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The Positive Conditional Salivary Reflex in Psychoneurotic Patients.

1. A positive conditional salivary reflex to an auditory stimulus was developed in 10 psychoneurotic patients. The stimulus was a metronome 150 beats per minute reinforced by lemon juice.

2. The salivary responses were designated as positive when the action of the metronome was accompanied by an increase in salivation over the rate immediately preceding the stimulus.

3. When the results for the first prolonged stimulus of the day were studied for each patient, the positive responses appeared in from 67 to 83 per cent. of the cases, the mean value of the positive reflex for the 10 patients being 77 per cent.

4. The mean value of the positive response for 15 seconds was 4·9 drops or 0·1 c.c.

(Authors' abstr.)

Level of Adreno-Cortical Substance in the Blood during Hypoglycemic Treatments for Schizophrenia.

1. Chemical studies on the levels of adrenalin-cortical material in the blood show marked differences in the cases who recover from insulin shock therapy as compared with those who fail to recover.

2. The curves of recovered cases are characterized by a rising residual A–C level and a stability in the amounts present even under the stress of hypoglycemic coma and electric shock.

3. Failures are characterized by a persistently low A–C value with great susceptibility to change when shocks are applied. (Authors' abstr.)

Presenile Psychosis of the Jakob Type.

The case of a man aged 53 is described, who showed an organic type of dementia accompanied by wasting and fibrillation of the muscles of the upper extremities. The course of the disease

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was rapidly downhill with increasing mental deterioration and marked muscular wasting, extending to the lower extremities. Vitamin E therapy was used without apparent effect. The duration of the disease was about one year. Pathologically there were widespread lesions of the neuron cells extending to the cerebral cortex, the basal ganglia, and particularly the motor cells of the medulla and spinal cord. The neuroglia was hyperplastic and hypertrophic; the microglia had also proliferated and numerous rod-shaped cells were observed. The case is considered an instance of presenile psychosis of the Jakob's type (cortico-striato-spinal degeneration). The few similar cases reported in the literature are summarized and some clinical, pathologic and etiologic aspects of the disease are briefly discussed. (Authors' abstr.)

The Toxic Delirious Reactions of Old Age.

1. Toxic delirious reactions in older people are quite common.

2. They probably can be prevented if the clinician will keep in mind the special factors in the handling of older people.

3. If a toxic delirious reaction does develop, it can be corrected by glucose infusion therapy. Simple elimination of the etiological factor will not correct delirious states in older people, as it does in younger people, in the great majority of cases. (Author's abstr.)

The Use of Amphetamine Sulfate (Benzedrine) in Child Psychiatry.

Benzedrine is a useful adjunct to treatment of the neurotic child, in that it gives him a feeling of well-being, and temporarily allows him to feel secure and loved. In this frame of mind he can face his difficulties, express his aggressive impulses without overwhelming fear of consequences, and obtain relief from inner tension and anxiety. The art productions and other means of expressing the fantasy life of these children reflect these processes as they take place. Benzedrine alone does not lead to any but a temporary solution of the child's problems, and must always be combined with a personal therapeutic approach.

In the more severely neurotic child, benzedrine acts only as an expedient to help the child adjust in an environment where he can later find help for his deeper conflicts, and leads to an evasion of these problems during the period of administration. Here, too, the art and fantasy production show an inhibition which parallels the evasion noted in the personal therapeutic approach during medication.

Benzedrine is of great benefit in stimulating interest and drive in learning in the child with a learning disability, providing the original impulse has been obscured through the operation of neurotic mechanisms.

Fear, depression and sexual tension in the child are often completely relieved during the period of benzedrine administration, as is hyperkinesis occurring on a neurotic basis. Activity is frequently integrated and made more productive, and the relationship to the group is thus facilitated.

In the group studied benzedrine had no appreciable effect upon the behavior of children with developmental brain defects or with schizophrenia, and its effect upon the psychopathic personality was in all respects unfavourable. Consequently its use in a controlled ward set-up may be an aid in the differential diagnosis of some obscure problems. It has also clarified our concepts in regard to the classification of behavior problems in children as they are here described. However, it is worth emphasizing again that the successful use of this drug in the behavior problems of children depends on a clear understanding of the causes of the child's problems, the proper choice of children to receive the drug, and the use of the drug only as an adjunct to adequate personal psychotherapy, tutoring and social adjustments. (Authors' abstr.)

Fluctuations of Blood Iodine in Cyclic Psychoses.

1. As a group, manic patients have higher, and depressive patients have lower blood iodine levels than a group of normal controls.

2. In individual cases of true manic-depressive psychoses, a close correspondence between changes in mood and changes in blood iodine is found.

3. In contrast to these findings there is no coincidence between changes in mood or motor excitement and blood iodine in other psychotic states. (Authors' abstr.)

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Brain Injury, Drugs, and Environment as Causes of Mental Decay in Epilepsy.

This is the second of a series of three papers dealing with mental deterioration in epilepsy. Comparison was made of the mental state of 449 "symptomatic" and 1,456 "essential" epileptics. Twenty-six per cent. of the symptomatic and 10 per cent. of the essential group showed definite deterioration, although the former group had experienced fewer seizures. The elimination of patients who were mentally deficient at birth decreased the disparity to 12 and 6 per cent. respectively. With respect to the age of patients at the onset of seizures, serious deterioration was more manifest in the symptomatic group in all ages, but the difference was greatest if seizures began in adult life. With respect to the duration of epilepsy, again deterioration was more marked in the symptomatic group in all periods, but the difference was greatest if the epilepsy had just begun. In the symptomatic group deterioration was more often present before seizures began.

Patients whose mentality improved while using anticonvulsant drugs numbered for phenobarbital 30 per cent., for bromides 26 per cent., and for patent medicines 13 per cent. Improvement of seizures was noted, respectively, in 65, 53 and 40 per cent. of patients reporting the use of these drugs. (Author's abstr.)

Further Follow-up Results in Insulin-Shock Therapy.

The results of Insulin-shock therapy, with an immediate recovery-rate of 55 per cent., show a tendency to level off at about 33 per cent. in the second, third and fourth years. (This tendency continues in the few cases which could be followed for five years.) With an immediate recovery-rate five times that of control cases in the Pennsylvania Hospital and with a long distance recovery-rate twice that of controls, the therapy seems justified.

Three cases died of insulin shock. In the other 185 cases there seem to be no signs of brain damage and no signs of mental deterioration greater than is found in schizophrenic patients not treated by shock. Eight recovered patients are doing their work with judgment and initiative five years after the termination of therapy. Two more made "spontaneous" recoveries some years after discharge from the hospital.

In all there are 7 deaths in the insulin-shock group of 188; in a control group of 116 patients there were 10 deaths. The control group was followed for a greater average number of years, but the deaths seem to be about in proportion to those of the insulin group.

The good results from insulin treatment were produced at once in about six weeks from the beginning of treatment. The good results in the control cases came in half the cases years after the admission to the hospital. In 13 of the cases recorded after the first year as unimproved, there were good remissions of at least one year (totalling 15 years) in which the patients supported themselves.

The difficulties in finding the prognosis in schizophrenia are well brought out in the papers of Romano and Ebaugh (2), Rupp and Fletcher (3), with their attached references.

The therapeutic activity which is involved in insulin shock with the remarkable immediate results visible to other patients and to nurses and physicians creates hope in patients, families of patients and staff. It opens a door for research into the psychological, cortical, metabolic nature of schizophrenia. (Authors' abstr.)

Comparative Study of the EEGs of Schizophrenic and Manic-Depressive Patients.

A comparative study of a group of EEGs of 126 schizophrenics and 81 manic-depressives revealed significant differences in the distribution of certain measurable factors. The distribution of the types of EEG pattern in the total psychotic group showed that 27 per cent. had "A" types of pattern and 24 per cent. had "MF" types. These percentages were lower than among "normals."

The "MF" and "B" types of patterns were almost equally distributed in the schizophrenics and included 50 per cent. of the entire group. Since these two types of pattern have a fast frequency component in common which differentiates them from other types of patterns, they were combined as one for purposes of comparison. By contrast, 36 per cent. of the manic-depressive group had "A" types of patterns which represented the largest number of any one type of EEG pattern.

The common baseline for alpha frequencies among "normals" is 10 to 10·5 cycles. Only 43 per cent. of the total psychotic series had alpha frequencies in this range. Of the remainder

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29 per cent. of the schizophrenics had alphas slower than 10 cycles, and 32 per cent. had alphas faster than 10·5 cycles. Of the manic-depressives outside the baseline alpha range, 32 per cent. had slow alphas and only 15 per cent. had fast alphas. Schizophrenics were found to have fewer EEGs with alphas of 10 to 10·5 cycles, but twice the number of fast alphas, in contrast to the manic-depressives.

The findings suggest more cortical activity among the schizophrenics, as implied by the fast component and high percentage of " MF " and " B " types of patterns, than by the " A " types of patterns characteristic of the manic-depressive group. The synchronization of cortical activity, however, is clearer in the " A " type of pattern, and it is the degree of synchronization of cortical activity in the EEGs which appears to differentiate the schizophrenics from the manic-depressives.

The presence of " choppy " activity (10), which is in a faster frequency range than the fast frequencies characteristic of the " MF " and " B " types of patterns, or fast alpha frequencies, was found in 61 per cent. of the schizophrenics in contrast to 39 per cent. of the manic-depressives. These findings are striking and significant since they are not related to type of pattern, alpha, or the factor of age. The " choppy " activity is regarded by the author as indicating, primarily, overstimulation or irritation of the cortex, which is due to unsynchronized activity within the central nervous system. This hypothesis is supported by animal experiments (1, 2, 3, 4, 12, 14, 15, 16). With this assumption, it might account for apparent early deterioration in schizophrenics as a secondary effect of prolonged or continuous overactivity. It was found to be present in 47 per cent. of the schizophrenics and in only 3 per cent. of the manic-depressives under 40 years of age.

Comparison of the EEGs of old persons suffering from cerebral arteriosclerosis, and deteriorated schizophrenics under 40 years, showed that this " choppy " activity is not associated with old age nor cerebral arteriosclerosis.

Experiments with mescalin on " normal " individuals, by Sulzbach and the author (not yet published), demonstrated the occurrence of the " choppy " activity with the appearance of schizophrenic-like symptoms. As the mescalin wore off both the " choppy " activity and the schizophrenic-like symptoms began to fade out at the same time, and the subject became normal again.

These findings give definite leads to a further understanding of schizophrenia, and support the hypothesis that schizophrenia may be inherent, or recognized at an early age. The EEGs clearly demonstrate that the condition is *primarily* not one of physiological sluggishness.

(Author's abstr.)

Unidirectional Electrostimulated Convulsive Therapy.

(1) Unidirectional electro-stimulation was therapeutically applied in convulsive doses to 176 hospitalized psychiatric patients. The present report covers 2,746 convulsive reactions induced through left temple (negative), vertex-of-skull (positive) electrode placements.

(2) The threshold convulsive dose, expressed in milliampere seconds (product of intensity and duration of stimulation), was determined for four different types of unidirectional electrostimulation. The technique for obtaining threshold convulsive doses was described.

(3) Type A1 stimulation consisting of rectified waves at 60/seconds, each wave lasting 1/120 second with intervals of 1/120 second was tried in 154 instances. Practically 68 per cent. of the trials gave convulsive thresholds at 50 mA. seconds or less, with 45 per cent. requiring intensity level of 46–60 mA.

(4) Type A2 stimulation designated as type A1 waves interrupted by a make commutator at 10/seconds giving rise to impulse bursts of 1/20 second was tried in 1,735 instances. In 83 per cent. of the trials the convulsive dose was 50 mA. seconds or less with 52 per cent. in the 26–50 mA. second group and 31 per cent. requiring 1–25 mA. seconds. The intensity level was in the 16–30 mA. group in over 70 per cent. of the trials.

(5) Type C2 stimulation is described as 10/seconds commutator interrupted type C1 wave form. Type C1 is a 60/second, slightly smoothed (filtered) rectified wave form, each wave lasting 1/60 second with no interval. Of the 270 convulsive doses by type C2 stimulation, 66 per cent. occurred at 50 mA. seconds or less, with the intensity level in the 16–30 mA. group in 72 per cent. of the trials.

(6) Type C3 stimulation, described as the type C2 form further interrupted by rapid manipuation of the hand switch, was given 587 trials. Of these, practically all occurred at doses of 50 mA. seconds or less, with 80 per cent. at 1–25 mA. seconds. This markedly low convulsive dose more than offset the higher intensities required (46–90 mA. in 82 per cent. of the trials).

(7) Unidirectional electrostimulation seemed to offer convulsive doses markedly less than required by techniques utilizing the alternating current. (Author's abstr.)

Evaluation of Continued Therapy with Phenytoin Sodium.

The total results of all groups comprising the follow-up study of the initial group plus the follow-up study of the new group may be summarized as follows :

Of 93 patients receiving phenobarbital (1½–10 gr.) for 5–44 months there was marked reduction of seizures in 15 per cent. (14) ; moderate reduction in 20·4 per cent. (19) ; and no reduction in 64·5 per cent. (60).

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Of 41 patients receiving phenytoin (1½–9 gr.) for 3–33 months there was marked reduction of seizures in 39 per cent. (16); moderate reduction in 24·3 per cent. (10); and no reduction in 36·5 per cent. (15).

Of 104 patients receiving phenobarbital combined with phenytoin there was marked reduction of seizures in 28·8 per cent. (30); moderate reduction in 21·1 per cent. (22); no reduction in 49·9 per cent. (52).

Analysis of the anticonvulsant effect obtained in 145 patients receiving phenytoin sodium, either alone or combined with phenobarbital during a period of 3–41 months, revealed marked reduction of seizures in 31·7 per cent.; moderate reduction in 22 per cent.; and poor results in 46·2 per cent.

Although several patients were seizure-free for 4–26 consecutive months, these seizure-free intervals were interspersed with recurrence of seizures for at least one to several months, except in one case seizure-free for 38 consecutive months on a combination of 3 gr. of phenytoin sodium and 1 gr. of phenobarbital. Toxic reactions are discussed. (Author's abstr.)

Evaluation of Continued Therapy with Phenytoin Sodium.

Anticonvulsant therapy with phenytoin sodium alone, or combined with phenobarbital, can be administered for periods as long as 41 consecutive months with relatively constant satisfactory results. In addition to favourable anticonvulsant effects, there is often improved disposition, efficiency, and behaviour. In therapeutic doses phenytoin sodium rarely produces hypnosis, and although in a fair proportion of cases it produces toxic manifestations, most of these are innocuous, and none of them should constitute a danger to the patient, provided he is under adequate medical supervision. (Author's abstr.)

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Physiological Suicide, with Regard to the Concept of Hypomesocephaly.

The causes of suicide are not always pathological; they may be purely psychological, which is considered equivalent to physiological. Inadequacy of the midbrain (hypomesocephaly) may impair the life instinct and foster suicidal tendencies. Physiological and hypomesocephalic suicides occur in otherwise normal people. H. L. ANSBACHER (Psychol. Abstr.).

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Effect of Certain Choline Derivatives on Electrical Activity of the Cortex.

The application of a 2·5 to a 10 per cent. solution of acetylcholine chloride to the surface of the cat's cortex produces a pronounced increase in the electrical activity of the cortex.

This electrical response is not altered or prevented by intravenous atropinization (1 mgm. of atropine sulfate per kilogram) of the animal.

Acetylbetamethylcholine chloride, carbamylcholine chloride and a mixture of acetylcholine chloride and prostigmine methylsulfate, when applied in the same way, also produce a change in the electrical record which is indistinguishable from that produced by acetylcholine chloride.

The minimum effective concentrations and duration of effect in each case appear to be closely related to the stability of the solution in the presence of cholinesterase. The more stable the solution the lower the minimum effective concentration and the longer the effect will last.

Acetylcholine chloride appears to be rapidly destroyed by the living cortex.

It is felt that in the light of present knowledge the effect of these drugs on the cortex is comparable to the well-known effect of acetylcholine chloride on the sympathetic ganglion and the myoneural junction of skeletal muscle.

Attention is drawn to the fact that acetylcholine chloride acts as a convulsant in both human beings and in cats, and to the similarities in the form and properties of the electrical activity of the cortex during convulsive seizures and after the experimental application of acetylcholine chloride.

Since acetylcholine is known to be a normal constituent of the brain and is felt by many to be important in the mediation of the nerve impulse, the facts previously cited suggest the possibility that disorders in the metabolism of acetylcholine may be concerned in the etiology or mechanism of convulsive seizures in human beings. (Authors' abstr.)

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Intracranial and Extracranial Vascular Accidents in Migraine.

1. Migraine in persons considered otherwise normal is occasionally associated with intracranial and extracranial vascular accidents.

2. Changes in caliber of cranial blood vessels known to occur during attacks of migraine are probably predisposing factors in hemorrhage and occlusion.

3. Activity producing sudden increase in pressure within the blood vessels of the head during the migraine headache is a precipitating factor in hemorrhage.

4. Unless such vascular accidents can be attributed to latent structural lesions of cranial blood vessels, migraine should be regarded as an instance of disordered function capable of causing irreversible tissue change. (Author's abstr.)

Water Metabolism in Relation to Convulsions: (2) Specific Gravity of Blood and Blood Serum.

In a series of 31 epileptic patients the oral administration of 2,000 c.c. of water within a period of 15 to 30 minutes combined with injections of pitressin produced a maximum average decrease in the specific gravity of the blood serum of 0·0014 one hour after drinking of water was begun.

In another series of 10 epileptic patients, the maximum mean decrease in specific gravity of the whole blood after ingestion of 2,000 c.c. of water, without the use of solution of posterior pituitary, was 0·0011, which was statistically without significance.

By means of determination of the specific gravity it is therefore possible to detect a small change in the direction of dilution of the blood after rapid oral ingestion of 2,000 c.c. of water, but this change on the average is apparently slight, corresponding to lowering of the protein content of the serum through a range of 0·5 gm. per hundred cubic centimeters.

Only one of the 41 patients exhibited a convulsive seizure during the course of these tests.

It is difficult to induce a state of hydremia in a clinical sense in the adult human subject by excessive oral fluid intake supplemented by antidiuretic measures. (Authors' abstr.)

Neuropathologic Changes in Arteriosclerotic Psychoses and their Psychiatric Significance.

A neuropathologic study of 28 cases of psychoses with cerebral arteriosclerosis is reported.

In all cases there was a variety of focal cerebral lesions, the most important of which were areas of softening and acellular or devastated areas. The observations indicated that the different types of focal lesions do not constitute separate anatomic or clinical forms of arteriosclerotic psychosis. The basal ganglia were more vulnerable than other parts of the brain, but in no case was the damage confined exclusively to these structures.

A scrutiny of the relationship between the extent of the neuropathologic changes and the degree of intellectual deterioration revealed numerous discrepancies; in many instances the psychosis could not be adequately explained by anatomic considerations alone. It is believed that the discrepancies are based on differences in the capacity of different persons to compensate for damage to the brain. Examples are given to illustrate that cerebral lesions do not inevitably produce psychotic disturbances. Attention is directed to qualities of the living patient as an important factor in the origin of the mental disorder. It is suggested that patients with an ill-balanced mental make-up possess weaker compensatory powers, and are thus more likely to acquire a psychosis than other persons with cerebral arteriosclerosis. (Author's abstr.)

Intraneural Conditioning: Cerebellar Conditioned Reflexes.

These experiments represent a study of intraneural conditioned responses established from movements initiated in the cerebellum. The cerebellar movements were produced by stimulation of the neocerebellum in chronic preparations (dogs), with induced electrical currents. The movements elicited were contractions of the ipsilateral ear, neck or shoulder muscles; with moderate electric shock they occurred without evidence of pain or disturbance to the animal.

Such movements were made the basis for conditioned responses by preceding the electric shock with a bell or light. Both excitatory and inhibitory conditioned responses could be formed from the cerebellum with the same ease that they can be formed by using a painful shock applied to the skin of the leg.

Thus intraneural conditioned responses can be established on the basis of cerebellar movements. The cerebellum may have an independent higher integrative function, or this apparent integration may be brought about through the thalamus and the cerebral cortex.

(Authors' abstr.)

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Blood Coagulation in Disseminated Sclerosis and Other Diseases of Brain Stem and Cord.

The reaction of the blood coagulation time to the intravenous administration of typhoid vaccine and to the subcutaneous administration of epinephrine was studied in patients with disseminated sclerosis and in patients with other disorders of the brain stem and spinal cord.

To the administration of typhoid vaccine both groups of patients responded with a reduction in coagulation time, the drop being 25 per cent. greater at maximum in disseminated sclerosis. The patients with disseminated sclerosis showed a prolongation of the reduotion in clotting time three times as great as the patients with other disorders.

To epinephrine the responses were similar. The intensity of the response was 40 per cent. greater at maximum in patients with disseminated sclerosis than in patients with the other disorders. The duration of the reduced coagulation time for disseminated sclerosis was more than twice that for the other diseases.

It is suggested that in disseminated sclerosis there is a constitutional or acquired disorder of the blood-clotting mechanism which makes it more sensitive to exogenous or endogenous stimuli which tend to reduce the blood coagulation time. Intensive or repeated stimulation of this oversensitive mechanism may lead to intravascular thrombosis under certain conditions.

The disorder of blood coagulation is characteristic of disseminated sclerosis, and was not found in patients with the other diseases of the brain stem and spinal cord studied.

(Author's abstr.)

Distribution of Alkaline Phosphatase in Normal and in Neoplastic Tissues of the Nervous System: A Histochemical Study.

The distribution of alkaline phosphatase in normal and in pathologic tissues of the nervous system has been investigated, a method based on that developed by Gomori and by Takamatsu being utilized. The species studied included chicken, mouse, cat and man.

Pronounced alkaline phosphatase activity was present in the endothelium of the blood vessels of the central nervous system and in the arachnoid; the phosphatase activity in the parenchyma of the nervous system varied in different species and in different portions of the nervous system, the greatest activity being found in the brain stem of the chick. The cellular elements of the spinal fluid were negative for phosphatase.

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Of the tumors studied, the phosphatase activity of the meningiomas was most striking. Moderate activity was present in several astrocytomas, in one oligodendroglioma and in astrocytic areas of one glioblastoma. In many tumors the parenchyma was negative for phosphatase, while the vascular endothelium was often positive. The vascular endothelium in the tumors was less constantly stained for phosphatase than that of the vessels of normal nerve tissue. Apparently the phosphatase content of tumors of the nervous system can be correlated roughly with (1) the phosphatase activity of the homologous normal tissue, and (2) the tendency of the tumor to become calcified.

Phosphatase was present in areas of astrocytosis, such as the chronic plaques of patients with multiple sclerosis.

It is suggested that the phosphatase in vascular endothelium may play a role in the passage of dextrose through the capillary wall, similar to that suggested by Lundsgaard to explain the passage of dextrose through the intestinal wall and the proximal convoluted tubule of the kidney.

The histochemical technic for phosphatase provides a uniquely effective method for demonstrating vessels, since it stains the vascular endothelium. By preparing thick serial pyroxylin sections and staining for phosphatase one may obtain a more complete picture of the vascular tree than that obtained by other methods. Studies of the vascular supply of various portions of the nervous system by this method are practicable.

The method has a limited usefulness in diagnosis of tumors when employed in conjunction with other technics. (Authors' abstr.)

The Pyramidal Tract: A Study of Retrograde Degeneration in the Monkey.

Retrograde degeneration with breakdown and loss of neurons does not occur in the pyramidal system of the monkey after section of the pyramidal fibers. Changes occur in the so-called Betz, or giant, cells of area 4, characterized by shrinkage and loss of Nissl substance, so that the normal configuration of these cells is lost. The Nissl substance may not be concerned with the nutrition and metabolism of the axon. The author believes the retrograde method fails to prove that the so-called Betz, or giant, cells give sole origin to the pyramidal tract fibers. The question is raised whether retrograde degeneration with dissolution of axis-cylinders can be produced in the spinal cord and brain stem of the central nervous system.

(Author's abstr.)

Intelligence in Cerebral Deficit States and Schizophrenia Measured by Kohs Block Test.

The Kohs block test offers a means of measuring the intelligence of persons suffering from intellectual deficits after cerebral damage, as it tests the functioning of the intellect at the moment relatively free from the influence of material which had been acquired prior to damage to the brain. With 5 aphasic patients and with 21 patients suffering from cerebral deficit states the test appeared to afford a good index of the intellectual resources. In 3 patients the clinical improvement was paralleled by appropriate increases in the score on the Kohs test.

As a test for the presence of deterioration the performance on the Kohs test is contrasted with the score on a vocabulary test. The advantages and limitations of the procedure are discussed. Twenty patients suffering from definite cerebral lesions with deterioration showed a mean difference of 4·2 years between the mental age on the vocabulary test and that on the Kohs test. Fifteen patients with schizophrenia showed no significant mean difference between the mental ages as determined by the two tests. Of 21 patients with deterioration due to cerebral lesions, all except 2 showed a difference of at least 2 years 4 months between the vocabulary and the Kohs determinations of the mental ages. None of the 15 schizophrenic patients showed a Kohs mental age as much as 2 years lower than the vocabulary mental age.

On the basis of the material, it is suggested that when the mental age on the Kohs test is equal to or higher than the mental age on the vocabulary test, it is unlikely that the patient is deteriorated unless a specific memory deficit is present. As the distribution curve and scatter for persons with intact brains are not known, it cannot be stated exactly what degree of difference between the vocabulary and the Kohs determination can be taken to signify a cerebral lesion. However, the test has shown itself a reliable adjunct to clinical studies, and even in its present state it suggests that when the Kohs mental age is more than 2 years lower than the vocabulary mental age, cerebral defects impairing the intellectual functioning should be considered. Greater differences add to the evidence proportionately.

The excellent performances of the schizophrenic patients on the Kohs test indicate that such patients may be capable of a high order of impersonal abstraction and may show no impairment of general intelligence. The thinking disorders of schizophrenic patients should not be included in uncritical fashion with the disabilities following damage to the brain.

(Authors' abstr.)

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Insulin Sensitivity of Patients with Mental Disease: Factors in their Serum Affecting Action of Insulin.

A group of 16 patients, consisting of 13 with dementia praecox, 2 with psychoneurosis and 1 with a neuroendocrine disturbance, were tested as regards their sensitivity to test doses of insulin as reflected by the changes in the blood-sugar level, according to the method of Csépai and Ernst.

Of the patients with dementia praecox, some showed a normal response and others either an increased or a decreased sensitivity to the test dose of insulin.

A group of 7 patients with dementia praecox were studied by a method similar to that of de Wesselow and Griffiths with regard to the possible presence of substances in the serum which affect the action of insulin.

The serum of some of the patients showed a pronounced antagonistic effect on the action of insulin, while others showed little or no effect.

The results obtained with both tests were compared with the report of Meduna and his co-workers, in which it was claimed that increased amounts of substances antagonistic to the action of insulin were present in the blood of schizophrenic patients.

The possible role of insulin antagonism in the pathogenesis of dementia praecox is discussed and the need for further investigations indicated.

A patient with depression associated with a combined Parkinson and Cushing syndrome showed evidence of resistance to the blood-sugar-lowering effect of insulin, associated with slow recovery to the initial blood-sugar level. The latter effect is in keeping with the claim of Fernbach that patients with Parkinson's disease show slow recovery from the depressed blood-sugar level.

The delayed recovery from the lowered blood-sugar level observed in the patients with dementia praecox may indicate a disturbance in the physiology of the neuro-vegetative system.

No strict correlation was found between the tests and the subsequent dose of insulin required to produce coma during insulin shock. The significance of this observation is discussed.

(Author's abstr.)

Effects of Destruction of Hypothalamus by Tumor.

A case is reported which throws light on the function of the hypothalamus in man. The following abnormalities are ascribed to the destruction of the hypothalamus by tumour: diabetes insipidus; suppression of function of the anterior lobe of the pituitary, the thyroid, the ovaries and the adrenal glands; disturbance of fat metabolism; disturbance of sleep; disturbance of thermal regulation, and disturbance of personality.

The role of the thyroid in diabetes insipidus is demonstrated, and information bearing on the anatomic and physiologic relationship between the hypothalamus and the anterior lobe of the pituitary gland is presented. (Author's abstr.)

Use of Testosterone Propionate in Treatment of Involutional Psychosis in the Male.

Twenty male patients suffering from involutional psychoses were treated with testosterone propionate, administered intramuscularly for a period of from six weeks to three months.

Sixty-five per cent. of the patients responded well. In the control group treated by procedures previously employed, only 46 per cent. improved. The best results were obtained with

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the mild and moderately severe types. The severe type did not respond well to androgenic therapy and may represent a different clinical entity from the other two.

The therapeutic test with testosterone propionate may be of some diagnostic value in differentiating the milder type, in which androgenic deficiency is an important etiologic factor, from the more severe type, in which other psychologic or organic factors predominate.

(Authors' abstr.)

DECEMBER.

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Relief of Pain by Mesencephalic Tractotomy.

Unilateral intractable pain may be alleviated by section of the spino-thalamic and secondary trigeminal tracts at the mesencephalon. This procedure produces hemianalgesia and hemithermanesthesia on the side of the body opposite the lesion immediately after the operation, with a peculiar feeling of "numbness" or "deadness." There is slight weakness of the contralateral leg, demonstrable only by having the patient hop or stand on that leg alone. Co-ordination is normal. Proprioceptive sensibilities are not impaired. (Author's abstr.)

Problem of Imperception of Disease and of Impaired Body Territories with Organic Lesions: Relation to Body Scheme and its Disorders.

The problem of the phenomena of imperception of disease and of the related types of amnesia for or non-recognition of or consecutive psychotic production with respect to the impaired parts or side of the body is studied. The anatomic, physiologic, psychologic and clinical aspects of the subject are discussed. The question of the value of the phenomena in cerebral localization is also alluded to. The concept of the so-called body scheme and the relation of these phenomena to it are examined. The conclusion is reached, on the basis of available evidence, that they are to be considered as indirect disorders of the body image. The direct disorders of the body scheme are reviewed and analyzed in this connection. The differentiation between the two groups of disorders and their particular characteristics is indicated. An attempt is made to categorize the various disturbances in the sphere of body scheme that have been observed with organic conditions.

In approaching the subject from a clinical-phenomenologic standpoint, the following classification of the diverse manifestations of body disorientation referable to the body scheme is arrived at: (1) Autotopopagnosia, or somatotopagnosia, i.e., general disorientation and lack of

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recognition in the sphere of the body and in the inter-relation of its individual parts. (2) Finger agnosia, i.e., primary specific disorientation and loss of recognition in the sphere of the fingers of both hands and in their spatial relationship. (3) Agnosia for laterality in the somatic sphere, i.e., disorientation for right and left of the body (usually associated with either of the two conditions just mentioned). (4) Anosognosia, i.e., lack of knowledge of disease, most frequently observed with left cerebral hemiplegia. Disturbance in orientation for laterality, if present, refers to the diseased side only. (5) Autosomatamnesia and autosomatagnosia, respectively, i.e., amnestic and agnostic unawareness of the impaired parts or half of the body, varying in degrees from simple neglect of their presence to the experience of their non-existence. Disorientation for laterality, if demonstrable, is related to the non-appreciated side. (6) Somatoparaphrenia, i.e., specific psychic elaboration (marked by formation of illusions, confabulations and delusions) with respect to the affected members or side of the body, believed or experienced as absent. (7) Fantom limb, i.e., non-realization of actual absence or experience of possession of a lost member of the body.

I believe that the study of the body scheme and its disorders associated with lesions of the brain should be given more attention than has hitherto been accorded it. The fundamental importance of the facts emerging from the study of these disorders for an understanding of many an obscure phenomenon in the fields of neurology and psychiatry is emphasized.

(Author's abstr.)

Convulsions in Non-epileptic Patients on Withdrawal of Barbiturates, Alcohol and Other Drugs.

The cases of seven non-epileptic patients who had convulsions four days after withdrawal of soluble barbital are reported; they had been accustomed to this sedative for one to two years. None of them had seizures prior to or after this occurrence.

Seizures occur after withdrawal of the various barbiturates, paraldehyde and other hypnotics of the aliphatic group. They are seen only after prolonged medication, never after acute intoxication with the same drug.

The dangerous increase of seizures in epileptic persons following sudden discontinuance of phenobarbital is explainable by the same mechanism. It seems that in this respect phenobarbital acts differently from other anticonvulsive drugs, such as bromides and dilantin.

The literature on withdrawal seizures after chronic intoxication with such hypnotics as barbiturates and paraldehyde reveals that these convulsions, in most instances, are associated with a delirium-like psychosis of several days' duration.

Withdrawal seems to be equally responsible for convulsions in cases of so-called alcohol epilepsy. Alcohol in large doses is a narcotic, and fits occur only during the sobering-up process, as demonstrated in two cases reported here. The possible relation between alcoholic delirium and seizures and the analogous manifestations in intoxication with barbiturates and paraldehyde are discussed.

Ether convulsions are mentioned as not belonging in the group of withdrawal seizures.

The time interval between withdrawal and convulsions or psychosis is rather constant for each drug.

No immediate action of the drug, but some unknown physico-chemical process developing after withdrawal in a chronically intoxicated patient, seems to be responsible for both the convulsions and the withdrawal psychosis. (Author's abstr.)

Electroencephalogram Accompanying Hyperactive Carotid Sinus Reflex and Orthostatic Syncope.

The electrical activity of the cortex has been studied in 17 patients with hyperactive carotid sinus reflexes and in three normal subjects in whom orthostatic hypotension developed after the ingestion of sodium nitrite. Electroencephalograms and cortical frequency spectrums were obtained before and during syncope. As a control, the response to compression of the carotid sinus was studied in 15 normal subjects and in 20 epileptic patients.

On the basis of these studies the following conclusions were drawn:

Slow waves of cortical origin are not prominent in carotid sinus syncope of either the circulatory or the central type, and ordinarily no gross disorder of the cortical rhythm is apparent during the syncope.

The most characteristic change that occurs in all types of carotid sinus syncope is a sudden decrease in amplitude; this change is difficult to distinguish from an ordinary attention response.

In rare cases of the cardiodepressor type a short period of slow activity occurs just before consciousness is lost.

In the majority of cases of carotid sinus syncope of the circulatory type spectrum analysis with the Grass analyzer reveals slowing of cortical activity during the period of unconsciousness.

In the majority of cases of carotid sinus syncope of the central type spectrum analysis reveals an increase in the frequency of cortical activity during the period of unconsciousness.

The failure to find evidence of gross slowing of cortical activity in cases of the circulatory type of carotid sinus syncope is explained by the assumption that cortical activity is primarily accelerated by stimulation of the carotid sinus, and that it is stopped, rather than slowed, by the sudden cerebral anemia.

The central type of hyperactive carotid sinus reflex can be considered a type of trigger zone epilepsy in which there is only slight cortical involvement. (Authors' abstr.)

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Effect of Hyperventilation on Electroencephalogram of Schizophrenic and Non-psychotic Subjects.

The influence of hyperventilation on the electroencephalograms of 35 schizophrenic patients and of 35 normal control subjects was studied.

A comparison of the two groups revealed no striking differences in the effect of hyperventilation on the amount of alpha activity. However, a second hyperventilation following the first by five or ten minutes did alter the number of persons whose per cent. time alpha increased or decreased on overventilation.

Slow waves appeared in the electroencephalograms of 55 per cent. of the control group on hyperventilation. The schizophrenic patients, however, were unresponsive in this respect, only 3 per cent. (one patient) showing slow activity. This unresponsiveness of the schizophrenic patients could not be correlated with such factors as age, level of initial per cent. time alpha, co-operation or time of day when observed.

It is suggested that some condition exists in schizophrenia which is unfavorable for synchronization of low frequencies, and other instances of the schizophrenic person's unresponsiveness to variables which produce slow rhythms in normal persons are cited.

Knowledge of the mechanism involved in the appearance of slow waves in the electroencephalogram on hyperventilation should contribute to understanding of the nature of schizophrenia.

(Authors' abstr.)

True Fatty Degeneration in Sensory Neurons of the Aged.

A study of aged human and animal sensory ganglion cells shows widespread fatty degeneration. This change is demonstrable as actual fat droplets when specific stains are applied to frozen sections, but appears as vacuoles in paraffin-silver preparations.

In the efferent sympathetic cells this destructive process is not as prevalent as in the afferent neurons. The reason for this difference is unknown.

Immediate fixation of the material of experimental animals precludes the possibility that these changes in the nerve cells represent post-mortem autolysis. The alterations are therefore valid ante-mortem changes.

Variations in the appearance of the lipoidal accumulations with different histologic technics are described. A recognition of these differences will eliminate erroneous interpretations of their pathologic significance.

The general literature pertaining to the problem is reviewed and discussed.

(Authors' abstr.)

ARCH. PATH.

VOL. XXXIV. SEPTEMBER, 1942.

Metastatic Tumors of the Nervous System. *Baker, A. B.* 484

OCTOBER, 1942.

*Tumors of the Striatothalamic and Related Regions: Their Probable Source of Origin and More Common Forms. *Globus, J. H., and Kuhlenbeck, H.* 674
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Tumors of the Striatothalamic and Related Regions: Their Probable Source of Origin and More Common Forms.

Evidence is presented to emphasize the significance of embryonal and histogenetic factors in the production of brain tumors.

It is demonstrated that these factors are operative particularly in the region designated as the striato-thalamic junction, including the sulcus terminalis, and in other areas—the zone of coalescence of the anterior horns of the lateral ventricles and the subependymal cell plate about the nucleus caudatus and the septum pellucidum.

These zones, the striato-thalamic and others, have been found to be frequent sites of tumor formation. The explanation for this is to be found in the fact that they constitute common sites for embryonal residues.

The tumors most commonly found in these situations are identified in accordance with a simple classification. The spongioneuroblastic variety is the most frequent, although others such as spongioblastoma multiforme or ependymale, as well as transitional forms, are occasionally encountered there. Tumors of the spongioneuroblastic variety are not infrequently multiple, with their distribution in zones of predilection for embryonal residues. The primitive character of embryonal residues found in the aforementioned locations is in all probability responsible for the character of the tumors developing there.

Further evidence has been presented that the spongioneuroblastoma and its transitional forms are of a type of tumor in which both neural and glial elements coexist in varying ratios.

Tuberous sclerosis has been found frequently associated with the spongioneuroblastic variety of tumor, and the fact that numerous ependymal granulations are frequently found in spongioneuroblastoma and tuberous sclerosis again points to the significance of the subependymal cell plate as the source of neoplastic alterations.

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Clinically this type of tumor is characterized mainly by the rapidity of the unfolding of the clinical picture in a large number of cases, by the frequency of convulsive seizures, by the depreciation of alertness and by somnolence as a frequent manifestation. (Authors' abstr.)

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Brain Bioelectrical Investigations on Fatigue and Sleep.

In fatigue alpha waves become irregular and discontinuous. Before sleep onset, a reduction of normal cortical activity is observed, but a considerable reduction of activity through fatigue does not necessarily lead to sleep. During sleep the cortex is, at least at times, very active. This activity, however, differs from that of the waking state. During sleep frontal activity is greater than occipital, while the reverse holds true during waking.

H. L. ANSBACHER (Psychol. Abstr.).

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Aphasia in Children.

Thirty cases of cerebral hemisphere lesions in children have been examined with a view to comparing with adult cases the frequency, clinical picture, and prognosis of acquired aphasia in children.

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In this group aphasia occurred with the same regularity as in adults.

In all cases under ten years and in some between ten and fourteen, the clinical picture is uniformly that of diminished speech production, with dysarthria and telegraphic style in the recovery period; this is equally true of cases with frontal and temporal lesions. The latter show disturbances of speech, receptive as well as expressive.

The recovery from aphasia of the purely motor type is surprisingly rapid, and most cases with a reversible lesion have recovered within four weeks.

Some cases of aphasia which were submitted to intelligence tests showed very little, if any, impairment; some cases with lesions of the right hemisphere and no aphasia did show retardation of intellectual development. This, if confirmed by a wider survey, would point to the brain damage rather than to the aphasia as the factor responsible for the disturbance of intelligence.

(Author's abstr.)

SEPTEMBER, 1942.

The Effect of Prolonged Increased Cerebrospinal Fluid Pressure on the Venous Pressure in the Superior Longitudinal Sinus of the Dog. *Bedford, T. H. B.* 233
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The Repair of Large Gaps in the Peripheral Nerves. *Sanders, F. K.* 281

The Effects of Striatal Injury.

(1) Small, unilateral lesions of the striatum may be sustained without producing easily detectable signs of physiological deficit but larger, bilateral lesions produce definite evidences of motor release and of fatuity.

(2) A specific "leaping" sign is described whereby striatal encroachment in carnivora may be distinguished from cortical injury alone.

(3) These signs of release are not the result of irritation, even though they become less obvious as time goes on since (*a*) such animals always remain potentially hyperkinetic and can be activated, if this is done properly; (*b*) even when the hyperkinesia is at its height, such animals can be quieted by reducing tactile and proprioceptive stimulation of the extremities; and (*c*) because specific stimulation of the striatum never produces positive motor but only inhibitory effects.

(4) The characteristics of motor release seen after striatal injury are discussed.

(Authors' abstr.)

Electroencephalographic Studies in Epilepsy.

(1) 86 per cent. of EEG tracings on 625 epileptics were borderline or abnormal, and 14 per cent. were normal.

(2) The authors would stress the variability of EEG tracings of epileptic patients.

(3) Many of the patterns obtained from epileptics are found in other neuro-psychiatric conditions. The spike and wave patterns usually found in epileptics occurred in less than 10 per cent. of our 625 cases. Less than half of these spike and wave patterns were found in *petit mal* epileptics.

(4) Because of the great variety of patterns obtained in epileptics, and because many of these patterns resembled those found in other disorders, the use of clinical terminology in describing the brain-wave patterns of epileptics is misleading.

(5) The EEG can continue to be of practical value to the neuro-psychiatrist in the diagnosis of epilepsy when used as an adjunct in conjunction with other laboratory data, the history and the clinical findings.

(Authors' abstr.)

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Visual Agnosia for Animate Objects. *Nielsen, J. M., and Sanborn, A. L.* 102

Fundamental Principles in Aphasia Based on Autopsy Material of Crucial Cases.

Six cases are described and illustrated to support conclusions that (1) the putamina are not involved in language; (2) the minor cerebral hemisphere may take over language functions; (3) visual, auditory, or motor language functions may be taken over separately; (4) "an artificial writing mechanism may be formed on the minor side by training" without necessarily involving transfer of other language processes; (5) the major temporal and major occipital lobes need not be ipsilateral. D. K. SPELT (Psychol. Abstr.).

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VOL. IV. 1942.

*Drugs and Mental Disease. *Moore, M., Raymond, A. F., and Gray, M. G.* . . . 238

Drugs and Mental Disease.

Of the 115,845 individual admissions to Massachusetts Mental Hospitals from 1917 to 1937 inclusive, 841 were associated with the excessive use of drugs. Order of frequency of involvement was opium derivatives, 363; barbiturates, 208; bromides, 101; other sedatives, 27; analgesics, 15; gases, 19; metals, 18. There was a higher incidence of persons with college education and persons from marginal economic levels than among other sorts of admissions. Native-born residents were more numerous than immigrants. Recovery-rate of cases of mental disease due to drugs is high, and death-rate is low. W. L. WILKINS (Psychol. Abstr.).

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Neuropathologic Features of General Paresis in Relation to Mental Disturbances. *Rothschild, D., and Sharp, M. L.* . . . 310

The Electroencephalogram in Neurosyphilis.

An attempt has been made to correlate rapid frequency (samples 4, 6 and 7) and slow frequency patterns (samples 9 through 12) with the clinical picture. In general paresis, rapid activity is more frequently encountered in those cases in which the psychotic elements predominate, while slow activity is more often found in those cases in which neurologic signs stand out in the clinical picture. In juvenile paresis slow activity is more common. The fact that the infection involves the brain before it reaches maturity in these cases may account for the predominance of slow activity. (Authors' abstr.)

The Relative Efficacy of Various Methods of Treating General Paresis.

Noteworthy progress has been made in the effectiveness of treatment of the general paretic patient by diathermy fever combined with specific chemotherapy. The result has been a marked decrease in the hospital death-rate and a marked increase in the discharged-improved rate.

However, further improvements in the results should be obtained (1) if all general paretic patients are given intensive antiluetic chemotherapy as soon as the diagnosis is suspected, regardless of age or physical condition, and (2) if specific chemotherapy is augmented by diathermy fever as soon as the diagnosis is established. These factors should be of considerable help in further lowering the death-rate and increasing the discharged-improved rate.

The prevention of acute infections in the general paretic patient will do much to lower the hospital death-rate still further. To neglect acute infection means signing the death warrant of the general paretic patient.

A careful study is warranted to find the agent or agents responsible for a decrease of almost 30 per cent. in the number of physical wrecks being admitted to the hospital with general paresis. (Author's abstr.)

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*Electrophysiological Analysis of the Influence of the Sympathetic Nervous System on Cutaneous Reception. *Jirmunskaya, E. A.* 491

Electrophysiological Analysis of the Influence of the Sympathetic Nervous System on Cutaneous Reception.

Action potentials were recorded during stimulation of the sensitive skin nerves with touch, pain, and chemical stimuli. The effect of the sympathetic nervous system on the tactile skin receptors manifested itself in a reduction in frequency and duration of the discharges. The effect of the sympathetic nervous system on the pain receptors was the reverse. The views of Pachornoff and Propper-Graschtschenkoff that the skin receptors are directly influenced by the sympathetic nervous system are supported. H. L. ANSBACHER (Psychol. Abstr.).

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Studies on the Nutritional Basis of Abnormal Behavior in Albino Rats.

Groups of albino rats were maintained on different levels of vitamin B_1 intake, which induced partial inanition. These animals were tested regularly for susceptibility to convulsive seizures by exposure to a standard auditory stimulus. During a 40-day experimental period a rising incidence of seizures was observed in all groups which was roughly parallel. There was some evidence for a critical level of vitamin B_1 intake which results in maximum sensitivity.

With food intake held constant at a low level, all groups showed a marked reduction in number of seizures during an additional 40 days of testing when certain additional vitamins and mineral supplements were provided. This indicates that protection was afforded by the supplement *per se*, or that they permitted a more effective utilization of the substances already present in the reduced food allowance.

The findings provide additional evidence to that previously presented that both caloric intake and a deficiency of essential food substances are important factors in the etiology of sound-induced seizures in the rat. (Authors' abstr.)

Cortical Localization of Symbolic Processes in the Rat.

Animals were trained in the linear maze, under the conditions described, until they reached a comparatively stable level of performance. They were then subjected to destruction of the cerebral cortex in varying amounts and positions and subsequently tested for retention and relearning of the maze-habit. Fourteen animals completed the experiment.

On the basis of the post-operative results, animals could be divided into two groups: those which showed marked loss of the habit and those which did not. Seven were in each group. With the exception of one rat, whose lesion seemed especially severe, the six showing amnesia had lesions in the frontal projection areas representing the medial and anterior parts of the ventral nucleus of the thalamus and corresponding generally to Fortuyn's area (*f*). There seemed to be a relation between the extent of destruction in this area and the amount of post-operative recovery, but final acceptance of this conclusion must await more extensive data. The destruction of other areas had no effect upon maze-performance, and the mass of lesions had little to do with post-operative disturbances.

It is clear, therefore, that the frontal areas are of primary importance in the psychological

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processes (which we presume to be of a symbolic character) involved in the maze-performance. A review of the neuro-anatomic relations of these areas to the thalamus and other cortical areas supports the view that there are functional areas in the rat which correspond to the frontal lobes in primates, and that these functional areas may play a role in mediating symbolic processes much as frontal lobes appear to do in primates. (Authors' abstr.)

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The Reorientation and Maze Behavior of the Rat after Noise-Fright and Electroshock Convulsions.

(1) Twenty-four rats learned a simple right-wrong position discrimination water-maze to a criterion of 10 consecutive trials without error and with a corresponding time score of 4 seconds or less. Ten of these rats were subjected to a series of noise-fright convulsions and 14 of the animals were given several electroshock convulsions. All the rats were placed in the water-maze immediately after the cessation of convulsions and left to swim spontaneously to the correct exit. One hundred and fifty additional trials were made by forcing animals to swim at time intervals of 2, 3 and 5 minutes after electroshock convulsions. Altogether, the trials after 250 electrical convulsions, 50 noise-fright convulsions and 30 noise-fright running reactions were observed in this study.

(2) The electrically induced convulsion produces longer lasting disorientation and a greater retardation of spontaneously initiated movement than does a noise-fright attack.

(3) Error scores are the same for the immediate post-convulsive maze performance of both groups.

(4) Beginning after the second to fifth electroshock convulsion, rats usually display many of the signs of "experimental neurosis."

(5) The maze performance of rats, in so far as error scores are concerned, does not appear to be affected by a long series of convulsions evoked either by electric shock or by noise-fright stimulation. (Authors' abstr.)

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Studies of Abnormal Behavior in the Rat. XI: Factors that Influence the Type of Reaction to Metrazol.

This experiment was undertaken to determine the specific factors responsible for the distinctly different reactions to metrazol obtained in two groups of rats. Each factor in which the groups differed has been tested in relation to its influence on the threshold and on the convulsive pattern for metrazol.

The most important factor in the two groups was the difference of strain. One strain was found to have a high incidence of individuals which reacted abnormally to auditory stimulation and has been designated as the unstable strain. The other was found to have a low incidence of such individuals and has been designated as the stable strain.

Comparing animals similarly treated in the two strains it was found that the metrazol-induced convulsion of the unstable strain was more elaborate and required a smaller dose than did that of the stable strain.

The metrazol reaction was also subject to modification by experience. The following effective conditions were found:

(1) Previous metrazol-induced convulsions cause (*a*) the convulsant threshold for metrazol to fall to a lower and more stable level and (*b*) the form of the convulsion to become more elaborate.

(2) Seizures induced by auditory stimulation have an effect on metrazol convulsions similar to that produced by previous metrazol convulsions, but the effect is less striking. In the unstable strain the seizures influenced both the threshold and the pattern of the metrazol convulsion and in the stable strain only the pattern was somewhat affected.

(3) Exposure to auditory stimulation without resulting abnormal behavior is less effective than sound-induced seizures in altering the reaction to metrazol, but nevertheless it produces a significant effect on the unstable strain.

(4) It is concluded that the instability of the unstable strain is general, rather than specific for either auditory stimulation or metrazol.

Whether or not an individual was potentially abnormal with respect to auditory stimulation was found to be an insignificant factor in the metrazol reaction. The apparent importance of this factor lies in the fact that animals possessing this predisposition are likely to be exposed to such stimulation and thus become altered in their metrazol reactions.

The native tendency to react to auditory stimulation thus distinguishes the strains (which also react differently to metrazol), and yet is not a determining factor in the metrazol reaction. It is therefore concluded that instability in auditory situations and in metrazol reactions are related but independent hereditary factors. (Authors' abstr.)

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Conditioning the Human Occipital Alpha Rhythm to a Voluntary Stimulus: A Quantitative Study.

The conditioning of the response of the occipital alpha rhythm of the human EEG to a voluntary stimulus (clenching of the fist) was quantitatively studied by determining the alpha, amplitude and activity level (AL) indices of a specific segment of record. This was the two seconds of activity starting 0·67 seconds after the beginning of the voluntary stimulus. Neither the conditioned stimulus alone nor the unconditioned stimulus (light) alone was effective in producing the response. However, pairing of these stimuli produced significant differences in the measured response to the fist-clench. The conditioned response so produced was extinguished by lack of reinforcement and the curve of extinction was a decelerated one. In the measurement of these events, the AL index is found to be the most useful of the three measures employed.

The results are discussed from the viewpoint that they represent a central neurophysiological parallel of events which have hitherto been studied at a more peripheral level.

(Author's abstr.)

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J. NERV. MENT. DIS.
VOL. XCVI. SEPTEMBER, 1942.

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Treatment of Epilepsy.

From their experience in the treatment of 137 epileptics, the authors recommend that where the attacks are not controlled by sodium diphenyl hydantoinate alone, this drug should be tried in combination with phenobarbital. To obtain satisfactory results full doses of both drugs must be administered. S. M. COLEMAN.

Visual Hallucination.

A patient with paraldehyde addiction experienced during the withdrawal period a visual hallucination of a characteristic pattern. Various structural details are described and their resemblance to mescaline hallucinations emphasized. An illusionary movement of the hallucination is described. The attempt is made to explain this movement on the basis of a disturbance of spacial stability. That stability is maintained by harmonizing forces belonging to the vestibular and optosensory apparatus. Another case manifesting similar features was used to support the idea that the stability of the individual and of space are inter-related.
S. M. COLEMAN.

Disturbances of Cortical Functions.

An analysis of clinical data indicates that the principle of primary and associated disturbances of the higher cortical functions explains the discrepancies that exist between symptomatology and the site of organic lesions in the temporal lobe. It is suggested that the various neural association systems are so arranged that certain essential parts are concentrated in certain areas of the cortex. A destructive lesion in a vital area might disrupt the entire system; a less strategically located lesion would produce only a partial lesion. S. M. COLEMAN.

" Discharging Function."

By the discharging function of the artificial epileptic attacks a means has been obtained to convey huge amounts of energy inherent to the death and destructive drives and to unload them in an individually and socially harmless manner. It is suggested that favourable results might be obtained in the treatment of other manifest destructive tendencies (constitutional delinquents, etc.). S. M. COLEMAN.

D, l, Alpha-Tocopherol Acetate.

Eighteen patients with different forms of neuromuscular disease were treated orally with the synthetic vitamine E over an average period of five months. There were no objective evidences of improvement in any of the patients. Five cases of dystrophy reported some slight subjective improvement. S. M. COLEMAN.

OCTOBER.

*Primary Melanoma of the Central Nervous System. *Mackay, F. H., and Hurteau, E. F.* 369
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*The Action of Pyridine and Some of its Derivatives in Preventing Experimental Convulsions in Animals. *Pollock, L. J., and Finkelman, I.* 424

Primary Melanoma.

A case of primary melanoma of the brain stem and cervical cord is reported in detail. It is one of the few recorded cases in which the lesion was intramedullary and simulated in many respects a small lesion in the parietal lobe. S. M. COLEMAN.

Muscular Dystrophies.

Six cases of muscular dystrophy were treated with wheat germ oil, alpha-tocopherol, vitamine E concentrate and vitamine B complex. No effect was observed on the urinary excretion of creatine and creatinine due to treatment. Of the six cases, five were unimproved, and one was definitely worse. Two claimed subjective improvement. S. M. COLEMAN.

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The Electrofit.

It is concluded that the electrofit therapy, as far as is known, is a relatively safe form of shock therapy. It has distinct advantages over metrazol and insulin shock therapy. The results obtained are about the same as those obtained by metrazol therapy. In the affective psychoses most authors report 80 per cent. of remissions. Under favourable circumstances the treatment can be administered at the office or in an out-patient department. The apparatus, technique, course of the treatment, indications, manifestations and complications are discussed.

S. M. COLEMAN.

Wilson's Disease.

Five cases of ordinary acquired liver disorder showing cerebral changes are compared with two cases of Wilson's disease. Fundamental clinical and patho-anatomical similarities in the cerebral manifestations of both groups are outlined. It is concluded that Wilson's disease is a primary hepatic disorder which affects the central nervous system secondarily.

S. M. COLEMAN.

Pyridine and its Derivatives.

Pyridine and its derivatives, in appropriate doses, were found significantly to reduce the severity and prevent the occurrence of convulsions following the intravenous injection of metrazol.

S. M. COLEMAN.

J. NEUROPATH. EX. NEUROL.

VOL. I. 1942.

*The " Motor " Cortex of the Cat. *Garol, H. W.* 139
The Neural Mechanisms of Athetosis and Tremor. *Bucy, P. C.* 224

The " Motor " Cortex of the Cat.

Using well controlled electrical stimulation the convexity of the cortex was explored. Two types of results were obtained—motor responses and suppression. Peripheral motor responses were most readily obtained from the area gigantopyramidalis of Brodmann and correspond in their cortical arrangement to those found in primates and man, with the exception of the trunk representation. The results show a wider representation of motor response areas on the cortex than heretofore reported. The second type of result has to do with suppression, which manifests itself in two ways. Stimulation of restricted regions in areas 8, 3–4, 2 and 19 produces a suppression effect by causing a transient rise in threshold of foci for motor response or by holding in abeyance motor after-discharge resulting from stimulation. The suppression effect occurs 3–5 minutes after stimulation of the delimited suppressor areas and may persist for 10–20 minutes. Knowledge of the location of these areas is a distinct aid in searching for or mapping responsive areas of the motor cortex.

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

J. NEUROPHYSIOL.

VOL. V. SEPTEMBER, 1942.

*Changes in Normal Electroencephalogram of *Macaca mulatta* with Growth. *Kennard, M. A., and Nims, L. F.* 325
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Changes in Normal Electroencephalogram of Macaca mulatta *with Growth.*

(1) In the infant monkey cortical potentials (EEG) begin to develop at or before birth, but are not well demarcated until three or four weeks after birth.

(2) From this time until the end of the sixth month there is progressive development and elaboration of the EEG until it resembles that of the adult.

(3) Frequency of waves is about 2–3 per second immediately after birth. It increases to about 7–8 per second during the first six months and then slowly to about 10–12 per second by the end of the second year.

(4) Amplitude is low at birth, increases during the first six months and then slightly decreases.

(5) During the growth period the EEG becomes at once more complex and more uniform. There are less variations of base-line and of type of potential.

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(6) The effect of sleep can be detected in the older animals, but in the newborn infant fluctuations in state of waking or sleeping are too slight and gradual to be correlated with the marked fluctuations in type of EEG, which may, however, be related.

(7) The changes in the development of the infant monkey are like those described for man, and are as far as is known coincident with the anatomical and functional development of the cerebral cortex. (Authors' abstr.)

Effect on Electroencephalogram of Lesions of Cerebral Cortex and Basal Ganglia in Macaca mulatta.

Lesions have been made in cerebral cortex and basal ganglia of 41 monkeys, and electroencephalograms (EEG) recorded before and after operations.

(1) In every instance there is a temporary change in EEG which appears during the first or second post-operative day, and which consists of flattening and slowing of the waves of medium frequency. It is transient; it is independent of the specific area injured; but it is more pronounced following larger lesions.

(2) In acute experiments under dial anesthesia, lesions of cortex or basal ganglia produce no change in EEG.

(3) Following lesions restricted to cerebral cortex thereis no significant change in EEG except the transient one described above.

(4) There was no focal effect of lesions of the cortex, and usually none following combined lesions of cortex and basal ganglia. In a few instances focal epilepsy could be seen.

(5) Lesions of head of caudate nucleus or putamen, or of both, were followed by marked changes in the pattern of cortical potentials. Hypersynchrony of the 8–10 per second waves became intensified, and the 15–20 per second waves became less marked or vanished.

(6) Combined lesions of the motor areas of the cortex with the basal ganglia caused the most marked changes. Hypersynchrony appeared and persisted for as long as two years. True epilepsy, both clinical and in EEG, were found in 5 out of 15 animals.

(7) All the lesions which caused changes in EEG produced the most extreme changes in those animals which had been operated upon in infancy. (Authors' abstr.)

Modification of Cortical Activity by Means of Intermittent Photic Stimulation in the Monkey.

Evidence was found of an effect of intermittent photic stimulation upon the cortical activity of the monkey (*Macaca mulatta*).

The effect was reflected by increased amplitude of cortical response and by stabilization of cortical rhythm. The effect is similar to the driving effect reported by Bishop and his co-workers for rabbit and cat and by various investigators for man.

The range of frequencies found to produce maximal cortical responses in monkey was from 10·5 to 11·5 per second.

The driving effect was found to be present in 100 per cent. of twelve monkeys.
(Authors' abstr.)

Relation of Fibrillation to Acetylcholine and Potassium Sensitivity in Denervated Skeletal Muscle.

Denervation renders skeletal muscle much more sensitive to acetylcholine and, less markedly, to potassium chloride. Small concentrations of these agents, when injected intra-arterially, produce action potentials comparable to and superimposed on those of fibrillation. This excitation is abolished by quinidine in doses which will arrest fibrillation. It is suggested, therefore, that the fibrillation seen in skeletal muscle after lower motor neurone denervation arises from an increased sensitivity of denervated muscle to chemically-induced excitation. The present experiments indicate that acetylcholine, potassium or both may be the usual causative agent or agents. (Authors' abstr.)

Cerebellar Action Potentials in Response to Stimulation of Proprioceptors and Exteroceptors in the Rat.

(1) Cerebellar action potentials in the rat were recorded from surface folia following stimulation of exteroceptive receptors by moving the hair on different regions of the animal's body, and of proprioceptive receptors by tapping the tendons of isolated muscles of the fore and hind limb. The lobules explored were the highest part of the culmen, the lobulus simplex, the folium and tuber vermis, the pyramis, the uvula, crus 1 and crus 2 of the lobulus ansiformis and the lobulus paramedianus.

(2) Of the lobules explored the pyramis showed the most consistent activity following proprioceptive stimulation and the culmen following exteroceptive stimulation. There were marked differences in distribution of the responses depending on which type of stimulation was used. Some of the potentials may have resulted from activity caused by intracerebellar connections.

(3) No consistent differences in the distribution of the responses was detected when different parts of the animal's body were stimulated. Because of the small size of its cerebellum, the rat is not the most suitable animal for this study.

(4) In respect to the cerebellar lobules activated, electrical stimulation of the sciatic nerve resembled exteroceptive stimulation more closely than proprioceptive stimulation. The distribution of activity throughout the cerebellum following electrical stimulation of the sciatic nerve in the rat was more widespread than in the cat, and much more so than in the monkey.
(Authors' abstr.)

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A Comparison of Effects of Upper and Lower Motor Neuron Lesions on Skeletal Muscle.

Using albino rats the atrophy of the gastrocnemius-soleus group of muscles following an upper motor neurone lesion (produced by spinal cord section at the 6th thoracic segment) was compared with the atrophy following a lower motor neurone lesion (section of the sciatic nerve). The two types of lesions produced atrophic processes which were quantitatively similar for the first 14 days. Thereafter the muscle groups with severed upper motor neurones started to recover lost weight while those with lower motor neurones cut showed an uninterrupted development of atrophy. Both types of injury produced hypersensitivity to acetylcholine in the muscles involved. This lasted only as long as the atrophic process was active, and was most marked in the cases of section of the lower motor neurone. Fibrillation was seen only when the lower motor neurone was cut.

Possible causes of the onset and regression of atrophy in skeletal muscle deprived of upper neurone control are discussed. (Authors' abstr.)

Stimulus Frequency as a Means of Analyzing Synaptic Activity.

When trains of electric stimuli are led through needle electrodes to the spinal cord certain wave patterns are set up which have been recorded from the sciatic nerve (decerebrate cats). These consist of a direct wave caused by stimulation of the ventral horn cells and by a number of relayed waves following after different latent periods.

By subtracting the latent period of the direct wave from those of relayed waves the central reflex times of the latter are obtained.

The direct waves follow frequencies of stimulation above 850 per second. The relayed waves follow frequencies which decrease with increasing central reflex times. A curve illustrating limiting frequency as a function of central reflex time is given.

Some relayed waves gradually recruit neurones and thereby increase in size; others have definite frequency optima and thus demonstrate the existence of synaptic resonance.

The findings are discussed in relation to excitation and inhibition, and also with a view to suggesting use of the limiting frequency as a method of studying the central paths.

Variations in frequency as such can serve as a means of distributing into special channels effects entering a central path containing synapses. (Authors' abstr.)

The Central Excitatory State Associated with Postural Abnormalities.

(1) Rigid muscles (lesion areas) associated with postural abnormalities commonly show spontaneous action potentials.

(2) When such spontaneous activity is absent, it can be induced by suitable stimuli; this is a useful criterion for detecting lesion areas.

(3) Induced reflex activity is probably dependent upon the presence of an enduring C.E.S. plus an accessory subliminal stimulus.

(4) Various unusual types of action potentials occur; these are of doubtful origin.

(Authors' abstr.)

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*Action Potential and Enzyme Activity in the Electric Organ of *Electrophorus electricus* (Linnaeus). I. Choline Esterase and Respiration. *Nachmansohn, D., et al.* . . . 499

Absence of Local Sign in Visceral Responses to Pain.

A series of experiments, designed to demonstrate localization of a sympathetic response in man following painful stimulation, has been presented. Left and right index finger volume changes, obtained simultaneously, failed to show any difference in amplitude following a unilateral painful stimulus. Skin resistance changes recorded at the same time from the ring fingers bear a similar relationship. Although variations in percentage change or original skin resistance were observed at times, the greater change was not consistently present in the stimulated hand. These experiments indicate that there is no tendency for localization of the responses studied. (Author's abstr.)

Potentials Recorded from the Nerve Trunk and the Dorsal Root by Micro-electrodes.

Micro-electrodes have been used to record potentials from nerve trunks and from dorsal root ganglia.

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(1) The form of the potentials recorded from the nerve trunk by micro-electrodes is the same as that recorded by gross electrodes similarly arranged.

(2) The records are easier to interpret when one micro-electrode is used in combination with a distant diffuse one.

(3) Micro-electrodes whose tip-diameters are greater than 15μ are not sufficiently selective to record single fiber responses from the nerve trunk when large numbers of the fibers are activated synchronously.

(4) Small electrodes (16μ) attentuate potentials arising at a distance far more than do large electrodes (42μ).

(5) The ganglionic potential curve is very complex when recorded by large micro-electrodes within the ganglion. It is composed of waves representing activity of the nerve fibers contained in the ganglion and others representing activity of the cell bodies.

(6) The various phases of the complex wave have been assigned to the various structures, and the alterations in the form of the curve with depth of penetration of the electrode explained.

(7) In a few instances single cell-body potentials have been recorded from the ganglia. This cell-body spike has a greater latency than can be explained by the conduction time in the nerve fiber, and this delay probably represents a slowing of the depolarization wave as it invades the cell body. (Author's abstr.)

Mediation of Descending Long Spinal Reflex Activity.

Some aspects of the transmission of reflex effect from the fore limb to the hind limb have been examined. Such transmission of necessity employs the descending propriospinal neurons, long and short, as a mediate system.

Transmission of activity arising on one side of the body involves propriospinal tracts of both halves of the spinal cord, as a result of the free yoking together of the brachial mechanisms. Free decussation occurs again in the lumbar cord. Consequently unilaterally evoked activity, by transmission through the propriospinal system, excites motoneurons by strictly unilateral paths, by decussating or crossed paths, and also reaches motoneurons of the same side through doubly decussated paths. The lateral columns are more intimately concerned with strictly unilateral transmission. The ventral columns subserve both unilateral and bilateral transmission. No significant functioning in the present experiments can be attributed to the dorsal column.

The first effect exerted in the lumbar cord by a brachial plexus volley is inhibition of some motoneurons of the ipsilateral side through unilateral pathways. The latency of inhibition allows only for conduction and a single synaptic relay in the cervical cord between primary afferent and propriospinal fibers. Hence long propriospinal fibers are involved and the inhibitory effect is a direct action.

Shortly after the onset of inhibition, interneurons of the lumbar enlargement become active and the motoneurons simultaneously are facilitated. At the height of the facilitation period, which lasts *ca.* 35 msec., motoneurons discharge impulses to the periphery. The long spinal reflex discharge is much more variable than short spinal reflexes, but under favourable conditions may approximate or even exceed the latter in size and synchrony.

In the lumbar enlargement the active neuron pools are confined to the ventral half of the cord. The dorsal horns and most, if not all, of the intermediate region remain inactive. In the ventral horn the most powerful activity is encountered in the *nucleus cornu-commissuralis anterior*, indicating the important role played by crossed mechanisms.

A degree of mutual interference takes place between long spinal reflex activity and short spinal reflex activity pertaining to multineuronal paths. This interference is designated as "mutual inhibition," for the deficit is frequently too great to be accounted for as occlusion. On the contrary, long spinal reflexes reinforce one another.

When nuclei are activated by diffuse discharges rather than synchronized volleys, synaptic delay is no longer the determining factor (along with conduction) in central latency. Nuclear delay, usually having several times the duration of the longest known central synaptic delays, becomes a characteristic feature of transmission and accounts for the greater part of central reflex time. (Author's abstr.)

Intersegmental Inhibition in the Spinal Cord of the Frog.

The effect of cooling and of sectioning the spinal cord of the frog when separated from the brain and removed from the body has been investigated.

(1) Prolonged cooling of the spinal cord diminishes or abolishes ipsilateral reflex responses to electrical stimulation of the skin of the foot.

(2) Diminution of reflex activity is often preceded by an increase.

(3) Section of the spinal cord, especially just above the lumbar enlargement, regularly produces a marked increase of reflex response. The threshold strength of current remains unchanged in all three cases.

(4) Cooling subsequent to low dorsal section always depresses reflex activity.

(5) Spontaneous movements, proved to be of reflex origin behave similarly to induced reflexes.

(6) These observations are interpreted as follows: intersegmental inhibitory mechanisms involving the cervico-dorsal segments of the cord are affected by cold earlier than segmental reflex arcs of the lumbar region. Removal of such inhibition by cooling or by cord section increases the magnitude of reflex responses. (Authors' abstr.)

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Oscillographic Studies on the Spinal Tract of the Fifth Cranial Nerve.

By means of the oscillograph, tactile impulses were traced into the spinal tract of the fifth nerve of the cat. Impulses originating in the ophthalmic division of the trigeminal were recorded as far as the caudal part of the first cervical segment, those from the maxillary area as far as the rostral part of the first cervical segment, and those from the mandibular area were followed to the junction of the medulla and cord.

Synchronous action potentials evoked electrically from a large branch of each of the divisions of the fifth nerve were recorded from the spinal tract and traced to approximately the same levels as given above. These potentials were easier to trace than the random tactile responses, but could not be detected an appreciable distance below the levels mentioned. Physiological evidence is presented to support previous anatomical findings regarding the relative position of the three trigeminal divisions within the spinal tract. The ophthalmic fibers assume a ventral position, the mandibular fibers a dorsal position, and the maxillary fibers an intermediate position. Each division remains relatively independent throughout its course.

The action potential evoked electrically consisted of one or two waves, each of which had one or more crests. The first wave was complete within 2 msec. and very likely resulted from activity in first order neurones. The second wave started at about 2 msec., lasted to as long as 4 or 5 msec., and evidenced activity in second or higher order neurones. (Authors' abstr.)

Reflex Discharges in Branches of the Crural Nerve.

The sartorious and the vastus internus are two muscles of different function which are supplied by motor axons originating in the same and adjacent segments of the spinal cord and passing together peripherally in the crural nerve. In a series of cats under pentobarbital sodium anesthesia, reflex discharges were evoked in the motor nerves to each of these muscles by the stimulation of dorsal roots. The discharges had a constancy from preparation to preparation, which stands in contrast with the variability observed in ventral root discharges similarly evoked in comparable preparations.

In spite of the topographical association of the two groups of motoneurons, the reflex discharges in the motor branches supplying the sartorius differed considerably from those in branches to the vastus internus and other components of the quadriceps. Furthermore, the reflex discharges to the two muscles were conditioned in different ways by antecedent stimulation of the same groups of sensory axons. An L6 dorsal root volley evoked in the nerve to the vastus internus a nearly synchronous discharge having a central latency of only 0·9 to 1·6 msec. It evoked in the nerve to the sartorius a dispersed discharge of relatively long central latency. An L7 dorsal root volley produced no conspicuous discharge of vastus internus motoneurons. Its only effect on the discharge produced by an L6 volley was inhibitory. The profound inhibitory effect had a duration as long as several hundred msec. The latency of its onset was brief; it was already present when the conditioning volley arrived at the L6 segment of the cord only 1·0 to 1·1 msec. before the firing of the tested motoneurons. In contrast, an L7 volley produced in the branches to the sartorius a discharge similar to that produced by an L6 volley. The discharge to an L6 volley was facilitated by an L7 volley preceding at intervals up to *ca.* 15 msec. At longer intervals the discharge to the L6 volley was inhibited. (Author's abstr.)

Action Potential and Enzyme Activity in the Electric Organ of Electrophorus electricus (*Linnaeus*)
(1) *Choline Esterase and Respiration.*

(1) Voltage, amperage and resistance have been recorded in the electric organ of four specimens of *Electrophorus electricus*, at different sections between head and caudal end. The data were compared with the concentration of Ch.E. at the same segments. V per cm. and QCh.E. run parallel not only in the same fish, but even in fishes of different size in which the E.M.F. of the discharge differs considerably. The experiments offer new evidence for the close relationship between E.M.F. and Ch.E. activity.

(2) The respiration has been measured in different sections of the electric organ with different substrates; glucose, pyruvate, and succinate. With succinate both the succinic oxidizing system and succinic dehydrogenase were examined. In contrast to the great variations of QCh.E. the QO_2 values are practically the same from the head to the caudal end. Even between the strong main organ and the weak bundle of Sachs there is no measurable difference. The oxygen uptake was about the same with all the substrates used.

(3) Histological preparations were made from different sections. The number of electroplaxes in series has been calculated. Photographs of the histological preparations, some of which are reproduced in the paper, demonstrate the different aspect of the voltaic pile. They show that not only the number of electroplaxes per cm. varies, but that there are also great varieties of the aspect of the single electroplax. (Authors' abstr.)

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A Multiphasic Personality Schedule (Minnesota). III: The Measurement of Symptomatic Depression.

The authors present the data obtained from administering their 60-item depression questionnaire to 690 individuals, of whom 40 were normal persons with high depression scores on a preliminary scale, 50 hospital patients without clinically observed depression but with a tendency to high scores on the preliminary scale, and 50 carefully chosen hospitalized depressed patients.

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It is concluded that: (1) Significant separation of depressed patients can be demonstrated for a large percentage of cases; (2) patients having only moderate degrees of depressive trend without specific abnormality can be differentiated; (3) depression scores for females are significantly higher than for males and become more so with increasing age; and (4) unselected patients on a psychiatric ward test higher on depression than do patients on other wards.

F. A. MOTE, jun. (Psychol. Abstr.).

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Two Factors in the Prognosis of Alcoholism.

(1) No attempt is made to explain why we partake of alcoholic beverages. The endeavour has been to emphasize the point, however, that consumption of alcoholic beverages is entirely a personal equation.

(2) Since it is a personal equation, some individuals must be subjected to re-education. For those whose education is beginning, the same facts must be brought to their attention. (*a*) The ability to practise self-control is essential. (*b*) The individual must possess a knowledge of his maximum tolerance.

(3) By means of education and re-education along these lines, many fixed ideas may be corrected.

(4) The alcohol susceptibility test is a simple procedure to evaluate an individual's nerve tissue susceptibility to the chemical ethyl alcohol.

(5) Each individual has a maximum tolerance for ethyl alcohol. If he stays within his tolerance, alcoholic beverages will always be serving him, but this requires the presence of the first and foremost factor—the ability to put into practice this knowledge.

(6) The prognosis of the alcoholic patient may be determined by gaining a knowledge of the personality, and by ascertaining whether he is in possession of the ability to enforce self-denial, or self-control. (Author's abstr.)

Contrasting Schizophrenic Patterns in the Graphic Rorschach.

1. The graphic Rorschach technique was applied to 28 mental hospital patients diagnosed as schizophrenic. Certain features of performance were found to be common to a large percentage of the group and a " composite schizophrenic deviation pattern " was decribed.

2. Criteria for good prognosis were isolated which indicated outcome correctly in 23 out of 28 cases. The standard for good prognosis was at least 35 per cent. of " 3 " ratings, and dominance of blot over concept no greater than a blot-concept quotient of + ·10.

3. The presence of " 1 " ratings was associated with the presence of hallucinations in 12 out of 13 cases. A small number of other patients also had hallucinations.

4. There was no observable relationship between the presence of delusional ideas and any feature of the graphic Rorschach performance.

5. There was no observable relationship between the presence of single schizophrenic sign or constellation of signs in the verbal Rorschach record and any feature of the graphic Rorschach performance. (Author's abstr.)

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Prognosis of Carbon Monoxide Poisoning in 15 Patients previously Mentally Ill.

(1) A study has been made of 15 mentally ill patients who attempted suicide by motor exhaust gas or illuminating gas. The courses of these patients have been emphasized to aid, in a limited way, in the prognosis of cases of carbon monoxide poisoning.

(2) Four patients who had sufficient gas to cause acute symptoms, but not unconsciousness, developed no sensorium or neurological changes.

(3) Four patients who were unconscious up to 30 minutes developed no changes.

(4) Two patients who were unconscious about one hour developed transient neurological changes. The sensorium of one was intact; cerebral arteriosclerosis complicated the case of the other.

(5) Five patients unconscious anywhere from 3 hours to 10 days showed extreme variability in power of recovery. One, unconscious 10 days, recovered in two months. The speed of recovery is also extremely variable.

(6) A patient poisoned by carbon monoxide is not likely to have serious sequelae if he regains consciousness within one hour after removal from the toxic atmosphere.

(7) Beyond this point, there appears to be no correlation between the duration of unconsciousness and the severity and duration of pathological clinical changes.

(8) There is no important clinical difference between the toxicity of motor exhaust gas and that of illuminating gas. (Author's abstr.)

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**The Electroencephalogram and Psychopathological Manifestations in Schizophrenia as Influenced by Drugs.*

Mescaline, cocaine, sodium amytal and benzedrine were given to 14 schizophrenic patients, and their influence upon personality functions and the electroencephalogram (EEG) was observed.

Changes in the EEG were found only when definite psychological changes took place.

The effects of the drugs could be classified into two types:

(1) *Those specific for a given drug.* Psychologically these were manifested in changes in attitude, anxiety, mood, etc. Correlated with the most extreme states of anxiety produced by mescaline was a 25 to 30 per cent. increase in frequency of the 10-per-second (alpha) rhythm. With sodium amytal the decreased tension was accompanied by the appearance of a 15 to 20-per-second (beta) rhythm.

(2) *Those characteristic of a given patient.* Psychologically these took the form of elaborations within the content of the psychosis and the patient's reaction to the setting, regardless of which drug was used. Similarly, a change in *per cent. time alpha* of the EEG was consistent in a given patient either in the direction of increase or decrease. (Authors' abstr.)

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QUART. J. STUD. ALCOHOL.

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Requirements for Rorschach Training.

In response to a questionnaire, leading Rorschach workers gave opinions concerning how much training is necessary before an individual may be considered competent to do good Rorschach work. Most workers believe (1) that at least 1–2 years' work are required, including approximately 20–30 hours of theoretical instruction, the rest of the time being devoted to intensive study of actual records under the guidance of a skilled worker; and that a college background with extensive training in either psychology or psychiatry or both is a necessary prerequisite for training in the method. Certain personal qualifications concerning adjustment and sincerity are also made. R. E. Horowitz (Psychol. Abstr.).

SCHWEIZ. ARCH. NEUROL. PSYCHIAT.

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Conclusions on the Cortical Sensory Syndrome Drawn from the Study of Cerebral War Wounds. *Brunnschweiler, H.* 165
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Localization of the Vegetative Centers in the Cat's Cerebral Axis by the Method of Electrical Stimulation.

This is a synopsis of Monnier's atlas showing the localization of the central regulating systems in their course from the telencephalon through the medulla. According to the effect of electrical stimulation they are divided into activating and inhibiting centers. The synergic ergotropic

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reactions (cardio-vascular, respiratory, somatomotor, etc.) and similarly the inhibiting and trophotropic reactions are elicited by stimulation of well-defined areas in the different axial segments. In the oral segments, notably the hypothalamus, the areas are organized according to a collective principle, and their activities, ergotropic or trophotropic, are concerned with emotional states. In the peduncle and pons the systems are scattered and intermingled. In the medulla, they reorganize themselves into circumscribed centers, and their action takes on the automatic spinal character. Plates. Extensive bibliography.

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

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Reorganization of Public Institutions for Child Care According to Inherited Potentialities and Educational Success. *Hecker, W.* 28
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*The Electrical Processes in the Human Brain. *Rohracher, H.* 209
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The Electrical Processes in the Human Brain.

This is a review of investigations of the electrical processes in the human brain, including also work done on animals. After considering the mass of experimental evidence, the theory is advanced that beta-waves arise from excitation processes in the ganglion cells, while alpha-waves fulfil a vital function for the ganglion cells, a nutritive-vegetative process, which restores their depleted energy. This is considered for its importance in the study of electrical processes, as well as its general psychological importance, as for example in explaining fluctuations of attention. The four chief objections advanced by Berger against this theory are answered in the light of the experimental evidence. D. T. SPOERL (Psychol. Abstr.).

The Origin of the Illusion of Recognition.

Many explanations have been offered of false recognition (déjà vu). Some of the earlier led to metaphysical speculation; others were that it results from reproduction of previous states of being, a similarity between the present and previous situations, a partial recognition, the "free existence" of a feeling, or insufficient functioning of the nervous pathways. An explanation is proposed where the object of false recognition is called the "critical object," which through a series of impressions comes to be "recognized" in the later applied impression as familiar. It is important that the phenomenon occurs most often in a state of weariness or tension where this process of apperception could occur most easily.

D. T. SPOERL (Psychol. Abstr.).

1. Anatomy, Physiology, Biochemistry and Pathology.

The Acetylcholine Theory of Myasthenia: A Critique. Saker, G. [*Klin. Wochschr.*, **20**, 257–9 (1941).]

The theory that myasthenia depends on a disturbance of the chemical stimulus transmission has not been proved. The cause of this disease lies definitely in a metabolic disturbance of the myasthenic musculature itself. RUTH BERGGREN (Chem. Abstr.).

The Role of the Sympathetic Nervous System in the Regulation of the Functional Condition of the Salivary Gland in the Course of Ontogenesis. Kryuchkova, A. P. [*J. Physiol. U.S.S.R.*, **29**, 47–54 (*in English*, 54) (1940).]

In puppies, stimulation of the peripheral end of the sympathicus resulted in qualitative alteration of the saliva. The secretion of the latter was induced by stimulation of the tympanic cord. The content of organic matter increased considerably above that of normal saliva, and ptyalin appeared, although normally it is absent in very young puppies. That these changes were due to the stimulation of the sympathicus was evident from the fact that upon excision of the upper cervical sympathicus ganglion the changes disappeared completely.

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

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Respiration of the Developing Brain. Tyler, D. B., and van Harreveld, A. [*Am. J. Physiol.*, **136**, 600–3 (1942).]

The O consumption and glucose utilization of excised rat brain were determined at different ages. Three distinct levels in the respiration of the brain can be distinguished. The lowest level, which occurs during the first week of life, is characterized by a low O and glucose utilization but a high glycolytic activity. The highest level occurs between the 4th and 7th week and is characterized by a high glucose and O utilization but a decrease in glycolytic activity. The adult level is reached at about the 20th week and is somewhat lower than the 2nd level. At birth the medulla has the highest respiration, followed by stem and pallium; in the adult this order is reversed. E. D. WALTER (Chem. Abstr.).

Effect of Diagnostic Treatment on Metabolism of Brain. Gorodisskaya, H. Ya. [*Biochem. J. (Ukraine)*, **17**, 105–13 (1941).]

In dogs and cats, cisternal puncture alters the N metabolism of the brain, increasing the residual N content. Bilateral trephining increases the content of non-albumin N.
B. C. P. A. (Chem. Abstr.).

Alteration of the Amino Acid Composition of the Brain Protein in Relation to the Age of Man. Dobrynina, V. [*J. Physiol. U.S.S.R.*, **29**, 220–4 (*in English*, 223–4) (1940).]

Analyses were made of brains from subjects who had died of trauma, not from disease, for tryptophane, tyrosine, cystine, arginine, histidine and lysine. The ages were from infancy to 65 years. Tryptophane decreases gradually with age; cystine increases from infancy to 9 years, then remains constant. Arginine reaches a maximum at 9, and drops slightly afterwards; cystine of the cerebellum increases considerably between infancy and 9 years. The cystine and lysine contents of the cerebellum differ sharply from those of the hemispheres in all age groups studied. C. S. SHAPIRO (Chem. Abstr.).

Production of Goiter and Myxedema by Thiocyanates. Kobacker, J. Lester. [*Ohio State Med. J.*, **38**, 541–2 (1942).] RUTH BERGGREN (Chem Abstr.).

Clinical Investigations on Beriberi (III). The So-called Subclinical Deficiency of Aneurine (Vitamin B_1). Meyers, F. M. [*Geneeskund. Tijdschr. Nederland.-Indië*, **80**, 1727–46 (1940); *Trop. Diseases Bull.*, **38**, 602–3 (1941).]

Descriptions of subclinical aneurine deficiencies from the temperate parts of the world show a much wider range of symptoms than those of the tropics. This difference in symptoms is believed to arise from different conditions of disease. In the Netherlands East Indies at least aneurine deficiencies are relatively uncomplicated and chiefly of exogenous origin. In Europe and in the U.S. these subclinical deficiencies are often conditioned by alcoholism and chronic diseases of the intestinal tract and are mixed furthermore with pellagra in its *forme fruste*. In a number of healthy Javanese estate-laborers the daily excretion of aneurine in the urine varied from 0 to 63γ, with an excretion after subcutaneous injection of aneurine test doses of 2–50 per cent. (in most cases, 10–30 per cent.). However, one healthy "prepared" person (i.e., a person who had received a diet rich in aneurine) showed excretion values of the same order as those of patients with mild beriberi. In 9 out of 14 healthy persons, a definite diuretic influence of the test doses of aneurine could be established. There was no clear correlation with the aneurine excretion values. Aneurine has properties of a true diuretic. In 3 out of 8 healthy individuals, the increase of systolic blood pressure after adrenaline became much stronger after the test doses with aneurine had been given. The same occurred in the cases of beriberi, but in none of the three "prepared" individuals. This vascular reaction proved to be a valuable means in establishing conditions of aneurine deficiency when other means had failed, but no definite correlation could be detected with the excretion of aneurine in the urine. The reaction seems to be a consequence of an unbalanced vascular tonus; with repeated injections of adrenaline and before the test doses had been given, the rise in blood pressure became much stronger, as was the case in the persons with a negative vascular reaction. The excretion of aneurine in the urine alone often does not seem to produce figures that are sufficiently unequivocal to judge whether or not in individual cases a deficiency is present. RUTH BERGGREN (Chem. Abstr.).

Studies in Pellagra: Preliminary Note. Díaz-Rubio, M. [*Rev. clin. españ.*, **2**, 161–2 (1941); *Trop. Diseases Bull.*, **38**, 716 (1941).]

The etiology of pellagra is discussed. From 1936 to 1939 the food supply in Madrid was grossly deficient in quality and quantity. "Para-pellagrous" states, characterized particularly by lesions of the nervous system, were commonly seen in Madrid. Other deficiency conditions were famine edema, hemeralopia, hyperkeratosis and anemias, while minor degrees of scurvy were present. Although the diet was deficient in vitamin B_1, there was no beriberi.
RUTH BERGGREN (Chem. Abstr.).

The Role of the Neuroglia in Cholesterol Metabolism. Gorizontov, P. D. [*Bull. biol. méd. exptl. U.R.S.S.*, **5**, 356–9 (1938); *Chem. Zentr.* (**11**), 88 (1940); *cf. C. A.*, **34**, 5158[8].]

In the meningo-encephalitis experimentally produced in dogs by subdural injection of turpentine or $AgNO_3$ a condition of hypercholesterolemia developed. Histochemical findings

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indicated that this was due to an increased cholesterol synthesis taking place in the neuroglial tissue of the brain and was not connected with cytolytic processes in the subcutaneous connective tissue. The hypercholesterolemia appearing in various cases of poisoning (by P, As, etc.), in progressive paralysis and in multiple sclerosis is probably due to an increased rate of synthesis of cholesterol and an increased rate of its discharge from the brain into the blood.

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

Release of Potassium by the Brain of the Dog during Electrical Stimulation. Cicardo, V. H., and Torino, A. [*Science*, **95**, 625 (1942).]

Electrical excitation of the brain of spinal or curarized dogs, in which there are no general contractions, produces an increase of K in the blood of the superior longitudinal venous sinus. This increase in plasma K is not accompanied by a similar increase of K in blood drawn simultaneously from the femoral artery. FELIX SAUNDERS (Chem. Abstr.).

The Decomposition of Proteins from the Cortical Substance of Brain by Human Blood Serum. Inoue, Itiro, and Kanai, Tutomu. [*Zyuzenkai Zassi* (*J. Perfect Health*), **45**, 962–72 (1940); *Japan. J. Med. Sci.* (**11**), *Biochem.*, 4, *No.* 4, *Abstracts* (*in English*), 108 (1941).]

In about 40 per cent. of healthy persons the blood serum was able to hydrolyze the protein from the cortical substance of brain. The hydrolysis was inhibited by heating and change in pH. C. L. B. (Chem. Abstr.).

Polyneuropathy in Thiamine-deficient Rats Delayed by Alcohol or Whisky. Lowry, J. V., Sebrell, W. H., Daft, F. S., and Ashburn, L. L. [*J. Nutrition*, **24**, 73–83 (1942).]

In paired feeding experiments with a thiamine-deficient diet, 54 rats on water without exception developed polyneuropathy before the paired litter mates on EtOH or whisky. Both EtOH and whisky delayed the onset of polyneuropathy. The explanation is not clear, and the data do not support the assumption that the ingestion of alcohol increases the thiamine requirement. Further experiments showed that the polyneuropathy observed was related to the thiamine deficiency, and could be prevented or alleviated by the administration of thiamine regardless of the presence or absence of EtOH or whisky. C. R. FELLERS (Chem. Abstr.).

Alcoholic Encephalopathy in Man and Fish-diet Disease in Foxes: A Study in Comparative Neuropathology. Alexander, Leo., Green, Robert G., Evans, C. A., and Wolf, Louis E. [*Trans. Am. Neurol. Assoc.*, **67**, 119–22 (1941).]

Wernicke's encephalopathy in human alcoholic patients is clinically and pathologically identical with the thiamine deficiency disease produced in foxes by a large amount of raw fish. The thiamine requirement is greatly increased by the fish diet if the thiamine and fish are given simultaneously, but not if the thiamine and fish are given 12 hours apart. This suggests that the fish contains a factor directly destructive to thiamine. The possibility that alcohol may have a similar effect is of interest in view of the consideration of addition of vitamin B_1 to alcoholic beverages. MARION HORN (Chem. Abstr.).

Clinical and Chemical Studies in Wernicke's Syndrome. Wortis, Herman, Jolliffe, Norman, Stein, Martin H., and Bueding, Ernest. [*Trans. Am. Neurol. Assoc.*, **67**, 115–18 (1941).]

Observations on 31 cases of Wernicke's syndrome led the authors to conclude that this syndrome is invariably associated with a thiamine deficiency, apparently related to the ophthalmoplegia, and in some cases to the marked disturbances in consciousness and mental functioning. Other deficiency syndromes (pellagra, nicotinic acid deficiency, encephalopathy, riboflavin deficiency) may superimpose themselves on the more usual Wernicke picture, and these require specific treatment. The development of ophthalmoplegia may be prevented by early administration of thiamine in patients showing delirium with marked increase in psychomotor activity (which usually precede the development of this syndrome). Among the first 27 cases, all receiving "adequate vitamin therapy" recovered, unless a fatal complicating condition (pneumonia, hepatitis) was present. The recovered cases, however, usually developed a Korsakoff syndrome which did not consistently respond to thiamine. Of the last four cases, in which detailed chemical studies were made, all recovered after thiamine therapy but were left with a residual Korsakoff syndrome. The chemical studies in the last four cases showed that in Wernicke's syndrome the blood pyruvate during fasting is elevated, and the pyruvic acid curve following glucose ingestion is abnormally high, with a delay in return to the fasting level. After thiamine therapy, these metabolic abnormalities tended to disappear at the same time as improvement occurred in the ophthalmoplegia and the mental status. MARION HORN (Chem. Abstr.).

Does Colamine Occur Free in the Brain? Müller, Ernst. [*Z. Biol.* **100**, 49–50 (1940); *Chem. Zentr.* (**1**), 3942 (1940).]

While choline is widely distributed in animal and plant tissues as a building unit of phosphatides, colamine as a building unit of the cephalins has not yet been found free. The brain, which is rich in cephalin, was examined to determine its content in colamine. The aqueous extracts from 69 fresh human brains were concentrated in vacuo under CO_2. Further treatment of the extracts, which is given in the original, resulted in the detection of choline. Attempts to precipitate colamine with Reinecke salt were negative. The absence of colamine in the tissues

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obviously is due to its rapid decomposition. It is also possible that for the formation of the colamine portion of the cephalin molecule a demethylization of lecithin takes place, or that a splitting off of colamine takes place simultaneously with a methylization of choline.

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

The Presence of Free Colamine in the Brain. Müller, Ernst. [*Z. Biol.*, **100**, 249–50 (1940).]

Choline phosphotungstate is 10-fold more soluble in 5 per cent. H_2SO_4 than is colamine phosphotungstate. With this in view, the filtrates from the previous analyses (*C.A.*, **36**, 4880[8]) were purified and reprecipitated with 2 $(H_3PO_4)_2$ WO_3 in a 5 per cent. H_2SO_4 solution. The voluminous precipitate was treated as essentially as before. Alcohol picrolonate was used for separation and then the colamine was precipitated as Au salt. This was recrystallized from HCl. A total of 3·5 mgm. of free colamine was found per kgm. of brain. Total choline was 68·4 mgm. per kgm. of brain. Details of the method of analysis are given.

M. Hoseh (Chem. Abstr.).

Nerve Regulation by the Thyroid Gland. Asher, L., and Ruetsch, Fr. [*Z. Biol.*, **100**, 1–7 (1940).]

The threshold value of adrenaline to produce a temperature rise was determined on normal rabbits. The temperature was measured with a Cu-Cu constantan thermo-element made of 0·13 mm. wire and soldered with Au solder. The averages from a large number of experiments show that the smallest threshold value, i.e., the greatest susceptibility to adrenaline, is found in normal animals (1 : 80 million); the value rises for animals whose sympathic nerve is severed (1 : 70 million), and attains the maximum in animals whose thyroid gland is removed completely (1 : 50 million).

M. Hoseh (Chem. Abstr.).

Formation of Phospholipide in vitro by Brain and Nerve with Radio-active Phosphorus as Indicator. Fries, B. A., Schachner, H., and Chaikoff, I. L. [*J. Biol. Chem.*, **144**, 59–66 (1942).]

The formation of phospholipide from Na_2HPO_4 containing radioactive P by excised brain of young and old rats and dog sciatic nerve *in vitro* was demonstrated. Brain slices formed phospholipide at 3–5 times the rate of the brain homogenate. Brain from 15 gm. rats formed phospholipide faster than brain from 50–200 gm. rats, but the significance of this is uncertain, since the rate of penetration of Na_2HPO_4 into the different kinds of brain slices was not determined.

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

Effect of the Puncture of Medulla Oblongata upon the Cytochrome Content of Organs. Kono, Makoto. [*Zikken Syokakibyogaku* (*Exptl. Gastroenterol.*), **15**, 319–24 (1940); *Japan. J. Med. Sci.* (**11**), *Biochem.* 4, *No.* 4, *Abstracts* (*in English*) **103** (1941).]

Cytochrome was decreased in liver, kidney and heart as a result of the puncture of nucleus motorius dorsalis n. vagi. The decrease was noticeable one hour after the operation, and a minimum was reached after 24 hours. The normal value was reattained in five days. This decrement of the cytochrome content was greatest in the liver, least in the heart.

C. L. B. (Chem. Abstr.).

The Nerve Trauma and its Consequences. Pigalev, I. A. [*J. Physiol. U.S.S.R.*, **29**, 255–64 (1940).]

Trauma of the great sciatic nerve increased the chloride content of the saliva secreted by the parotid gland in the same side as the trauma, unless the degree of stimulation was sufficient to produce severe pain; then the chlorides decreased. Chronic stimulation of this nerve (in dogs) caused an impairment of the excretory function of the kidneys on the same side as the trauma. Injection of Tl salts into this nerve (in rabbits) caused loss of hair on the same side, and formation of ulcers four months after the trauma on soles of the feet, deformation of joints and loss of one or more phalanges. Stimulation of the trigeminus caused formation of ulcers not only on the same side, but also in remote places of the body. Strychnine produced ulcers six months later on all limbs, and destruction of bones in the fore limbs. This was especially severe on the same side on which injection was made. In narcotized rabbits stimulation of the great sciatic nerve for ten minutes with an electric current produced an increase of lactic acid in the brain hemisphere of the side on which the trauma occurred. When the nerve was severed, the lactic acid of the brain increased during the first few days, then passed through the normal value and decreased to a minute, after which it was restored to normal. The total period of observation was 30 days. Arsenic given intravenously at the same time with the nerve stimulation was absorbed by the brain in a quantity greater than normal. The hemisphere from the same side where the nerve was stimulated contained less As than that from the normal side.

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

Acetylcholine in Various Vascular Regions during Reflex Activity of the Vegetative Nervous System. Alpern, D. E., and Fesenko, T. E. [*J. Physiol. U.S.S.R.*, **29**, 249–54 (*in English*, 254) (1940).]

Excitation of the vagus during the oculocardiac reflex leads to changes in acetylcholine content in different regions of the vascular system. In the sinus the acetylcholine concentration is higher than in blood from arteries or veins, hence this substance is liberated by the central

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nervous system; it is formed in the synapses of the central nervous system. Arterial blood contains more of it than the veins, owing to the fact that the site of maximum liberation is the left heart. The hepatic vein contains less acetylcholine than the femoral artery or vein. The cholinesterase content increases only slightly in the peripheral vascular bed, but rises considerably in the sinus; thus accumulation of this substance is associated with its increased breakdown.
C. S. SHAPIRO (Chem. Abstr.).

Acetylcholine in Human Cerebrospinal Fluid. Brecht, K. [*Klin. Wochschr.*, **19**, 1087 (1940); *Chem. Zentr.* (**1**), 791 (1941); *cf. C.A.*, **35**, 1466[8]; **36**, 5875[9].]
In the cerebrospinal fluid of patients with tubercular and meningococcus meningitis and with epilepsy, acetylcholine was detected in concentrations of $1 : 10^{9}$–$1 : 10^{16}$, using as test material the lung preparation of winter frogs in accordance with the method of Brecht, Carsten and Sullies.
M. G. MOORE (Chem. Abstr.).

Aneurine in the Cerebrospinal Fluid. Kasahara, Mitio, and Mori, Humio. [*Klin. Wochschr.*, **19**, 631 (1940); *cf. C.A.*, **32**, 9200[1].]
The cerebrospinal fluid of normal rabbits contained 0·0125–0·0220 mgm. per cent. aneurine. Vitamin B_1 injected intravenously into normal rabbits passed into the cerebrospinal fluid.
RUTH BERGGREN (Chem. Abstr.).

The Sodium Chloride Content of the Cerebrospinal Fluid at Different Stages of Insufficient Blood Circulation. Aviosor, M. L. [*J. méd. Ukraine*, **10**, 1329–39 (*Russian and German summaries*) (1940); *cf. C.A.*, **33**, 6431[5], 8765[8].]
In circulatory disturbances the Cl concentration in the cerebrospinal fluid increases. This increase in Cl is greater the more pronounced the circulatory disturbance. The only exception was the 3rd (irreversible) stage, in which the NaCl content was relatively diminished compared with the preceding stage. An attempt is made to explain the above increase in NaCl by a retention of Cl in the organism. Since such a retention has been demonstrated for tissue and edema fluids, with which the cerebrospinal fluid possesses analogous properties, it can also be assumed for the latter. Moreover, in the increase of the NaCl content of the cerebrospinal fluid, the venous stagnation in the entire organism, including the central nervous system, probably also plays a role. This stagnation leads to passage of fluid from the dilated, poorly nourished walls of the vessels to the cerebrospinal fluid system; it can favor a subsequent transition of NaCl into the cerebrospinal fluid. The above exception to the general rule can be ascribed to the influence of a prolonged saltless regimen, and in the 3rd stage to the effect of the disturbance of the blood-brain barrier.
RUTH BERGGREN (Chem. Abstr.).

The Protein of the Cerebrospinal Fluid in Patients with Chronic Alcoholism. Trowbridge, Ellsworth H., jun., and Secunda, Lazarus. [*New Engl. J. Med.*, **226**, 195–7 [1942).]
The protein content of the cerebrospinal fluid was greater than 45 mgm. per cent. in 20 per cent. of 641 patients with chronic alcoholism. The abnormally high concentrations were more than twice as frequent as in a series of control patients. The concentration was not influenced by the duration and number of previous attacks of alcohol psychosis or by the presence of polyneuritis.
E. R. MAIN (Chem. Abstr.).

An Electrophoretic Study of the Protein Components in Cerebrospinal Fluid and their Relationship to the Serum Proteins. Kabat, Elvin A., Moore, Dan H., and Landow, Harold. [*J. Clin. Investigation*, **21**, 571–7 (1942).]
The electrophoretic pattern of cerebrospinal fluid resembles that of serum. Alterations in the composition of the protein of the serum are reflected in the spinal fluid, but the changes are not as marked. An exception is found in neurosyphilis. Colloidal gold activity is associated with the γ globulin fraction, and albumin has an inhibiting effect on the colloidal gold reaction.
J. B. BROWN (Chem. Abstr.).

The Value of the Cerebrospinal Fluid Examination in the Diagnosis of Intracranial Tumors. Bligaard, Karen. [*Acta Psychiat. Neurol.*, **16**, 111–42 (1941).]
In 400 cases of intracranial tumors, 66 per cent. showed increased albumin in the spinal fluid, and in 80 per cent. the pressure was increased. The cell count was normal in 92 per cent.
M. L. C. BERNHEIM (Chem. Abstr.).

Microdetermination of Bromine in Cerebrospinal Fluid. Hardwick, P. J. [*Analyst*, **67**, 223–5 (1942).]
In case of suspected poisoning by CH_3Br, a determination of total Br in a small sample of cerebrospinal fluid was required. To prevent loss of Br, the sample was first saponified by the method of Francis and Harvey (*C.A.*, **28**, 1374[2]). Then, after numerous experiments with different procedures in test experiments with 0–20 mgm. of KBr added to 17 mgm. NaCl, it was found that the fluorescein and iodometric methods of Doering (*C.A.*, **31**, 3820[6]) gave satisfactory results in the determination of Br in the presence of Cl. Detailed directions are given for carrying out both procedures.
W. T. H. (Chem. Abstr.).

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Sodium Hypobromite Azotometric Research on Cerebrospinal Fluid. *Oi, Masaomi.* [*Zyuzenkai Zassi* (*J. Perfect Health*), **45**, 789–97 (1940); *Japan. J. Med. Sci.* (**11**), *Biochem.*, 4, *No.* 4, *Abstracts* (*in English*) (111) (1941).]

In four cases of tuberculosis the hypobromite coefficient of cerebrospinal fluid was strikingly lower than in normal persons. C. L. B. (Chem. Abstr.).

Chemical Control of Nerve Tension used by Graduate Students. *Gardner, T. S.* [*J. Tenn. Acad. Sci.*, **16**, 290–2 (1941).]

Benzedrine sulfate was found to give increased mental acuteness in graduate students. The dose should not exceed 10 mgm., and 2·5 mgm. is usually effective. Overdosing makes relaxing very difficult. About 1½ hours is required for the effect to appear. Relaxation is assisted by the use of a sedative just before retiring. Benzedrine sulfate taken by the use of an inhaler has some effect, and should not be used habitually because of the effect on the heart.

A. Lloyd Taylor (Chem. Abstr.).

Lead Encephalopathy in a Chinese Infant. *Kian, Loe Ping.* [*Geneeskund. Tijdschr. Nederland.-Indië*, **81**, 1667–73 (1941) (*English summary*); *Trop. Diseases Bull.*, **39**, 198–9 (1942).]

A case is reported of a 7-month-old child who was suffering from plumbism as a result of the ingestion of a preparation known locally as "Yok-san-merah," which has been applied by the mother to the buccal and lingual mucosa to prevent aphthae. This preparation is a red powder which contains both Pb and Hg; one of the constituents is "tjoeseh" or HgS (cinnabar). This preparation is a popular household remedy among the Chinese in Java.

Ruth Berggren (Chem. Abstr.).

Effect of Carbon Dioxide on the Spinal Cord of the Frog. *Leuken, B.* [*Z. Biol.*, **100**, 373–93 (1940).]

The effects of CO_2-air mixtures containing 5, 10, 15, 20, 30, 50 and 100 per cent. of CO_2 were studied. The results were recorded as curves of intensity of stimulus *vs.* intensity of response and intensity of stimulus *vs.* interval of response. M. Hoseh (Chem. Abstr.).

Thiamine Deficiency and Chastek Paralysis in Foxes. *Hodson, Adrian Z., and Smith, Sedgwick E.* [*Cornell Vet.*, **32**, 280–5 (1942).]

The clinical symptoms of anorexia, weakness, ataxia, spasms and lowering of the body temperature were observed in foxes fed a thiamine-deficient diet. These symptoms are apparently identical with those of foxes suffering from Chastek paralysis as a result of feeding an adequate diet with added uncooked fish (smelt). Both conditions were cured completely with thiamine chloride. Chastek paralysis was not cured by pyridoxine, riboflavin or Ca pantothenate. K. D. Jacob (Chem. Abstr.).

Pulmonary Cerebral Effect Time as Determined by Amyl Nitrate. (1) *Establishment of a Normal Range.* *Uhley, M. H.* [*J. Lab. Clin. Med.*, **27**, 1111–16 (1942).]

A simple method for quantitating pulmonary cerebral effect time is described which involves the inhalation of $AmNO_2$ by the subject and the detection of the drug action on the vessels of the head. The $AmNO_2$ is placed in a special inhaler that is constructed from $\frac{1}{16}$ in. A1 tubing. After a normal expiration, the subject inhales slowly and deeply from the inhaler (usually for two seconds). The starting time of the test is the time at the end of the inhalation, and the end point is the time of a prearranged signal given when the subject experiences a slight dizziness or fullness in the head. This test measures the effective pulmonary ventilation, the circulation time of the left side of the heart, and is affected by variations in the reaction time of the subject. Measurements made on 100 persons selected at random gave an average value of 12 seconds, with most of the values within the range 10–16 seconds. The advantages and the limitations of the method are discussed. Howard W. Robinson (Chem. Abstr.).

Cerebral Metabolism in Fat-fed Dogs. *Mulder, Arthur G., and Crandall, Lathan A., jun.* [*Am. J. Physiol.*, **137**, 436–9 (1942); *cf. C.A.*, **35**, 498.]

The brain of the dog which has been fed fat for a sufficient time not only to develop ketosis but to become habituated to the ketotic state does not burn acetone bodies. The brain of the fat-fed dog has an R.Q. of approximately 1·0. The amounts of O and glucose removed by brain during the ketotic state are not significantly different, in terms of mgm. per 100 ml. of blood, from those removed by the brain tissue of normally fed dogs.

E. D. Walter (Chem. Abstr.).

The Vitamin C Content of the Blood Serum in Various Psychoses and its Change after Administration of the Vitamin. *Nilsson, Per.* [*Nord. Med.* (**1**), 600–3 (1939); *Chem. Zentr.* (**1**), 793 (1941).]

In tests made on 100 mentally diseased persons either no vitamin C or very little of the vitamin was found in the blood serum. The values found for 21 normal individuals were likewise very low. After administration of the vitamin (300 mgm. in 12 days), the same type of curves of the vitamin C level were obtained for normal individuals and for manic-depressed individuals; the curves obtained for individuals suffering from dementia praecox were steep with maximum about twice as great as those of the curves just mentioned.

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

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The Histochemical Determination and Localization of Vitamin C in the Central Nervous System. Wolf-Heidegger, Gerhard. [*Confinia Neurol.*, **4**, 121–47 (1942).]

The distribution of ascorbic acid (I) in the different structures and in the cells of the brain was determined in guinea-pigs and rats with the histochemical method of Giroud and Leblond (*C.A.*, **29**, 7414[4]): reduction of intravenously injected $AgNO_3$ by (I). Ag granules, indicating the presence of (I), were found in nerve cells of the various types in all brain regions of normal animals. In scorbutic guinea-pigs no (I) was found. Ag granules were seen only in the cell plasma, never in the nucleus. Peripheral nerves gave no (I) reaction.

WARREN M. SPERRY (Chem. Abstr.).]

Blood-Brain Barrier. Friedemann, Ulrich. [*Physiol. Rev.*, **22**, 125–45 (1942).]

The barrier which exists between the brain and blood is localized in the central nervous system capillaries which possess selective permeability. Experiments made with aniline dyes, toxins, viruses, antibodies and drugs to determine the capillary permeability indicate that this is governed by the electrochemical properties, the cerebral capillaries being permeable to substances with a positive or no charge (basic dyes, cobra venom) at the pH of the blood but impermeable to substances with a negative charge (acid dyes, toxins). The capillary system as a whole is more permeable to electropositive than to electronegative substances. The toxicity, however, seems to be more directly correlated with the electrokinetic potential than with the sign of the charge. The permeability of cerebral capillaries may be increased under pathological conditions, also under the influence of theophylline, adrenaline and testicular extracts.

S. MORGULIS (Chem. Abstr.).

Anaphylactogenic Properties of Normal and Virus-infected Brains, with Special Reference to Neurokeratin. Bailey, G. Howard, and Gardner, Raymond E. [*Am. J. Hyg.*, **36d**, 205–15 (1942).]

The tissue-specific, water-soluble anaphylactogen found in autoclaved aqueous extracts of brain, particularly in the white matter, is derived from neurokeratin. Purified preparations of the white matter of brain were made by prolonged and repeated extraction with acetone, abstract alcohol and ether until there remained no substance soluble in these chemicals or in chloroform or benzene. The lipoid extracts of white matter gave no anaphylactic action. Guinea-pigs passively sensitized with anti-brain-broth rabbit serum, when injected with the heated aqueous extracts of the residual purified brain matter, gave positive anaphylactic shock. These extracts were active after being twice autoclaved in distilled water in H-ion concentration between pH 6·7 and 7·8, but not at neutrality. The anaphylactogen is more active at pH 7·2 to 7·8 than at pH 6·7 to 7·0. Glycerol seemed to inactivate the antigen. Autoclaving an infusion of whole brain may destroy the anaphylactogen, but this is not true of the purified preparation, especially at the high pH. The specific substance is present in autoclaved extracts of neurokeratin after digestion with pepsin, but is absent after digestion with trypsin. The anaphylactogen was present in the brains of several animal species in various stages of autolysis and in the brains of animals infected with the neuroviruses (rabies, neurovaccinia, equine encephalomyelitis, eastern but not western strain), as shown by positive anaphylactic tests.

MARY S. SHORB (Chem. Abstr.).

Eastern Equine Encephalomyelitis. VI: Facilitation of Infection in the Mouse. King, Lester S. [*J. Exptl. Med.*, **76**, 325–34 (1942); *ibid.*, **71**, 59; **72**, 573 (1940).]

Glycerol (50 per cent.) injected intraperitoneally, intramuscularly or intravenously greatly enhances the activity of equine encephalomyelitis virus injected intramuscularly, increasing its virulence up to 100-fold. The same effect is produced by very concentrated NaCl. The results appear due to dehydration of the nervous system, suddenly produced. Gradual withdrawal of body fluids, produced by depriving animals of drinking water, results in sharp concentration of the blood, equal to that produced by glycerol or salt; but such deprivation of water alone does not result in significant dehydration of the brain, nor does it have any effect on virus action. The facilitation effect is not produced by drastic procedures involving shifts of electrolytes without loss of total water from the brain. The fact that glycerol has no facilitating action when the virus is administered intranasally or intraocularly suggests a fundamental difference in pathogenesis between these routes and the intramuscular. C. J. WEST (Chem. Abstr.).

Investigations on the Changes in the Acetylcholine Content of the Central Nervous System of the Rabbit under Strong Stimulation by Strychnine and Tetanus Toxin. Fegler, J., and Lelusz-Lachowicz, Z. [*Acta Biol. Exptl. (Warsaw)*, **13**, 69–88 (1939); *Chem. Zentr.* (**11**), 3052 (1940).]

The administration of strychnine to rabbits produced a decrease in the total acetylcholine (I) content and a relative increase in the content of free (I) in the central nervous system. Tetanus toxin increased the total (I) and decreased the relative amount of free (I). The (I) which is fixed in the central nervous system therefore is reduced by strychnine and increased by tetanus toxin. The reduction in (I) produced by strychnine disappeared after the stage of excitation had been passed. With the tetanus toxin, however, the content of (I) continued to increase with increased poisoning. The breathing of O_2 checked the reduction in (I) in strychnine poisoning.

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

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Sleep after Injection of Calcium Chloride into the Hypothalamus. Tonkikh, A. V. [*J. Physiol. U.S.S.R.*, **30**, 191–4 (*in German*, 194) (1941).]

CaCl injected in small doses into the hypothalamus or into the brain ventricle induces in cats a sleep that differs from the sleep induced by electric stimulation of these regions. Injection of CaCl is effective both on normal cats and those with severed sympathetic innervation. The sleep induced in both cases resembles in all particulars a sleep under narcosis.

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

The Metabolic Effects of Potassium, Temperature, Methylene Blue and p-Phenylenediamine on Infant and Adult Brain. Himwich, Harold E., Bernstein, Albion O., Fazekas, Joseph F., Herrlich, Herman C., and Rich, Edith. [*Am. J. Physiol.*, **137**, 327–30 (1942).]

The cerebral tissues of rats of various ages exhibit differences in the response to metabolic stimulants. The O uptake of the infant brain is accelerated to a lesser degree by K, increases of temperature and p-phenylenediamine, and the decolorization time of methylene blue is delayed. The smaller response to K and increase of temperature in the young may be ascribed to a general effect on all enzymes which are of lesser concentration in the newborn, while the slower utilization of p-phenylenediamine and the delayed decolorization time of methylene blue may be accounted for by smaller concentrations of cytochrome oxidase and glucose dehydrogenase respectively.

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

The Phosphorus Content of the Brain during B_1 Avitaminosis. Boldyreva, N. V. [*J. Physiol. U.S.S.R.*, **29**, 582–8 (*in German*, 588) (1940); *cf. C.A.*, **34**, 5132.7]

Normal pigeon brains and those from B_1-avitaminized birds were analyzed for total P, inorganic P, creatine phosphate, P hydrolyzate (with 1 N HCl for 7, 30 and 180 minutes), nonhydrolyzable (after 3 hours) P, orthophosphoric acid, acid-soluble P, lipide P, protein P and total dry matter. Creatine phosphate was determined by calculating the difference between inorganic P and total orthophosphoric acid. Most of the above constituents were also determined in the lobi optici and cerebellum of normal and avitaminized pigeons. The same analyses were done on another series of birds that was kept under hunger conditions. Of these one group received vitamin B_1 and water and the other was in a state of a natural B_1 deficiency, owing to lack of food. This type of avitaminosis was compared to that produced by feeding autoclaved rice. In the cerebral hemispheres, lobi optici and cerebellum the total P, protein P, lipide P and acid-soluble P were present in equal amounts in normal and B_1-deficient birds. B_1 avitaminosis produced an increase of inorganic P, nonhydrolyzable P and creatine phosphate in the hemispheres. Accordingly, the 7-, 30- and 180-minute hydrolyzates decreased, but not in the same proportion. The most pronounced fall was in the 30-minute fraction, which was mostly phosphopyruvic and hexose-diphosphoric acids. The 7-minute fraction, consisting chiefly of adenylpyrophosphoric acid, also decreased considerably, the rate of fall being higher than the rate of creatine phosphate increase. Under fasting conditions the lobi optici and cerebellum of the birds receiving vitamin B_1 and water showed no change as compared with the normal cases. The hemispheres gave a considerable increase of nonhydrolyzable P and a slight rise in creatine phosphate. The 30- and 180-minute hydrolyzates were decreased, but the 7-minute fraction showed no change. The lipide P decreased, while the acid-soluble P increased. In complete fasting natural B_1 avitaminosis produced no changes in the lobi optici and cerebellum. In the hemispheres the total P rose and the 7-minute hydrolyzate fell. The concentration of other P fractions were the same as in the normal hemispheres. This included the 30-minute hydrolyzate, which, contrary to autoclaved rice avitaminosis, remained equal to that of the normal brain. It can be concluded that in B_1 avitaminosis the increase in inorganic P is due chiefly to the formation of hydrolysis products, especially the decomposition of adenylpyrophosphoric acid. The increase in creatine phosphate and decrease in adenylpyrophosphate, as well as of phosphopyruvic and hexosephosphoric acid in B_1 avitaminosis, indicate impaired carbohydrate metabolism as a result of this deficiency.

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

Anatomic Changes of the Peripheral Nerves due to Interference with Nutrition Equilibrium caused by a Predominantly Fat or Protein Diet. Bertrand, Ivan, and Lecoq, Raoul. [*Compt. rend.*, **211**, 306–8 (1940).]

F. H. RATHMANN (Chem. Abstr.).

The Vegetative Cutaneous Reflexes and the Effect of Electrolytes. Shirokii, V. F. [*J. Physiol. U.S.S.R.*, **29**, 165–72 (*in English*, 172) (1940).]

Intracutaneous injection of NaCl, KCl, CaCl and MgCl in isotonic or hypertonic solutions affects the vegetative nerves of the heart and the nictitating membrane of cats, as shown by alteration of excitability of the peripheral end of the cardiac vagus under action of induction current. The tonus of the sympathetic nervous system is augmented by all the above electrolytes in the isotonic concentrations. In addition 0·85 per cent. NaCl solution simultaneously increases the tonus of the parasympathetic nervous system in practically all cases. An isotonic (1 per cent.) KCl solution increases the tonus of the latter in 70 per cent. of the cases, a 2·8 per cent. CaCl solution in 30 per cent. of the cases, and a 2·5 per cent. MgCl solution in only a few cases. In the remaining cases K, Mg and Ca ions lower the tonus of the parasympathetic system, while increasing that of the sympathetic nerve-tonus, accompanied by a lowering of the tonus

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of the parasympathetic system. The narcotic used and the species of the animal affect the results. The specificity of the electrolyte action was demonstrated by additional experiments with Ringer solution. C. S. SHAPIRO (Chem. Abstr.).

Olfactory Reactions in the Brain of the Hedgehog. Adrian, E. D. [*J. Physiol.*, **100**, 459–73 (1942).]

The oscillograph demonstrates a characteristic periodic activity under nembutal anaesthesia in the olfactory bulb and pyriform area. Normal breathing produces a series of large regular waves in the pyriform area at each inspiration. They have no relation to the respiratory movements, their frequency (15–45 per second) being determined by the velocity of the air. Plugging the nose abolishes them. If a strong odor (e.g., cloves) is added to the air, the resting rhythm is replaced by small irregular waves, about 50 per second. With leads from the mitral cell layer of the olfactory bulb a discharge is heard at each inspiration. An odor increases the discharge. These results apparently demonstrate that the olfactory organ is stimulated both mechanically by the air current and chemically by odors in it. The air current produces a uniform excitation resulting in synchronous waves, whereas chemical stimulation is unevenly distributed, the large waves breaking up because of the differential sensitivity of the neurones. Different chemical stimuli apparently produce cheracteristic distributions of excitation, and thus a familiar smell is recognized by the specific pattern which it arouses in the brain. The olfactory discharge in mammals resembles that previously found in fishes. M. E. MORSE (Psychol. Abstr.).

The Antagonistic Effects of Posterior Pituitary and Corticoadrenal Hormones in the Epileptic Subject. McQuarrie, Irvine, Anderson, J. A., and Ziegler, M. R. [*J. Clin. Endocrinol.*, **2**, 406–10 (1942); *cf. C.A.*, **32**, 7554[8]; **36**, 1657[8].]

The effect of desoxycorticosterone acetate on the water and electrolyte exchanges and on the occurrence of *grand mal* seizures was determined in two severely epileptic patients. It effectively antagonized not only the electrolyte responses, but also the seizure-provoking effect of pitressin. It also decreased the tendency to spontaneous occurrence of seizures. The probable mechanism of this action is discussed. FELIX SAUNDERS (Chem. Abstr.).

Formation of Acetylcholine in the Brain of Pigeons during B_1 Avitaminosis. Karyagina, M. K., and Karlina, M. I. [*J. Physiol. U.S.S.R.*, **29**, 576–81 (*in English*, 581) (1940).]

Experiments were made in an atmosphere of O at 37°. Acetylcholine was determined by stimulation of the dorsal leech muscle (Minz, *C.A.*, **27**, 776). The accuracy of this method is only 10–12 per cent., but because only minute amounts are present it is to be preferred to chemical procedures. In B_1 avitaminosis the brain contained 1·4 times the normal quantity of free acetylcholine, and approximately the normal quantity of combined acetylcholine. Glucose and pyruvic acid added to normal brain tissue produced equal increases in total acetylcholine. In avitaminosis 25 per cent. of cases showed the same rate of increase; the rest showed little or no change. Glucose and pyruvic acid decrease the combined acetylcholine in avitaminized brains, and do not affect free acetylcholine. These experiments *in vitro* suggest that *in vivo* the acetylcholine synthesis must take place with the aid of glucose and pyruvic acid, and confirm the possibility that the synthesis goes through the stage of combined acetylcholine. The decreased or arrested synthesis in B_1 avitaminosis indicates a close relation between acetylcholine formation and the B_1 activity in the body. C. S. SHAPIRO (Chem. Abstr.).

The Lactoflavin Content and Tissue Respiration of the Brain: Leemann, H., and Pichler, E. [*Klin. Wochschr.*, **20**, 36–40 (1941); *cf. C.A.*, **32**, 4221[4].]

Since it is assumed that the tissue respiration remaining after poisoning with HCN or CO (rest respiration) (I) is rendered possible chiefly through the yellow respiration enzyme, a parallelism between the lactoflavin (II) content and (I) is to be expected in the various organs. The (II) content was established by the Emmerie method (*C.A.*, **33**, 3834[8]) (grinding with quartz sand, 24 hours extraction with 75 per cent. MeOH, filtration, oxidation of the filtrate with 4 per cent. $KMnO_4$ in AcOH solution, destruction of the excess permanganate with 3 per cent. H peroxide, filtration, colorimetry with the Pulfrich step photometer) in portions of human brains which had been removed 10–17 hours after death. The free (II) was determined in the dialyzate after dialysis of the ground organ for 24 hours against distilled water. The (II) content, in γ/g., in the various portions of the brain was as follows: stratum 3·8–4·75, nucleus caudatus 2·5–3·75, nucleus ruber + substantia nigra 3·85, nucleus dentatus cerebelli 2·8–3·5, globus pallidus 3·4–4·6, thalamus 3·4–3·48, medulla oblongata 1·7–3·35, midbrain 3·0–3·1, cerebral cortex 2·4–2·8, cerebral medulla 1·47–1·90, and cerebellar medulla 1·7. For the first 24 hours the time of removal had no appreciable effect on the analytical results. The free (II) in the cortex and nucleus caudatus amounted to 16·7 and 20 per cent. respectively of the total (II). (I) was determined by the Warburg method (*C.A.*, **19**, 1720) in brain sections of freshly killed guinea-pigs not later than 10–15 minutes after death; the suspension fluid consisted of NaCl 0·9, glucose 0·2 per cent., and 0·01 M Sørensen phosphate buffer of pH 7·6. Poisoning was produced by the addition of 0·3 c.c. of 0·1 N KCN to 2 c.c. suspension fluid. The following values were found for the respiration without and with the addition of KCN, in cu.mm. O_2/100 mgm. moist weight in 60 minutes, and for the ratio of the respiration with the addition of KCN to that without the addition of KCN, in per cent.: striopallidum 123, 15·3, 12·9; thalamus, 120, 12·5, 10·4; cerebral

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cortex, 97, 10·3, 10·5; medulla oblongata, 104, 9·0, 8·6; midbrain, 101·5, 7·7, 7·5; and cerebral medulla 92, 6·8, 7·3 respectively. With the exception of the relation of the medulla oblongata to the cerebral cortex, the order of (I) is the same as that of the (II) content. Determinations of the (II) content of the guinea-pig brain showed, however, that in contrast to the human brain the cortex was richer in (II) than the brain stalk. The (II) content and (I), therefore, parallel each other. WALTER WILBRANDT, RUTH BERGGREN (Chem Abstr.).

The Biological Properties of the Products of Metabolism of the Central Nervous System of Verbetrates (1). *Sessunin, P. A.* [*Bull. biol. méd. exptl. U.R.S.S.*, **5**, 496–9 (1938); *Chem. Zené.* (**1**), 3293 (1940).]

The action of varying concentrations of the products of metabolism of the brain and spinal cord of different animals on the frog heart (inotropic or chronotropic effect) was studied. The products of metabolism of the brain showed a marked activity. The type of action (sympathicotropic or vagotropic) depends upon the stage of phylogenetic development of the experimental animal. M. G. MOORE (Chem. Abstr.).

Antagonism between Thyroid and Posterior Pituitary and its Relation to the Autonomic Nervous System. Peczenik, O., Popper, L., and Schmid, G. [*Confinia Neurol.*, **3**, 331–47 (1941).]

In normal or thyroidectomized guinea-pigs thyroxine (I) prevented or lessened the effect of procaine (II) in lowering body temperature. When extracts of the posterior pituitary (p.p.) were given along with (I), (II) exerted its usual temperature-depressing effect. Pitressin (III) gave a larger effect than the crude posterior pituitary extract and oxytocin was inactive. In guinea-pigs in which the thyroid has been stimulated by keeping the animals at 0–3° or by administration of the thyrotropic anterior pituitary hormone, posterior pituitary extracts or (III) intensified the effect of (II) in lowering body temperature. It is concluded that (III) does not diminish the activity of the thyroid but that it inhibits the action of the secreted thyroid principle. Atropine counteracted the antagonistic effect of (III) on (I), but adrenaline intensified it. The inhibiting effect of (III) on (I) is related to its parasympathetic action in counteracting the increase in sympathetic tone, produced by (I). The use of (III) in therapy of hyperthyroidism is discussed. WARREN M. SPERRY (Chem. Abstr.).

Convulsive Reactivity in Hypercholesteremia. Spiegel, E. A., and Wycis, H. [*Confinia Neurol.*, **3**, 262–5 (1940).]

Hypercholesteremia, produced in rabbits by intraperitoneal injection of cholesterol (I) emulsions in olive oil, by feeding (I), or by intravenous injections of aqueous emulsions of (I), had no effect on the convulsive reactivity of the brain as determined by electrical stimulation. WARREN M. SPERRY (Chem. Abstr.).

Free and Combined Acetylcholine in Intestinal Tract. Bacq, Z. M., and Goffart, M. [*Schweiz. med. Wochschr.*, **71**, 310–14 (1941).]

The highest concentration of acetylcholine (2.16 γ per gm.) in the intestinal tract of dogs is found in the upper jejunum; lowest concentrations are found in the esophagus (0·27γ) and in the colon (0·66γ). Partial or complete denervation of the intestines raises the content. Sympathetic denervation alone has little effect. The mucosa always contains less acetylcholine than the muscularis. There is agreement between the amount of tissue acetylcholine and that in eserinized venous blood from intact or denervated intestinal segments. The presence of aneurine and its esters in trichloroacetic acid tissue extracts (Chang and Gaddum, *C.A.*, **28**, 519[8]) does not invalidate the assay of acetylcholine. The potency of acetylaneurine on rat gut is like that of choline; the eserinized frog abdominal rectus muscle is insensitive to aneurine and acetylaneurine in concentration of 1 in 10^{-4}; the tissue extracts do not contain sufficient concentration of vitamin B_1 to affect the acetylcholine-effect on muscle; there is no parallelism between the tissue concentration of vitamin B_1 and that of acetylcholine.
B. C. P. A. (Chem. Abstr.).

Relationship between Intercellular Electric Fields and Brain Function. Gerard, R. W. [*Schweiz. med. Wochschr.*, **71**, 397–8 (1941).]

A capillary electrode was placed upon the uninjured ventricular surface in the frog. No injury potential existed between the ventricular electrode (V) and an electrode placed upon the pial surface (P). A regular PV potential of 2–3 mv. existed (sometimes 10 mv. or more). The waves, manifest after the isolated brain was soaked in 0·5 per cent. solution of caffeine for 2–3 minutes, were simpler in form and of greater magnitude if led from PV electrodes instead of two surface electrodes. The potential sign of the caffeine wave became sharply inverted as a micro-electrode was progressively inserted into the pallium. Polarizing currents of 0·01–0·02 ma. with P positive to V initiated caffeine waves in a preparation which had become inactive. The sign of the caffeine wave followed the wave of the PV potential and became reversed with it.
MAURICE M. RATH (Chem. Abstr.).

The Cholinesterase Activity of the Serum and the Cerebral Substance of Dogs with and Without a Predisposition for Reflex Epilepsy after Stimulation. Longo, Vito, and Colaciuri, Vittorio. [*Riv. patol. sper.*, **24**, 113–28 (1940); *Chem. Zentr.* (**11**), 1606 (1940).]

The predisposition to the appearance of epileptic spasm after stimulation by the method of

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Amantea was determined for the group of dogs used. After the appearance of the spasm the cholinesterase content of the blood and that of the urine were found to be reduced in the case of the predisposed animals, while no such reduction in cholinesterase value was observed in the non-predisposed animals. The cholinesterase activity showed a pre-critical increase in the blood and in the nervous tissue of the predisposed animals. The mechanism of the decomposition of acetylcholine is regarded as an important factor in the development of a predisposition to epilepsy. M. G. MOORE (Chem. Abstr.).

Study of the Function of the Hypothalamus. Benetato, Grégoire, and Munteanu, N. [*Arch. ges. Physiol.* (*Pflüger's*), **245**, 170–88 (1941); *cf. C.A.*, **36**, 8085.]

Introduction of acetylcholine (I) into the infundibular center produces results similar to electric stimulation of the hypothalamus (II). As little as 0·007γ of (I) produces a detectable fall in blood pressure, which suggests that the function of the blood-regulating center is conditioned by (I) arising from normal physiological processes. Atropine annuls the effect of (I) on blood pressure. The function of (II) involves a cholinergic mechanism.

H. L. MASON (Chem. Abstr.).

Acetylcholine in Sensory Nerves. Brecht, Karl, and Corsten, Martin. [*Arch. ges. Physiol.* (*Pflüger's*), **245**, 160–9 (1941.)]

Determinations of acetylcholine (I) in eserine-Ringer solution extracts of posterior nerve roots of rabbits and cattle and of the optic nerve of cattle showed, respectively, 0·00723, 0·00398 and 0·0315γ. Faradic stimulation of these nerves liberated (I) from the cut surface immersed in eserine-Ringer solution. No detectable amount of (I) diffused from the cut surface of unstimulated nerves. H. L. MASON (Chem. Abstr.).

The Nitrogen Balance in Patients Suffering from Melancholia. Schou, H. I., and Trolle, C. [*Acta Psychiat. Neurol.*, **16**, 243–60 (1941).]

In 14 out of 16 patients with melancholia, a N retention of 0·5 to 1·5 gm./24 hours was found. In general, N equilibrium was re-established with recovery.

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

Prolan and Folliculin Content of the Urine of Schizophrenic Women having Tactile Hallucinations Localized in the Region of the Genitals. Nilsson, Per. [*Upsala Läkareförens Förh.*, **44**, 495–504 (1939); *Chem. Zentr.* (**11**), 1455 (1940).]

Prolan and folliculin were determined in the urine of nine women having sexual hallucinations caused by schizophrenia. The probability that this condition was caused by hormone disturbances could not be confirmed. M. H. (Chem. Abstr.).

The Antigenic Relationship of Alcohol-Soluble Substances of Corpus Luteum to those of Testis and Brain. Lewis, Julian H. [*Am. J. Path.*, **17**, 725–30 (1941).]

The alcohol extract of beef corpus luteum gives complement-fixation reactions with antiserums for beef corpus luteum, testis and brain. If the corpora lutea have been removed from beef ovaries, then alcohol extracts of the latter do not react with the above antiserums. The antiserum for beef corpus luteum will react with extracts of beef brain and testis but not with those of liver, kidney, heart, lung or spleen. An antihuman brain serum reacts with an alcohol extract of corpus luteum, and an antibeef corpus luteum serum reacts with an alcohol extract of sheep brain. The cross reactions between the alcohol extracts of brain, testis and corpus luteum are apparently not accounted for by the cholesterol present in the extracts.

F. B. SEIBERT (Chem. Abstr.).

Pyruvic Acid Studies in the Peripheral Neuropathy of Alcohol Addicts. Wortis, Herman, Bueding, Ernest, and Jolliffe, Norman. [*New Engl. J. Med.*, **226**, 376–9 (1942); *cf. C.A.*, **35**, 7481⁵.]

The blood pyruvate content was increased over the normal level in 45 of 48 cases of acute peripheral neuropathy. No hyperpyruvemia was observed in patients with "chronic" peripheral neuropathy or with chronic alcoholism unassociated with nutritional disturbances. After ingestion of glucose, the blood-pyruvate curves in patients with acute neuropathy tended to be abnormally elevated and prolonged, reaching a maximum at the end of 2–4 hours, whereas normally the maximum concentration is reached at the end of the first hour. Acute peripheral neuropathy in the alcohol addict appears to be associated with a deficiency in thiamine, although deficiencies in other nutritive essentials may be involved. The blood pyruvic acid concentration was reduced by thiamine therapy. E. R. MAIN (Chem. Abstr.).

2. Pharmacology and Treatment.

Effect of Adrenaline, Acetylcholine and Nervous Stimulation on Purine-containing Compounds in Cardiac Muscle. Makarevich-Hal'perina, L. M. [*Biochem. J. (Ukraine)*, **17**, 115–26 (1941); *cf. C.A.*, **34**, 8013⁸.]

The proportion of phosphorylated nucleotides in heart muscle is decreased by intravenous injection of adrenaline, but increased by acetylcholine and vagus stimulation. This stimulation

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also increases the content of total and free purines. Adrenaline injection also increases the content of free inorganic PO_4 ions, of non-phosphorylated nucleotides, and of total and free purines. The content of total and free purines is not affected by acetylcholine injection, but that of non-phosphorylated nucleotides is decreased. B. C. P. A. (Chem. Abstr.).

Effect of Tri-o-tolyl Phosphate Poisoning upon Nerve-muscle Chronaxie. Walthard, K. M. [*Schweiz. med. Wochschr.*, **71**, 392–4 (1941).]

Faradic stimulation of nerves in late injuries following tri-o-tolyl phosphate poisoning in patients may give normal results when study of the nerve-muscle chronaxie shows pathological states. Polyneuritis and independent muscle changes are the causes of the alterations. Upon microscopical examination, the muscle shows partial primary atrophy.

MAURICE M. RATH (Chem. Abstr.).

Effect of Caffeine on Parasympathetic Synapses. Fredericq, H. [*Schweiz. med. Wochschr.*, **71**, 368 (1941).]

The effects of stimulating the peripheral end of the vagus nerve upon the tortoise heart are enhanced by 0·5 mgm. doses of caffeine. The latter acts by sensitizing cardiac nuscle to acetylcholine. In large doses of 5 mgm., however, caffeine blocks transmission of impulses in the intracardiac vagal ganglia. In all doses, caffeine antagonizes the effects of postganglionic and preganglionic stimulation on the cat nictitating membrane.

MAURICE M. RATH (Chem. Abstr.).

Properties of Acetylcholine Succinate. Frommel, E., and Bischler, A. [*Schweiz. med. Wochschr.*, **71**, 372–3 (1941).]

Injections, by the intramuscular, intravenous or subcutaneous routes, of acetylcholine succinate had the same action on the systemic or retinal blood pressure of anesthetized or non-anesthetized rabbits as injections of equimol. concentrations of acetylcholine HCl. The onset of its hypotensive action was not delayed and its action was not prolonged. The salt is lipoid-soluble, is readily soluble in water or alcohol and is very unstable.

MAURICE M. RATH (Chem. Abstr.).

Action of Various Substances on the Autonomic Nervous System. Stern, L. [*Schweiz. med. Wochschr.*, **71**, 367–8 (1941).]

Several mgm. of K salts and small doses of acetylcholine caused sympathetic stimulation, as revealed by increased arterial blood pressure, when injected intra-arterially in a number of species of animals. When injected intravenously, K salts produced parasympathetic effects. Ca injected systemically produced sympathetic actions; when injected intra-arterially, parasympathetic effects. Similar results were noted after injection of thyroxine and intraventricular grafts of thyroid gland tissue. MAURICE M. RATH (Chem. Abstr.).

Neuromuscular Junction. XXV: Eserine-like Actions of Aliphatic Alcohols and Ketones. Feng, T. P., and Li, T. H. [*Chinese J. Physiol.*, **16**, 317–40 (1941); *cf. C.A.*, **35**, 6668[9].]

The substances were applied to cat soleus or inferior oblique *in situ* by irrigation and to toad nerve-sartorius preparation by irrigation or as vapour. MeOH and EtOH and Me_2CO intensified Wedensky inhibition, and produced a prolonged contracture (prevented by excess of K or Ca) following indirect, but not direct, stimulation, MeOH being effective after a single shock. They increased the sensitivity to acetylcholine of the sartorius and soleus, augmented post-tetanic facilitation of twitches in the latter, caused prolonged negativity following a single volley in the sartorius and decurarized it by increasing its end-plate potential. The alcohol caused spontaneous twitching of the soleus, and potentiation of twitches accompanied by repeated discharge of the motor nerve endings in all three muscles, while Me_2CO produced these effects in the soleus only. Higher alcohols were less effective.

B. C. P. A. (Chem. Abstr.).

Changes of End-plate Potential during and after Prolonged Stimulation. Feng, T. P. [*Ibid.*, 341–72.]

Oscillograph records were taken of the end-plate potential of indirectly stimulated curarized toad nerve-sartorius preparations, with or without eserine, Mg or Ca. The potential declines during rapid stimulation, especially with Ca; at some stage it fails to respond to every other stimulus, especially with eserine or Mg. The potential during low-frequency stimulation, interposed during or after high-frequency stimulation, is greater than that during high-frequency stimulation and may be greater than that during previous low-frequency stimulation, especially with Mg; with Ca, it is at first decreased. The increase of the potential to single shocks following repeated or single volleys lasts longer at lower temperature and is not affected by eserine or Ca; with Mg it rises rapidly to a high maximum. The potential is decreased by direct stimulation.

B. C. P. A. (Chem. Abstr.).

Insulin Hypoglycaemia. Lawrence, R. D. [*Lancet*, **241**, 602 (1941).]

When diabetic patients are first given insulin hypoglycaemic reactions they show marked autonomic disturbances e.g., faintness, sweating tremors and hunger pains, before signs of

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affection of the central nervous system appear, e.g., mental confusion, symptoms like alcohol intoxication, convulsions and coma. After a few years of insulin usage the premonitory autonomic symptoms fail to appear and central nervous symptoms appear without warning.
B. C. P. A. (Chem. Abstr.).

Insulin, Cholesterol, Emotions and Psychosis. Stenberg, Sven. [*Acta Psychiat. Neurol.*, **16**, 289–324 (1941).]

In 21 cases of strong emotional disturbance the cholesterol level in the blood was high. When insulin treatment was successful the cholesterol values decreased. In six cases of schizophrenia, without emotional disturbance insulin treatment had no effect, and the blood cholesterol was slightly higher after treatment than before. M. L. C. BERNHEIM (Chem. Abstr.).

The Influence of Large Doses of Insulin on the Respiration of Brain Tissue. Komisarenko, V. P., and Maevskaya, I. P. [*J. méd. Ukraine*, **10**, 1145–52 (*Russian and German summaries*) (1940); *cf. C.A.*, **35**, 4850.²]

These experiments were performed to determine whether the convulsions and coma which appear after large doses of insulin are caused by a diminished consumption of carbohydrate or by a direct toxic action of the insulin. The sugar content of the blood and the respiration of the cerebral tissue were studied in rabbits which had received large doses of insulin (10 units per kgm.), and had been decapitated immediately upon the appearance of coma or convulsions. The respiration of the cerebral tissue was studied by the Thunberg method (*C.A.*, **33**, 88⁹) in rabbits which had been decapitated 2½ hours after the administration of insulin; of the animals studied 20 were decapitated upon the appearance of convulsions and 20 in the absence of convulsions, while 20 rabbits served as controls. In 22 rabbits (11 controls and 11 experimental animals) the capacity of the brain tissue to take up O was studied by the eudiometric method of Batelli and Stern. The brain tissues of insulinized rabbits decapitated during convulsions (2½ hours after the administration of insulin) showed a prolonged reduction of methylene blue compared with the tissues of the control animals, while the brain tissues of insulinized rabbits decapitated in the absence of convulsions (2½ hours after the administration of insulin) reduced methylene blue the same as the brain tissue of normal rabbits. The amount of O taken up by the cerebral tissue of insulinized rabbits was significantly smaller than that of normal rabbits. In these experiments the intensity of the cerebral tissue respiration in the insulinized rabbits was not found to be directly dependent on the extent of reduction of the sugar content of the blood. The diminution in the intensity of the cerebral tissue respiration under the influence of large doses of insulin is probably not caused so much by the reduction of the sugar supply and uptake in the cerebral tissue as by the toxic action of the insulin on the respiration enzymes of the brain. RUTH BERGGREN (Chem. Abstr.).

The Effect of Large Doses of Insulin on the Glycolytic Activity of Cerebral Tissue. Komisarenko, V. P., and Marchuk, R. Ya. [*J. méd. Ukraine*, **10**, 1135–43 (*Russian and German summaries*) (1940); *cf. C.A.*, **35**, 4850⁹.]

The experimental animals (18 dogs) were decapitated upon the appearance of insulin convulsions and coma. Glycogen reducing substances (since the formation of lactic acid in the tissues takes place chiefly at the expense of the reducing substances) and preformed lactic acid were determined in the brain, muscle and liver tissues. The increase in lactic acid was determined after two hours' autolysis at 38°. Similar experiments were performed on the control dogs (without insulin). The effect of insulin, which had been administered to dogs in large doses (10 units per kgm. body weight), on the glycolytic activity of the cerebral tissue, skeletal muscle and liver differed. The glycolytic activity of the cerebral tissue (after two hours' incubation) was significantly higher in the insulinized dogs and that of the muscle tissue was diminished compared with the control dogs, while the increase in lactic acid in the liver tissue of the experimental dogs did not differ markedly from that of the control animals. The amounts of preformed lactic acid in the brain tissue of insulinized dogs was significantly smaller than in the control animals. The decrease in the amount of preformed lactic acid in the brain tissue of insulinized dogs with simultaneous increase in its uptake by the brain tissue and the absence of a noticeable increase in the glycogen content of the brain indicate that large amounts of lactic acid were oxidized. The content of preformed lactic acid in the muscle tissue of insulinized dogs was greater than that of the control dogs, while in the liver tissue the increase in preformed lactic acid was insignificant compared with the control experiments. The increase of lactic acid in the brain tissue in insulinized animals is probably caused by the greater intensity of enzymic processes in the brain tissue. RUTH BERGGREN (Chem. Abstr.).

Schizophrenic-brain Metabolism in the Course of Insulin-shock Treatment, with Special Reference to Blood Carbon Dioxide and the Tendency to Convulsions. Wortis, Joseph, and Goldfarb, Walter. [*N.Y. State J. Med.*, **42**, 1053–9 (1942); *cf. C.A.*, **31**, 8703²; **33**, 5512⁹; **35**, 3717⁸; 4838⁸.]

The metabolism of the schizophrenic brain was studied before and during insulin hypoglycemic coma as well as before and after a series of treatments. The arteriovenous O difference of the schizophrenic brain did not differ from the normal; no change in the average arteriovenous O difference was observed in a group of schizophrenic patients after a course of 30 or

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more shock treatments. During insulin coma the arteriovenous O differences were regularly found to be markedly reduced. The arterial CO_2 content was elevated within one hour after the insulin injection, and returned to normal within half an hour after glucose administration. In cases which developed seizures, the arterial CO_2 was found to rise sharply preceding the onset of convulsions. During or after the post-convulsive period of hyperpnea very low CO_2 values were found. These results indicate that there is a depression of the respiratory center during insulin hypoglycemia which results in a decreased sensitivity to the normal stimulus of blood CO_2. In those patients who showed abnormally low blood CO_2 values preceding treatment, the tendency of the treatment was to restore normal values.

RUTH BERGGREN (Chem. Abstr.).

Mental Symptoms in Bromide Intoxication. Kitching, E. Howard. [*Brit. Med. J.*, **1**, 754–7 (1942).]

Mental symptoms are described in 9 cases of bromide intoxication after prolonged treatment with large doses of bromides. Blood bromide values were over 200 mgm./100 c.c. as compared to a normal of 2·5. J. B. BROWN (Chem. Abstr.).

Appearance of a Barbiturate in Human Milk. Mayo, C. W., and Schlicke, C. P. [*Proc. Staff Meetings Mayo Clinic*, **17**, 87–8 (1942.)]

Barbiturate appeared in the milk, as well as in the blood and urine, after injection of pentothal-Na into the veins of a lactating woman. RUTH BERGGREN (Chem. Abstr.).

Studies on Barbiturates, Especially their Cyclic Disappearance from and Reappearance in the Blood Following Intravenous Injection. Anderson, B. M., and Essex, H. E. [*Proc. Staff Meetings Mayo Clinic*, **17**, 337–9 (1942).]

These experiments apparently confirm Delmonico's observation (Theses, University of Minn., 1940) on the cyclic variation of concentration of barbiturate in the blood of the intact dog, and reveal that such a variation is produced by the isolated heart and lungs, legs and kidneys (2 heart-lung preparations, 2 heart-lung hind leg preparations and 2 heart-lung kidney preparations were used). The fact that these results were obtained repeatedly in several experimental setups and with two different analytical methods eliminates the possibility that this cyclic disappearance and reappearance in the blood of barbiturates injected intravenously is purely one of chance. No satisfactory explanation of this phenomenon can be offered.

RUTH BERGGREN (Chem. Abstr.).

Influence of the Cation on the Hypnotic Power of Mineral Salts of Barbituric Acids. Salts of Cyclopentenylallylbarbituric Acid. Rolland, Pierre, and Vieillefosse, Roger. [*Bull. soc. chim. biol.*, **22**, 512–19 (1940).]

The solubility in water of the salts of cyclopentenylallylbarbituric acid decreased in the order Na, Li, K, Cs, Rb, Mg, Ca. The effects on fish and rats were determined. No significant differences in action were found except that the action of the Mg salt was shorter than that of the others. L. E. GILSON (Chem. Abstr.).

Human Blacktongue Treated with Nicotinic Acid. Wilkinson, P. B. [*Caduceus*, **19**, 100–2 (1940); *Trop. Diseases Bull.*, **38**, 721 (1941).]

In an otherwise healthy woman, who had been on a well-balanced diet and showed none of the signs of the pre-pellagrous state, there was hypertrophy of the filiform papillae of the tongue with grey or black pigmentation. The tongue was almost clean within 72 hours after the oral administration of 50 mgm. nicotinic acid morning and night. The etiology of the condition is not clear. So far as is known, there is no connection with canine blacktongue.

RUTH BERGGREN (Chem. Abstr.).

Influence of Experimental Fever upon the Constituents of Cerebrospinal Fluid. (III) Urea. IV. Amino Acids. (V) Total Creatinine. Nisizima, Itiro. [*Nagoya Igakkai Zassi* (*J. Nagoya Med. Assoc.*), **51**, 237–56 (1940); *Japan. J. Med. Sci.* (II), *Biochem.*, **4**, No. 4, *Abstracts* (*in English*) (*III*) (1941).]

In fever caused by typhoid vaccine and tetrahydro-β-naphthylamine in the rabbit and also by keeping the animal in an incubator, the urea, amino acid, creatine and creatinine contents of cerebrospinal fluid were increased. C. L. B. (Chem. Abstr.).

Effects of Benzedrine on Respiration and Oxygen Consumption after Morphine in Men and Rats. Abreu, Benedict E., and Handley, Carroll A. [*Univ. Calif. Pub. Pharmacol.*, **2**, 99–104 (1942).]

In man, oral administration of morphine sulfate, in dose of 0·3 mgm. per kgm. of body weight, did not significantly depress O consumption or respiration; in such morphinized persons, the same dose of benzedrine sulfate did not increase O consumption or stimulate respiration. In albino rats, which had received morphine sulfate in an intraperitoneal dose of 20 mgm. per kgm., benzedrine sulfate, in an intraperitoneal dose of 10 mgm. per kgm., significantly increased the O consumption. JOSEPH S. HEPBURN (Chem. Abstr.).

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Immediate Metabolic Effect of Benzedrine Sulfate in Man. *Emerson, George A., and Abreu, B. E.* [*West Virginia Med. J.*, **37**, 74–7 (1941).]

The oral administration of 20 mgm. benzedrine sulfate to each of 15 young men and 5 young women caused a mean maximum increase in O_2 consumption of 15·7 = 3·1 per cent. of the basal level. Two individuals showed increases of 42 and 54 per cent. respectively and one a decrease of 13 per cent. of the basal level. Correlation of magnitude of metabolic effect with basal metabolic rate shows a significant inverse relationship. RUTH BERGGREN (Chem. Abstr.).

Changes in the Composition of the Gases of the Blood under the Influence of Narcotics (Diethyl ether). *Zlastion, M. I.* [*Méd. exptl. (Ukraine)*, 1939, *No.* 1, 36–42; *Chem. Zentr.* (**11**), 1612 (1940).]

In dogs ether narcosis caused a reduction in the arterial O content and saturation, i.e., an arterial anoxemia developed. In most cases the same changes were observed in the venous blood. The anoxemia had a deleterious effect upon the respiratory center. The changes in the respiratory activity during narcosis resulted in a reduction in the CO_2 content of the blood. M. G. MOORE (Chem. Abstr.).

Studies on the Action of Narcotics and the Tolerance to Narcotics in Childhood. (III) The Content of Adaline and Noctal in the Rabbit Brain after Narcotic Doses. *Grüninger, U., and Scheurenberg, G.* [*Z. ges. exptl. Med.*, **107**, 529–31 (1940); *Chem. Zentr.* (**11**), 2050–1 (1940); *cf. C. A.*, **32**, 5503[6].]

A dose of 700 mgm. of Adaline was administered *per os* to a rabbit 2 kgm. in weight. Twenty minutes later the brain (fresh weight 7·855 gm., dry weight 1·755 gm.) was found to contain only 0·306 mgm. (3·8 mgm. per cent. of the fresh weight) of Adaline. The larger portion of the drug was decomposed in the stomach. Moreover, the blood and liver contained only slight amounts of undecomposed Adaline. The administration of 300 mgm. of Noctal to a rabbit of 1·71 kgm. weight produced a strong narcotic effect. However, less than 1 mgm. of the preparation was found in the brain. A portion of this was an ether-soluble decomposition product. The Noctal was less rapidly decomposed in the stomach than Adaline. After the administration of 0·1 gm. Noctal per kgm. of body weight, which produced no symptoms, no undecomposed drug was found in the brain. A large portion was decomposed in the stomach. Adaline and Noctal were determined by the refined Br method of Leipert and Watzlawek (*C.A.*, **28**, 6749[6]). M. G. MOORE (Chem. Abstr.).

Fluctuation of Narcotic and Hyperglucemic Effect of Several Narcotics on Rabbits of Different Age. *Asakawa, Hisasi.* [*Mitt. med. Ges. Okayama*, **51**, 2175–6 (1939); *Chem. Zentr.* (**1**), 77 (1941).]

The narcotic effect of equal amounts (per kgm. body weight) of morphine, chloral hydrate, veronal, luminal and urethan is smaller and briefer in young rabbits than in adult animals. Veronal and luminal (120 and 80 mgm. per kg., respectively) have practically no effect on grown rabbits, but in young ones they produce hyperglucemia. Urethan (1–1·5 gm. per kgm.) produces hyperglucemia in both young and grown animals. Chloral hydrate (0·2–0·5 gm. per kgm.) causes hyperglucemia in grown rabbits, hypoglucemia in young animals. Morphine (5–20 gm. per kgm.) produces hyperglucemia in old as well as young rabbits. M. HOSEH (Chem. Abstr.).

Absorption of Narcotics by the Skin. *Vorozhtsova, E. D.* [*Akusherstvo i Ginecol.*, *No.* 1, 93–5 (1939).]

A bandage soaked in a 50 per cent. alcohol solution of chloral hydrate (equivalent to 2 gm. per kgm. body weight) placed on a shaved portion of rabbit skin produced a long (18–24 hrs.) sleep frequently leading to death. The state of narcosis came on only after 4–7 hours. Chloroform applied to the skin in the same manner (one or two 10 gm. doses) penetrated the skin in 2–4 hours and induced sleep of 30–90 minutes in 41·6 per cent. of animals. Aqueous solutions of evipan-Na and alcohol solutions of barbital and phenobarbital in 1·5–2·0 gm. doses were totally ineffective. C. S. SHAPIRO (Chem. Abstr.).

Awakening Action of Various Analeptics in Narcosis Induced by Alcohol or Chloralose. *Hess, J.* [*Arch. exptl. Path. Pharmakol.*, **197**, 204–9 (1942).]

In rats narcotized with EtOH moderate doses of metrazole, coramine, pervitin and cycliton had an awakening action, while large doses of coramine or cycliton prolonged the narcosis. In narcosis produced by chloralose, metrazole and pervitin prolonged the narcosis and coramine and cycliton had a marked toxic action. L. E. GILSON (Chem. Abstr.).

Variation in the Mineral Constituents of the Plasma during the Antagonistic Action of Metrazole and Coramine (on Chloralose Narcosis). *Cardini, C. E., and Serantes, M. E.* [*Anales farm. bioquim. (Buenos Aires)*, **13**, 9–23 (1942).]

Chloralose anesthesia causes a decrease in the K of the blood plasma. The injection of metrazole into a chloralosed dog causes convulsions and a transient awakening accompanied by a transient but marked rise in plasma K. Injection of a large dose of coramine causes convulsions

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and a transient rise in plasma K without awakening the animal; smaller doses may produce transient convulsions without any rise in K. The other mineral constituents of the plasma show no important change after injection of either drug. L. E. GILSON (Chem. Abstr.).

The Effect of Analeptics on the Circulation. (II) Changes in the Time of Circulation of the Blood and in the Gases of Arterial and Venous Blood after the Administration of Various Analeptics. Bansi, H. W., and Kalinke, M. [*Z. ges. exptl. Med.*, **103**, 301–19 (1938); *Chem. Zentr.* (**11**), 660 (1940); *cf. C.A.*, **32**, 1789⁷.]

Centrally acting analeptics (metrazole, coramine, neospiran) and the adrenaline substances (ephedrine, suprifen, sympathol, icoral) produced no increase in the O content of the arterial blood in inflammatory disorders of the lung tissue in which there was a retardation of the passage of O into the alveoli. After injection of analeptics blood CO_2 was diminished as a result of a centrally excited deepening of respiration. In fevers the circulation time was often shortened by analeptics, especially by those of the adrenaline group, and the flow of the peripheral blood was accelerated. The amount of blood circulating peripherally was occasionally reduced by metrazole and icoral. M. G. MOORE (Chem. Abstr.).

The Action of Metrazole. Gutierrez-Noriega, C. [*Rev. soc. biol. Lima*, **1**, *No.* 2 (1939); *Rev. sud-americana endocrinol. immunol. quimioterap.*, **25**, 148 (1942).]

From experiments on mammals, toads and insects it is concluded that the convulsions caused by metrazole are due to an immediate action on the neuron. The theory that the effect is caused by vasoconstriction is rejected. A. E. MEYER (Chem. Abstr.).

Antagonistic Action of Metrazole and Sparteine. Schnittspahn, Ferd. [*Arch. exptl. Path. Pharmakol.*, **197**, 252–8 (1941).]

Metrazole and sparteine are mutual antagonists in their action on respiration and blood pressure. L. E. GILSON (Chem. Abstr.).

Effects of Cocaine and Sympathomimetic Amines on Humoral Transmission of Sympathetic Nerve Actions. Lawrence, W. S., Morton, M. C., and Tainter, M. L. [*J. Pharmacol.*, **75**, 219–25 (1942); *cf. C.A.*, **34**, 6713.]

When cocaine and adrenaline in Locke solution are perfused together through the cat isolated leg the pressor responses are increased and the rate of destruction of adrenaline by the tissues is decreased. When the sympathetic nerves to the leg are first allowed to degenerate and the perfusion is made with diluting defibrinated ox blood, the absolute pressor potency of adrenaline, cobefrine and neosynephrine is increased severalfold although their relative activities, compared to one another, remain unchanged. These amines, ephedrine and tyramine, do not show the above increase in vasoconstrictor potency, and hence must act independently of the sympathetic endings in the blood vessels. The cat nictitating membrane is not suitable for this type of study. It is postulated that ephedrine, tyramine and cocaine partially block the enzyme within the smooth muscle cell which inactivates the adrenaline taken into the cell continuously from the blood stream, or the sympathin derived intermittently from the local sympathetic endings. The resulting local increase in adrenaline or sympathetic nerves makes the muscle cell more permeable to adrenaline, sensitizing the cells to adrenaline, but not to ephedrine and tyramine, which act through a different mechanism. L. E. GILSON (Chem. Abstr.).

Epilepsy following Application of Sulfathiazole near the Brain. Watt, A. C., and Alexander, G. L. [*Lancet* (**1**), 493–5 (1942).]

Five cases of epilepsy following application of sulfathiazole in the proximity of the brain are reported. In experiments on cats and dogs, application of sulfathiazole to the cerebral surface was followed by an epileptic syndrome comparable to that observed clinically. Sulfapyridine, sulfadiazine and sulfanilamide did not have this effect. E. R. MAIN (Chem. Abstr.).

The Effect of Propazone on the Metabolism of Rat Cerebral Cortex in vitro. Fuhrman, Frederick A., and Field, John, 2nd. [*J. Cellular Comp. Physiol.*, **19**, 351–9 (1942); *cf. C.A.*, **36**, 3261⁶.]

Propazone (5, 5-dipropyl-2, 4-oxazolidinedione) inhibits the O consumption of excised cerebral cortex of the albino rat, suspended in Ringer-phosphate-glucose at 37·5°. Inhibition is evoked by propazone concentrations ranging from $9{\cdot}66 \times 10^{-4}$ M to $1{\cdot}21 \times 10^{-1}$ M. Concentrations below $9{\cdot}66 \times 10^{-4}$ M have no effect on brain respiration. No stimulation is observed with graded concentrations ranging down to $4{\cdot}83 \times 10^{-1}$ M. About 15 per cent. of the respiration is propazone-stable and is not affected by concentrations up to $1{\cdot}21 \times 10^{-1}$ M. The action of propazone is selective to some extent. Concentrations which markedly inhibit respiration with glucose and pyruvate as substrate have little effect when the substrate is succinate or p-phenylenediamine. With fall in temperature the maximum percentage inhibition of respiration decreases. At 40°, 16 per cent., and at 15° 60 per cent. of this respiration is propazone-stable. Anaerobic glycolysis is not affected by propazone concentrations as high as $2{\cdot}42 \times 10^{-2}$ M (which produced maximum inhibition of respiration in Ringer-phosphate-glucose solution). Propazone appears to inhibit brain-respiration in a manner similar to other central nervous system depressants. However, it is preferable to most such agents for investigation *in vitro* because of its great solubility in water and its neutral reaction. FELIX SAUNDERS (Chem. Abstr.).

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The Pellagra-preventive Factor of Vitamin B. I–XVII. Pawel, Martinus. [*Rev. gastro-enterol. São Paulo*, **8**, 85–101, 115–26, 145–60, 183–218 (1940–41); *Trop. Diseases Bull.*, **39**, 574 (1942).]

A highly condensed and amply documented statement of the various aspects of this much debated subject. The pellagra-preventing activity of the pyridine compounds, the biological specificity of the factor, its metabolism, the biochemistry of glucolysis, the possible connection with porphyrin excretion and the effect of S are discussed.

RUTH BERGGREN (Chem. Abstr.).

Serum Therapy in Epidemic Meningitis, and Studies on the Sugar and Cell Content of Spinal Fluid. Stoffel, Walter. [*Deut. Arch. klin. Med.*, **186**, 113–24 (1940).]

A sharp decrease in the sugar content of the spinal fluid is an unfavorable sign in epidemic meningitis. An attempt has been made to correlate variations in sugar content with neurological symptoms.

P. Y. JACKSON (Chem. Abstr.).

Clinical and Experimental Studies on the Influence of Vitamin B_1 on Postdiphtheritic Paralysis. Dieckhoff, J. [*Monatsschr. Kinderheilk.*, **82**, 53 (1940); *Klin. Wochschr.*, **19**, *Ref. Tl.* 957 (1940).]

In animal experiments vitamin B_1 exerted neither a prophylactic nor a therapeutic effect in postdiphtheritic paralysis. It was also unsuccessful clinically. The slight decrease in the aneurine content of the blood plasma in the 2nd and 3rd weeks in toxic diphtheria has no connection with the postdiphtheritic neuritis. The early intensive serum treatment of acute diphtheria remains the most reliable treatment of postdiphtheritic paralysis.

RUTH BERGGREN (Chem. Abstr.).

The Action of Respiratory Poisons on Frog Spinal Cord. Lueken, B., Soehring, Kl., and Jebramek, H. [*Z. Biol.*, **100**, 486–517 (1941).]

The determinations were done on preparations of the entire spinal cord (except for a few 3-segment lengths) kept in Ringer's solution at 3–5°. The action of HCN, H_2S, CO and Et_2O were tested on a simple function of the central nervous system. Although essentially similar, the effect of NaCN (0·04–4 per cent.) varies with the concentration in respect to period before onset and strength of the reaction. At high concentration spasms begin after a few minutes, accompanied by paralytic symptoms which become more prevalent the longer the cyanide is in contact. These reactions are reversible. H_2S (administered both as the gas and liberated by HCl from Na_2S) gives similar effects which are irreversible particularly at paralysis. CO, in pure form or in combination with O, possesses an exclusively paralysing effect which continues in the dark but becomes reversible with exposure to light. Et_2O added to the Ringer's solution in doses of 0·5–10 per cent. results in spasms followed by paralysis for the high percentage, whereas there is no spasmic stage for the low.

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

The Pharmacological Action of Some So-called Extra Pyramidal Poisons. (II) The Action on the Rabbit Uterus in situ, on Isolated Smooth Muscle and on the Muscles of the Earthworm. Aoyama, Tutomu. [*Mitt. med. Ges. Okayama*, **51**, 576–7 (1939); *Chem. Zentr.* (**11**), 2054–5 (1940); *cf. C.A.*, **34**, 7418⁶.]

Bulbocapnine in small doses had a stimulating effect on the rabbit uterus *in situ* but medium to large doses were inhibitory. The stimulating action was due in part to stimulation of the peripheral para-sympathetic fibers and in part to stimulation of the uterine musculature. The inhibiting effect was the result of stimulation of the sympathetic centers. Harmine and harmaline had a stimulating effect in all concentrations, which was brought about predominantly by the action on the sympathetic centers, less by that on the musculature. Small doses of all three of the preparations mentioned had a stimulating effect on the isolated uterus and the smooth musculature of the rabbit and on the rat uterus. Medium doses usually had a stimulating effect or an initial stimulating effect followed by paralysis, while high concentrations had a paralyzing action. On the surviving small intestine of the rabbit small doses were stimulant, medium doses inhibitory and large doses paralytic. The isolated detrusor of the rabbit bladder was stimulated by small doses and paralyzed by large ones. When medium doses were used harmine and harmaline produced stimulation exclusively, while bulbocapnine produced inhibition either from the beginning or after an initial stimulation. Small doses of bulbocapnine had an inhibitory effect on the isolated small intestine of the rat; medium doses had either an inhibiting or a stimulating effect, while large doses either had a stimulating effect or an inhibiting action following an initial stimulation. Harmine and harmaline in small doses sometimes produced stimulation and sometimes inhibition; in medium doses these preparations either produced inhibition or paralysis following an initial inhibitory effect; in large doses they produced only paralysis. The stimulating action of the three preparations and the inhibitory action of harmine and harmaline on the small intestine of the rabbit and the rat were muscular effects. The inhibiting effect of bulbocapnine on the small intestine of the rat was due to stimulation of the sympathetic nerves; that on the detrusor of the rabbit bladder was due in part to stimulation of the musculature. The muscle of the earthworm was stimulated by small and medium doses of bulbocapnine and paralyzed by large doses. Harmine and harmaline had only a stimulating effect.

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

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Relation of B Vitamins and Dietary Fat to the Lipotropic Action of Choline. Engel, R. W. [*J. Nutrition*, **24**, 175–85 (1942); *cf. C.A.*, **33**, 9375[3].]

When thiamine, riboflavin, pantothenic acid, pyridoxine, corn oil and choline were fed to rats receiving a purified diet containing 18 per cent. casein for a three-week experimental period, an abnormal accumulation of liver fat resulted. Under these conditions 2 mgm. of choline chloride per rat per day failed to prevent the kidney hemorrhages of choline deficiency. At least 10 mgm. of choline chloride was necessary for this factor to exert its maximum lipotropic action, but normal liver-fat levels were still not being maintained. The addition of 3 mgm. of inositol per rat daily to the diet adequate in choline and containing the above B vitamins reduced the liver fat to the normal level found in rats receiving an adequate stock diet. Prolonged feeding of a diet deficient in pyridoxine or essential fat acids resulted in fatty livers, even though the diet contained adequate choline. Conclusion: Pyridoxine and a source of essential fat acids are necessary in the diet for choline to function properly as a lipotropic agent. Inositol, in addition to choline, is a necessary dietary constituent for the rat receiving purified diets supplemented with the other B-vitamins known to be required by the species.

C. R. Fellers (Chem. Abstr.).

The Influence of the Quality of the Diet on the Action of Acetylcholine and the Synergism between Aneurine (Vitamin B_1) and Acetylcholine. Abderhalden, Rudolf. [*Arch. ges. Physiol.* (*Pflüger's*), **245**, 155–9 (1941).]

Rats fed on meat (rabbit) were less sensitive to acetylcholine (I) than rats fed on mixed grains. When fed a vitamin B_1-free diet rats were more resistant to (I). Injection of 1 mgm. of aneurine 0·5–1 hour before the test increased slightly the sensitivity of normally fed rats to (I). H. L. Mason (Chem. Abstr.).

Cure of Paralysis in Rats with Biotin Concentrates and Crystalline Biotin. Nielsen, Edward, and Elvehjem, C. A. [*J. Biol. Chem.*, **144**, 405–9 (1942); *cf. C.A.*, **36**, 522[7].]

A typical paralysis or spasticity of the hind legs develops in biotin-deficient rats. This paralysis is produced consistently by the inclusion of egg white in a synthetic diet which allows good growth in the absence of egg white. High levels of fat in the diet did not hasten the onset of this spasticity but had a slight protective action. Riboflavin, pyridoxine or the combination of the two vitamins did not correct the paralysis. The leg muscle creatine of paralytic rats is abnormally high, decreasing upon the administration of biotin. The paralysis observed is not due to low creatine levels. The animals showed no gross pathology of the nerves as is the case with riboflavin rats. W. J. Peterson (Chem. Abstr.).

The Physiological Role of Adrenaline, Sympathin and Acetylcholine. Danielopolu, D., and Marcu, I. [*J. physiol. path. gén.*, **37**, 1290–1341 (1939–40); *cf. C.A.*, **34**, 3797[8]. *Research on the Condition of the Blood Vessels in Adrenalectomized Animals.*]

The experiments were carried out on dogs, rarely on cats. The general vascular toxicity is established according to the variations in the blood pressure of the carotid, and the local vascular toxicity in the dog foot is determined according to the variations in the pressure in the peripheral end of the femoral artery. After the operation there is a first phase of hypotension due to the operative shock; then the pressure is partially restored and at the end of several hours there is a second phase of hypotension. The experiments are carried out in this second phase. The action of adrenaline in this phase is less intense, slower and of longer duration than before the operation. The explanation offered is that a factor X (which the authors call complex adrenaline) maintains the excitability of the terminal organ. X seems to be a product of transformation of the medullo-adrenal adrenaline. In fact after injecting an extract of real adrenaline from the animal the same dose of adrenaline produces a more intense effect, more rapid and of shorter duration. The excitation of the lumbar sympathetic system, which has no effect on the blood pressure in the adrenalectomized animal, produces a new vascular reaction after the injection of a suprarenal extract. The action of adrenaline in hypotension which is kept up with an abundance of blood is normal. *Experiments made on adrenalectomized animals:* The results show that adrenaline injected into the animal is not destroyed, as is suggested by the transiency of its action, but is transformed into a complex adrenaline. In the adrenalectomized animal which reacts feebly and slowly to an injection of adrenaline, successive injections of adrenaline produce reactions which are more and more intense and rapid (phenomenon of sensitization to adrenaline). The adrenaline sensitizes the vessels to the action of vaso-constrictors (sympathin). An extract of the animal's adrenals made up in physiological salt solution possesses the same properties of sensitization as adrenaline. The excitation of the sympathetic fibers sensitizes the vessels for the action of adrenaline; adrenaline also sensitizes the vessels to the action of vasodilators (acetylcholine). Acetylcholine in small doses produces a sensitization of the vessels to adrenaline. The authors studied the existence of a product of transformation of acetylcholine (complex acetylcholine) which maintains the excitability of the organs. *The role of adrenaline, sympathin and acetylcholine:* Adrenaline, secreted by the adrenal medulla (efficient adrenaline), is poured into the blood and is changed in the organism into a new product which does not have the excitation or inhibitory properties of the efficient adrenaline (complex adrenaline). This maintains the excitability of the terminal organ of sympathetic and parasympathetic systems, and probably constitutes the stock from which the sympathetics draw the efficient sympathin and

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the chromaffin cells, the efficient adrenaline. The principal role of the adrenal medulla is not to maintain the tone of the organs (a function which appears to be taken care of by the sympathetic and parasympathetic nerves, and consequently by sympathin and efficient acetylcholine), but to maintain in the fluids and organs a permanent concentration of complex adrenaline.

GUIDO RIVA, BENJAMIN PRESCOTT (Chem. Abstr.).

Effect of Alcohols and Related Substances on Sensitivity of Muscles to Acetylcholine. *Meng, C. W.* [*Chinese J. Physiol.*, **16**, 291–302 (1941).]

Alcohols increase the sensitivity of toad rectus muscle to acetylcholine; aldehydes, ketones and higher alcohols are more, while polyhydric, secondary and tertiary alcohols are less effective. They cause contracture in the same relative concentrations. Their action is unaffected by denervation or eserine; they do not inhibit cholinesterase, but increase the sensitivity of the muscle to nicotine.

B. C. P. A. (Chem. Abstr.),

Routine Treatment of Epilepsy with Snake Venom. *Chowhan, J. S.* [*Indian Med. Gaz.*, **76**, 382 (1940); *Trop. Diseases Bull.*, **38**, 170 (1941).]

Cobra venom acts as an anticonvulsant; it probably reduces the sensitivity of the higher centers to extraordinary incoming impulses. Russell viper venom appears to alter the mineral and water metabolism and thus influences the epileptic convulsions. Extract of *Rauwolfia serpentina* is given by mouth as a sedative and is used along with the injections of the venom.

RUTH BERGGREN (Chem. Abstr.).

Relation between the Excitability of the Central and Peripheral Motor Neurons of Frogs during Various Pharmacodynamic Effects. *Chauchard, Jacqueline.* [*J. Physiol. path. gén.*, **37**, 1362–71 (1939–40); *cf. C.A.*, **32**, 7125[8].]

In *Rana temporaria* or *R. esculenta* drugs were applied directly to the exposed optic lobes of the brain, or were injected into the lymph sacs, or if volatile were given by way of the respiratory tract. Morphine, $CHCl_3$, chloral and evipal first decreased, then increased, central and peripheral motor chronaxie. When the central neurons became inexcitable the peripheral chronaxie returned to normal. Pyrethrins, acetylcholine, adrenaline and yohimbine first decreased, then increased, central and peripheral chronaxie. Atropine increased both central and peripheral chronaxie. The isochronism that normally exists between central and peripheral neurons seems to persist during the action of toxic drugs as long as the central neurons remain excitable.

GUIDO RIVA, L. E. GILSON (Chem. Abstr.).

Cure of Experimental Staphylococcal Meningitis. *MacNeal, Ward J., Spence, Martha J., and Blevins, Anne.* [*Proc. Soc. Exptl. Biol. Med.*, **50**, 176–9 (1942).]

Infected rabbits were saved by combined treatment with bacteriophage and sulfathiazole.

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

Peripheral Neuritis following the Administration of a Glucose-sulfapyridine Compound. *Sugar, Samuel J.* [*New Engl. J. Med.*, **226**, 1021–2 (1942).])

Peripheral neuritis developed after the administration of a condensation product, containing 1 molecule glucose and 1 molecule sulfapyridine. A total of 50 gm. glucose-sulfapyridine and 2 gm. sulfapyridine was given in six days. The effects are considered to be due to sulfapyridine alone, since the complex is broken down in the intestinal tract.

E. R. MAIN (Chem. Abstr.).

The Role of the Sympathetic Nervous System in the Cataleptic Action of Tetrahydro-β-naphthylamine. *Tonkikh, A. V.* [*J. Physiol. U.S.S.R.*, **27**, 41–8 (1939); *Chem. Zentr.*, 1940, **1**, 3815.]

Symptoms of general excitation, increase in body temperature and metabolic rate, and changes in muscle tone were observed in cats after subcutaneous injection of tetrahydro-β-naphthylamine (I). In sympathectomized cats the increases in body temperature, metabolic rate and muscle tone were less pronounced. Experiments on cats subjected to different operations indicated that the action of (I) is both central and peripheral.

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

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