author's abstr.)

The Course of the Striae Medullares in the Human Brain.

The striae medullares are distinct fiber bundles which lie in the floor of the fourth ventricle. When traced laterad from the rhomboid fossa three groups were observed: (1) In rostral sections a small number of fibers passes into the white matter of the cerebellum which forms the lateral wall of the fourth ventricle at that point; (2) more caudalward, a few fibers pass by way of thin bands of white matter into the peduncle of the flocculus; and (3) still farther caudad, the majority of the strial fibers enter the pontobulbar body.

Medially the striae medullares dip into the raphe, and after a complete or partial decussation pass ventrad in the raphe to the region of the arcuate nuclei; beyond this the authors were unable to trace them in their preparations due to intermingling with the ventral external arcuate

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fibers. Whether the striae consist of fibers coursing medially or laterally the authors cannot say. They are not a part of the secondary auditory system. (Authors' abstr.)

Physiologic Consequences and Anatomic Degenerations Following Lesions of the Primate Brain-stem: Plantar and Patellar Reflexes.

1. Abduction and/or extension of the hallux with or without extension and/or abduction of the toes may appear as a pathologic reflex in monkeys including *Ateles, Cercopithecus cephus* and *Macacus* (*rhesus, nemistrinus* and *irus*) as well as in the baboon.

2. No evidence could be found to indicate that abnormal plantar or patellar reflex responses are dependent upon damage of the cortico-spinal system.

3. They may, however, be produced without any evidence of paralysis, by damage to the lentiform nucleus (which produces a contra-lateral effect), damage to the mesencephalic tegmentum (which usually produces a homolateral effect), or, in the pons or medulla, damage to the area occupied by the rubro-spinal system (which produces a homolateral effect).

4. There was no conclusive evidence that extensor plantar or abnormally overactive patellar reflexes can be evoked by reticulo-spinal or vestibulo-spinal system damage.

(Author's abstr.)

The Tegmento-Olivary and Central Tegmental Fasciculi.

1. The only long myelinated descending single-neuron systems traversing the mesencephalon and proceeding caudal to the pons and located outside the pes pedunculi and medial longitudinal fasciculi are the rubro-spinal and anulo-olivary (tegmento-olivary) systems.

2. The latter is composed of fine fibers and proceeds from the anulus aquaeductus to the inferior olive.

3. There is no myelinated thalamo-olivary tract.

4. The conception of a specific "central tegmental fasciculus" as an important, descending, extrapyramidal system is untenable. The composition of the fiber accumulations to which this name has been applied varies from level to level. Apart from the anulo-olivary (tegmento-olivary) system which at some levels is partly coincidental with the fibers called central tegmental fasciculus, none of the latter belong to any significant, long, descending, myelinated, single-neuron system.

5. There is no adequate present reason for considering the anulo-olivary (tegmento-olivary) an extrapyramidal motor system, and destruction of it fails to produce any characteristic physiologic defect clearly attributable to its dysfunction. (Author's abstr.)

The Structure and Fiber Connections of the Human Habenula.

1. The human habenula is composed of five cellular groups, each of which is in connection with a special fiber tract.

2. The fiber tracts associated with the human habenula are the same as in other animals but are quantitatively less developed.

3. In addition to a hippocampo-habenular tract (medial cortico-habenular tract), there are a few fibers from the nucleus of the lateral olfactory stria. These form a lateral cortico-habenular tract.

4. The olfacto-habenular tract arises from the eminentia parolfactoria (olfactory tubercle) and from a medial and a lateral parolfactory nucleus. These nuclei respectively correspond with the medial part of Meynert's basal ganglion and the nucleus of the diagonal band and with Ganser's nucleus of the basal longitudinal bundle.

5. The septo-habenular tract originates from the medial parolfactory nucleus in the septum.

6. There are two connections with the striatum—the amygdalo-habenular tract *via* the stria terminalis, and the pallido-habenular tract.

7. The thalamus is connected with the habenula by means of thalamo-habenular (principally originating in the pulvinar) and hypothalamo-habenular fibers. There are also connections with the tectum and with the pretectum. The position of all these tracts within the stria is as follows: centrally one encounters the olfactory, dorsolaterally the amygdalo-habenular, laterally the pallido-habenular, and ventromedially the thalamic tracts. The ending of these fibers within the habenula is at sites corresponding to their position in the stria.

8. The efferent fibers in the fasciculus retroflexus are arranged in three groups: pulvinar, habenular, and commissural fibers. (Author's abstr.)

The Nerve Supply to the Pituitary of the Rat.

An investigation of pituitary innervation in the albino rat has yielded the following results:

1. The nerve supply to the posterior and intermediate lobes arises from the infundibular tract in two discrete bundles. These bundles, which course along the superior and inferior border of the pars nervosa, have been termed the superior and the inferior hypophysial fasciculus respectively.

2. Compared with the rich innervation of the posterior lobe, the nerve supply of the intermediate lobe is relatively small, and is distributed throughout widely separated areas. The nerve-endings, which may be single or forked, show definite terminal enlargements.

3. The relatively smaller innervation of the anterior lobe is derived from (*a*) the infundibular

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tract, by way of the capsular sheath; (*b*) the hypophysial fasciculi, by way of the pars intermedia; and (*c*) the small nerves accompanying the blood vessels to the anterior lobe.

4. The total number of nerve-fibers present in the pars anterior is approximately 12,000, of which the larger portion (75 per cent.) is contributed from the hypophysial fasciculi. Again, of this percentage the greater part arises from the inferior fasciculus and enters the central region of the lobe. About 20 per cent. of the total number of nerve-fibers accompany the hypophysial blood vessels, and the remainder proceed to the pars anterior from the infundibular tract.

5. The nerve-endings in the anterior lobe are in all cases single, and exhibit terminal enlargements. No evidence of pericellular nerve nets was observed in either the anterior or in the intermediate lobe. (Author's abstr.)

Degeneration in the Dog's Mammillary Body and Ammon's Horn Following Transection of the Fornix.

The fornix after entering the cephalic dorsolateral corner of the mammillary body passes caudad in the lateral border of the median mammillary nucleus to terminate when about halfway through the nucleus. Usually the fornix passes median to the lateral mammillary nucleus, but sometimes extends outward above it. The distribution of degenerated fornix fibers is apparently confined to the external portion of the median mammillary nucleus (about one-fourth of its cephalic half), although short bulgings out of degenerated fornix fibers into the lateral mammillary nucleus were noted.

The mammillo-thalamic tract leaves the median portion of the mammillary body at approximately the same level that the fornix enters it from in front. In contrast to the fornix, its terminal fibers in the mammillary body are either in the form of finger-like branches or capsular fibers. The former come from the median portion of the median mammillary nucleus (possibly three-fourths of its total area), and extend much further caudad than the fornix; while the latter come from the lateral mammillary nucleus and possibly from the caudal portion of the median mammillary nucleus. There is no evidence of the finger-like bundles encroaching into the territory of the degenerated fornix fibers.

Nissl sections through Ammon's horn disclose chromatolysis not only of all the pyramidal layer cells, but of isolated pyramidal cells in the polymorphic layer of the dentate gyrus, thus making the inferior alveus a significant component of the fornix.

The complete chromatolysis of all the pyramidal cells of Ammon's horn after transection of the fornix, the absence of more than the normal number of degenerated fibers in the fornix behind its transection, and a solid field of degenerated fibers in front of its transection, are indicative that the fornix is solely an efferent tract from the hippocampal region.

(Author's abstr.)

The Substantia Nigra and the Entopeduncular Nucleus in the Cat.

While studying the amygdala and its fiber connections, lesions were produced in kitten brains (Horsley-Clarke technique) medial to this complex. Results obtained, other than expected, appear interesting in the light of recent reports on the substantia nigra and the globus pallidus.

The cells of the substantia nigra, and of the so-called ventral tegmental area of Tsai with its included nucleus of the mammillary peduncle, disappeared in four brains with lesions in the cerebral peduncle and the ventromedial end of the internal capsule that destroyed the entopeduncular nucleus and damaged the globus pallidus. The nucleus subthalamicus, part of the mammillary body and the hypothalamus were injured in two of the above four brains, but none of these structures was involved in the remaining four brains. The combination of these results indicates that the axons of the substantia nigra are directed cephalad in the cerebral peduncle and agrees with the Marchi experiments of Ranson and Ranson ('41) and Kimmel ('42). Moreover, since the ventral tegmental area of Tsai, with the associated nucleus of the mammillary peduncle, degenerated equally well in these four brains, it seems likely that this nucleus does not contribute fibers to the mammillary peduncle, but rather that it is a part of the substantia nigra and sends its fibers forward in the cerebral peduncle.

The entopeduncular nucleus degenerated completely in one brain, although the globus pallidus remained intact following a lesion medial to the entopeduncular nucleus that extended into the fields of Forel and interrupted the pallidofugal fibers. This disappearance of the entopeduncular nucleus suggests the homology of this nucleus with the medial segment of the primate globus pallidus which Ranson and Ranson ('39) have shown degenerates after similarly placed lesions. (Authors' abstr.)

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Studies of Abnormal Behavior in the Rat. XVI. A Case of Generalized Inhibitory Neurosis.

1. Abnormal behavior characterized by extreme passivity which conforms to generally accepted criteria of abnormality has been observed in a rat. It was shown that this behavior was associated with the type of test situation to which the animal was subjected. For example, a conflict situation (one-window test) was found much more effective than a frustrating situation (no-solution problem).

2. Those situations most effective in producing the passive behavior were also most effective in producing a decrease in the level of spontaneous activity as measured by an activity wheel. The abnormality thus extended outside the experimental situation.

3. Because the abnormality was associated with the one-window test, this situation is regarded as highly stressful for the rat. (Authors' abstr.)

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Eight Cases of Section of Corpus Callosum in Individuals with a History of Epileptic Seizures: Psychological Tests.

The author presents pre-operative and post-operative test results for eight cases of section of corpus callosum. Tests used included Stanford Binet, Healy Pictorial Completion, Arthur Scale performance tests, Gates Visual Perception A1, 2, 3, and Rorschach Ink-blots. "Of the tests given only those of immediate memory show any decrease. No picture of the 'syndrome of the corpus callosum' is reflected in the test scores."

H. H. Nowlis (Psychol. Abstr.).

Patterns and Scatter of Mental Abilities in Various Psychoses.

Two hundred and sixty-nine institutionalized mental cases, including schizophrenics, paretics, manics, psychoneurotics, drug and alcoholic cases, and mentally defectives, were given the Wechsler-Bellevue intelligence test in an effort to check the effect of the various psychoses on mental ability. Results indicate that the psychotic groups did not show mental patterns essentially different from those of the control group (100 attendants) on different sub-tests of the Bellevue scale. The same data were further analyzed for scatter on different parts of the test. No greater scatter in mental abilities was found among any of the psychotic groups or the mentally deficient group than among the normal group. Present results are being supplemented by data obtained on the Bellevue vocabulary sub-test to check the Babcock theory that vocabulary does not deteriorate as do other mental functions.

H. H. Nowlis (Psychol. Abstr.).

A Rapid Test for "Deterioration" with Comparison of Three Techniques.

A test consisting of the serial subtraction of sevens from one hundred, previously standardized for mental age in school-children, was administered to 580 patients with a wide variety of psychiatric disorders. Correlation with the Babcock test (r=·702) and the Shipley-Hartford test (r=·797) suggests that serial-sevens is testing a factor more allied to the abstract thinking ability measured in the Shipley-Hartford than to the memory-learning and motor-ability items of the Babcock. Comparison of results on the three tests for progressively severe deterioration suggests that serial-sevens is a sensitive indicator of mental deterioration.

H. H. Nowlis (Psychol. Abstr.).

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

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Physiology of the Spinal Cord.

An attempt was made in four patients to alleviate by chordotomy some of the disagreeable features of motor disturbance. The writer concludes: "Anterior chordotomy is practically of no benefit in the treatment of spasticity resulting from cerebral or cord lesions because the spasticity is basically governed by spinal reflexes. . . . Section of a posterior column has failed to alleviate in any way the disorders of dystonia musculorum (one case)."

S. M. COLEMAN.

Physiology of Schizophrenic Thinking.

The writer summarizes: "This paper attempts to indicate a physiological substratum for basic disturbances of schizophrenic thought. A detailed analysis of a few excerpts from a case history allows us to differentiate symptoms indicative of a disturbance both in the structure and in the dynamics of the processes of thinking."

S. M. COLEMAN.

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

Psychoneurotics and Contraception.

The writer concludes: "Many of the failures recorded by maternal health clinics are most probably due to the use of the contraceptive pessary by psychoneurotic patients. The use of the contraceptive pessary does not in any way alleviate the sexual or other symptoms of the psychoneurotic." S. M. COLEMAN.

NOVEMBER.

*Dissolution of the Ego, Mannerism and Delusion of Grandeur. *Bak, R. C.* . . 457
*Prognosis in Schizophrenia. *Chase, L. S., and Silverman, S.* 464
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*Oxygen in Electro-Shock Therapy. *Holovachka, A.* 485
*The Guillain-Barré Syndrome. *Gayle, R. F., jun., and Groom, D.* 488
Mediate Psychotherapy and the Acute Homosexual Panic (Kempf's Disease). *Karpman, B.* 493
Dyshormonism in Psychoses and Its Correction by Shock. *Meduna, L. J.* . . . 507
Endocrine Maldevelopment in Schizophrenia. *Kerschbaumer, L.* 521

Dissolution of the Ego.

Dissolution of the personality is one of the most striking features of the schizophrenic process. Mannerisms and delusions of grandeur are reconstruction mechanisms. "The threat of the dissolution of the boundaries is met by the ego with attempts to fortify the boundaries by building up an exaggeratedly demarcated personality. Thus the schizophrenic mannerism is the manifestation of the attempted self-cure against the tendency of dissolution of the personality in the group concept." Again: "The schizophrenic models his delusions of grandeur and origin on kings, princes and aristocrats because in his childish conception these were persons who stood out in relief and were congenitally exceptional persons, sharply demarcated and apart from the masses." S. M. COLEMAN.

Prognosis in Schizophrenia.

The writers summarize: "In cases with especially favourable prognosis, shock therapy is beneficial, but when the prognosis is poor, shock-therapy is of little value. Shock therapy is found to shorten the duration of illness in patients of good prognosis, and may be the deciding factor in patients of doubtful prognosis." Short duration of illness and absence of process symptoms are the two most significant factors for favourable outcome.

S. M. COLEMAN.

Oxygen in Electro-Shock Therapy.

The administration of oxygen in electric-shock treatment is found to reduce post-therapy symptoms, including headache, cyanosis, confusion, nausea and vomiting. Respiratory distress encountered without the use of oxygen is abolished. The mode of administration of the gas is easy and does not interfere with procedure of treatments. S. M. COLEMAN.

The Guillain-Barré Syndrome.

The literature is reviewed and a case is reported in a four-year-old child. There was complete flaccid paralysis of all extremities, generalized hyperaesthesia and prostration. In the C.S.F. the total protein reached 160 mgm. per cent., the cell-count remaining below 5. Except for some muscular atrophy the child made a good recovery. S. M. COLEMAN.

DECEMBER.

*Spasmodic Torticollis. *Patterson, R. M., and Little, S. C.* 571
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*Some Aspects of Mind in Asthma and Allergy. *Brown, E. A., and Goitein, P. L.* . . 638
*Death During Sulfonamide Treatment. *Pollak, O., and Ziskind, J. M.* . . . 648

Spasmodic Torticollis.

From a study of 103 cases the authors conclude that the condition is usually of organic origin involving vestibular and extrapyramidal pathways. The psychogenic aetiology is relatively rare. There is evidence to suggest a relationship between spasmodic torticollis and encephalitis. Surgical treatment is often very satisfactory, the most effective operation being intradural rhizotomy. S. M. COLEMAN.

Electric Shock Therapy.

Of 90 schizophrenics treated, 31 are recovered and 11 improved; of 15 depressives, 11 recovered, 4 improved. Five chronic alcoholics were treated without favourable results. Dementia

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

or flattening were not observed in the recovered group. Subconvulsive shock, besides being painful and terrifying, was therapeutically ineffective. S. M. COLEMAN.

Mind in Asthma and Allergy.

It is concluded that there is a respiratory personality, whose vectors can be deduced. The asthmatic subject is of cyclothymic disposition associated with paranoid features, repressed hostility and self-punishment motives. S. M. COLEMAN.

Death during Sulfonamide Treatment.

The writer summarizes: "A case of lupus erythematosis treated with sulfonamides is reported, with autopsy finding of emboli of necrotic cells in the brain. The cells are most probably liver cells carried to the brain by the blood circulation." It is noted that there is danger in administering sulfonamides to patients with lupus erythematosis or this disease associated with arthritis and rheumatic fever. S. M. COLEMAN.

VOL. XCIX. JANUARY, 1944.

*Neuropathological and Psychopathological Implications of Bilateral Prefrontal Lobotomy. *Kisker, G. W.* 1
The Human Pyramidal Tract. VII. A Critical Review of Its Origin. *Lassek, A. M.* . 22
*Constitutional Analysis. A Case Study. *Freyhan, F. A.* 29
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*Traumatic Psychosis: A Questionable Disease Entity. *Moros, N.* 45
*Studies in Subconvulsive Electric Shock Therapy. Effect of Varied Electrode Applications. *Gottesfeld, B. H., Lesse, S. M., and Herskovitz, H.* 56
*Homosexuality: Biological Anomaly. *Williams, E. G.* 65
A Note on the First Demonstration of an Intracranial Foreign Body by Roentgen Rays. *Pilcher, C.* 71

Bilateral Prefrontal Lobotomy.

Twenty patients were subjected to operation, of whom 50 per cent. showed some degree of improvement; 35 per cent. were unchanged. In so far as intelligence is concerned, there is essentially no measurable impairment following operation. The writer lists the following behaviour changes in the post-operative state: Somnolence, motor automatisms, lack of restraint, facetiousness and tactlessness. Some showed a pathological degree of euphoria, others disturbances of the time, space and body-schema. S. M. COLEMAN.

Constitutional Analysis.

Anamnesis of a woman of 34 suffering from recurrent mania, is followed by a detailed constitutional analysis, under the sub-headings genotypical factors, temperament, sexuality and egodynamics. The study is an attempt to evaluate the quantitative and qualitative relationship of genotypical and paratypical factors to one another in their production of this patient's characteristics and present mental situation. S. M. COLEMAN.

Traumatic Psychosis.

Of 41 traumatic psychotics, 17 traced their mental disorder to a head injury allegedly received in the first World War. This study indicates that in the majority of cases there was sufficient evidence pointing to some basic mental disorder which was only incidentally associated with the trauma. It is concluded that the diagnosis traumatic psychosis as a disease entity is not warranted. The diagnostic label should indicate the primary condition and the presence of the traumatic factor. S. M. COLEMAN.

Subconvulsive Electric Shock Treatment.

Of 24 cases, of the affective psychoses, none showed improvement on subconvulsive treatment. S. M. COLEMAN.

Homosexuality: A Biological Anomaly.

Feminine male homosexuals differ from other males in that the usual decrease in serum cholinesterase following prostigmine does not occur. The masculine male homosexuals studied are probably facultative in their anomaly. S. M. COLEMAN.

FEBRUARY.

*Unusual Congenital Anomalies of the Lumbo-Sacral Spine (Spina Bifida) with a Report of Three Cases. *Meredith, J. M.* 115
*Neurotic Components in Psychopathic Behavior. *Caldwell, J. M.* 134
*Responses of Schizophrenic Patients to Induced Anoxia. *Corwin, W., and Horvath, S. M.* 149
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*The Incidence of Bromism at Warren State Hospital. *Kippen, A. A.* 168

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

A Reaction Around Cerebral Vascular Lesions and Its Bearing on Cerebral Localization. *Alford, L. B.* 172
The Closeup of Psychosexual Gratification. *Eliasberg, W.* 179

Anomalies of the Lumbo-sacral Spine.

Three unusual cases of lumbo-sacral spina bifida are presented: (1) Very extensive spina bifida occulta in a six-year-old girl with pronounced bladder difficulty as her chief complaint. The essential lesion was the adherence of a number of strands of the cauda equina to the dura at S2 vertebral level. (2) An adherent conus medullaris (to the dura at S2 vertebral level) in a very tall man, aged 22, with marked symptoms of cauda equina involvement. (3) A large congenital tumour of the cauda equina (cholesteatoma) in a thirteen-year-old girl in whom a simple meningocele, immediately caudal to the tumour, had been repaired ten years previously.

S. M. COLEMAN.

Psychopathic Behavior.

Analysis of psychopathic personality in 30 cases showed that the most common traits involved social delinquency, frequent change, rationalization, emotional immaturity, lack of judgment, lack of responsibility, drug addiction and callousness. Psychogenic motivation was demonstrated in only 9 cases. Neurotic personality traits and neurosis were frequent. The family history was considered as neuropathic in 23 cases. It is felt that a broken home is the most important single contributing factor to the development of psychopathic behaviour. It would seem from the evidence that environmental factors play a greater part in the development of psychopathy than do congenital factors.

S. M. COLEMAN.

Responses to Induced Anoxia in Schizophrenics.

Ten chronic schizophrenics were exposed to the inhalation of a gaseous mixture containing low percentages of oxygen. There were no permanent ill-effects and there was no change in the mental state.

S. M. COLEMAN.

Incidence of Bromism.

Bromide determination in 1,000 consecutive cases at the Warren State Hospital are reported. 12·3 per cent. showed bromides in serum levels of 25 to 400 mgm. per cent., whereas 2·6 per cent. were in the toxic range over 150 mgm. per cent. Bromide psychoses were present in about one-third of the cases in the toxic range, a total incidence of 0·8 per cent.

S. M. COLEMAN.

MARCH.

*The Anterior Cerebral Artery in the Macaque Monkey (*Macaca mulatta*). *Campbell, J. B., and Forster, F. M.* 229
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*Variations of Blood Diastase and Glucose in Depression. *Roberts, C. S., Turner, W. J., and Huddleson, J. H.* 250
*Vertebral Fractures in Metrazol Therapy With and Without the Use of Curare as a Supplement. *Easton, N. L., and Sommers, J.* 256
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Electricity as a Pathogenetic Agent in the Central Nervous System. *Ostow, M.* . . 270
The Symbolic Identification Test. *Goitein, P. L.* 279
Experimental and Clinical Studies with Methyl Guanidine Sulphate. *Madden, J. J., and Kaplan, L. A.* 285
A Contribution to the Differential Diagnosis of Myoclonus. *de Jong, H., and Jacobs, L.* . 290

Anterior Cerebral Artery in Macaque.

Ligation of the anterior cerebral artery gives rise to widespread clinical and pathological changes. Occlusion at genu results in retardation, underactivity, prehensile difficulty, weakness of legs and positive Babinski. With occlusion at confluence the signs are as above, but are more marked. In addition postural changes are evoked. Occlusion at the origin results in coma, followed by stupor and finally underactivity. The gross and microscopic pathological changes are also described.

S. M. COLEMAN.

Blood Diastase and Glucose in Depression.

Quantitative determinations of blood glucose and diastase have been related to certain of the manifestations of depression. Increases of blood glucose are related to increases in "voice loudness," "speech rate," and increasing sadness as judged from facial expression. Blood diastase activity is related to a decrease in "voice loudness" and an increase in apathy.

S. M. COLEMAN.

Vertebral Fractures in Metrazol Therapy.

In a series of 800 cases a fracture incidence of 26·1 per cent. was found. They are about twice as frequent in males as in females and are greatest in those under 21. All fractures occurred

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

in the dorsal spine, and only vertebral bodies were involved. Kyphosis, scoliosis, arthritis, nuclear change and old fractures are no contraindication to metrazol therapy. Osteoporosis is a definite contraindication to the use of metrazol alone. In a series of 275 cases treated with curare, the incidence of fractures showed a marked drop (5·8 per cent.).

S. M. COLEMAN.

APRIL.

*Psychoneurological Problems Related to the Surgical Transection of the Prefrontal Association Areas in Man. *Kisker, G. W.* 343
Observations Bearing on the Presence of Latent Herpes Simplex Virus in the Human Gasserian Ganglion. *Richter, R. B.* 356
*Biochemical Component of the Manic-depressive Psychosis. *Baird, P. C., jun.* . . 359
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*Psychiatric Reactions to the War as seen in Civilians and Soldiers Referred to a Mental Hospital. *Prout, C. T.* 389
*Electric Shock Therapy in Involutional Psychoses. *Davidoff, E., and Raffaele, A.* . 397
Mr. Jacks and His "Brain Myth." *Mulford, H. J.* 406

Prefrontal Association Areas in Man.

It appears that the principal neural tracts affected by bilateral prefrontal lobotomy are those making up the corticothalamic system, particularly the anterior thalamic peduncle. Histopathological investigation has indicated that there is a certain amount of cellular degeneration back to the medial thalamic nuclei, with occasional partial lobar atrophy of the prefrontal poles. There is reason to believe that an important consideration in the behavioural modifications accompanying lobotomy is the disruption of the neural chain consisting of the prefrontal association areas, the thalamus and the cerebello-pontine centres. The alterations in behaviour may be considered to be a reflection of underlying changes in motoric identification which constitute the substructure of both postural set and social attitudes. S. M. COLEMAN.

Biochemical Component of the Manic-depressive.

Seven adrenalectomized cats were studied as control. These received intraperitoneal injections of Ringer's solution and of the citrated whole blood of healthy subjects. The average duration of life of these controls was four days. Eleven adrenalectomized cats receiving citrated whole blood of manic patients lived on an average eleven days. These experiments provide biological evidence that the blood of manic patients may differ from the blood of healthy subjects.

S. M. COLEMAN.

Picrotoxin in Barbiturate Poisoning.

Two cases of barbiturate poisoning treated with picrotoxin are presented. It was found that respiratory failure necessitating artificial respiration did not occur after the administration of this drug was begun. S. M. COLEMAN.

Psychiatric Reactions to the War.

Forty-one patients showing psychiatric reactions attributable to the war or war effort are reviewed. The observed symptom-complexes were not distinguishable from those observed in peace-time admissions. The prevalence of a predisposing heredity was noteworthy.

S. M. COLEMAN.

Electric Shock in Involutional Psychoses.

From experience with 30 patients it is concluded that electroshock is the most useful form of therapy in the severe types of involutional melancholia. It should be combined with psychotherapy and administration of sex hormones. Those cases of long duration, those with severe schizoid or paranoid trends and those with arteriosclerotic features did not respond favourably.

S. M. COLEMAN.

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Pathological Considerations of Contusion of Cauda Equina. *Hassin, G. B.* . . . 172
Effects of Implantation of Methylcholanthrene in the Brain of the Dog. *Bailey, P., et al.* 184
The Human Pyramidal Tract. *Lassek, A. M.* 189

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

Experimental Studies on Electro-shock Treatment: The Intracerebral Vascular Reaction as an Indicator of the Path of the Current and the Threshold of Early Changes within the Brain Tissue.

1. Electric shocks varying from 60 to 2,000 milliamperes flowing for times varying from two-fifths of 1 second to 10 seconds were administered to cats, through electrodes measuring 100 mm.^{2}, applied to the temples. The site of the electrodes upon the skull corresponded to the anterior suprasylvian gyrus and small adjacent parts of the remainder of the fronto-cruciate lobe of the left and the right hemisphere.

2. With single shock doses of 500 to 1,800 milliamperes arteriolar vasoconstriction with blanching of the capillary bed, still noticeable at times varying from 5 minutes to 1½ hours after the shock, could be produced within the path of the current through the brain, where the maximum current density was 5 to 18 milliamperes per square millimeter of the diameter of the path. A shock dose of 300 milliamperes produced only a brief period of arteriolar vasoconstriction and blanching, noticeable within the path of the current 4 minutes, but not one-half hour after the shock. No vascular and perivascular changes following shocks with similar currents (350–450 milliamperes) were seen 1, 3 and 7 days after the shock.

3. With shock doses of 2,000 milliamperes, flowing for 5 seconds and more, vasoparalytic stasis could be produced within the core of the path of the current through the brain, where the maximum current density was at least 20 milliamperes per square millimeter of the diameter of the path. Marginal parts of the path of the current, where current density was less, showed arteriolar vaso-constriction and blanching of the capillary bed.

4. Early pathological changes of the neural parenchyma could be produced only with currents of 1,800 milliamperes and above, and only within the path of the current. With currents of 1,800 milliamperes, flowing for 2 to 5 seconds, where current density was 18 milliamperes per square millimetre of the diameter of the path, they were of an essentially reversible type. With currents of 2,000 milliamperes flowing for 5 to 10 seconds, where current density was 20 milliamperes per square millimetre of the diameter of the path within the core of the path of the current, they were of an essentially irreversible type. All these pathogenic currents were in amperage, time of flow and density far above the range of currents used in electro-shock treatment in man, in which currents of 300–900 milliamperes flowing for periods varying from $\frac{1}{10}$ to $\frac{3}{10}$ of a second through electrodes measuring 2,000–3,000 mm.^{2} are usually employed.

5. With single shock doses within the range of amperage used in electro-shock treatment in man, no pathological changes of the neural parenchyma could be produced which were recognizable with present-day histological methods at times varying from 4 minutes to 7 days after the shock. It is concluded that early organic physiological and physico-chemical changes of the neural parenchyma must nevertheless exist, but that they are of an order not yet demonstrable morphologically. The nature of these early physiological and physico-chemical changes awaits future investigation. The question of late changes is likewise uninvestigated and open to future study. (Authors' abstr.)

J. NEUROPHYSIOL.

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*Interaction of Neighboring Fibers in Myelinated Nerve. *Marrazzi, A. S., and Lorente de Nó, R.* 83
*The Electrical Activity of Regenerating Nerves in the Cat. *Berry, C. M., et al.* . . . 103
*Effect of Temperature on the Oxygen Consumption of Brain Tissue. *Field, J., jun.* . 117
*Experimental Analysis of the Functions of the Basal Ganglia in Monkeys and Chimpanzees. *Kennard, M. A.* 127

Interaction of Neighbouring Fibers in Myelinated Nerve.

A systematic analysis has been carried out of the changes occurring in the excitability of nerve-fibers, induced by impulses travelling in neighboring nerve-fibers. The experimental results have been expressed in the form of interaction curves.

Flow of the action currents of the active fibres through the membrane of the inactive ones is the mechanism underlying the interaction.

Two parts may be differentiated in the interaction curve, because besides an immediate interaction, there is a residual interaction which outlasts the flow of the action currents. The residual change in excitability has an electric sign that consists of a change in the membrane potential.

The shape of the interaction curve depends upon the geometrical conditions determining the flow of the action currents through the inactive fibres and upon the temporal course of the testing stimulus. (Authors' abstr.)

The Electrical Activity of Regenerating Nerves in the Cat.

1. Action potentials and microscopic preparations of regenerating tibial, peroneal and saphenous nerves of cats were studied at intervals up to 466 days following primary suture.

2. Action potentials were detected as early as 17 post-operative days and were small and slowly conducted at velocities less than 1 mps. At longer post-operative intervals the potentials

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

increased in size, velocity, and complexity, showing at least two prominent components plus a C wave.

3. The thresholds for electrical stimulation of regenerating fibers were high peripherally and low centrally to the suture. At longer post-operative intervals the thresholds of the distal fibers became progressively lower.

4. The maximum conduction velocities were measured for regenerating fibers on both sides of the suture, and abrupt changes in velocity were noted as the impulse passed the suture. Also the most rapidly conducting fibers of the distal stump were not necessarily projections from the most rapidly conducting fibers of the central stump.

5. The progress of the return of conduction velocity in the fibers distal to the suture was slow and the velocities increased at a constantly decreasing rate with respect to time. The return of maximum fiber diameter followed a similar course.

6. The relationship between the maximum conduction velocity and the maximum fiber diameter in the regenerating nerve was approximately linear. (Authors' abstr.)

Effect of Temperature on the Oxygen Consumption of Brain Tissue.

1. Mean values of the oxygen consumption of cerebral cortex slices from adult albino rats were determined at graded temperatures within the limits 0·2° to 47·5° C. Most observations were made within the range 0·2° to 40° C. Three hundred and forty-five animals were used. Oxygen consumption was expressed in cubic millimeters (microliters), N.P.T., per milligram dry weight per hour (Qo_2). The standard deviation of the distribution and the standard error of the mean were calculated for the values of oxygen consumption at each temperature used in the range 0·2° to 37·5° C.

2. It was shown that the graph of log oxygen consumption as a function of temperature in degrees Centigrade was approximately linear over the range 10° to 37·5° C. The equation for this curve was—

$$\text{Log } Qo_2 = -0{\cdot}2438 + 0{\cdot}328t,$$

where "t" represents the temperature in degrees Centigrade. The Van't Hoff temperature coefficient, Q_{10}, in this temperature range was 2·13.

3. In the range 0·2° to 37·5° C. Qo_2 was constant for more than three hours. However, at 40° and above, Qo_2 diminished with time. This effect was the more marked the higher the temperature. However, when Qo_2 were calculated from the 20-minute period immediately following thermo-equilibration there was no evidence of discontinuity in the Qo_2-temperature curve.

4. Decrease in Qo_2 with time at 40° C. was found to be reversible for periods of exposure to 40° of as long as 3 hours. However, at 40·8° an exposure of more than 30 minutes resulted in some loss of capacity for oxygen consumption on restoration to 37·5°. This loss became progressively greater with increase in temperature, exposure time or both. However, there was a limit to the decline in Qo_2, at least for temperatures up to 47·5° and exposure times up to 2 hours. The "steady state" value of Qo_2 under these conditions amounted to about 10 per cent. of the Qo_2 at 37·5° and was termed the "thermostable" Qo_2.

5. There was no indication of the accumulation of a substance capable of inhibiting the oxygen uptake of fresh brain tissue when brain slices or brei were incubated for 70 minutes at 47·5° C.

6. The possible significance of these data in relation to the effect of hyperthermia on the intact animal was discussed. (Author's abstr.)

Experimental Analysis of the Function of the Basal Ganglia in Monkeys and Chimpanzees.

1. Lesions of one or more of the nuclear complexes of the basal ganglia of monkeys or chimpanzees produce disorders of movement which are similar to the choreo-athetosis and tremor seen in man following lesions of the same regions.

2. Irregular, involuntary, jerking choreiform movements appeared only to any degree in chimpanzees but occurred in slight form in the monkeys also. They were always contralateral to the ablation, affected arm and head more than leg, and were transient.

3. Tremor followed the same lesion in chimpanzees and in similar lesions in monkeys. It was an action tremor, absent during complete rest, but present during the maintenance of posture or during movement. It was always marked at the beginning of voluntary movement and was accentuated by emotional stress and fatigue, and was bilateral, appearing whenever a sufficient amount of tissue within the circuit had been damaged.

4. The mechanisms involved in choreo-athetosis and tremor predicate two systems not greatly influencing each other, which exist within the basal ganglia. They cannot be geographically distinguished.

5. Anatomical and physiological evidence indicates that the cortical areas 6, 8 and 45 are connected with the basal ganglia, and that these nuclei are also directly influenced by thalamus and hypothalamus.

6. The relation of spasticity or rigidity to the basal ganglia has not been made clear by this investigation. But although isolated lesions of basal ganglia do not change resistance to passive manipulation, corticosubcortical lesions seem to increase resistance over that encountered following pure cortical ablations. Some differences in posture also appear when basal ganglia are removed in addition to decortication, as compared to the posture of a pure decorticate preparation.

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

7. There is a marked difference between the effects of lesions in monkeys and chimpanzees, and this is probably true for man also. The difference can be associated with anatomical changes in the putamen and extrapyramidal cerebral cortex. It is concomitant with the development of skilled use of the hands. (Author's abstr.)

MAY.

*The Hind-Brain and the Early Development of Behavior in Frogs. *Wang, G., and Lu, T.* 151
*Reflex Inhibition of Intestinal Motility Mediated through Decentralized Prevertebral Ganglia. *Kuntz, A., and Saccomanno, G.* 163
*Experimental Hypogeusia from Horsley-Clarke Lesions of the Thalamus in *Macaca mulatta*. *Patton, H. D., et al.* 171
*The Structural Identity of the Pain Spot in Human Skin. *Bishop, G. H.* . . . 185
*Physiological Neuronography of some Cortico-subcortical Connections in the Chimpanzee. *Garol, H. W., and McCulloch, W. S.* 199

The Hind Brain and the Early Development of Behavior in Frogs.

1. The reflex response of embryos of *Rana limnocharis* to tactile stimulation varies in nature and duration as development advances. For embryos 2·0 mm. body-length the duration of the response averages more than 4 seconds. In embryos 3·0–4·5 mm. the duration decreases gradually and in larger individuals remains *ca.* 1·5 seconds on the average.

2. Transection of the cervical cord does not alter the nature of the tactile reflex with development, nor its duration in embryos 3 mm. long. In larvae longer than 4 mm. the duration of the reflex is lengthened by transection of the cord. The increase in duration persists up until metamorphosis.

3. Transection of the dorsal cord does not increase the duration of the tactile reflex in 5 mm. tadpoles.

4. Decerebration does not alter either the nature or duration of the tactile reflex in tadpoles at any stage. Destruction of the rostral half of the hind brain has the same effect as transection of the cervical cord.

5. In the early stage of its action cyanide poisoning lengthens slightly the duration of the tactile reflex in normal and decerebrate larvae but does not alter it in spinal and bulbospinal preparations.

6. Spinal tadpoles exhibit more spontaneous activity than normal and decerebrate ones. Cyanide poisoning in the early stage of its action increases the spontaneous activity of normal and decerebrate tadpoles, but does not alter it significantly in spinal larvae.

7. These data indicate that a mechanism is laid down in the spinal cord of *Rana limnocharis* in its development, from the non-motile stage to one of translatory movements, for repeated reactions to a brief tactile stimulus, and that this mechanism is inhibited by impulses from the rostral half of the hind brain at and after hatching. (Authors' abstr.)

Reflex Inhibition of Intestinal Motility Mediated through Decentralized Prevertebral Ganglia.

In the cat the terminal branches of some axons remain intact in the inferior mesenteric ganglia following degeneration of all preganglionic fibers of spinal origin which reach these ganglia. Some nerve-fibers also remain intact in the distal segments of mesenteric nerves to the colon and the small intestine, following their interruption, after degeneration of all the fibers which grow distalward. These are regarded as the axons of ganglion cells located in the wall of the enteric canal which extend into the prevertebral ganglia.

Distension of the distal segment of the transected colon or direct faradic stimulation of its nerves has resulted in inhibition of motility in the proximal segment both before and after degeneration of the interrupted nerve-fibers following decentralization of the inferior mesenteric ganglia. Distension of the ileum or direct faradic stimulation of mesenteric nerves, likewise, has resulted in inhibition of motility in a more proximal segment of the small intestine following decentralization of the celiac ganglia by removal of the spinal cord from the lower cervical region caudalward and section of the vagi.

Demonstration of the intestino-intestinal inhibitory reflex in the large intestine following degeneration of the visceral afferent fibers which reach the colon *via* the inferior mesenteric plexus and the preganglionic fibers of spinal origin to the inferior mesenteric ganglia supports the assumption that true reflex connections are effected in the prevertebral ganglia.
(Authors' abstr.)

Experimental Hypogeusia from Horsley-Clarke Lesions of the Thalamus in Macaca mulatta.

1. The preference method was employed for assaying taste acuity because it yields a quantitative and objective measure. The reliability of the method was established by repeated determinations of the threshold curve.

2. Bilateral electrolytic lesions of the posteroventral thalamic nuclei produced consistent elevations of the preference thresholds for quinine hydrochloride in five monkeys.

3. Microscopic examination of serial sections through the lesions revealed that the severity of the taste deficit paralleled the amount of damage to the nucleus ventralis posteromedialis (arcuate nucleus).

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4. The findings support the hypothesis that taste fibers synapse in the thalamus in close association with those bearing somatosensory impulses from face, mouth and tongue. The significance of the results with respect to cortical localization of taste was discussed.
(Authors' abstr.)

The Structural Identity of the Pain Spot in Human Skin.

1. After the removal of skin to various depths by chemical or by surgical means, exploration of the exposed surfaces by electrical stimulation yields information concerning the nervous structures at different levels. During regeneration of skin and of its sense organs after their experimental removal, similar procedures permit further analysis of the character of the unit pain spot.

2. Epithelium regenerates from the base of each hair-follicle before sensory endings are restored, and a nerve twig containing pain fibers grows up toward the epithelium near each group of one to three follicles. This twig then distributes to an area containing one pain spot and one follicular group. Normal skin may contain many follicles which at a given time contain no hairs.

3. The extreme sensitivity of the central high point in a unit pain area may be correlated with its position directly over the pain twig, such that terminals of several fibers may be activated by a stimulus at one point.

4. The growing ends of pain fibers in the skin are more sensitive to mechanical stimulation, and less sensitive to electrical, than are their final sensory endings. This distinction, however, is qualified by the conditions under which these stimuli are necessarily applied, such as conductivity to current of different tissue components, depths of endings and protection by overlying tissue, etc.

5. Dendritic fibers invade newly regenerated epithelium at about the stage when nerve fibers are approaching it, and appear first in the regions lying over the nerve twigs. It is not clear whether this indicates a functional relationship, or is related only to the stage of development of epithelium from follicles.

6. It is to be noted that accounting for the uniqueness of individual pain spots on a structural basis does not constitute an explanation of sensory localization for pain.
(Author's abstr.)

Physiological Neuronography of Some Cortico-subcortical Connections in the Chimpanzee.

The method of physiological neuronography has demonstrated the following in the chimpanzee:

(1) A cortico-caudatal system from band I (area 8), band III (area 4s), band VII (area 2) and area 24.

(2) A cortico-putamenal system from band II (area 6), bands IV and V (area 4) and band VI (area 1).

(3) A cortico-pallidal system (*a*) to the external segment from band II (area 6) and (*b*) to the internal segment from the anterior margin of band IV (area 4?) and from the anterior margin of band VIII (area 5?).

(4) A cortico-pulvinar system from bands IX and X (areas 40 and 39 respectively).

(5) A cortico-thalamic connection from the arm-subdivision of the central sector to its corresponding portion of the lateral thalamic nucleus. The firing into this thalamic nucleus appeared more retricted than in the monkey. (Authors' abstr.)

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Muscular Activity and Choline Esterase.

High and low serum choline esterase activities are contrasted with respect to the prevailing condition of autonomic and neuro-muscular activity. High values occur in acute emotional states and thyrotoxicosis; low values in catatonic stupor and after administration of narcotics. The purpose of this study is to define more clearly the relationship between serum choline esterase and exercise, in which both autonomic and neuromuscular activity occur together. The subjects were normal persons and effort syndrome patients. The latter gave the same results as the normals. A variety of vigorous exercises for 5–10 minutes produced a significant rise in serum choline esterase, which subsided within 10 minutes and was inhibited by eserine. The increase probably comes from the red corpuscles, since they suffer a simultaneous fall in choline esterase equal in amount to the rise in the serum. The site of the transference is unknown, but it is not in the muscle exercised. Further data are necessary to determine the physiological significance of serum choline esterase, but neuromuscular activity is certainly one of the factors. M. E. MORSE (Psychol. Abstr.).

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Psychological Researches in Schizophrenic Language and Thought.

The most commonly accepted psychological approaches to the investigation of schizophrenia involve studies of cognitive dysfunctioning. Thought has been abstracted from its conative and affective determinants, has been approached through the assumed parallelism of thought and language; and has often been measured with general tests developed for use with normals. Inquiries have been made as to the schizophrenic's inability to generalize and the relationship between schizophrenic and primitive thought. The selection of cases in many studies "reveals the need for a reformulation of the basic disturbance in schizophrenia in terms of empirically established psychological, psychiatric and psychoanalytic facts and for the recasting and reorientation of psychological methodologies in terms of this reformulation."

R. B. AMMONS (Psychol. Abstr.).

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

A Delineation of Schizophrenic Language and Thought in a Test of Imagination.

An attempt was made to elicit fantasies from 75 schizophrenic patients, using the ten neutral pictures of Murray's Thematic Apperception Test. Analysis of the recorded fantasies showed a lack of direct relation to the life events of the patient, an inability to maintain an orientation toward fulfilling the instructions, a stirring of " inner unrest " in the direction of some sort of activity, and an orientation of the patient's responses in the present. There appeared to be an almost total unawareness of the self in relation to the outer world of persons and objects and to inner experiences, with an almost complete interpenetration or fusion of subject and object in the various productions. It appears that almost any stimulus from the vague and " dread external infinitude can evoke anything . . . from the equally dread, internal, undifferentiated infinitude of items indiscriminately fused from all levels of experience." Schizophrenic experience is thus merely relived " livid " experiences. R. B. AMMONS (Psychol. Abstr.).

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Abstract and Categorical Behavior Following Therapeutic Brain Surgery.

It is apparent that all patients do not show impairment or deterioration of abstract thinking following prefrontal lobotomy.

In the author's series of cases, the two patients who did not show pre-operative impairment of these functions also failed to show impairment in the post-operative period. That the possibility of pre-operative impairment be recognized is of utmost importance. There is a question as to whether the impaired abstract behavior observed following lobotomy is indeed a function of the surgical insult to the intact brain, or whether it is a residual of the pre-operative psychotic structure. Their data are inconclusive on this point. What is needed is a series of cases in which there is a demonstrable lack of pre-operative impairment of abstract behavior with subsequent post-operative determinations. It is clear from their data that clinical improvement may occur in the absence of improvement in abstract behavior and, conversely, there may be decided improvement in abstract functions without noticeable improvement in the general behavior patterns of the patient. (Author's abstr.)

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Central Representation of Pain.

Histological and clinical evidence leads to the conclusion that pain is integrated at three levels in the brain: the cerebral cortex, where pain may be accurately appreciated and localized; the thalamus, where pain may be integrated with other modalities; and the tectum mesencephali, which probably rarely functions in normal man, and where appreciation of painful stimuli is closely related to feeling-tone, rather than sensory pain. F. W. IRWIN (Psychol. Abstr.).

Subjective Disturbances of the Sense of Pain from Lesions of the Cerebral Cortex.

The author describes five cases in which pain was associated with cortical lesions involving the parietal area. F. W. IRWIN (Psychol. Abstr.).

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Negative Conditioned Reflexes versus Absence of Response Elicited from External Inhibition. *Allen, W. F.* [*Proc. Soc. exptl. Biol., N.Y.*, **54**, 169–70 (1943).]

The possible confusion beteeen absence of response due to external inhibition and that due to negative conditioning is demonstrated by observations on dogs trained to flex the foreleg in response to certain stimuli and to withhold response in the presence of others. Absence of response occurred in normal dogs long before there were signs of correct differentiation. It also appeared in dogs with parts of the association cortex removed, when the negative conditioned response cannot be elicited. During this external inhibition respiration is inhibited and the animal becomes quiet. It is suggested that external inhibition is a simpler response than a negative conditioned response. H. Peak (Psychol. Abstr.).

Three Years of Neuropsychiatry in the Canadian Army (Overseas). Part II. Van Nostrand, F. H. [*Canad. med. Ass. J.*, **49**, 367–73 (1943).]

Out of the mass of literature published on the subject of neuropsychiatric problems in war, four salient facts have emerged: " 1. Psychiatric disabilities account for approximately 30 per cent. of all casualties invalided out of the Army during war. 2. Of these, over 80 per cent. show definite evidence of constitutional predisposition to psychotic or neurotic breakdown, or have constitutional defects such as mental deficiency or psychopathic personality. 3. In chronic or recurrent cases, where the above constitutional factor is present, the results from treatment are poor. Less than 25 per cent. of cases are rehabilitated to the point where they become useful combatant soldiers. 4. Psychoneuroses (including exhaustion states), occurring in stable personnel as a result of severe battle stress, respond well to early and adequate treatment and should not, as a rule, be evacuated to base general or special hospitals."

J. E. Zerga (Psychol. Abstr.).

A Mathematical Theory of the Affective Psychoses. Lettvin, J. Y., and Pitts, W. [*Bull. math. Biophys.*, **5**, 139–48 (1943).]

The theory introduces two variables, ϕ and ψ. The first represents the intensity of emotion, the second measures the intensity of activity. A set of integrodifferential equations is assumed to govern the variation of ϕ and ψ with respect to time. Since for increasing values of ϕ the conduct of the organism varies from great impassivity through a normal level of feeling to extremes of a circular depression or catatonic excitement, whereas an increase of ψ results in a transition from stupor to manic excitement, the solutions of the equations represent quantitative specifications of different psychotic states. (Psychol. Abstr.).

Electrical Responses from the Primary Acoustic Centre of the Frog. Ek, J., and Euler, C. L. v. [*Nature, Lond.*, **152**, 132 (1943).]

Sound stimuli elicit electrical potential changes in the central auditory pathways of the cat;

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and this study carries such work to the frog, using micro-electrodes which afford a more detailed account of some of the phenomena studied previously in the cat. With electrodes in the superficial cell layers of the acoustic area some spontaneous activity was recorded. Sound stimuli elicit " off " and " on " potentials of opposite polarity. Amplitude of the discharges remained constant when the stimulation was as short as two seconds. But for longer stimulation the potentials gradually became diminished in amplitude. During the off-effect a definite inhibition of the discharge was seen. The frequency of spike potentials corresponded closely with the frequency of the sound stimulus, but this effect is not microphonic, as is attested by the off-effect and to 20–40 msec. latency. The spike potentials do not behave like single auditory fiber discharges, since amplitude varies with intensity of stimulation. There was no correlation between the duration of stimulation and the amplitude of the off-effect, but rather the off-effect was correlated with intensity of stimulation. R. L. SOLOMON (Psychol. Abstr.).

A Study of Thalamocortical Relations in the Rabbit. Rose, J. E., and Woolsey, C. N. [*Johns Hopk. Hosp. Bull.*, **78**, 65–128 (1943).]

The purpose of this study was to determine which thalamic areas degenerate and which remain intact after removal of the whole cerebral cortex (neo-, paleo-, and archicortex). The results demonstrate that after ablation of the entire telencephalon by the suction method, the behavior of the thalamic nuclei follows a rather simple pattern consonant with ontogenetic and phylogenetic considerations. There are two types of thalamic projection systems: one from the dorsal nuclei to circumscribed cortical fields, and a second, the ventral, to the whole or to extensive portions of the cortex. The epithalamus appears to be entirely independent of the telencephalon. M. E. MORSE (Psychol. Abstr.).

Control of Movements by the Cerebral Cortex in Primates. Hines, M. [*Biol. Rev.*, **18**, 1–31 (1943).]

The frontal lobe of the monkey contains the neural mechanisms which control the maintenance of posture, initiate progression, and select the appropriate skeletal muscles to be innervated. The use of a skeletal muscle in mass organization for purposive behavior depends upon the extrapyramidal system, while for discrete organization the pyramidal system is active. " Coincident with the remarkable mosaic type of localization of sensibilities within the three posterior lobes, control of movement, the initiation of contraction, fixation of more proximal muscles, distribution of tone, sequence of contraction with innervation of prime movers and of co-operating muscles have migrated as a whole to the frontal lobe of the primate, *Macaca mulatta*. Compared with the cat, in which extrapyramidal activity is distributed generously in three of the four lobes of the cortex cerebri, the frontal lobe of the monkey, like that of man, 'serves in the motor aspect of the mind.'" These conclusions are derived from studies of electrical stimulation of the cortex, differentiating the various cytoarchitectural areas.
R. L. SOLOMON (Psychol. Abstr.).

Psychoneuroses in the Canadian Army Overseas. Hyland, H. H., and Richardson, J. C. [*Canad. med. Ass. J.*, **47**, 432–42 (1942).]

Of 1,171 cases of mental disease admitted to the No. 1 Neurological Hospital overseas during an 18-month period (September, 1940, to April, 1942) psychoneuroses (649 cases) constituted over half the total number. Of the remaining 522 cases, psychoses constituted 165, mental deficiency 100, psychopathic personality 220, and chronic alcoholism 37. There are four common precipitating factors of neurotic illness: " (*a*) Difficulties in adaptation to army life; (*b*) domestic worries; (*c*) fears related to enemy action; (*d*) trauma."
J. E. ZERGA (Psychol. Abstr.).

Neurosis and Intelligence. Eysenck, H. J. [*Lancet*, **245**, 362–3 (1943).]

" The records of 3,000 male and female neurotic Service patients (N.C.Os. and other ranks) on the progressive matrices test of intelligence have been analyzed. The neurotic group tested is, on the average, neither more nor less intelligent than comparable non-neurotic groups. Taken in conjunction with previous results, this finding supports the view that the lower intelligence of neurotics is caused by a weakness in the efficiency of mental functioning, rather than by their inability to abstract and reason. Conversion hysterics are on the average less intelligent than other neurotics, while dysmnesic hysterics are on the whole of average intelligence. Patients suffering from chronic anxiety are on the average more intelligent than other neurotics. The distribution of scores in the neurotic groups is distinctly abnormal (platykurtic); there are far fewer cases of average intelligence and more cases of above average intelligence than would be found in a comparable sample of the normal population."
C. K. TRUEBLOOD (Psychol. Abstr.).

Psychosurgery: Collective Review. Walker, A. E. [*Surg. Gynec. Obstet.*, **78**, *Suppl.* 1–11 (1944).]

This is a comprehensive consideration of prefrontal lobotomy. In France, Germany and England, where psychoanalysis and shock therapy were increasingly used, Moniz' operation was practically ignored, but in Italy it was enthusiastically received. Many physicians think that the patient pays a high price for relief from fear, worry, and anxiety. The operation can be

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endorsed only if he will probably use his new freedom in socially acceptable ways. Hence the operation should be refused to those persons whose previous behavior has suggested psychopathic propensities. Walker believes that the operation has a place. On a symptomatic basis it may be indicated after adequate psychotherapy has failed. Psychosurgery alone, however, will not produce social recovery; post-operative rehabilitation is equally important. Its future can be determined only after many cases have been studied intensively for at least five years, during which investigations much will be learned of the functions of the frontal lobes.

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

The Relationship Between Anxiety States and Organic Disease. Dunbar, F. [*Clinics*, **1**, 879–908 (1942–43).]

Dunbar gives tables of comparative personality profiles derived from a total of 1,000 cases of coronary occlusion, cardiac arrythmias, anginal syndrome and fractures. The cases are classified according to the sphere of major conflict (authority), their differing behavioristic and somatic reactions to it, and the trauma precipitating breakdown. Each syndrome is correlated with a well-defined personality type, although there is no implication of cause and effect, and the results cannot be used as an infallible guide to diagnosis or prognosis. Nevertheless, any person whose psychosomatic profile corresponds in general to one of the types is probably susceptible to the associated illness, and likely to develop it when subjected to special strain in the sphere of his major difficulty. Anxiety is the first sign of autonomic influence on the cortex or ego, and situations creating it have a relationship to disease. The more conscious and overtly expressed it is, the less the structural damage. Two contrasting patterns, cardiac and accident, emerge from this study.

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

Anxiety and Fatigue. Braceland, F. J., and Rome, H. P. [*Conn. med. J.*, **7**, 827–41 (1943).]

The authors discuss the reciprocal relations of anxiety and fatigue in the psychosomatic life of the Navy personnel. Fatigue activates the latent anxiety of normal persons, while in psychoneurotics anxiety induces fatigue. The gradations of psychosomatic response to combat are: (1) Simple fatigue and fear states with somatic preponderance. (2) Combat fatigue, or reaction to conditions close to the limit of physical and emotional endurance. This gradation is the same as operational fatigue resulting from daily routine flights, patrols, watching and waiting on lonely islands—all situations in which there is no opportunity to discharge accumulated tension. Its criteria are extreme irritability, chronic startle reaction (vigil), profounced visceral disturbances, and panic. After a certain point restoration is impossible, and permanent changes in personality result. (3) Psychoneurotic reaction, in which fatigue becomes an escape from the traumatic situation. (4) Psychotic reaction, with great prominence of the somatic element and a characteristic distintegration of all systems of functioning. The treatment of the different classes is outlined.

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

Altitude Sickness in Fliers. Vokhmianin, P. F. [*Amer. Rev. Soviet Med.*, (**1**), 140–4 (1943).]

The author describes the symptoms of airsickness. In the collaptoid type of subject the first symptoms are cardio-vascular. In the non-collaptoids, who have comparatively great cardiovascular stability, the first symptoms are cerebral. Cardiovascular instability is related to fatigue and fear, which in turn decrease resistance to hypoxia. Individuals presenting the cerebral reaction are more resistant to anoxia and better able to compensate generally. Autonomic lability is unfavorable to compensatory mechanisms in general. The nervous and psychological residues of altitude sickness usually pass unnoticed because the flier fails to complain after returning to ground level.

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

Report of a Case of Severe Anoxic Anoxia with Recovery. Ward, R. L., and Olson, O. C. [*J. Aviat. Med.*, **14**, 360–5 (1943).]

"A twenty-year-old white man was without supplementary oxygen, at high altitudes, for 55 minutes. He was unconscious for eight hours, and semicomatose for an additional eleven hours. Neurological examinations during the first 20 hours revealed diminished to absent deep and superficial reflexes, and a bilateral Babinski. There was also an increased spinal fluid pressure, and projectile vomiting. Patient had no subjective symptoms, such as headaches or dizziness, at any time. Psychological changes lasted about six days and subsequently cleared up, leaving no apparent intellectual defects nor personality changes" aside from an amnesia for three days preceding and six days following the accident.

A. CHAPANIS (Psychol. Abstr.).

The Effects of Pressure on the Carotid Sinus at Various Altitudes: Case Reports. Palitz, L., Frist, T., and Kocour, E. [*J. Aviat. Med.*, **14**, 346–55 (1943).]

Pressure on the carotid sinus produces reflex slowing of the heart-rate and, in hypersensitive individuals, dizziness and fainting. The authors describe two cases which suggest that a hypersensitive carotid sinus becomes more sensitive as the individual becomes anoxic at simulated high altitudes.

A. CHAPANIS (Psychol. Abstr.).

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

Sexual Libido in the Female. Greenblatt, R. B., Motara, F., and Torpin, R. [*Amer. J. Obstet. Gynec.*, **44**, 658–663 (1942).]

The authors found that progesterone (corpus luteum hormone) depressed excessive libido, while androgenic substances, as administered to 55 patients between 22 and 53 years, decidedly increased both libido and general well-being. The best results were obtained by implantation of pellets of testosterone propionate. Virilization never occurred, but almost every patient who, having once known libido, had lost it, experienced a resurgence. However, it could not be aroused in some psychologically frigid women who had never experienced it, and women who had had a marked to moderate degree before implantation experienced no change. The role of the hormonal component in women has not received due attention. The psychotic tendencies of nymphomania, premenstrual tension, the neuroses of frigidity and the problems of the incompatible couple are amenable to hormone therapy

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

Bisexuality and Male Homosexuality; Their Biologic and Medical Aspects. Myerson, A., and Neustadt, R. [*Clinics*, **1**, 932–57 (1942–3).]

The authors correlated the urinary excretion of androgens and estrogens with the physical and psychological characteristics of 102 males showing homosexual conduct. Their results show in general that the active homosexual has a high or normal androgen level and excessive estrogens, while the passive type has a low androgen level with only relative elevation of estrogens. The amount of androgens largely determines the vigor of the sex drive, and the absolute or proportionate amount of estrogens determines its direction. Homosexuality is not a biological entity, but a quantitative deviation. The biological aberrations come too late to affect the anatomy, although they are evident in behavior. It is not in itself a disease, but has the value of a psychopathic trait which makes the individual an abnormal personality, in addition to which he may be neurotic or psychotic. The authors obtained no lasting cures by hormone treatment, although the urinary formula could be changed.

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

Electroencephalography in the Selection of Naval Recruits. Solomon, P., Harris, H. I., Wittson, C. L., and Hunt, W. A. [*Nav. med. Bull., Wash.*, **41**, 1310–17 (1943).]

EEG records are being employed at the psychiatric unit of the U.S. Naval Training Station at Newport, R.I., as an aid in the proper selection of recruits. The report covers a total of 432 EEG subjects. The EEG recordings were found to be of positive selection value in 63 per cent. of the cases. The method was found to be of some screening value in denoting various neuropsychiatric conditions: Epilepsy, migraine, head injuries, organic feeble-mindedness, somnambulism and enuresis.

G. W. Knox (Psychol. Abstr.).

Significance of Transmineralization in the Pathogenesis and Therapy of Mental Diseases. Ratner, Ya. A. [*Nevropatol. i. Psikhiat., No.* **9**, 10–17 (1940).]

In psychoses and neuroses, transmineralization of the cerebral cells with resulting change of potential plays a major role both in the course of disease and in its cure. Insulin and cardiazole injections and hyperpyrexia bring about transmineralization, succeeded by a remineralization phase and return to normal. In hyperpyrexia produced by chemicals there is a remineralization phase; S-containing substances are especially effective.

C. S. Shapiro (Chem. Abstr.).

Vitamin B_2 Activity and Chronaxia. Chauchard, Mme. B., Chauchard, P., Busnel, R. G., Raffy, A., and Lecoq, R. [*Presse méd.*, **51**, No. 8, 93 (1943).]

The determination of nervous excitability is most important for the estimation of vitamin B_2 activity.

R. P. E. Hopf (Chem. Abstr.).

Vitamin B_2 and the Nervous System. Chauchard, Mme. B., Chauchard, P., and Raffy, A. [*Presse méd.*, **51**, No. 5, 54 (1943).]

Observations on deficiency and excess of riboflavin in test animals indicated that vitamin B_2, as well as aneurine, must be considered as most important for the nervous system.

R. P. E. Hopf (Chem. Abstr.).

Synthesis of Ascorbic Acid by Brain Tissue in vitro. Pandra, José. [*Rev. soc. argentina biol.*, **19**, 137–50 (1943).]

Ox brain pulp shows a progressive decrease in ascorbic acid when incubated at 38° with egg yolk or egg white in phosphate buffer of pH 7·2. But if the brain pulp is first treated with O_2 for 15 minutes before incubation, the ascorbic acid first decreases, then increases to above the original value. This increase is even higher (40 per cent.) if the egg yolk is added after the second hour of incubation of the pulp alone. The increase appears to be due to enzymic synthesis of ascorbic acid.

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

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

The Nutritional Basis of Abnormal Behavior in Albino Rats. IV: Convulsive Seizures, Associated with Pyridoxine Deficiency. Patton, R. A., Karn, H. W., and Longenecker, Herbert E. [*J. biol. Chem.*, **152**, 181–91 (1944).]

A decreased sensitivity to sound-induced seizures is correlated with increased dietary levels of pyridoxine. Spontaneous seizures in suckling rats from pyridoxine-deficient mothers were alleviated by administration of 10γ of pyridoxine per day. Although 10 to 50γ of pyridoxine per day did not protect against sound-induced seizures, very high levels (150γ per day) delayed and lessened their severity. It is suggested that some other dietary factor or factors may be concerned. EDITH R. NEWTON (Chem. Abstr.).

Variations of Nervous Excitability in Avitaminosis C in Guinea-pigs. Chauchard, B., and Chauchard, P. [*Compt. rend. soc. biol.*, **137**, 135–6 (1943).]

As the animal is depleted of vitamin C chronaxia increases. The effect is central as in other vitamin deficiencies and the anesthetized avitaminotic guinea-pig exhibits normal chronaxia. The injection of vitamin C or desoxycorticosterone causes a transient return of normal chronaxia. L. E. GILSON (Chem. Abstr.).

Vitamins and the Nervous System. Chauchard, Paul. [*Rev. sci.*, **79**, 620–41 (1941); *cf. C.A.*, **37**, 6712³.]

A review. E. J. C. (Chem. Abstr.).

A Color Reaction of Ascorbic Acid with Nicotinamide and Nicotinic Acid. Milhorat, Thomas H. [*Proc. Soc. exptl. Biol. Med.*, **55**, 52 (1944).]

When dry ascorbic acid is mixed with nicotinamide or nicotinic acid and moistened, a bright yellow color soon develops. L. E. GILSON (Chem. Abstr.).

Metabolism of Nicotinic Acid. Moglia, J. L. [*Anales farm. bioquim.* (*Buenos Aires*), **14**, 53–76 (1943).]

After the intraperitoneal injection of 25 mgm. of nicotinic acid (I) in rats there was a prolonged accumulation of (I) in the liver, with slow conversion to trigonelline (II), which was subsequently eliminated. The skeletal muscles fixed considerable (I) and showed little further variation during the experimental period of three hours. (II), probably formed in the liver, also increased in the muscles. The heart showed a large and rapid increase in both (I) and (II); this seems to indicate a more rapid conversion of (I) to (II) in heart muscle than in liver. The kidneys showed a marked and prolonged increase in (I) and (II). In dogs, 10 mgm./kgm. of (I) injected intraperitoneally passed into the blood in a few minutes and was quickly taken up and fixed by the tissues. A small amount was retained by the erythrocytes. L. E. GILSON (Chem. Abstr.).

Disturbances of Neuromuscular Excitability during Dietary Imbalance and Avitaminoses. (I) *Acute Carbohydrate Imbalance and Avitaminosis B in Pigeons. Lecoq, R., Chauchard, P., and Mazoue, Henriette.* [*Bull. soc. chim. Biol.*, **25**, 73–9 (1943).]

In pigeons fed a diet containing 66% of galactose or a diet deficient in thiamine the results are similar. There is increased excitability of the brain and an increase in the chronaxia of the skeletal muscles. There is no important change in the chronaxia of the peripheral nerves although they show histological evidence of degeneration. L. E. GILSON (Chem. Abstr.).

Electroencephalography in Chickens in Avitaminosis B_1. de Finis, Mario L., and Odorix, Jose B. [*Rev. soc. argentina biol.*, **19**, 314–20 (1943).]

Tracings are presented and discussed. The irregularities due to the avitaminosis disappear within a few hours after administration of a massive dose of thiamine. L. E. GILSON (Chem. Abstr.).

Formation of Action Substances in Peripheral Nerves under the Influence of Artificial and Natural Stimuli. Scheinfinkel, N. [*Helv. Physiol. Pharmacol. Acta*, (1), 149–65 (1943) (*in German*).]

The liberation of acetylcholine by stimulated frog sciatic nerve was again demonstrated by the effect on the isolated frog heart. Vagus nerve from rabbit neck liberated acetylcholine and also an adrenaline-like substance. Thiamine unites with some enzyme system in the isolated frog heart and makes the heart refractory toward acetylcholine, even in the presence of eserine. L. E. GILSON (Chem. Abstr.).

Behavior of Blood Sugar after Removal of Parts of the Hypothalamus. Bloch, W. [*Helv. Physiol. Pharmacol. Acta*, (1), 177–81 (1943) (*in German*).]

In cats, bilateral lesions of the middle hypothalamus between the columna fornicis descendens and the tractus mammillothalamicus disturb blood-sugar regulation. Fluctuations both above and below the normal range of 85–137 mgm. per cent. occur in an irregular manner. L. E. GILSON (Chem. Abstr.).

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The Hypothalamic Control of Acetylsalicylic Acid Antipyresis in the Monkey. Guerra, F., and Brobeck, J. R. [*J. Pharmacol.*, **80**, 209–16 (1944).]

In *Macaca mulatta* temperature control was unstable after experimental lesions in the anterior and anterolateral hypothalamus. The hypothalamic lesions did not alter the rate of decline of fever produced by yeast injection nor the rate of decline of temperature after administration of acetylsalicylic acid. The lesion usually increased the respiratory response to environmental warming and to fever. Sweating, normally occurring in monkeys with fever or placed in a hot chamber, practically disappeared after the lesions. Plasma specific gravity and chlorides increased after the operation, although blood dilution occurred in response to external heat and to fever. L. E. GILSON (Chem. Abstr.).

Regulation of the Fats, Lipoids and Ketone Bodies in the Blood by the Central Nervous System. Schrade, Werner. [*Z. ges. exptl. Med.*, **110**, 623–42 (1942); *Chem. Zentr.*, (**11**), 1811 (1942).]

Insufflation of air into the ventricles caused in the dog after 3–4 hours a considerable drop in the total blood fats. There was a constant drop in phospholipides and also of the cholesterol, the latter being almost exclusively in the ester fraction. The neutral fat also decreased. Similar treatment caused in the rabbit an increase in the ketone bodies which is considered a consequence of an increased fat metabolism. A. E. MEYER (Chem. Abstr.).

Nervous Regulation of Clotting Mechanism. Takáts, Géza De. [*Arch. Surg.*, **48**, 105–8 (1944).]

Autonomic stimuli as fear, nervous strain and hemorrhage increase the tendency to clotting. This may be due to a retention of heparin in the liver, or to increased formation of prothrombin, or hepatic production of an unknown substance which hastens coagulation.
JOHN T. MYERS (Chem. Abstr.).

A Comparison of the Action of Ca Gluconate and of $CaCl_2$ on Neuromuscular Excitability. Chauchard, Paul, Mazoue, Henriette and Lecoq, Raoul. [*Compt. rend.*, **216**, 744–6 (1943).]

Chronaximetric measurements establish that in the rabbit, the gluconate (I) and chloride (II) of calcium injected intravenously behave differently. (I) produces alkalosis after a hypercalcemic phase, (II) an acidosis. Analogous results occur with the rat and the guinea-pig. In man the chronaxie of nerve in tetany can be attributed to variations in alkali reserve and not in the blood Ca level. W. H. FISHMAN (Chem. Abstr.).

The Effect of CO_2 Tension on the Metabolism of the Cerebral Cortex and Medulla Oblongata. Craig, Francis N. [*J. gen. Physiol.*, **27**, 325–38 (1944); *cf. C.A.*, **37**, 4784[8].]

Raising the CO_2 from 1 per cent. to 5 per cent. under definite experimental conditions and pH 7·5 doubles the aerobic lactic acid output (Q_{O_2}) without altering the O uptake (Q_{O_2}), while increasing the CO_2 from 5 to 20 per cent. has no further effect on the Q_{O_2} of the cerebral cortex and medulla oblongata. The Q_{O_2} only of the medulla is depressed under this condition. At pH 8·1 raising the CO_2 from 1 to 5 per cent. increases the Q_{O_2} and Q_{O_2} of the cortex by nearly 60 per cent. By reducing the O tension (from 95 to 3 volumes per cent.) the lactic acid output increases in the cortex by 114 mgm. per gm., and in the medulla by 8 mgm. per gm., while the CO_2 output in the cortex increases from 12·3 to 13·5 and in the medulla it decreases from 5·1 to 3·8. S. MORGULIS (Chem. Abstr.).

A Rapid Silver Stain for Nerve Fibers in Formol-fixed Paraffin Sections of the Human Spinal Cord and Medulla. McManus, J. F. A. [*J. path. Bact.*, **55**, 503–5 (1943).]

Dehydrate formalin-fixed tissue, embed and cut in paraffin; then pass through xylene and graded alcohols. Place the sections in chloral hydrate solution (chloral hydrate 1·0 gm., $AgNO_3$ 20·0 gm. and distilled water 100 c.c.) at 58° for 20–30 minutes. Rinse in water and place in the reducing solution (hydroquinone 1·0 gm., anhyd. Na_2SO_3 5·0 gm. and distilled water 100 c.c.). Wash and place in 1 per cent. aqueous $AuCl_3$ containing 4 drops of glacial HOAc per 100 c.c. for 10 minutes. Wash and place in 2 per cent. oxalic acid until the fibers can be clearly seen under the microscope. Place in 5 per cent. $Na_2S_2O_3$ for 5 minutes and wash. By varying the concentration of chloral hydrate and $AgNO_3$ it is possible to apply the method to other parts of the central and peripheral nervous systems. JOHN T. MYERS (Chem. Abstr.).

Inhibition of Brain Respiration by Picrotoxin. Klein, J. Raymond, and Hack, Marvin. [*J. biol. Chem.*, **151**, 651–7 (1943).]

The respiration of a cat brain and its ability to oxidize glutamate, succinate, fumarate and pyruvate *in vitro* was inhibited by picrotoxin. PHILIP L. HARRIS (Chem. Abstr.).

Decrease in Lactic Acid Content of the Brain in Poliomyelitis. Kabat, Herman, Erickson, Dorothy, Ehlung, Carl, and Nickle, Margaret. [*Science*, **98**, 589–91 (1943).]

Lactic acid content of the brain is significantly decreased in mice infected with the virus of poliomyelitis. This appears to be evidence for the view that the virus may interfere in a specific manner with cell metabolism. E. D. WALTER (Chem. Abstr.).

Changes in Acid-soluble P Compounds in the Brain in Poliomyelitis. Kabat, Herman. [*Science*, **99**, 63 (1944).]

Normal albino mice and mice injected by intracerebral inoculation of poliomyelitis virus

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were sacrificed by immersion in a mixture of solid CO_2 and EtOH. The brains of normal mice contained 8·13 mgm. of phosphocreatine (I), 16·9 of adenosine triphosphate (II), and 18·7 of residual organic phosphate. The brains of mice with poliomyelitis contained 3·44 of (I), 25.7 of (II) and 4·18 of (III). E. S. G. BARRON (Chem. Abstr.).

The Sugar in the Cerebroside of the Spleen in Gaucher's Disease. Klenk, E., and Rennkamp, F. [*Z. physiol. Chem.*, **272**, 280–2 (1942); *cf. C.A.*, **35**, 3314[5]; **37**, 2802[5].]

The sugar from the cerebrosides isolated from the liver and spleen of a 20-year-old man with Gaucher's disease (supplementary to a fatal case of meningitis) was identified as glucose. The cerebrosides were isolated by usual methods. The cerebroside from spleen had $(\alpha)\ ^{20}_{D} = -10{\cdot}35°$ (pyridine, c = 4); cerebroside from liver had $(\alpha)\ ^{20}_{D} = -9{\cdot}76°$ (pyridine, c = 4). For preparation of the free sugar in solution the cerebrosides were hydrolyzed for 30 minutes in 20 volumes 10 per cent. HCl at 100°, filtered, washed with 1 per cent. HCl, freed from excess HCl by $Pb(OAc)_2$ and AgOAc, from excess Pb++ and Ag+ by H_2S, and from HOAc by ether extraction in presence of CaO; the solution was concentrated *in vacuo* at 40–5° and made up to volume with H_2O. The sugar was identified as glucose. Both cerebroglucoside and cerebrogalactoside may be found in the spleen in Gaucher's disease, but the former appears to be more frequent.

IVAN A. WOLFF (Chem. Abstr.).

Ganglioside of the Brain of the Tay-Sachs Type of Infantile Idiocy. Klenk, Ernst, and Schumann, E. [*Ber.*, **75B**, 1632–6 (1942); *cf. C.A.*, **37**, 5743[7], 6285[3].]

Tay-Sachs' idiocy is a brain disease. A brain from a child about 3 years old (143·5 gm. dry weight) yielded 10 per cent. of fat and cholesterol, 14 per cent. of glyceryl phosphatides, a trace of sphingomyelin, 0·1 per cent. of cerebroside and 8 per cent. of ganglioside (I) fraction (containing 2·6 per cent. $C_3H_5(OH)_3$, 24·5 per cent. sugar (as galactose) and 10·77 per cent. neuraminic acid). The purification of (I) was carried out according to *C.A.*, **37**, 6285[3]; its formula was $C_{84}H_{118}O_{26}N_2$, m. 200–10° (decomposition); it was optically inactive in C_5H_5N. Hydrolysis of (I) with 10 per cent. HCl gave stearic acid and possibly nervoic acid ($C_{24}H_{46}O_3$), sphingosine, glucose and galactose (the last two in the ratio of 1 : 2). C. J. WEST (Chem. Abstr.).

Liberation of an Acetylcholine-like Substance in the Inner Ear during Stimulation by Sound. Martini, Virgilio. [*Arch. sci. biol. (Italy)*, **27**, 94–9 (1941); *Chem. Zentr.*, (**11**), 2583 (1941).]

After stimulation by sound the perilymph of the inner ear of the pigeon shows a 4-fold increase in a substance which acts on leech muscle as does acetylcholine.

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

Synthesis of Acetylcholine in Sympathetic Ganglia and Cholinergic Nerves. Feldberg, W. [*J. Physiol.*, **101**, 432–45 (1943).]

Sympathetic ganglia (superior cervical ganglion) and cholinergic nerves (cervical sympathetic, vagus, phrenic nerve and motor roots) divided with scissors into small pieces and incubated for 1–2 hours in buffered saline solution containing eserine synthesize acetylcholine (I). This property appears to be dependent on the intactness of some structural part of the tissue, since it becomes lost or greatly reduced when the mechanical destruction is carried too far, as by grinding the tissue with silica. No synthesis of (I) has been observed with sensory roots. Chopping sympathetic ganglia or cholinergic nerves with scissors for one or two minutes leads, without subsequent incubation, to some synthesis of (I). Synthesis occurs apparently only in order to replace released (I) and to restore its original concentration in the tissues. The procedure of chopping the tissue may release and bring into solution amounts of (I) corresponding to those originally present in the tissue, but about half of this amount is resynthesized in the particulate matter of the suspension during the one or two minutes of chopping. When the cervical sympathetic trunk is cut in a preliminary operation, the distal part of the nerve and the superior cervical ganglion lose their property of synthesizing (I) at an early stage of nerve degeneration (after about 48 hours). The loss of synthesis occurs with the great drop in the (I) content of the tissue and must be considered responsible for it. The loss precedes the loss of nervous conduction. In the ganglion it coincides with the time when synaptic transmission becomes impaired and lost. It is concluded that synthesis of (I) in sympathetic ganglia is a property of the preganglionic endings, and a necessary preliminary for normal and particularly sustained synaptic transmission. RUTH BERGGREN (Chem. Abstr.).

Mechanism of the Action of Acetylcholine: I. *Genuit, H., and Kubel, W.* [*Arch. exptl. Path. Pharmakol.*, **202**, 110–19 (1943).]

The Hypotensive Effects of Acetylcholine, Papaverine, Muscle Adenylic Acid and "Irenal" (4-dimethylaminophenylpiperidine-HCl) are Discussed: II. *Genuit, H., and Mussgnug, G.* [*Ibid.*, 120–31.]

In a few cats and dogs the hypotensive effect of acetylcholine was primarily the result of a modification of heart action, but in the majority the effect was primarily on the arterioles.

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

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Acetylcholine and Acetylcholinesterase Contents of Organs of B_1-deficient and Normal Rats. Lissák, K., Kovács, T., and Nagy, E. K. [*Arch. ges. Physiol.* (*Pflügers*), **247**, 124–31 (1943).]

The acetylcholine content of B_1-deficient rats was increased in cholinergic effector organs (heart, striated and small intestinal muscles) and diminished in the central nervous system. The acetylcholine content of the sciatic nerve remains unchanged. The cholinesterase content of the serum was reduced in all cases, whereas the content of this enzyme in the various organs followed the changes in acetylcholine. In the sciatic nerve, however, the cholinesterase was lower in B_1-deficient than in normal animals. ARTHUR GROLLMAN (Chem. Abstr.).

The Acetylcholine-like Nature of Anaphylactic Shock and of Shock Produced by Agar. Danielopolu, Daniel. [*Compt. rend.*, **216**, 618–20 (1943).]

By injecting 0·1 gm. acetylcholine into a vein of a 2-kgm. rabbit one obtains symptoms characteristic of anaphylactic shock. Similar results occur with eserine, which acts through acetylcholine. A suspension of agar produces an anaphylactic-like shock, which is enhanced by eserine and inhibited by atropine. W. H. FISHMAN (Chem. Abstr.).

The Change in the Determination of the Cholinesterase Activity as Proposed by Longo, Colaciuri and Sorrentino. Pighini, Giacomo. [*Biochim. terap. sper.*, **28**, 51–4 (1941); *Chem. Zentr.*, **11**, 2040 (1942); *cf. C.A.*, **36**, 5876[8].]

The claim that aqueous solutions of acetylcholine or its HBr salt show spontaneous hydrolysis does not correspond to facts. The solutions are stable for several hours. Cholinesterase has its highest activity close to the neutral point. The proposed titration after 14 hours causes errors, since the developing acidity inhibits the cholinesterase. The method of Pighini (*C.A.*, **34**, 3292[9]) gives sufficiently accurate and comparable results for nerve tissues.
A. E. MEYER (Chem. Abstr.).

Relation Between Cholinesterase and Ascorbic Acid. Frommel, E., Herschberg, A. D., and Piquet, J. [*Helv. Physiol. Pharmacol. Acta*, (**1**), 229–39 (1943) (*in French*).]

In severe hypovitaminosis C in guinea-pigs the serum cholinesterase becomes inactive. Inactivation of serum cholinesterase in the normal animal does not affect the vitamin C content of the tissues. Addition of ascorbic acid does not increase the cholinesterase activity of normal guinea-pig serum *in vitro*, but does reactivate serum cholinesterase previously inactivated by poisons such as Au and As compounds. L. E. GILSON (Chem. Abstr.).

Action of Anticholinesterases on Motility of Extrinsically Denervated Intestine in situ. Youmans, W. B., Karstens, A. I., and Griswold, H. E., jun. [*J. Pharmacol.*, **80**, 205–8 (1944); *cf. C.A.*, **37**, 2814[2].]

In dogs, prostigmine (I) and physostigmine (II) exert their characteristic excitatory action on the motility of the intestine *in situ* in the absence of the extrinsic nerves. Atropine reduces or prevents this action of (I) and (II). The minimal doses of (I) and (II) required to stimulate the denervated intestine are sufficient to enhance the excitatory action of acetylcholine on motility. There is also a possibility that (I) and (II) have some excitatory action on intestinal motility exclusive of their anticholinesterase action. L. E. GILSON (Chem. Abstr.).

Cholinesterase. III. Specific Tests for True Cholinesterase and Pseudocholinesterase. Mendel, B., Mundell, Dorothy B., and Rudney, H. [*Biochem. J.*, **37**, 473–6 (1943); *cf. C.A.*, **37**, 5436[2].]

Acetyl-β-methylcholine (Merck's mecholyl) is hydrolyzed only by true cholinesterase, while benzoylcholine is hydrolyzed only by the pseudocholinesterase, and neither substrate is acted on by ordinary esterases. The methods for carrying out these cholinesterase determinations are described. S. MORGULIS (Chem. Abstr.).

Changes in Brain Volume and Blood Content after Experimental Concussion. White, James C., Brooks, John R., Goldthwait, Joel C., and Adams, Raymond D. [*Ann. Surg.*, **118**, 619–34 (1943).] RACHEL BROWN (Chem. Abstr.).

Ca and Mg in the Spinal Fluid in Progressive General Paralysis. Schere, Moises. [*Semana méd.* (*Buenos Aires*), (**11**), 733–5 (1943).]

In general paralysis the Ca in the spinal fluid varies between 4·1 and 6·8 mgm. per cent. The Mg is always increased to values between 4·8 and 8·2 mgm. The quotient Ca : Mg varies between 0·7 and 1·13. A. E. MEYER (Chem. Abstr.).

Mitogenetic Radiation of the Blood in Cases of Tumors of the Central Nervous System. Lotsman, L. A. [*Nevropatol. i Psikhiat.*, **9**, *No.* 3, 112–17 (1940).]

Ascorbic acid solutions irradiated by mitogenetic rays of the blood are partially decomposed, with a change in pH. This action is made the basis of a method of measuring mitogenetic rays. Acidity with HCl a solution of 0·005 mgm. of ascorbic acid in 25 c.c. H_2O; place half of this solution in each of two evaporating dishes; cover one with an ordinary watchglass and the other with a quartz watchglass. Expose the dish with the quartz watchglass to the rays from a drop of blood for periods of 30 seconds, and 1, 5 and 10 minutes. After each exposure pipet equal

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quantities of the control and the exposed ascorbic acid into test-tubes containing equal amounts of an indicator and titrate with equal quantities of NaOH solution in the presence of a universal indicator. When there is no difference in color the effect is zero; when the irradiated tube has a lighter shade than the control, i.e., its acidity is increased by irradiation, the effect is called positive; when the sample is darker than the control, the effect is called negative. Curves were constructed from the values obtained on the indicator color scale for the four exposures for 10 normal and 72 pathological subjects, affected by different neurological conditions, of which 29 were cerebral and 11 spinal tumors. In normal subjects the effect of mitogenic radiation was usually positive from the beginning and gradually increased in intensity with the length of exposure. In acute and chronic encephalitis the effect was similar. Of the tumor patients, 31 showed a positive but abnormal mitogenetic effect; in 22 the initial radiation was very high, but within a minute dropped rapidly to zero and remained there for the rest of the exposure; in 9 subjects of this group the decrease was more gradual, reaching zero at the end of 10 minutes. A majority of another group of 9 patients showed a high negative initial effect, which was intensified during 10 minutes. A few patients of this group gave a normal initial value, decreased to a minumum and then gradually increased to the initial value. One patient gave a zero effect throughout the 10-minute exposure. In some there was a change from initial negative value to a high positive value toward the end of 10 minutes. In none of the tumors investigated was there any relation of the nature of the tumor, or its location (cerebral or spinal) to the shape of the curve. Six diffuse-sclerosis patients gave a typical curve; the effect was negative and of moderate intensity, beginning at 30 seconds and remaining unchanged during the 10 minutes. C. S. SHAPIRO (Chem. Abstr.).

The Functional Development of Some Mammalian Neuromuscular Mechanisms. Barron, D. H. [*Biol. Rev.*, **16**, 1–13 (1941).]

This is a comprehensive review of the literature concerning the appearance of various neuromuscular mechanisms during the ontogeny of many organisms. Some features are found to be common to all the animal forms so far studied. In early stages of development embryos are inactive, but toward the end of this period skeletal muscles will respond to faradic stimuli. Following the inactive period is a stage where the skeletal muscles are active, but the source of the stimulation to the central nervous system is not known; one possible source is postulated—changes in the external environment producing activity through sensory nerves and spinal mediation. The active stage becomes reactive when direct stimulation from sensory fibers results in responses which vary with their central connections. Eventually the sensory fibers in many regions of the embryo act simultaneously in such a way that segregation of muscle groups results and inhibition is developed, so that localized stimuli produce fairly restricted reactions in the muscle groups. A generalized sort of inhibition is exerted by regions of the central nervous system lying above the medulla, and such centers are responsible for changing jerky movements into smooth ones. R. L. SOLOMON (Psychol. Abstr.).

2. Pharmacology and Treatment.

Production of Changes in Permeability by Narcotics and Analeptics. Hofmann, H. [*Arch. exptl. Path. Pharmakol.*, **201**, 529–68 (1943).]

An application for measuring the permeability of frog skin is described. Ethylurethan, paraldehyde, amylene hydrate, chloral hydrate, barbital and phenobarbital in subnarcotic concentrations produce a reversible increase in the permeability to ions, in narcotic concentrations produce a reversible decrease in permeability, and in still higher (toxic) concentrations produce an irreversible increase. The effects of two narotics used together are additive. Metrazole, strychnine, coramine and picrotoxin in increasing concentrations produce the same changes in permeability in the same order as the narcotics. The reversible effects of narcotics are antagonized by suitable concentrations of analeptics, and vice versa.

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

Relation of Vitamin B to the Duration of Anesthesia Induced by Pentobarbital Sodium. Higgins, Geo. M., and Mann, Frank C. [*Surg. Clin. North Am.*, **23**, 1205–11 (1943).]

Duration of anesthesia which followed intravenous injections of proportionate amounts of pentobarbital-Na has been determined for ten white rats maintained on (*a*) basal diet, (*b*) vitamin-B-free synthetic diet, (*c*) synthetic diet with vitamin B supplements, and (*d*) the same diet as (*c*), but limited to the amount eaten by rats on (*b*). The average period between injection and awakening was 28·8 minutes for (*a*), 67·7 for (*b*), 26·6 for (*c*) and 37·8 for (*d*). Data indicate but do not prove that rapid destruction of the drug in animals adequately provided with vitamin B was due to a high concentration of these principles in the liver. The liver is rich in these vitamins and is probably also one of the sites for destruction of pentobarbital-Na. However, the factors which make the liver so effective a defense mechanism against some of the barbiturates must await further study. DOROTHY A. MEYER (Chem. Abstr.).

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Pharmacology of sec-amyl (2-bromoallyl) Barbituric Acid and of its Combination with Antipyrine. Krop, Stephen, Modell, Walter, and Gold, Harry. [*J. Am. Pharm. Assoc.*, **33**, 10–14 (1944).]

The behavior of the mixture of antipyrine (I) and *sec*-amyl (2-bromoallyl) barbituric acid (II) was investigated in the cat by oral, rectal and intravenous administration. (I), (II) and the mixture (III) are rapidly absorbed by the oral and rectal routes. The persistence of action of (II) is long in the cat. Recovery after doses of 30 mgm. per kgm. (about twice the usual doses used in man) requires an average of about 20 hours. After still larger doses (in the range of those which cause fatalities) recovery takes 2–4 days. The persistence of action in the cat appears to be similar to that in man. The pattern of effects produced by (II) in the cat is similar to that of other barbiturates, viz., fairly marked individual variations, some excitement prior to the narcosis, and a protracted period of excitement and hyperexcitability following the narcosis. (II) abolishes the convulsant action of (I). The effect of (III) depends on the dosage. The dose of (III) (30 mgm. of (I) and of (II) per kgm.), representing about twice the usual amount advocated for use in man, produces effects which in their speed of onset, intensity and duration are barely distinguishable from those of a similar dose of (II) alone, although a suggestive intensification of the depth of narcosis was present. In a higher dosage range (100 mgm. of (I) and of (II)) there is marked synergism; the toxicity of (II) is nearly doubled. On the other hand with (III) in which convulsant doses of (I) are used, there is an indication of antagonism. A few cats were encountered which showed irreversible functional disturbances of the central nervous system, in some after (II) alone and in others after (III). In a comparison of the effects by the rectal and oral routes, the beginning of absorption of the compounds is not materially different, but (III) is only about one-third as effective by rectal as by oral administration; this difference appears to be due to (II), for the toxicity of (I) is practically the same by the two routes. The differential absorption or destruction of the components of a mixture may be pointed out as a source of error in relation to inferences that are sometimes drawn regarding the behavior of a mixture given by rectum, from results obtained through their oral adminstration.

A. PAPINEAU-COUTURE (Chem. Abstr.).

Duration of Sleep Produced by Pentobarbital-Na in Normal and Castrated Female Rats. Gaylord, Charles, and Hodge, Harold C. [*Proc. Soc. exptl. Biol. Med.*, **55**, 46–8 (1944).]

When the drug was given in doses of 30 mgm./kgm. subcutaneously, normal rats slept about twice as long as the castrated rats. In both groups the duration of sleep decreased with increase in room temperature in the range 13–37°.

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

Significance of Artificial Respiration in Accidents with Anesthetics of the Barbituric Acid Group. Donatelli, Leonardo, and Ingiulla, Wladimiro. [*Giorn. ital. anesiesia analgesia*, **6**, 390–405 (1940); *Chem. Zentr.*, (**1**), 3537 (1941).]

The toxic action and the effect on respiration of the preparations evipan, narconumal, eunarcon, pernocton and rectidon were compared in rabbits. The animals were injected intravenously with 100 mgm./kgm. per hour until breathing ceased; when cardiac insufficiency was evident artificial respiration was begun. All animals which manifested respiratory paralysis from lethal doses could be saved by artificial respiration when it was continued for a sufficiently long period. Under almost the same conditions this could be accomplished easily with evipan, eunarcon and narconumal and with difficulty with rectidon and pernocton. Arterial pressure and cardiac function were only slightly influenced by lethal doses, but rapid failure occurred after respiratory paralysis due to lack of O and excess CO_2. The artificial respiration restored the disturbed circulation and brought the blood pressure to normal. The significance of halogen substitution and the length of the side chains in the preparations were discussed.

HELEN LEE GRUEHL (Chem. Abstr.).

The Action on the Heart of Narcotics of the Barbituric Acid Series. Donatelli, Leonardo. [*Arch. ist. biochem. ital.*, **12**, 209–20 (1940); *Chem. Zentr.*, (**11**), 2838 (1941).]

The Na salts of evipan, narconumal, eunarcon, pernocton and rectidon at concentrations of 0·1 to 0·001 M were tested on the amphibian and mammalian hearts. All these compounds diminished strength of cardiac contraction without influencing the frequency. The Br-containing compounds and those alkylated in the 5-position (eunarcon, pernocton and rectidon) were more toxic.

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

Does the Diacetylation of Yohimbine and of Corynanthine Modify the Sympatholytic Action of the Alkaloids? Raymond-Hamet. [*Compt. rend.*, **216**, 614–16 (1943).]

Experiments on dogs in which the diacetyl derivations of yohimbine and its isomer corynanthine and the corresponding unacetylated compounds were tested for their power of inverting a minimal hypertension induced by adrenaline indicated that the presence of the acetyl groups did not modify the sympatholytic action of these alkaloids.

W. H. FISHMAN (Chem. Abstr.).

Action of Anesthetics on the Mineral Composition of the Brain. Serantes, Maria E. [*Anales farm. bioquim. (Buenos Aires)*, **14**, 77–80 (1943).]

When deep anesthesia was induced in rats by intraperitoneal injection of $MgCl_2$ or chloral

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hydrate, or by inhalation of $CHCl_3$, the K of the brain increased slightly. Anesthesia with Et_2O caused a slight decrease in K, and urethan caused no change. The Mg of the brain was doubled by the $MgCl_2$, increased 33 per cent. by the chloral hydrate and increased 20 per cent. by the $CHCl_3$. Urethan and Et_2O did not affect brain Mg. The normal average K content of rat cerebrum is 255 mgm. per cent. and the Mg content 153 mgm. per cent.

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

Further Investigation of the Peripheral Results of Localized Pharmacological Action on the Cerebral Cortex. Chauchard, A., Chauchard, B., and Chauchard, Paul. [*Compt. rend. soc. biol.*, **136**, 336–7 (1942); *Chem. Zentr.*, (**11**), 1817 (1942).]

In dogs, nicotine solution applied to the cerebral cortex motor areas for extension and flexion of the toes causes a marked immediate increase in the chronaxie of the paw, followed by a rapid decline to the normal value. This decline corresponds to the appearance of the non-irritable phase of the cortical area. When this phase has begun further treatment with nicotine has no effect. If the cerebral cortex is made non-irritable by general anesthesia the above effects on chronaxie are not observed. (*Cf.*, *ibid.*, **135**, 1340 (1941).)

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

The Effect of Insulin on the Responses of the Frog Heart and Rectus Abdominis to Acetylcholine. Welsh, John H. (*Am. J. Physiol.*, **141**, 109–16 (1944).]

The responses of the isolated frog heart and rectus abdominis muscle to acetylcholine (I) can be modified by previous administration of insulin to the intact frog. At a temperature (15°) at which the action of insulin on the frog is relatively slow, its effect during the first 24 hours is to increase the responsiveness of the rectus abdominis to (I) and to decrease the percentage inhibition of the heart at concentrations of 10^{-8} and higher. At 25° the responses of the rectus abdominis to (I) at intervals of 6 to 24 hours after insulin are subnormal, and the percentage inhibition of the heart is greater than normal. These changes are not directly related to blood-sugar levels nor to levels of muscle glycogen, but it is suggested that they may be due to changes in the rate of utilization of carbohydrate. E. D. WALTER (Chem. Abstr.).

Preparation and Pharmacological Testing of Acetylcholine Phosphate and β-glycerophosphate. Nagy, T. Vályi, and Mihalik, I. [*Arch. exptl. Path. Pharmakol.*, **202**, 43–59 (1943).]

Moncholine phosphate (I) and monoacetylcholine phosphate (II) were prepared by treating solutions of the corresponding neutral sulfates with $Ba(H_2PO_4)_2$. In like manner monocholine β-glycerophosphate (III) and monoacetylcholine β-glycerophosphate (IV) were obtained by treating the sulfates with monobarium β-glycerophosphate. (I) and (II) are very hygroscopic, (III) is somewhat less so, and (IV) is readily crystallized from water. The pharmacological action of frog rectus abdominis muscle, isolated intestine and blood pressure of cats decreased in potency in the order: (II), (IV), choline chloride, (I), (III).

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

Mechanism of the Action of Sympathomimetic Drugs. XIII. Action of Sympathomimetic Drugs on Sensory Nerves. Orzechowski, Gerhard. [*Arch. exptl. Path. Pharmakol.*, **202**, 80–4 (1943); *cf. C.A.*, **37**, 5781[5].]

The application of a 1–2 per cent. solution of a salt of ephedrine, sympathol, veritol, benzedrine, pervitin or β-tetrahydronaphthylamine to the exposed sciatic nerve of a frog blocked transmission of stimuli in a manner similar to that of procaine. Washing with Ringer solution restored normal conduction. L. E. GILSON (Chem. Abstr.).

Effects of Morphine on Cortical Electrical Activity of the Rat. Cahen, Raymond, L., and Wikler, Abraham. [*Yale J. biol. Med.*, **16**, 239–42 (1944).]

Doses of less than 200 mgm./kgm. of morphine, like moderate doses of barbiturates, had little effect on cortical electrical activity of unanesthetized rats. Large doses (200 mgm./kgm.) or doses of 40–100 mgm./kgm. combined with 9–30 mgm./kgm. barbiturate abolished cortical electrical activity because of the anoxia due to respiratory depression. When artificial respiration was given the cortical activity reappeared. G. H. W. LUCAS (Chem. Abstr.).

Late Effects of Lead Poisoning on Mental Development. Byers, Randolph K., and Lord, Elizabeth E. [*Am. J. Diseases Children*, **66**, 471–94 (1943).]

A study was made of 20 children who had had Pb poisoning in infancy or early childhood and who had apparently made a complete recovery. With one exception, none of the children progressed satisfactorily in school. Conclusion: Pb in the circulation of an infant interferes with the changes normally occurring in the cortex, and in a high percentage of cases prevents normal growth and development of the cortex. E. R. MAIN (Chem. Abstr.).

Influence of Some Analeptics (Metrazole, Coramine, Neospiran and Cycliton) on Body Temperature of Normal and Narcotized Rabbits. Hahn, Fritz. [*Arch. exptl. Path. Pharmakol.*, **202**, 165–93 (1943); *cf. C.A.*, **37**, 5137[9].]

In normal rabbits convulsive doses of metrazole may raise body temperature as much as

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2·8°. Coramine, cycliton and neospiran lower the body temperature. In rabbits narcotized with allonal the effects are similar but less marked. L. E. GILSON (Chem. Abstr.).

Carbocholine. Kulakovskiĭ, B. [*Farmatsiya, No.* **1**, 34–5 (1941).]

Carbocholine (I), $Me_2N(Cl)CH_2CH_2OOCNH_2$, is a tasteless, odorless, water-soluble white powder, m. 203–205°. As a stimulant for the parasympathetic nervous system (I) is many times more active than acetylcholine (II). Given *per os*, (I) is slower than (II) to decompose within the body and more uniform in effect in prolonged systematic use. It lowers blood pressure in 10–15 minutes. The effect reaches its maximum in 25–30 minutes, returning to the initial level in an hour. In glaucoma a 0·75 per cent. solution of (I) is as potent as 2 per cent. pilocarpine.

Qualitative tests for (I) are described. An argentometric method of determination is recommended. JULIAN F. SMITH (Chem. Abstr.).

Influence of Drugs and Chemotherapy on Enzyme Reactions. III. Cholinesterases of Brain and Erythrocytes. Zeller, Ernst A., and Bisseger, Alfred. [*Helv. Chim. Acta*, **26**, 1619–30 (1943); *cf. C.A.*, **37**, 1135⁵.]

Human-serum cholinesterase is strongly inhibited by nupercaine, irgamide and isopropylantipyrine, but the cholinesterase of human erythrocytes and brain are only weakly inhibited by these drugs. Morphine inhibits all three cholinesterases and caffeine only serum cholinesterase. Both brain and erythrocyte cholinesterases are inhibited by excess of substrate. From the above and other data the cholinesterases can be classified into two types. Characteristics of each type are discussed. L. E. GILSON (Chem. Abstr.).

Experimental Studies on Headache: Pharmacodynamics of Urine Excreted during Migraine Headache and Its Relation to 17-Ketosteroid Content. Torda, Clara, and Wolff, Harold G. [*J. clin. Invest.*, **22**, 853–8 (1943).]

Urine collected during periods of migraine headache contracted rectus abdominis muscle of frogs to a greater extent than that collected during attack-free periods. During the headache period the 17-ketosteroid content was increased. Other factors in causation of the attack, such as histamine, acetylcholine and K, were ruled out. J. B. BROWN (Chem. Abstr.).

Effect of Certain Sulfonamides on the Electrical Activity of the Cerebral Cortex. Brenner, Charles, and Cohen, Sidney. [*J. Am. Med. Assoc.*, **123**, 948–50 (1943).]

Sulfanilamide or its salt even up to 20 per cent. does not affect the electrical activity of the cerebral cortex, but salts of sulfathiazole, sulfapyridine or sulfadiazine produce striking changes which are attributed to their convulsant action. The general conclusion is that "sulfanilamide is the safest of these four drugs for local intracranial application."

S. MORGULIS (Chem. Abstr.).

Effect of High CO_2 Concentrations on Experimental Convulsions. Moussatche, H. [*Anais assoc. quim. Brasil*, **2**, 80–3 (1943).]

Application of a square of filter-paper moistened with strychnine solution to the motor cortex of dogs anesthetized with morphine produces epileptic convulsions. The convulsive state can be maintained by keeping the filter-paper moistened with strychnine. When 18 per cent. CO_2 is added to the inspired air the convulsions are inhibited at once, and in a majority of cases do not return for some time after normal air is again breathed. Theoretical aspects are discussed.

BRUNO VASSEL (Chem. Abstr.).

Effect of Adrenaline- and of Ephedrine-HCl on Anaphylactic Shock in the Rabbit. Vallery-Radot, Pasteur, Mauric, G., and Holtzer, Mme. A. [*Presse méd.*, **51**, No. 14, 183 (1943); *cf. C.A.*, **38**, 792⁵.]

Adrenaline-HCl, intravenously injected into rabbits in doses varying from 0·001, 0·01, 0·1 to 0·2 mgm. per kgm. does not prevent anaphylactic shock. However, in certain tests a dose of 0·5 mgm. per kgm. produced some protection, although an uncertain one (in 6 out of 11 animals). Intravenous injection of ephedrine hydrochloride in doses of from 5 mgm. to 10 mgm. per kgm. had no corresponding protective effects. R. P. E. HOPF (Chem. Abstr.).

Production of Epileptic Convulsions with Essence of Absinthe. Propper-Grashchenkov, N. I. [*Sovet. Psikhonevrol.*, **16**, *No.* 4, 17–29 (1940).]

Experiments on dogs have shown that the intravenous administration of essence of absinthe is far more effective in producing epileptic convulsions than is suboccipital injection or direct introduction into the cortical or subcortical region of the brain. This indicates that the active substance is carried by the blood-stream repeatedly to the brain-cells and produces with each cycle a distinct convulsion, the interval between them being about three minutes. The chemical action is twofold: (1) the threshold of excitation of the pyramidal cells in the brain is lowered; (2) the irritating effect of the chemical causes overstimulation of these cells, which is the primary cause of epileptic convulsions. This hypothesis is supported by the fact that any therapeutic agent with depressant action is known to relieve the convulsive state.

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

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press

Effect on the Electrical Activity of the Cortex of Certain Depressant and Stimulant Drugs, Barbiturates, Morphine, Caffeine, Benzedrine and Adrenalin. *Gibbs, F. A., and Maltby, G. L.* [*J. Pharmacol.*, **78**, 1–10 (1943).]

The EEGs of six normal men given the above drugs were analyzed by the Grass method. Phenobarbital, pentothal and morphine caused a shift in frequency to the slow side. Pentothal caused a great increase in voltage, morphine less, and phenobarbital least. Caffeine, benzedrine and adrenalin caused a shift to the fast side, comparable to, but not greater than, that occurring with attention. The most depressant drug clinically (pentothal) caused the greatest shift to the slow side, and the most stimulating (adrenalin) the greatest shift to the fast side. A shift of one cycle per second can occur without signs of disturbed nervous function; the shift of four cycles produced by pentothal is associated with unconsciousness comparable to deep normal sleep. Direction of change in frequency was constant for a given class of drugs, but direction of change in voltage level varied with dosage and with drugs of the same class.

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

Action of Intrathecally Injected Prostigmine, Acetylcholine and Eserine on the Central Nervous System in Man. *Kremer, M.* [*Quart. J. exp. Physiol. cognate med. Sci.*, **31**, 337–57 (1942).]

Prostigmine, acetylcholine, and eserine were injected into the lumbar theca of human subjects with no abnormality of the central nervous system and subjects with some form of spasticity of pyramidal origin. Case-studies are presented. Doses of 0·1–1·5 mgm. of prostigmine produced depression of muscle tone and reflexes. Larger doses tended to produce nausea, vomiting, and drowsiness. Voluntary movement was impaired, bladder emptying was temporarily abolished, and "no changes in sensation were ever noted." When prostigmine was injected in patients below the level of their spinal block, the spinal cord depression was limited to the cord below the level of the block. No effects were noted due to injection of 2–500 mgm. of acetylcholine. Doses of 0·25–1 mgm. of eserine sulphate produced an "initial transient depression of spinal reflexes followed by a rapid return to a level exceeding that noted prior to the injection." Eserine also produced "striking sensory changes including facilitation of sensory transmission."

L. C. Mead (Psychol. Abstr.).

https://doi.org/10.1192/bjp.90.381.879 Published online by Cambridge University Press