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

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Remarks on Electroencephalography in Cerebral Abscess.

Seven cases diagnosed as cerebral abscess have been examined by E.E.G. In 3 of them pus-filled cavities were found by operation, in 1 by post mortem examination (Group I). Three patients (Group II) were treated with chemotherapy alone.

But for the patient who died shortly after admission to the hospital, all the patients were examined repeatedly during the convalescent period. In all patients focal dysrhythmias were found.

The material is too small for definite conclusions to be drawn, but the author feels assured that the following statements are warranted:

(*a*) E.E.G. is of great value for a localization of cerebral abscess, partly because the dysrhythmia occurs at an early stage of the illness.

(*b*) Repeated E.E.G.'s in the convalescent period are of importance for an evaluation of the treatment, and may give hints about prognosis as to late complications.

(*c*) In some cases of recent abscess or incipient abscess it may possibly be an indication to try treatment with chemotherapy alone, provided repeated E.E.G.'s at frequent intervals can be carried out.

(*d*) The dysrhythmia in recent abscess seems to be so severe that E.E.G. may give some information not only about the localization, but also about the nature of the focus recorded. E.E.G. in cases of recent abscess seems to give more severe dysrhythmias than in cases with a comparatively long history of illness, the rapidity of the expanding process here being a deciding factor.

(*e*) The combination E.E.G.-cerebral angiography, in addition to the clinical examination, is very useful for the exact localization of cerebral abscess.

(Author's abstr.)

A Study of the Potassium and Sodium Content of the Blood Serum in Schizophrenic Subjects.

First the writer gives an account of the hormonal function of the adrenal glands, especially the mode of action of the cortical hormone. Then follows a review of part of the literature available on the biological aspects of schizophrenia, particularly that dealing with adrenal dysfunction. The technique used in determining serum sodium and serum potassium is described, and an account is given of the accuracy of the analysis and the calculations in determining the mean error on each individual analysis and the mean error on the mean value.

The normal material is presented. The results of the analyses show that serum sodium ranges from 329·2 to 353·0 mgm. per cent., mean value 337·9 mgm. per cent. $\pm$ 1·55. Serum potassium ranges from 16·8 to 21·0 mgm. per cent., mean value 18·8 mgm. per cent. $\pm$ 0·30. All the results accord well with the findings of earlier workers.

After reporting the case-histories the writer proceeds to give the results of the analyses among the schizophrenic patients who were divided into 2 groups. Group I including recent cases, i.e. psychoses of up to 2 years' standing, and Group II, psychoses of longer duration. In Group I the serum sodium ranges from 330·0 to 342·3 mgm. per cent., mean value 335·0 mgm. per cent. = 1·2, whereas serum potassium ranges from 16·9 to 22·6 mgm. per cent., mean value 19·7 mgm. per cent. = 0·55. In Group II serum sodium ranges from 327·6 to 339·9 mgm. per cent., mean value 332·3 mgm. per cent. = 1·0, whereas serum potassium ranges from 17·2 to 21·5 mgm. per cent., mean value 18·6 = 0·34.

Discussing the results, the writer arrives at the conclusion that, as far as serum sodium is concerned, all the individual values are within normal limits, whereas the mean value representing the acute, and particularly the chronic, cases is lower than the mean value found in normal subjects. Serum potassium does not appear to show any definite abnormality. The mean value representing the acute cases is rather high compared with the mean value in the normal material, but not high enough to be pathological.

The results are interpreted as a further support of the theory that the adrenal glands are a link in the pathogenesis of schizophrenia without, however, being an active factor in starting the process. (Author's abstr.)

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Determinations of Glutamine and Glutamic Acid in a Material of Mental Patients.

Determinations of glutamic acid and glutamine in the plasma of 150 patients with mental affections have shown decreased glutamic acid values in various psychotic states, especially in schizophrenia in the active phases, and in convulsive patients in a few cases.

Besides, increased glutamine values have been demonstrated in schizophrenics in the active phase, and in convulsive patients. (Author's abstr.)

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Nonconvulsive Electric Stimulation Therapy: Its Place in the Treatment of Affective Disorders, with Notes on the Reciprocal Relationship of Anxiety and Depression.

Convulsive treatment through frontal leads inhibits respiration temporarily; non-convulsive treatment through frontal or temporoparietal leads stimulates respiration.

Convulsive treatment through frontal leads relieves depression but reduces awareness for memory content and may enhance anxiety, while nonconvulsive treatment through temporoparietal leads relieves anxiety and restores awareness for memory content, but may enhance depression. By using both, it is possible to avoid the " untreatable " residua after electroshock treatment.

(Author's abstr.)

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Comparative Results in Seizure Control Using Phenobarbital, Dilantin, and Mesantoin.

The advent of each new drug that proves effective in hitherto uncontrolled cases of *grand mal* epilepsy is heralded by the press and others as the wonder drug that promises more than any other drug we have had available in the past. The toxic reactions, though reported, are often glossed over as if they were not of serious consideration. If the temporal order of introduction of the 3 discussed drugs were reversed, we can well imagine the resultant enthusiasm of workers and the press. Phenobarbital would surely be heralded as the drug of drugs that is practically non-toxic and that, at the same time, controls the seizures of as many patients as the other two drugs. Dilantin and Mesantoin each has a useful function in the control of convulsions, but only as a supplement and occasionally as a substitute in the unusual case not responsive to phenobarbital medication. It behoves us all to continue unremittingly our search for better methods of aiding

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this type of patient, but our expressed enthusiasm in reporting our results should be tempered by the knowledge that to date we have not presented a single drug for *grand mal* epilepsy that can be considered more than a supplement, and occasionally a substitute, for phenobarbital, which has remained the drug of choice since its advent in 1912. (Author's abstr.)

Constitutional Factors in the Prognosis of Schizophrenia.

1. In a series of 2,100 consecutive admissions to the Veterans' Administration Hospital, Lyons, N.J., 72 per cent. of the schizophrenics were photographed in the standardized somatotype position shortly after admission.

2. These somatotype photographs were rated by Dr. William H. Sheldon, who had no knowledge as to the diagnosis, disposition, or any other pertinent information about the patients. Since these patients were included in a much larger series made up of psychoneurotics, neurological cases, and non-neuropsychiatric patients, in addition to the schizophrenics, the rater had no way of knowing even that they were schizophrenics.

3. The patients were allowed to follow their normal course in the hospital without awareness on the part of the staff as to their somatotype rating. The staff had no particular training in possible relationships between somatotype and psychiatric factors.

4. In all, 1,000 relatively consecutive admissions were somatotyped in the present series, and an extremely detailed review made of all pertinent material, including records while in service, laboratory data, cardiac and E.E.G. consultations, symptomatology, etc.

5. Two years after the first patient in the series was admitted (and 6 months after the last series admission), the disposition of the patients was reviewed.

6. There was found to be a significantly positive correlation between mesomorphy and good prognosis and a suggestively poor one with high endomorphy.

7. This correlation between prognosis and somatotype proved to be independent of correlations between somatotype and diagnosis. In other words, relationship between prognosis and somatotype is more basic than relationship between prognosis and diagnostic subcategory.

8. Significant correlations were found to exist between somatotype and diagnosis: mesomorphs tended to be paranoid and hebephrenic, whereas ectomorphs tended to be hebephrenic and not paranoid.

9. It was also found that those who were overendowed and underendowed from an absolute point of view, had a poor prognosis.

10. On the basis of other parts of the study, it is suggested that with the somatotype as a frame of reference a much-needed factor will be introduced into the organic approach to schizophrenia, making comprehensible much of the data that are now characterized only by their great variability. (Authors' abstr.)

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Effect of Treatment on Excretion of 17-Ketosteroids in Patients with Mental Disease.

The daily excretion of 17-ketosteroids is in or slightly above the normal range in patients with psychoses or severe neuroses. The values found are high if the reduced caloric intake of the patients is considered.

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Early in the course of psychotherapy, insulin therapy or electric shock therapy, increased excretion of 17-ketosteroids may occur. Late in the course of treatment, and after it, a diminution in output is found in patients who show notable improvement, whereas no decrease occurs in patients who are not improved. These changes may be masked by an increase in excretion of 17-ketosteroids when an increase in caloric intake occurs in association with remission of the psychosis.

(Authors' abstr.)

The Cerebrospinal Fluid in Methyl Alcohol Poisoning.

Sixty-four spinal punctures were performed on 13 patients with acute methyl alcohol poisoning. Abnormal elevation of spinal fluid pressure occurred in 5 of 11 patients throughout a five-week period of convalescence.

In 8 of 10 patients spinal puncture performed on the third day after ingestion of the poison showed elevated pressures. Two had pressures of 300 and 390 mm. of water, respectively; 3, a pressure of over 200 mm. of water, and 3, pressures of over 150 mm. of water.

All patients known or suspected of having ingested methyl alcohol should have repeated determinations of the spinal fluid pressure during the week following ingestion, in addition to the accepted standard procedures. Elevated pressures should be reduced by drainage. By this procedure, toxic metabolic products may be removed.

It is not possible to determine from clinical findings in the conscious patient the presence of an increased cerebrospinal fluid pressure. Direct manometric measurement is therefore indicated to determine the spinal fluid pressure in all suspected cases. This procedure was judged to be an important emergency and therapeutic measure.

Death apparently occurs as a result of accumulative toxic products. The effects of abnormal cerebrospinal fluid pressure on the central nervous system are reflected in delirium, coma, convulsions and central respiratory depression, in the presence of acidosis.

Generally, patients with the most obvious ophthalmoscopic changes also had abnormally high spinal fluid pressures. (Author's abstr.)

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Effects of A.C.T.H. in Patients with Mental Disease.

It seems clear that in patients with schizophrenia or depression of any duration the reaction of the adrenal cortex to certain physical stresses and to the injection of A.C.T.H. is not diminished as compared with the changes observed in non-psychotic subjects. It is possible, moreover, that psychotic patients show exaggerated metabolic changes after the injection of A.C.T.H. If the latter observation should prove valid, it might be possible to relate psychosis to metabolic

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changes consequent to an unusual response of the adrenal cortex to A.C.T.H. or or of the tissue to cortical hormone released during ordinary stresses.

Changes in eosinophil count, uric acid and 17-ketosteroid excretion and sweat sodium concentration after the injection of A.C.T.H. are not diminished in psychotic patients as compared with the changes in non-psychotic subjects. Patients with schizophrenia or manic-depressive psychoses appear to show greater than normal changes in carbohydrate metabolism after the injection of A.C.T.H.

(Authors' abstr.)

Colloidal Gold Reaction in Multiple Sclerosis.

The quantitative colloidal gold test as performed at, and reported by, the Division of Laboratories and Research of the New York State Department of Health is a valuable aid in the diagnosis of multiple sclerosis.

Multiple sclerosis was the presumptive diagnosis in 64 per cent. of the 263 cases of non-syphilitic disorders in which the spinal fluid showed a type D colloidal gold reaction of one or another strength. Some form of the type D reaction was also found in 36 per cent. of a miscellaneous series of disorders of the central nervous system. These findings are in accord with the known lack of specificity of the type D reactions for this or any other disease.

On the other hand, the type D reactions were present in 94 per cent. of 158 cases with a " definite diagnosis " of multiple sclerosis, and in 83 per cent. of 203 cases in which this disorder was either definitely diagnosed or reasonably suspected. Therefore, the absence of the type D reaction (i.e. the presence of any other type of curve) renders a diagnosis of multiple sclerosis uncertain.

The strong type D reaction (exclusive of weak and minimal types) was found less commonly (46 per cent.), but was more indicative of the disease, as it occurred rarely (8 per cent.) in non-syphilitic patients without multiple sclerosis.

The presence of the type D colloidal gold reaction in cases of multiple sclerosis and syphilis of the central nervous system closely parallels the relative increase in gamma globulins over albumin in the cerebrospinal fluid, as reported by the other observers.

The total proteins were moderately increased in 36 per cent. of our cases of multiple sclerosis.

The cerebrospinal fluid cell count was increased to above 10 cells per cubic millimeter in only 8 per cent. of the cases of multiple sclerosis.

No correlation was found between the duration, stage or clinical activity of the disorder and the colloidal gold reaction, total protein concentration or cell count of the cerebrospinal fluid. (Authors' abstr.)

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Cortical Rhythms Not Seen in the Electroencephalogram.

(1) Two examples are described of records made from electrodes inserted in the brain across the cortex which have been compared with the E.E.G. Normal rhythms, abnormal rhythms and random wave complexes, all of high voltage, arose in the cortex, but could not be recorded from the overlaying scalp using accepted electroencephalographic techniques.

(2) In some cases the electroencephalogram does not reflect the electrical potential changes arising in the underlying cortex. This fact can be related to the individual variations and anomalies which have been observed in the E.E.G.'s of some normal and abnormal subjects, and it requires further study.

(3) A possible explanation of the absence of potential changes at the scalp when marked rhythmic changes can be recorded through the underlying cortex is that the potential changes are occurring through the depth of the cortex from many points, but reach its surface synchronously. (Authors' abst.)

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An Experimental Study of the Mechanism of Photic Activation in Idiopathic Epilepsy.

A single photic stimulus to the eyes of a normal animal gives rise, after a latency of 15 to 20 m.sec., to a response in the lateral geniculate body and in the primary and secondary visual cortices. This discharge may comprise one or three of the following components: (1) A rapid triphasic wave (initially positive, then negative, and finally positive); (2) a repetitive wave of alpha frequency; (3) a very slow wave of delta frequency.

Intermittent rhythmic photic stimulation produces a simplification of the cortical responses by a progressive cutting off of its slowest components and by a tendency to bring about a telescoping of the different components.

The local application of strychnine augments the amplitude and the duration of the negative second phase of component 1 and suppresses components (2) and (3).

The intravenous injection of Metrazol brings about an augmentation of the three components of the response, particularly component (3), even if attenuation has occurred as the result of a previous local application of strychnine. Intermittent photic stimulation at an approximate frequency of 3 c./sec. brings about, under these conditions, a repetition of the above responses. By two methods of simplification (" amputation " and " telescoping ") the response assumes the typical form of the spontaneous discharge of idiopathic epilepsy—the spike and wave complex. It has been pointed out that this may be wrongly interpreted as being composed only of a negative spike followed by a slow wave of similar sign.

Under these same conditions of intravenous Metrazol injection, the topography of the response changes markedly when a certain concentration is attained. Suddenly it irradiates to the thalamic nuclei and to other regions of the cortex, where it predominates in or may even be localized to fronto-precentral regions. The latency of this irradiated response is of the order of 25 m.sec. in the thalamus and 30 m.sec. on the cortex. Each of these responses is accompanied by a muscular twitch of the extremities predominant in flexion. This latter is not suppressed by the complete ablation or freezing of the precentral sensorimotor cortex.

The injection of Tridione electively brings about the disappearance of the irradiated response without producing an alteration in the primary visual response. Phenobarbital in high concentrations causes the disappearance of the irradiated as well as the primary responses.

The ablation, isolation and freezing of the visual cortex or of any other cortical area on one side only does not suppress the irradiation response nor the bilateral myoclonic jerk, which accompanies it. The isolation of the visual cortex on both sides by section of its cortico-cortical connections is equally ineffective. Bilateral ablation, however, brings about the disappearance of the irradiated response and myoclonic jerk. From these findings the authors have concluded that the irradiated response is elaborated in the thalamus. It appears to result from an abnormal permeability of the thalamic synapses to the convergent action of impulses derived from the visual pathways. These latter include an essential relay in the visual cortex. The authors' believe that idiopathic epilepsy with its bilaterally synchronous negative spike and wave involves similar mechanism.

(Authors' abstr.)

The Electroencephalogram During Hyperventilation followed by Apnoea (A Preliminary Report).

(1) Following hyperventilation, the period of involuntary apnoea was reinforced by voluntary breath-holding. After an interval of normal record, high voltage slow waves similar to those during hyperventilation returned. This

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response was observed to a variable degree in 36 of 50 subjects, and was accompanied by cyanosis.

(2) In two subjects with idiopathic epilepsy, apnoea activated typical E.E.G. spike and wave discharges.

(3) An attempt is made to interpret these findings in the light of the two main theories as to the mechanism by which hyperventilation affects the brain and activates the E.E.G. (the hypocapnia and the hypoxia or ischemia theories). The evidence, although indirect, appears to support the hypoxia theory.

(Author's abstr.)

Studies of the Regulatory Functions of the Anterior Limbic Cortex.

1. Stimulation of the anterior limbic area, and infra-limbic area, can produce three general types of changes in electrical activity. These responses have in common: That they can occur in all areas of cortex bilaterally at the same time; that they occur immediately when elicited by electrical stimulation; and that they act via cortico-subcortical mechanisms.

The types of changes in electrical activity affected are:

(*a*) *Attenuation*.

(1) Decrease in voltage without change in pattern.

(2) Decrease in voltage with decreased number of bursts or with simplification of burst patterns.

(*b*) *Augmentation* of bursts.

(*c*) *Activation* or "arousal" responses.

(1) With decreased voltage.

(2) With increased voltage.

Subcortical mechanisms by which these effects may be produced have been suggested.

2. The anterior limbic cortex ("24's") cannot be accurately described as a "suppressor area" on the basis of its electrical properties. This is based upon two facts:

(1) That type of electrical response called "suppression" in the literature, and attributed to this area as a localizable property has been shown to be the phenomenon of spreading depression which has no such local characteristics.

(2) Attenuation of cortical electrical activity (which differs markedly from the "suppressor" response described in the literature) can be evoked by stimulation of this area; but so also can the contrasting types of responses in electrical activity herein called augmentation and activation.

The term "regulatory" seems to describe the functional properties of anterior limbic cortex better than "suppressor."

3. It has been suggested that intimate relationships exist between phylogenetically old areas of the brain, i.e. the "mesocortex" of the anterior limbic regions, the thalamic reticular system, and the reticular formations in hypothalamus, subthalamus and brain stem; all possessing important regulatory control of cortical electrical activity and function. (Authors' abstr.)

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Preliminary Report on Sixty-two Prefrontal Lobotomies on Psychotic Male Veterans at the Veteran's Hospital, Northport, Long Island, New York.

1. Results of prefrontal lobotomy in 62 patients during a three and one-half year period reveal that 37 per cent. are markedly, 29 per cent. are moderately, 27 per cent. are slightly improved, 7 per cent. are unimproved. None are in remission and none are worse.

2. Loss of agitated, self-destructive and disturbed behavior in chronic psychotic patients is the outstanding accomplishment of lobotomy in a substantial percentage of the cases selected.

3. In this series, catatonics and hebephrenics showed greater improvement than other types of schizophrenia.

4. Twelve of the patients had convulsions following lobotomy, 6 of whom had no previous shock therapy. Average time between operation and onset of convulsions was six and one-half months.

5. Patients under 40 years of age showed a slight tendency to better response after lobotomy than older patients.

6. Normal E.E.G.s post-operatively reflect a greater degree of improvement in patients than do abnormal ones.

7. In this series the E.E.G. was not found to be a valuable guide to indicate which patients would develop post-operative convulsions. (Author's abstr.)

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Experiences with Antabuse Treatment of Alcoholism in a General Hospital.

In 35 consecutive private hospital admissions for alcoholism, antabuse was contraindicated in 8 and administered in 27. In 16 patients, followed three to nine months, there was full co-operation with treatment and no return to alcohol. In 4 cases there was at least one episode of drinking, but the patients continued to co-operate with treatment and attained partial success. In 7 cases, including 3 in which antabuse was stopped because of organic disease, treatment was unsuccessful. Insufficient insight and lack of family co-operation account for 4 failures.

The importance of detecting cardiovascular and hepatic disease as contraindications, the potential dangers of the test with alcohol and the necessity of continuous supervision by nurse and physician throughout the test reaction have been stressed. Sustained results depend upon individual psychotherapy, family co-operation, careful follow-up and control of side reactions of the drug.

(1) Treatment should be instituted only within a hospital because of hazards involved.

(2) Further evaluation is necessary before the final status of antabuse in the physiologic control of alcoholism can be established.

(3) Patients with evidence of pre-existing liver or brain disease should be closely observed for the development of abnormal mental symptoms.

(4) There is need for further research, particularly in hope of finding safer and less toxic drugs.

(5) Antabuse should not be released for general use until these problems have been settled.

(6) Despite these limitations, with careful selection of patients, personal management under hospital conditions, close follow-up and adjuvant therapy, treatment with antabuse shows great promise.

(7) We believe that the principle of a physiologic antagonist to alcohol is basic in order to control the chronic compulsive type of drinker. Purely psychologic management is inadequate. (Authors' abstr.)

Thyroid Function in Mental Disease. A Multiple Test Survey.

(1) Thyroid function in groups of schizophrenic, manic and depressive patients is significantly different from normal controls as measured by a pattern of the four tests used in this study, but is normal by clinical evaluation, and the test results fall within the normal range. The pattern for the psychoneurotic group is most like the normal.

(2) Thyroid function in schizophrenic, manic and depressive patients is significantly different from patients with thyrotoxicosis and myxedema, in that the test results fall within the normal range, and the patterns of test results on all four tests taken together are unlike those in patients with known thyroid disease.

(3) Thyroid function in schizophrenic, manic, depressive and psychoneurotic patients is different among the four groups. The patterns of test results are different with many seeming inconsistencies. (Authors' abst.)

A Report on the Current Status of an Attempt to Correlate Abnormality of Distribution of One Brain Enzyme with Mental Dysfunction.

Data from a study of a single enzyme, carbonic anhydrase, have been presented which indicate a functional chemoarchitecture of the central nervous system.

Certain findings have been presented which suggest that disturbances in the contours of this quantitative distribution pattern may result in disturbed mental reactions.

The case incidence, with reference to the enzyme level found in the frontal pole, has been plotted from data on patients with paretic neurosyphilis, cerebral arteriosclerosis, dementia praecox, and on non-hospitalized persons.

The low level of the enzyme found in a considerable proportion of the cases of dementia praecox, and also found in cases where there is a known injurious agent, suggests an organic origin, either endogenous or exogenous, in at least some categories of this so-called functional disease. (Author's abstr.)

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*Electrocorticographic Effects of Stimulation of Posterior Orbital, Temporal and Cingulate Areas of *Macaca mulatta*. *Lennox, M. A., et al.* . . 383

Gastric Motor Effects of Acute Removal of Cingulate Gyrus and Section of Brain Stem.

1. Bilateral ablation of the cingulate gyrus in acute experiments in dogs under chloralose-urethane anesthesia produces a moderate increase in the rate of contraction of the pyloric antrum.

2. Intercolliculo-mesencephalic brain stem section increases the pyloric antral rate to a greater degree than cingulate ablation.

3. Hypothalamic ablation produces an increase in pyloric rate which is not further affected by brain stem section.

4. Evidence is presented that these effects are not due to traumatic stimulation.

(Authors' abstr.)

Some Physical and Pharmacological Factors Affecting Delayed Response Performance of Baboons following Frontal Lobotomy.

1. Two immature female Chacma baboons (*Papio porcarius*) were trained in the delayed response situation, subjected to bilateral frontal lobotomy, and retested under various physical and pharmacological conditions.

2. The animals showed a low level of performance in the delayed response situation for six months postoperatively under normal conditions (food intake approximately 350 calories per day, temperature approximately 80°).

3. The following conditions significantly improved test performance: Intramuscular injection of Nembutal in approximately half the anesthetic dose; the intramuscular injection of 0·25–0·50 unit of insulin per kgm. body weight; a reduction of the environmental temperature by 15°–20° for three hours before testing; fasting for 48–60 hours before testing.

4. Benzedrine (5 mgm.), elevation of the environmental temperature for three hours before testing, and prefeeding immediately before testing, resulted in a few chance trials or complete refusal to test.

5. The relationship of these physical and pharmacological changes to energy metabolism is discussed; those alterations in conditions which temporarily increase food intake increase test scores; those which temporarily decrease food intake impair performance.

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6. The nature of the impairment in delayed response performance following frontal lesions is discussed.

7. The physical changes and pharmacological agents used have been shown to affect central neural mechanisms. The significance of the relation between these mechanisms and frontal lesions and their behavioral implications are pointed out. (Author's abstr.)

Electrocorticographic Effects of Stimulation of Posterior Orbital, Temporal and Cingulate Areas of Macaca mulatta.

1. Unelicited spikes were recorded frequently from the periamygdaloid cortex, temporal pole, and posterior orbital areas, and simultaneously at needle electrodes in the region of the amygdala and hippocampus.

2. Electrical stimulation of the periamygdaloid temporal polar, posterior orbital and anterior cingulate areas produced similar electrocorticographic effects: (i) Elimination of strychnine spikes in areas other than that stimulated; (ii) elimination of unelicited spikes in areas other than that stimulated; (iii) production of an after-discharge locally and sometimes in areas other than that stimulated.

3. These effects were independent of one another, in that each might occur alone or in any combination with others.

4. Certain areal differences were noted. Stimulation of the anterior supracallosal area and of the temporal pole produced all effects. Stimulation of the periamygdaloid cortex produced a seizure discharge in all trials. Stimulation of the posterior orbital area eliminated strychnine and spontaneous spikes but did not result in a seizure discharge. No effect was produced by stimulation of the pre- or subcallosal areas.

5. Some implications of these findings with respect to the mechanisms involved in psychomotor epilepsy are discussed. (Authors' abstr.)

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*Spike Discharges of Single Units in the Cerebellar Cortex. *Brookhart, J. M., et al.* 465

The Elementary Vestibulo-ocular Reflex Arc.

Artificial endolymph currents have been produced in different semicircular ducts of cats and dogs through fine glass cannulas introduced under the control of a stereoscopic microscope into the ducts with the aid of a micromanipulator. In some cases the posterior semicircular duct was stimulated in a similar way after extirpation of the utriculus, sacculus and the membranous ampullae of the superior and lateral semicircular duct. The activity of the extra-ocular muscles has been recorded simultaneously on a kymograph.

The receptors of the vertical semicircular duct are—as was described first by Ewald and recently by many other authors—more responsive to endolymph currents of the direction " from the ampulla," the receptors of the horizontal ducts to those " toward the ampulla."

From stimulation of the different semicircular ducts it appears that there is a predominant functional correlation between any crista and two of the extra-ocular muscles. The crista of the superior semicircular duct has a predominant connection with the ipsilateral superior rectus and the contralateral inferior obliquus; the crista of the posterior duct with the ipsilateral superior obliquus and the contralateral inferior rectus; the crista of the horizontal duct with the ipsilateral and medial rectus and the contralateral lateral rectus.

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This functional correlation is in accordance with previous anatomical investigations concerning the pattern of the three-neuron-reflex-arc between labyrinth and extra-ocular muscles. From this agreement it may be inferred that the predominant correlation between any crista and two extra-ocular muscles is established by the elementary vestibulo-ocular reflex arc, in which three neurons are involved. This assumption is supported by the results of experiments with transection of the posterior longitudinal fasciculus, and of the pons with the exception of the former tract.

Besides the elementary three-neuron-arc there exists—as was first clearly shown by Lorente de Nó—numerous arcs, most of them closed through the reticular formation, by way of which the impulses from any labyrinthine receptor may be brought into connection with any one of the extra-ocular muscles. The function of the reticular formation seems to be essential, especially for elaboration of inhibitory responses. Nystagmus is generally suppressed by this mode of stimulation, for which fact no adequate explanation can be given, but it was advantageous for investigation of the function of the elementary arc, which thus became more dominant. (Authors' abstr.)

Trigeminal Neurotomy and Blood Pressure Responses from Stimulus of Lateral Cerebral Cortex of Macaca mulatta.

These results were obtained under the conditions usually present in acute experimental studies involving the cerebral cortex. Since stimulation of so many cortical points resulted in marked changes of blood pressure, such changes must be taken into consideration in evaluating the results of the effects of cortical stimulation on all physiological systems.

The most likely explanation of the effect of trigeminal section on the responsiveness of the cortex is that afferents from the cortical vessels have been interrupted. However, since, in unanesthetized humans no pain is elicited from stimulation of blood vessels on the lateral surface except near sinuses, it is somewhat surprising to find so widespread a distribution of afferents in the monkey. It is, therefore, possible that an intact trigeminal nerve potentiates cortical responses to stimulation either by an effect on cerebral circulation or a direct neural synergism. However, the effect of trigeminal section is mediated, these results suggest that a separate autonomic mechanism involving the trigeminal nerve exists on the surface of the cortex. (Authors' abstr.)

Field of Retinal Induction and Optical Illusion.

1. The field of retinal induction around a retinal image was mapped out by employing the method used previously in physiological studies on simultaneous color contrast, and it was found that the field was circular around a circle, triangular around a triangle, but cruciform around a square.

2. The induction at a point in the middle of the dark cross bounded by four yellow squares was found lower than at any other parts of the cross. The phenomenon was not so conspicuous on the oblique cross bounded by four rhombs. These physiological findings were in good agreement with our psychological experience.

3. Wertheimer-Benary's contrast, which is one of the most important psychological phenomena for Gestaltpsychology, was demonstrated more directly by our physiological method than by the psychological.

4. It was shown that the patterns of the field of retinal induction were closely connected with optical illusions of varying types—for example, the optical illusions of Müller-Lyer, of Zöllner, of Hering, of Köhler, etc. It seems likely that optical illusion takes place when the field around the retinal image of a figure is deformed by some modification of the figure or by the presence of the images of other figures.

5. The distance over which the field around a bar extended in the direction perpendicular to it was found longer in the vertical position of the bar than in the horizontal. So-called anisotropy of visual space seems to be based on such functional anisotropy of the retina.

6. The importance of retinal induction for visual acuity was emphasized, and the vernier effect with respect to visual acuity was accounted for on the basis of field patterns.

7. Qualitative differences of the field of retinal induction from the magnetic, electric and gravitational fields were shown by several examples, among which the

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dependence of retinal induction upon the angle subtended by the inducing figure is the most fundamental. The mechanisms of contrast phenomena and optical illusions stated above were discussed on the basis of these peculiarities.
(Author's abstr.)

Biochemical and Physiological Differentiation during Morphogenesis. X. Onset of Electrical Activity in Developing Cerebral Cortex of Fetal Guinea-pig.

Rhythmic potentials can first be recorded from the cortex of the fetal guinea-pig at the 46th day of gestation (term 66 days), immediately following the period found to be critical for morphological and biochemical changes which are believed to accompany the differentiation of neuroblasts into neurones. Prompt production of strychnine spikes following local application of strychnine to the cortex provides evidence that the potentials are at least partly cortical in origin. The onset of cortical electrical activity is correlated temporally with evidence that can be interpreted to mean that the neurones of the cortex become permeable to sodium at this time. (Authors' abstr.)

Termination of Spinal Afferents to Inferior Olive in Cat.

Lesions have been made at various levels of the spinal cord in 20 cats. The lesions involved different funiculi and/or the dorsal horns. The ensuing degeneration of terminal fibers and boutons in the inferior olive has been studied in silver preparations. The principal findings are the following:

1. The spinal fibers to the inferior olive ascend in the ventral funiculus, and some also in the adjoining part of the lateral funiculus. They appear to originate from all levels of the cord.

2. Somewhat more than half the number of fibers cross in the medulla spinalis.

3. The fibers terminate by means of typical terminal boutons on the perikarya and processes of the cells in certain parts of the inferior olive. Most, if not all, terminal fibers are collaterals from ascending fibers.

4. The bulk of the spino-olivary fibers reach the ventro-lateral part of the dorsal accessory olive and the ventro-lateral part of the caudal half of the medial accessory olive. Some fibers pass to two distinct small parts of the olive: the nucleus β and the dorso-medial cell column, and quite a few to the dorsal cap.

5. A comparison with the pattern of the olivo-cerebellar projection, studied previously reveals that spinal impulses are distributed by means of the olive in great numbers to the vermis of the anterior lobe, some to the pyramis, a few to the uvula and the decline and still fewer to the nucleus fastigii.

6. The fibers from the cervical and upper thoracic cord are far more scanty than those from the lumbo-sacral cord. There is some indication that the number of cervical and upper thoracic cord fibers reaching the olivary areas projecting on the lobulus centralis are even more scanty than those passing to the olivary areas sending their fibers to the culmen. It is suggested that the spino-cerebellar pathway through the external cuneate nucleus (considered commonly to be the cervical cord equivalent of Clarke's column) may represent an accessory pathway also for the spino-olivo-cerebellar system from higher levels of the cord.

7. The spino-olivo-cerebellar pathway with regard to its organization presents a striking similarity to the dorsal spino-cerebellar tract. The only difference appears to be that the impulses transmitted through the olive reach the vermis of the anterior lobe only, while the fibers of the dorsal spino-cerebellar tract terminate also in the intermediate parts of the anterior lobe. Together with other differences in fiber connections this emphasizes the importance of considering the subdivision of the anterior lobe in three longitudinal zones.

8. The anatomical findings tend to show that the " spinal " areas of the inferior olive function purely as relay stations. Impulses mediated through the spino-olivo-cerebellar pathway will reach the cerebellum later than those passing in the dorsal spino-cerebellar tract. The similarity in the organization of these two systems indicate a similarity in function. For anatomical reasons the spino-olivo-cerebellar system cannot be supposed to mediate tactile impulses to the cerebellum. The findings made in this study emphasize the necessity of considering the functional subdivision of the inferior olive in physiological experiments. Some of the reports on the physiology of the inferior are discussed. (Authors' abstr.)

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Some Functional Connections between Hypothalamus and Medulla.

Preliminary stimulus mapping of the posterior hypothalamus shows a pattern response similar to that described earlier for vasomotor responses, but in addition respiration and somatic reflexes were found generally to vary in the same direction as the blood pressure responses.

Interruption of the medial inhibitory reticular formation in the medulla served to enhance hypothalamic facilitation of vasomotor, respiratory and somatic reflexes.

Interruption of the dorsolateral facilitatory reticular formation resulted in a depression or abolition of hypothalamically induced facilitation of vasomotor, cardiac, respiratory and somatic reflexes.

Simultaneous stimulation of the bulbar inhibitory system opposed hypothalamically induced vasopressor responses to the same extent that uncomplicated stimulation of this system caused vasodepression.

Further evidence is presented to indicate that the bulbar facilitatory and inhibitory systems, activated by the posterior hypothalamus, influence vasomotor, respiratory and somatic activity in the same direction. (Authors' abstr.)

Spike Discharges of Single Units in the Cerebellar Cortex.

Spike potentials of single units have been recorded from the cerebellar cortex of decerebrated or anesthetized cats through the use of fine, wire microelectrodes which circumvent the detrimental influences of cerebellar movement and pressure which make the use of rigid electrodes unsatisfactory.

Intrinsic cerebellar neurons were found to be spontaneously active at frequencies ranging from 20 to 125 per sec., with the majority falling in the range of 70–80 per sec. This activity occurred in erratic bursts of variable length separated by silent intervals of variable duration. Factors controlling the resting frequency and the timing of the periods of activity and silence have not been determined.

The identity of the unit producing this activity is unknown. Activity in intrinsic units may be differentiated from activity in extrinsic, or afferent, units through the use of local strychnine and through differences in the responses of the two types of units to sensory stimulation. The intrinsic units were active in animals with chronic surgical isolation of areas of the cerebellar cortex.

Local strychnine applied to the cerebellar cortex produces characteristic convulsive, avalanching outbursts of activity in intrinsic cerebellar neurons. Similar patterns of activity are also produced by other forms of intense stimulation.

Some responses of cerebellar neurons to afferent volleys over spinocerebellar paths and over cortico-ponto-cerebellar paths are described. It has been possible to evoke, to augment and to inhibit activity in cerebellar neurons by such afferent stimulation. (Authors' abstr.)

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A Rorschach Study of a Group of Medical Students.

1. The individual Rorschach scores of 60 fourth-year medical students were statistically analyzed and compared with those of various groups of superior adults reported by other investigators.

2. In the intellectual sphere the 60 medical students were similar to other superior adults in productivity, intellectual drive and organizational energy, form accuracy and originality of interest content; they differed from other superior adults in the emphasis upon Dd (rare detail) in the mode of approach.

3. In the affective sphere these medical students resembled other superior adults in richness of sources of energy available for adjustment. They were unusual in the frequency with which both shading and colour shock were noted.

4. The experience balance of the medical students showed half of the total group to be introversive, while a quarter were extratensive and a quarter were approximately ambiequal.

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5. The mean number of white space responses given by the medical students was significantly higher than in other groups.

6. The significance of various Rorschach variables in the total personality structure of medical students is discussed. (Author's abstr.)

The Anxiety Syndrome in Alcoholism.

In the study of 67 alcoholics, and a review of 38 cases previously studied, it was noted that, even in the cases where drinking started in childhood, the nervous tension with symptomatology of the anxiety syndrome observed at and after puberty, appeared to serve as the basis for the persistent use of alcohol. Why more individuals do not drink to satisfy their anxiety which would seem to be greatest at puberty is a problem that needs further study. It is the opinion of Schilder that alcoholics experience definite feelings of sexual inferiority. Banay has suggested that alcohol may become a substitute for sex gratification and points to a psychosexual problem in alcoholics. Moore has noted that alcohol is used to relieve the nervous tension of drinkers, that this drinking usually started while young, that inadequate preparation for, or information about, sex was a factor for pertinent consideration. Karpman, too, has considered the alcoholic very definitely as a neurotic, while Kraines attributes addiction to a determined internal drive. The findings of these authors are parallel with many of the present observations. The studies by Stevenson into the causes given by patients for their drinking revealed, as did the present one, that they have no deep insight into their basic cause for drinking.

The return of alcoholics to the mother or mother-substitute following separation or divorce on the part of the male ; or the return of the female to the father is one point which needs further study. The frequent findings of equal regard for wife and mother, with a leaning slightly toward the mother, is a pertinent observation.

Norberry has noted strong filial over-dependence in his cases, while parental training and attitude would seem pertinent to Schilder. In this respect, Knight has noted that most alcoholics have been married and divorced at least once, so that adjustment to marriage constituted a problem to them. Moore has described an attachment of males to their mothers greater than the average, noting some infantile and immature patterns of behaviour as well, all of which were observed in this study. All in all, it showed that marriage as a way of life was not fully accepted by the alcoholics studied.

Strecker has noted that the alcoholic is preponderantly an introvert. This, the author believes, is definitely associated with psychosexual behaviour and, hence creates part of the difficulty in making a satisfactory proper heterosexual adjustment.

The wish to escape reality, as noted by Peabody should be carefully evaluated, since the incidence has been noted as being originally psychosexual and later extending to all difficulties encountered. Moore has observed the need of alcohol to sublimate the emotions in the alcoholic.

While the cases studied were too few from which to draw definite conclusions, certain trends were noted.

(1) The symptoms that seemingly provoked alcoholism or caused its persistent use were those of the anxiety syndrome and occurred mostly at puberty. (2) Alcohol was found capable of relieving such symptoms, but gradually increasing amounts were necessary. (3) Whenever an emotional upset or problem arose thereafter alcohol was tried as the best means of relieving the unpleasant feeling or situation, and eventually the condition was blamed for alcoholism—hence the many reasons given for it. (4) Alcoholics seem to remain with their marital partners chiefly when the partner is " tremendously in love " with the non-drinking personality of the alcoholic. (5) Regardless of whether a satisfactory sexual adjustment is established at marriage, if the first method of meeting this problem was with alcohol, the patient will still at intervals, resort to long periods of heavy drinking. (Author's abstr.)

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Activity of Cholinesterase in (Various) Organs and the Action of Adrenaline on this Activity. Speranskaya, E. N. [*Doklady Akad. Nauk S.S.S.R.*, **71**, 411–13 (1950).]

The cholinesterase activity of a group of specimens (frog liver) is a variable quantity; in 100 specimens 48 per cent. had very high activity, 35 per cent. a medium value, and 17 per cent. a very low one. Lowering the functional activity of the organ (liver) also lowers the enzyme activity; in hypophysectomized frogs only 8 per cent. had high cholinesterase activity, 16 per cent. medium and 76 per cent. low. Action of adrenaline depends on initial cholinesterase level and on the dosage of adrenaline (1×10^{-7} to 1×10^{-10} concentration). The high activity of cholinesterase is usually depressed by the drug, but a low activity of tissue cholinesterase is raised by adrenaline; the effects are most pronounced at 10^{-8}–10^{-9} concentration of the drug. G. M. KOSOLAPOFF (Chem. Abstr.).

Electrophysiological Analysis of the Action of Acetylcholine on Nerve Centers. II. Action of Eserine, Prostigmine and Atropine on the Electrical Activity of the Visual Lobes of a Frog. Artem'ev, V. V., and Babskii, E. B. (*Lenin State Pedagog, Inst., Moscow*). [*Fiziol. Zhur.* (*J. Physiol.*), **36**, 151–60 (1950); *cf. C. A.*, **44**, 4105*b*.]

Eserine or prostigmine at 1×10^{-5} to 2×10^{-5} concentration acting on the visual lobes of a frog enhance the spontaneous electric activity of the nerve centers. Atropine in similar concentration does not affect or lower the activity and completely eliminates (blocks) the action of acetylcholine; applied after the latter it leads to restoration of the normal oscillations, although reflex actions are not eliminated. G. M. KOSOLAPOFF (Chem. Abstr.).

Relation Between the Reflex Erythemas following Intracutaneous Injection of Acetylcholine in Normal and Pathological Carbohydrate Metabolism. Kohler, V., Penew, L., Heil, E., Vorbrugg, M., and Bauer, R. (*Univ.-klinik, Wurzburg Ger.*). [*Endokrinologie*, **27**, 35–45 (1950).]

The reflex erythema reaction in a normal subject is increased after injection of glucose. Likewise, after insulin injection, there is about 30 per cent. increase in the erythema reaction, during the hypoglucemia, whereas the erythema reaction decreases about 50 per cent. after adrenaline injection, while the blood-sugar level is raised. In patients with endogenous hypoglucemia, the erythema reaction is great, but as the blood-sugar level is raised the erythema reaction decreases. In precomatose diabetic patients with ketonuria the erythema reaction is relatively small, but increases during treatment. S. MORGULIS (Chem. Abstr.).

Determination of the Proteins in the Spinal Fluid. Hinsberg, Karl, and Gleiss, Jorn. [*Klein. Wochschr.*, **28**, 444–8 (1950).]

The protein content of 62 spinal fluids was determined by volumetric, photometric and chemical methods. The volumetric method (Kafka, *C. A.*, **27**, 744) gave up to 40 per cent. lower values than those obtained with other methods. After establishing the optimum conditions for the formation of the biuret-protein color complex, the authors describe a photometric method, suitable for clinical use, which gave values practically identical with those obtained by determining the protein N by Kjeldahl procedure. B. LUSTIG (Chem. Abstr.).

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The Cerebrospinal Fluid in Premature Infants. Otila, Eino (Univ., Helsinki, Finland). [*Acta Paediat.*, **35**, *Suppl. VIII*, 100 *pp.* (1948) (*in English*)].

The yellow color of the cerebrospinal fluid (I) of newborn premature infants, obtained by lumbar puncture, is due chiefly to bilirubin. The cell count and amount of protein in (I) of the premature infant are considerably higher than those in normal (I) and moderately higher even than those in the (I) of the full-weight newborn infant. With premature infants of low birth weight the cell count and amount of protein in (I) are higher and maintain the elevated level for a longer period than those of premature infants with a higher birth weight. These elevated cell and protein values are believed to be due chiefly to the greatly increased meningeal permeability in premature infants, perhaps augmented in certain cases by a condition caused by cerebral hemorrhage *sub partu*. The results of tryptophan and mastic reactions suggest that the proteins present in (I) of the premature infant frequently differ somewhat in the first month of life and particularly in the neonatal period from the (I) proteins in later life. The (I) sugar values of the premature infant were fairly high and on an approximate level with the blood-sugar values determined simultaneously. This is attributed to the increased meningeal capacity in the premature infant. Following intramuscular administration uranin diffuses more rapidly and to a greater extent into the (I) of premature than of full-term, control infants. RUTH BERGGREN (Chem. Abstr.).

Microphotelometric Determination of Globulin and Total Protein in Cerebrospinal Fluid or Diluted Blood Serum. Salt, Harold B. (Roy. Infirmary, Worcester, Engl.). [*J. Lab. Clin. Med.*, **35**, 976–82 (1950).]

A photoelectric measuring device, equally suitable for absorptiometric or dispersimetric measurements is described. Total protein is detected in diluted blood serum or cerebrospinal fluid. The protein solution is added to salicylsulfonic acid reagent and buffered gum ghatti reagent and the degree of light dispersion by the suspension is determined. Globulin is determined on diluted blood serum or on diluted cerebrospinal fluid. The protein solution in this case is added to gum ghatti reagent, NaCl solution, and MeOH and after incubation at 37° for 1 hour, the light dispersion value is determined. Standard reference graphs are prepared with known solutions of total protein and of globulin. Regular determinations are made with light of 700 mμ. wave length, but where concentrations are low it is advantageous to use light of 430 mμ. Protein in quantities of 0·1 to 1·4 mgm. per aliquot analyzed are determined. W. DONALD GRAHAM (Chem. abstr.).

Vitamin B_1 in the Spinal Fluid in Inflammations of the Brain and the Meninges. Blume and Puschel (Dortmund, Ger.). [*Monatsschr. Kinderheilk.*, **98**, 147 (1950).]

Normal spinal fluid contains 1·2 to 1·9γ B_1 in 100 c.c. In hydrocephalus 0·9 to 1γ was found. Low values were found in tubercular meningitis and in one case of poliomyelitis. Intravenously administered vitamins B_1 appears promptly in the spinal fluid. A. E. MEYER (Chem. Abstr.).

Changes in the Normal Spinal Fluid by the Action of Streptomycin. Araya, Norma Terra (Univ. Chile, Santiago). [*Farm. Chilena*, **24**, 201–3 (1950).]

Protein and Cl do not change, glucose increases rapidly.
A. E. MEYER (Chem. Abstr.).

Lead Content of Blood and Cerebrospinal Fluid in Experimental Lead Poisoning. Straube, Günther (Landesheilstätte, Hofheim, Ger.). [*Klin. Wochschr.*, **26**, 595–7 (1948).]

The presence of Pb could be detected in the blood of hamsters for the first time 4–5 days after the start of a daily oral Pb $(OAc)_2$ administration. The upper limit of blood Pb concentration before death occurred varied with different animals between 38–110γ per cent. The first Pb in the cerebrospinal fluid was detectable after the blood Pb concentration passed a 20γ per cent. level. Maximum Pb content encountered in cerebrospinal fluid amounted to 22γ per cent. The Pb blood and Pb cerebrospinal fluid contents rose and fell with each other, but the

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latter always remained well below the level of the former. No Pb could be detected in the brains of animals which succumbed to Pb poisoning. The liver Pb concentration rose to about 60γ per cent., and that of the bone marrow varied between 2810 and 8030γ per cent. BRUNO VASSEL (Chem. Abstr.).

The Potassium Permeability of the Myelin Sheath of Vertebrate Nerve. Harreveld, A. Van (California Inst. Technol., Pasadena). [*J. Cellular Comp. Physiol.*, **35**, 331–40 (1950).]

The sciatic nerves of rabbits contained 140 to 220 mgm. per cent. K, the lower concentrations being in nerves of older animals. The K content remained unchanged in oxygenated Ringer solution containing glucose. In the absence of glucose a small amount of K was lost in 6 hours. Approximately 40 per cent. was lost in the absence of glucose and O_2; a similar loss occurred in Ringer solution containing 0·001 M arsenite. Loss of K from a nerve killed by formalin was moderately greater than from the asphyxiated nerve. The K diffused rapidly from nerve killed by heat which destroyed the myelin sheath. Lobster nerve, which does not have a well developed myelin sheath, and rabbit muscle lost K quickly in formalin solution. H. L. MASON (Chem. Abstr.).

Uptake of Glutamic Acid and Glutamine by Brain and Other Tissues of the Rat and Mouse. Schwerin, Paula, Bessman, S. P., and Waelsch, Heinrich (Columbia Univ.). [*J. Biol. Chem.*, **184**, 37–44 (1950).]

Brain tissue contains 0·01 mole free glutamic acid (I) and 0·004 mole glutamine (II) per kgm. In periods up to 1 hour intravenously injected (I) (1·2–1·3 mgm./gm. body weight) did not result in increases of brain (I) or (II); was quickly removed from blood; increased in liver and muscle through blood plasma and extracellular fluid equilibration; caused accumulation of (I) and (II) in kidney. Similarly injected (II) resulted in a slight rise in brain (II) suggesting (II) may enter the brain; liver showed rise in concentration of (II) with liberation of (I); and also caused accumulation of (I) and (II) in kidney.

GEORGE K. DAVIS (Chem. Abstr.).

The Proteins of the Gray and White Brain Substances. Palladin, A. V., and Goryukhina, T. A. (Acad. Sci. U.S.S.R., Moscow). [*Fiziol. Zhur.*, **33**, 727–36 (1947); *Chem. Zentr.*, 1948 (1), 777–8.].

By fractional extraction of the gray and the white brain substance with (1) water, (2) 4·5 per cent. KCl (pH 9·1), and (3) 0·1 N NaOH, 3 protein fractions were obtained from each substance. Under the same experimental conditions the protein contents of these fractions were fairly constant. The proteins of the individual fractions differed from each other in their isoelectric points, which were determined as the point of maximum precipitation of protein. The isoelectric point of the aqueous fraction was at pH 4·6. That of the KCl fraction was at pH 5·6 and that of the NaOH fraction at pH 5·2. About 30 per cent. of the total protein of the gray brain substance was extractable with water; the value was 19 per cent. for the white substance. Corresponding values were 28 per cent. (gray substance) and 23–4 per cent. (white substance) for protein extractable with KCl. The proportion of the total protein extractable with NaOH was the same for both the gray and white substance. In the gray substance 5 per cent. of the total protein was insoluble in the solvents used; 20 per cent. of the white substance was insoluble in these solvents. M. G. MOORE (Chem. Abstr.).

Determination of the Ionic Exchange During Nervous Activity by Activation Analysis. Keynes, R. D., and Lewis P. R. (Univ. of Cambridge, Engl.). [*Nature*, **165**, 809–10 (1950).]

Single 200-μ Sepia (cuttlefish) axons were dissected, dried and sealed in fine quartz tubes. For activation analysis (*C. A.*, **43**, 6537*h*, 9139*i*) batches of these tubes were irradiated in the Harwell pile together with spectroscopically pure samples of Na_2CO_3 and K_2CO_3. After irradiation the nerves were transferred to Ni dishes and counts were taken, first with a brass filter of 4·6 gm./sq. cm. for γ-radiation and then with one of 0·46 gm./sq. cm. for K^{42} β-radiation. After the standards were counted, Na and K contents were calculated. The limiting factor

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in accuracy was the difficulty of measuring volume and weight of single axons reliably. Radioactivity measurements had a standard error of about 2 per cent and samples of 0·3 mgm. containing 0·3γ Na and 3γ K were analyzed without difficulty. The object of the experiment was to compare Na and K contents of resting nerves with those of nerves stimulated usually at 100 impulses/sec. for 20 minutes before being stored for analysis. Na content was increased from resting value of 40 millimoles/kgm. axoplasm to 130 millimoles/kgm., while K decreased from 325 millimoles/kgm. to 245 millimoles/kgm. In a series of 16 stimulated axons there was an average net entry of $3{\cdot}8 \times 10^{-12}$ mole Na/sq. cm. membrane/impulse and a net loss of $3{\cdot}4 \times 10^{-12}$ mole K/sq. cm. membrane/impulse. In axoplasm extruded from 500μ squid axons, resting values were 46 millimoles Na/kgm. axoplasm and 323 millimoles K/kgm.; during stimulation at 200 impulses/sec. there was an entry of $3{\cdot}5 \times 10^{-12}$ mole Na/sq. cm./impulse and a loss of 3×10^{-12} mole K/sq. cm./impulse. These results provide further support for the theory of Hodgkins *et al.* (*J. Physiol.*, **108**, 37 (1949)) that during rising phase of nerve action potential there is considerable increase in the permeability of membrane to Na.

MARJORIE MUELLER (Chem. Abstr.).

Synchronized Recording of Brain Potentials, Muscle Action Currents and the Start of Movement in Reaction Time Experiments on Patients with "Chronic" Mental Symptoms after Carbon Monoxide Poisoning. Fellenius, V. (*Inst. of Applied Psychology, Stockholm*). [*Acta Paediat.*, **38**, 157–69 (1949) (*In English*).]

RUTH BERGGREN (Chem. Abstr.).

Relative Vagotonia. Hornykiewytsch, Th. (*Univ. Strahlen Inst., Marburg a. d. Lahn, Ger.*). [*Z. ges. exptl. Med.*, **115**, 404–35 (1950).]

Parasympathetic symptoms are caused by an unbalance in the acetylcholine (I)-cholinesterase (II) system. Absolute vagotonia arises when an excess of (I) is present with normal amounts of (II), while in relative vagotonia there is a normal amount of (I) and a deficiency of (II). For determination of (II) in serum: Incubate for 1 hour at 39° a mixture of 1 ml. serum and a solution of 20 mgm. (I) in 20 ml. H_2O at pH 8. Stop the hydrolysis by addition of 5 ml. 0·1 per cent. prostigmine at pH 8 and titrate the AcOH liberated with 0·01 N NaOH. The unit of (II) is that amount which liberates 1 ml. 0·01 N AcOH in 1 ml. serum in 60 minutes.

J. H. WEISBURGER) Chem. Abstr.).

(*Free*) *Amino Acids of Nervous Tissue. Roberts, Eugene, Frankel, Sam, and Harman, Pinckney J.* (*Washington Univ., St. Louis, Mo.*). [*Proc. Soc. Exptl. Biol. Med.*, **74**, 383–7 (1950).]

Two-dimensional paper chromatograms were prepared. The brains of mice of several strains and various parts of the nervous system of rabbits were studied. The pattern of free amino acids in mouse brain does not reflect the amino acid composition of the brain as a whole. Free taurine, glutamine, cystine, serine, glycine, alanine, valine, the leucines and glutamic, aspartic, and γ-amino-butyric acids were detected consistently. Variations in these constituents with age, sex, and strain in mice are discussed. The sciatic nerve in the rabbit had considerably smaller quantities of detectable amino acids than the various parts of the central nervous system. A transplantable neuroblastoma in mice had a pattern of free amino acid similar to that found in other malignant tissues and in brains of 15-day embryos and significantly different from that found in all samples of normal mouse brain examined.

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

Changes in Brain pH Response to Carbon Dioxide after Prolonged Hypoxic Hyperventilation. Brown, E. B., jun. (*Univ. of Minnesota, Minneapolis*). [*J. Applied Physiol.*, **2**, 549–52 (1950).]

The CO_2 titration curves were determined for brain homogenate from 10 guinea-pigs which had been exposed to hypoxic hyperventilation for 24 hours, and for 10 normal guinea-pigs. A given pCO_2 produced a lower pH in the brain homogenate of the hyperventilated animals than it did in the controls.

THERESA MCKEE (Chem. Abstr.).

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Alterations in the Central Nervous System of Vascular Origin in Carbon Disulfide Poisoning. Vigliani, Enrico C., and Cazzullo, Carlo L. (Univ., Milan, Italy). [*Med. lavoro*, **41**, 49–56 (1950).]

Workers who had been exposed to an atmosphere containing 0·1 to 1 mgm. CS_2 per l. for about 20 years developed asthenia, paresthesias, progressive impairment of gait, and mental deterioration. Some cases developed hemiplegias and others hypertension; 6 had signs of arteriosclerotic kidneys. All subjects were of less than 45 years of age. A. E. MEYER (Chem. Abstr.).

The Blood-brain Barrier. II. Attempts to Influence the Passage of Substances into the Brain. Hurst, E. Weston, and Davies, O. L. (Imperial Chem. Inds., Ltd., Manchester, Engl.). [*Brit. J. Pharmacol.*, **5**, 147–64 (1950); *cf. C. A.*, **43**, 3110*b*.]

Adrenaline, pituitrin, theophylline, sodium acetate, sodium lactate, urethan, histamine, hexamine, 50 per cent. glycerol, coal gas and ether anesthesia were tested for their effect on the passage of strychnine, cocaine, picrotoxin, morphine, sulfonanilamide (I), sulfanilic acid (II), and a number of acidic, basic and triphenylmethane dyes into the brains of mice. Visual appearance of fixed sectioned brain in the case of the dyes, mortality from the convulsant drugs, the analgesic effect of morphine and chemical determination of (I) and (II) were the criteria of altered penetration employed. None of the drugs or treatments had a consistent effect on penetration by all of the test substances; measures increasing the penetration of one substance into the brain did not necessarily increase the penetration of another chemically or physically similar substance. The results found for many combinations of test substances with different drugs or treatments are tabulated. It was found preferable to use in this type of study substances, the concentration of which in the grain, could be determined chemically.

RICHARD F. RILEY (Chem. Abstr.).

Cerebral Angiography. Roach, John F. (Johns Hopkins Univ., Baltimore, Md.). [*Am. J. Med. Sci.*, **219**, 559–69 (1950).]

A 35 per cent. solution of diodrast is recommended; the 70 per cent. solution should never be used for this purpose. Colloidal triiodoethyl stearate closely approximates the ideal contract medium, if reports from Europe, where it was used before World War II, are correct; however, the drug has not been tried in North America, and attempts to obtain it from Europe or to synthesize it in the U.S. have been unsuccessful. Thorotrast is not recommended because of its radio-activity and non-excretability. MARION HORN PESKIN (Chem. Abstr.).

Turnover of Radioactive Phosphate Injected into the Subarachnoid Space of the Brain of the Rat. Lindberg, O., and Ernster, L. (Wenner-Gren Inst., Stockholm). [*Biochem. J.*, **46**, 43–7 (1950).]

After injecting intracranially P^{32} for 2 minutes, 40 per cent. is organically linked in the rat brain, and this increases to 70 per cent. after 8 hours, when the binding of the P^{32} becomes about constant. The P^{32} is found chiefly in adenosine triphosphate and in creatine phosphate. The labile phosphate is replaced at a rate (approx.) of 40γ P/min./gm. brain. For blood corpuscles, liver, and muscle the rate reported is 1, 15, and 20–30 respectively. S. MORGULIS (Chem. Abstr.).

Blood Destruction and Cerebral Damage in Hemolytic Disease of the Newborn. Kuster, F., and Krings, H. (Med. Acad., Dusseldorf, Ger.). [*Lancet*, **258**, 979 (1950); *cf. Goldman, E., Abhandl. preuss. Akad. Wiss. Math.-naturw. Klasse* 1913, 1 *Spatz. Arch. Psychiat. Nervenkrankh.*, **101**, 267 (1933).]

Injection of a highly concentrated (amount not stated) solution of bilirubin (I) into the carotid arteries of rabbits did not effect yellow discoloration of the brain. Cerebral icterus was brought about by a 30-minute infusion into the carotid artery of 100–150 mgm. (I)/100 ml. 5 per cent. glucose.

BARBARA R. MURRAY (Chem. Abstr.).

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The Blocking Effect of Thiamine on the Superior Cervical Ganglion of the Cat. Mazzella, H., and Ferrero, N. (Facultad med., Montevideo, Uruguay). [*Arch. intern. pharmacodynamie*, **82**, 220–7 (1950).]

In decerebrate cats under dial anesthesia, the contraction of the nictitating membrane can be inhibited by large doses of thiamine, which prevent the stimulating effect of acetylcholine, nicotine, or K ions on the superior cervical ganglion.
M. L. C. BERNHEIM (Chem. Abstr.).

The Change in the Chromophile Substance of Nerve Cells on the Addition of Thiamine, as Determined by Ultraviolet Microscopy. Moiseev, E. A., and Ferkhmin A. A. (Pavlov Inst., Pavlovo, U.S.S.R.) [*Doklady Akad. Nauk. S.S.S.R.*, **60**, *No.* 1, 123–6 (1948); *cf. Caspersson, C. A.*, **35**, 29[8].]

Dogs were injected intramuscularly with a total of 100–1,000 mgm. of thiamine (I) (5–100 mgm. at a time). The spinal ganglia were then illuminated at 250–280 mμ. wave-length, and examined with the microscope and spectrophotometer. The cytoplasm of ganglionic cells of (I) treated dogs showed a greater ultraviolet absorption than that given by normal dog nerve cells. The increased absorption was probably caused by the nucleoproteins, which had been newly formed under the influence of (I). The pyrimidine component of (I) may participate in the synthesis of nerve cell nucleoproteins. H. PRIESTLEY (Chem. Abstr.).

The Role of Vitamin B_1 in the Function of the Sympathetic Nervous System. (1) *Enzymic Formation of Sympathin. Titaev, A. A. (Acad. Med. Sci. U.S.S.R., Moscow).* [*Zhur. Fiziol.* (*J. Physiol.*), **36**, 203–8 (1950).]

Active adrenaline may be formed from the oxidized form by the action of blood serum in the presence of thiamine *in vitro* in Ringer solution. The blood enzyme responsible for the reaction of adrenaline also causes irreversible oxidation of thiamine to thiochrome in the presence of oxidized adrenaline, which is thus reduced. Perfusion of frog heart with Ringer solution containing thiamine (5 minutes) followed by BuOH extraction shows on fluorescence examination only traces of thiochrome in a normal heart fluid, but in the presence of adrenaline a significant rise of thiochrome occurs (in frog and rabbit experiments). The result is similar on excitation of atropinized heart nerves in the presence of thiamine. Usual precipitation methods are ineffective in actual isolation of thiochrome from blood media, but extraction with iso-BuOH after precipitation of the blood by means of 1 : 2 EtOH appears to be satisfactory. Thiochrome itself is not an inert substance and experiments with the pure substance (by ferricyanide oxidation of thiamine *in vitro*) at 10^{-4}–10^{-6} concentrations showed a definite stimulation of frog heart action, analogous to that caused by adrenaline. Mg stimulation of the activity of the thiamine-dehydrogenase is readily shown *in vitro* and *in vivo*. This enzyme system may be the possible route for the formation of sympathins *in vivo*.
G. M. KOSOLAPOFF (Chem. Abstr.).

Hypophyseal Changes Following Hypothalamic Injuries. Action of Phlorizin. Soulairac, A., and Desclaux, P. [*Ann. endocrinol.* (*Paris*), **8**, 343–6 (1947); *Chem. Zentr.*, **1**, 588 (1948).]

In animal experiments bilateral injury to the hypothalamus caused hypophyseal degranulation, hyperphagia, and gain in weight. Phlorizin injections repressed the hyperphagia. After these injections the chromophilic cells of the anterior lobe appeared to be normally granulated. Phlorizin repressed the intestinal absorption of glucose. M. G. MOORE (Chem. Abstr.).

Effects of Pituitary Adrenocorticotropic Hormone (ACTH) Therapy. Electroencephalographic and Neuropsychiatric Changes in Fifteen Patients. Hoefer Paul F. A., and Glaser, Gilbert, H. (Columbia Univ.). [*J. Am. Med. Assoc.*, **143**, 620–4 (1950).]

The powerful side effects, such as significant electroencephalographic or psychiatric changes, are described, resulting from ACTH therapy.
S. MORGULIS (Chem. Abstr.).

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Chemical Composition of Myelin. Brodal, A., and Harrison, R. G. [*Quart. J. Microscop. Sci.*, **89–102** (1948).]

Application of Baker's acid hematein and pyridine-extraction tests indicate the presence of phospholipides in the myelin of the central nervous system of rats and man. Probably, fibers of diameter down to at least 0·5μ have a lipide investment and the distinction between myelinated and non-myelinated fibers is arbitrary.
B. A. (Chem. Abstr.).

Alkaline Phosphatase in the Choroid Plexus. Firket, H., Heusghem, C., Gerebtzoff, M. A., and Ninane, G. (*Univ. Liege, Belg.*). [*Compt. rend. soc. biol.*, **143**, 1407–8 (1949).]

The choroid plexus of the rabbit and guinea-pig contains a large amount of a phosphatase with maximum activity at pH 9·5 and a small amount of another phosphatase with maximum activity at pH 4·5. L. E. GILSON (Chem. Abstr.).

Carbonic Anhydrase in the Nervous System. Kreps, E. M. (*Acad. Sci. U.S.S.R., Moscow*). [*Fiziol. Zhur.*, **36**, 97–110 (1950).]

Review with many references. The concentration of the enzyme in the brain is characteristic for the species; with increased complexity of the organism the bulk of the enzyme shifts to the cortex of the large hemispheres. Oxygen starvation leads to rise of activity of the enzyme in the brain.
G. M. KOSOLAPOFF (Chem. Abstr.).

β-Glucosidase in the Brain. Kartasheva, N. V., and Rozengart, V. I. (*V. M. Bekhterev Psychoneurol. Inst., Leningrad*). [*Biokhimiya*, **15**, 168–72 (1950).]

β-Glucosidase is absent in the brain of man, rabbit and cat. If sterile conditions are not maintained, the incubation of brain tissue with salicin does lead to the formation of glucose, the β-glucosidase having been supplied by contaminating micro-organisms (streptococci and staphylococci).
H. PRIESTLEY (Chem. Abstr.)

Anoxybiotic Processes in Frog Nerve. Aykut, R., and Winterstein, H. (*Univ. Istanbul, Turkey*). [*Arch. intern. pharmacodynamie*, **81**, 222–9 (1950).]

Nerves continuously washed in O-free Ringer solution retain their function much better than nerves in unchanged O-free Ringer solution. Addition of O causes quick recovery of the latter but not the former. Evidently the lethal substances are oxidizable and dialyzable. In O-free solutions containing $NaNO_2$, exactly the reverse results are obtained. M. L. C. BERNHEIM (Chem. Abstr.).

Allergenic Encephalitis and Its Possible Relation to Human Disease. Peers, James H. (*Natl. Inst. Health, Bethesda, Md.*). [*Am. J. Clin. Path.*, **20**, 503–14 (1950).]

Allergenic encephalitis is an inflammatory and degenerative process in the brain of animals produced by parenteral injection of homologous or heterologous brain tissue. It has considerable resemblance to human post-vaccinal encephalitis. The encephalogenic substance is connected with the phosphatide fraction of brain tissue. It is water-soluble, can be removed from rabies vaccine by treatment with $Ca(OAc)_2$ and is dialyzable through a cellophane membrane.
JOHN T. MYERS (Chem. Abstr.).

Brain Metabolism in vivo. (1) *The Distribution of Lesions Caused by Cyanide Poisoning, Insulin Hypoglycemia, Asphyxia in Nitrogen and Fluoracetate Poisoning in Rats. Hicks, S. P.* (*New England Deaconess Hosp., Boston, Mass.*). [*Arch. Path.*, **49**, 111–37 (1950).]

Maximum non-lethal doses of KCN to rats were selectively destructive to the white matter of the brain. Insulin and asphyxia caused different types of brain lesions, also mild heart lesions. Fluoroacetate damaged the heart and testes, but not the brain.
M. L. C. BERNHEIM (Chem. Abstr.).

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Analysis of Physiological Processes Underlying Experimental Reflex Epilepsy. Krushinskii, L. V., Fless, D. A., and Molodkina, L. N. [*Zhur. Obshchei Biol.*, **11**, 104–19 (1950).]

Effects of NaBr, KBr, MgO, caffeine, strychnine and luminal were tested in rats with experimental epilepsy. Results, as compared with controls, are shown in kymographs. JULIAN S. SMITH (Chem. Abstr.).

2. Pharmacology and Therapy.

Curarizing Agents and Experimental Epilepsy in the Rat. Quivy, D., Bertrand, Ivan, and Gayet-Hallion, Th. (*École pratique Hautes-Études, Paris*). [*Compt. rend. soc. biol.*, **143**, 1597–9 (1949).]

The two curarizing drugs, myanesin and 1,2,3tris(ethylaminoethoxy)benzene triethiodide (RP 3697, flaxedil), protected rats against lethal doses of metrazole and offered some protection against electric shock. Myanesin protected against the LD_{100} of strychnine, the other drug did not. Neither protected against picrotoxin. L. E. GILSON (Chem. Abstr.).

Action of d-tubocurarine on Nervous Centers. Arduini, A., and Zanchetti, A. (*Univ. Parma, Italy*). [*Boll. soc. ital. biol. sper.*, **24**, 582–3 (1948).]

d-Tubocurarine (I) has a stimulating action which is reversibly abolished by Et_2O. The effect is comparable to that obtained with equimolecular amounts of strychnine nitrate (II) (threshold concentration of (II), $1{\cdot}29 \times 10^{-3}$ M); however, it sets in later and lasts longer. Approximate 0·1 per cent. solutions of curare or (I) produce equivalent motor excitation. J. H. WEISBURGER (Chem. Abstr.).

Action of Curarizing Agents on the Electroencephalogram of the Rabbit. Quivy, D., Bertrand, I., and Gayet-Hallion, T. (*Hospice Salpétrière, Paris*). [*Arch. intern. pharmacodynamie*, **81**, 121–7 (1950).]

In non-anesthetized rabbits with no artificial respiration, d-tubocurarine causes a burst of waves of high potential but does not suppress β waves as well as does 3697 RP. Cresoxypropanediol produces an electroencephalogram resembling that of sleep. M. L. C. BERNHEIM (Chem. Abstr.).

The Effect of d-Tubocurarine Chloride on Human Perceptivity. Kellgren, J. H., McGowan, A. J., and Wood, D. R. (*Wingfield-Morris Orthopedic Hosp., Oxford, Engl.*). [*Brit. Med. J.*, **2**, 898 (1946); *Chem. Zentr.*, **1**, 204 (1948)].

Intravenous injection of 5 or 7·5 mgm. of d-tubocurarine chloride produced considerable paralysis of the facial and maxillary muscles and, to a lesser degree, of the cervical and arm muscles. Neither cerebral activity nor sensitiveness to pain were influenced. M. G. MOORE (Chem. Abstr.).

The Value of Artificial Respiration in Pentobarbital Poisoning of Rabbits. Schack, Jerome A., Goldbaum, Leo R., and Faison, Elenora D. (*Army Med. Dept. Research and Graduate School, Washington, D.C.*). [*Anesthesiology*, **11**, 452–4 (1950); *cf. C. A.*, **42**, 279*a*; **43**, 7582*f*.]

The rabbit will tolerate toxic doses of pentobarbital (I) providing adequate pulmonary ventilation is maintained. The (I) metabolism, as evidenced by the disappearance of (I) from the circulating blood, continues while the animal is maintained under artificial respiration. The basic importance of maintenance of adequate pulmonary ventilation in the therapy of barbiturate depression is affirmed. RUTH BERGGREN (Chem. Abstr.).

A Method for the Prevention of Suicidal Deaths Caused by the Barbituric Acid Derivatives. Miskimon, Robert M., and Miskimon, R. Roy (*1001 West Franklin Street, Richmond, Va.*) [*Virgina Med. Monthly* **77**, 119–22 (1950).]

Experiments on dogs indicated that $ZnSO_4$ is the most constant and certain emetic both alone and in the presence of the barbituric acid derivatives. In the presence of the chosen barbiturate, the dosage of $ZnSO_4$ required to produce emesis

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was five times the amount required for $ZnSO_4$ alone. This suggests that the barbiturate has some local action on either the gastric mucosa or on the nerve endings in the gastric wall. When the barbiturate was combined with $ZnSO_4$ the usual sedative dose of the barbiturate produced the usual amount of sedation without any evidence of nausea. With this combination an established fatal dose of the barbiturate did not even produce sedation because of complete gastric emptying by emesis. This effect was produced by $ZnSO_4$ even upon a full stomach. No after effects were noted. The established fatal dose of the barbiturate given alone proved fatal to these same dogs in every case.

RUTH BERGGREN (Chem. Abstr.).

Effect on Markmanship of Some Motion Sickness Preparations Containing Barbiturates and Hyoscine. Tyler, David B. (Calif. Inst. of Technol., Pasadena). [J. Applied Physiol., 1, 737–42 (1949).]

MSP (65 mgm. amytal, 0·2 mgm. hyoscine, 0·15 mgm. atropine per capsule) had a beneficial effect on markmanship. RCN (100 mgm. niacin, 0·15 mgm. hyoscine, 0·4 mgm. hyoscyamine per capsule), or V 12 (130 mgm. ethyl (2-methylallyl)thiobarbituric acid) had no significant effect. MSP in doses recommended as a preventive of motion sickness can be safely given to military personnel.

THERESA MCKEE (Chem. Abstr.).

Effect of Some Surface-active Agents on the Action of Barbiturates. Cole, Versa V., Hulpieu, H. R., and Hopper, S. H. (Indiana Univ., Indianapolis). [Proc. Soc. Exptl. Biol. Med., 73, 554–7 (1950).]

The duration of hypnosis by pentobarbital-Na in mice was increased by all of the 11 surface-active agents (anionic, cationic and nonionic) tested. Di-Na-dibutylhydroxybiphenyldisulfonate (Aresklene 400) (I), the only one studied in other animals, increased the duration of pentobarbotal hypnosis in rats and rabbits, but not in dogs. In mice thiopental-Na showed an increase in effect with some but not all of the surface-active agents. (I) increased the activity of thiopental apparently by decreasing its rate of destruction in the body. The time of onset of hypnosis was decreased by (I) given with barbital-Na in mice, rabbits and dogs but not in rats. The duration was not affected. Six of 10 other agents had the same effect on onset of hypnosis in mice. L. E. GILSON (Chem. Abstr.).

Hyperkinesis of Mesencephalic Origin, which Arises in Frogs under Barbiturate Narcosis. Markova, I. V. (Leningrad Pediat. Inst.). [Fiziol. Zhur. (J. Physiol.), 36, 161–5 (1950).]

In the initial stage of barbiturate narcosis frogs exhibit enhanced mobility of two types; free motion (crawling, jumping) and a hyperkinesis which arises after the primary stages and which depends on intact condition of mesencephalon; this is exhibited in the form of inability of the animal to return from dorsal position, relaxation of skeletal musculature and lengthening of the latent period of reflex motions. As a result, the frog may be used as a test object for study of drugs which affect either the frontal sections of the brain or primarily the mid-brain locations. G. M. KOSOLAPOFF (Chem. Abstr.).

Identification of Barbituric Acid in Urine in the Presence of Sulfonamides. Mohrschulz, Wilhelm (Stadt. Krankenhaus, Munich, Ger.). [Suddeut. Apoth.-Ztg., 90, 335–6 (1950).]

Sulfonamides or their Na salts when present in urine give false positive tests for barbituric acid with Zwikker's reaction (*cf. C. A.*, **26**, 396).

EDWARD H. SHEERS (Chem. Abstr.).

Action of Certain Substances with Narcotic and Stimulating Action on the Subsequent Discharges as a Result of Stimulation of Afferent and Pyramidal (Descending) Fibers. Zakusov, V. V. (1st Pavlov Med. Inst., Leningrad). [Fiziol. Zhur. (J. Physiol.), 36, 184–90 (1950).]

Application of rapidly interrupted d.c. to the afferent (by means of chlorinated Ag electrodes) and pyramidal (by means of Pt electrodes) fibers of rabbits with administration of the various drugs, showed that: At low doses (0·1 gm./kgm.)

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urethan weakens and shortens the subsequent discharges to a greater extent after stimulation of the afferent fibers than that of the pyramidal ones; at larger doses the difference vanishes. Subtoxic level of scopolamine affects only the subsequent discharges resulting from stimulation of the pyramidal fibers and has no effect on the results with stimulation of afferent fibers. Strychnine and corazole enhance and lengthen the discharges in both instances, strychnine being more effective with "afferent" stimulation. Hence narcotics depress excitation processes in the central nervous system caused by external stimuli, while analeptics sustain them.

G. M. KOSOLAPOFF (Chem. Abstr.).

The Sympathomimetic Depressor Agents: A Review. Ahlquist, Raymond P., and Hensen, James P. (Med. Coll. of Georgia, Augusta). [*J. Am. Pharm. Assoc.*, **39**, 382–8 (1950).]

A review of the depressor activities and acute toxicity of 87 depressor sympathomimetic amines.

DAVID B. SABINE (Chem. Abstr.).

Absence of a Toxic Effect of Folic Acid on the Central Nervous System of Persons Without Pernicious Anemia. Harvey, Earle A., Howard, Isabel, and Murphy, Wm. P. (Harvard Med. School, Boston, Mass.) [*New Engl. J. Med.*, **242**, 446–7 (1950).]

No spinal cord or peripheral-nerve damage occurred in 40 subjects with hypochromic anemia during treatment with 20 mgm. folic acid daily for 3–12 months. Folic acid did not alter the blood of persons with normal hemoglobin levels or those with slight to moderate anemia. The rate of hemoglobin increase after the use of ferrous sulfate plus folic acid in 3 patients with moderately severe anemia was not definitely more rapid than would have been expected from ferrous sulfate alone. An increase of appetite and a slight gain in weight occurred in a few subjects during the first few weeks of treatment only.

MARION HORN PESKIN (Chem. Abstr.).

Niacinamide in Bromide Intoxication. Harris, R. S., and Derian, P. S. (Univ. of Virginia Med. School, Charlottesville). [*Southern Med. J.*, **42**, 973–8 (1949).]

Chronic Br intoxication shows marked parallels in symptomatology with the pellagra syndrome. In experiments on 3 groups of dogs, Group I was placed on a black tongue-inducing diet; Group II was maintained at a level of 300 mgm. per cent. blood Br; Group III was placed on a Br régime plus massive doses of niacinamide. The urinary excretion of total coproporphyrins was increased in Groups I and II. Group III dogs failed to show increased urinary prophyrins or any of the other associated signs and symptoms of bromism. Six patients with bromism were presented in whom coproporphyrin excretion was above normal. Clearance of symptoms was rapid (average 5 days) in two of the patients receiving 600–750 mgm. niacinamide per day in conjunction with NaCl therapy and in the remaining 4 patients given niacinamide only. A working hypothesis is advanced postulating destruction or inhibition of coenzyme I and II by a high level of serum Br or a reduced blood Cl.

RUTH BERGGREN (Chem. Abstr.).

Effects of a New Quarternary Amine and a New Imidazoline Derivative on the Autonomic Nervous System. Longino, F. H., Grimson, K. S., Chittum, J. R., and Metcalf, B. H. (Duke Univ., Durham, N.C.). [*Surgery*, **26**, 421–34 (1949); *cf. C. A.*, **43**, 5496e.]

The compounds, 2,6-dimethyl-(1),(1)-diethylpiperidinium bromide, and 2-(N-p-tolyl-N-(m'-hydroxyphenyl)aminoethyl) imidazoline-HCl were effective and well tolerated.

RUTH BERGGREN (Chem. Abstr.).

Action of Myanesin on Medullary Synaptic Transmission in the Acute Spinal Dog. Baisset, A., Laporte, Yves, and Grezes-Rueff, F. (Univ. Toulouse, France). [*Compt. rend. soc. biol.*, **143**, 1515–17 (1949).]

The drug depresses transmission. Action of 1,2,3-tris(diethylaminoethoxy) benzene triethiodide (*Ibid.*, 1518–19). The Compound has no effect on medullary synaptic transmission even in doses four times as great as are sufficient to block neuromuscular transmission.

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

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Drugs Accelerating and Inhibiting Alcoholic Intoxication. *Chauchard, Paul, Mazoué, Henriette, and Lecoq, Raoul (École hautes études, Paris).* [*Compt. rend. soc. biol.*, **143**, 1550–3 (1949).]

Apomorphine, tetraethylthiuram disulfide, and 1-octanol augment the effect of EtOH on chronaxia in the rat, while KSCN and 1-phenyl-2-aminopropane decrease the effect. $MgSO_4$ given subcutaneously or intravenously has no influence.

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

Treatment of Alcoholism with Antabuse (Tetraethyl-thiuram disulfide). *Carratala, Rogelio.* [*Rev. asoc. med. argentina*, **64**, 220–1 (1950).]

Ingestion of EtOH after antabuse results in an increase in acetaldehyde in the blood. In rabbits this increase is 4–11 times that produced by EtOH alone. The intravenous injection of 0·03–0·12 gm./kgm. acetaldehyde produces transient narcosis in dogs, cats and rabbits; 0·25–0·35 gm./kgm. produces death by respiratory arrest. L. E. GILSON (Chem. Abstr.).

Disappearance of the Convulsant Activity of Brucine when Converted to its Methiodide. *Busquet, H., and Vischniac, Ch.* [*Compt. rend. soc. biol.*, **144**, 53–4 (1950).]

Brucine methiodide is quite toxic to experimental animals, but has little or no convulsant activity as compared with brucine.

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

Effect of Some Anticonvulsant Agents on Agene-induced Convulsions in Dogs. *Belford, J., and Bonnycastle, D. D. (Yale Univ.).* [*J. Pharmacol. Exptl. Therap.*, **99**, 325–8 (1950).]

Without producing signs of toxicity, phenobarbital can prevent the occurrence of convulsions in dogs receiving agenized zein at a dosage level which induces convulsions in 100 per cent. of controls. There is some evidence that diphenylhydantoin has a positive synergistic action with the convulsant action of agenized zein. Trimethadione protects from the convulsions, but only at levels which result in toxic effects. Paradione affords some protection against the convulsions without toxic effects. L. E. GILSON (Chem. Abstr.).

Metrazole Activation of Acetylcholine-treated Cerebral Cortex. *Forster, Francis M., and Madow, Leo (Jefferson Med. Coll., Philadelphia, Pa.).* [*Am. J. Physiol.*, **161**, 426–9 (1950).]

Cerebral cortex treated with acetylcholine topically is activated by parenteral injections of metrazole in doses below the threshold of untreated cortex. With careful control the seizure discharge can be limited to the area of acetylcholine application. These results of metrazole activation are similar to those seen in patients with focal epileptogenic lesions.

Experimental Sensory-induced Seizures. [*Ibid.*, 430–4.]

Sensory-induced seizures in experimental animals can be induced by the application of acetylcholine to a sensory cortex and administration of the appropriate stimulus during metrazole activation. These observations are correlated with clinical studies in sensory-induced epilepsy. E. D. WALTER (Chem. Abstr.).

Anticonvulsant Action of Isopropanol. *Schaffarzick, Ralph W. (Stanford Univ. Med. School, San Francisco).* [*Proc. Soc. Exptl. Biol. Med.*, **74**, 211–15 (1950).]

Rats and rabbits were given (by stomach tube) the optimal single dose of iso-PrOH, 1250 mgm./kgm. Larger doses produce ataxia. Analyses of blood iso-PrOH and Me_2CO in relation to elevation of cortical threshold to electric stimulation indicate that the alcohol itself is responsible for the anticonvulsant effect, although the acetonemia may contribute. 2-Butanol, 3-pentanol, and 2-methyl-2-butanol effectively raised the cortical threshold, with or without acetonemia. Iso-PrOH antagonized the convulsive action of metrazole and thujone (cedar-leaf oil), but was not effective against picrotoxin. L. E. GILSON (Chem. Abstr.).

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Deoxycortone with Ascorbic Acid in Mental Disorders. Some Clinical and Laboratory Findings. Cranswick, E. H., and Hall, T. C. [*Lancet*, **258**, 540–3 (1950).]

Mental cases with symptoms of less than one year's duration showed euphoric reactions after administration of deoxycortone and ascorbic acid. Response to the treatment was associated with decrease in eosinophils and changes in the urinary uric acid/creatinine ratio. BARBARA R. MURRAY (Chem. Abstr.).

Tannic Acid and Adrenaline and Sympathetic Nerve Activity. Konzett, H (Edinburgh Univ., Scot.). [*Arch. intern. pharmacodynamie*, **81**, 251–7 (1950).]

Tannic acid (1 : 10,000,000) enhances the effect of adrenaline on rabbit intestine and uterus. Given intravenously, it increases the effect of adrenaline on the nictitating membrane and blood pressure of cats. The acid alone has no effect on isolated organs or *in vivo*. M. L. C. BERNHEIM (Chem. Abstr.).

The Effects of Intravenously Administered Aminophylline on Cerebral Circulation and Metabolism in Man. Wechsler, Richard L., Kleiss, Lee M., and Kety, Seymour S. (Univ. of Pennsylvania, Philadelphia). [*J. Clin. Invest.*, **29**, 28–30 (1950).]

The effects of administration of therapeutic amounts of aminophylline on the blood gases, blood pH, cerebral blood flow, cerebral O consumption, and cerebrovascular resistance was studied in 10 subjects. It produced a marked constriction of cerebral vessels and a real anoxia of cerebral tissue. Some individuals react with an increased cerebral O consumption accompanied by disturbing symptoms and anxiety. JOHN T. MYERS (Chem. Abstr.).

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