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The Psychodynamics of the "Dry Drunk"

The authors' study of the responses of the 52 respondents to the questionnaire on the dry drunk leads them to the following conclusions:

1. The dry drunk is experienced by the majority of alcoholics who have maintained sobriety over a long period.
2. The occupation of an alcoholic has no statistical significance in maintaining sobriety.
3. A number of alcoholics will drink from 10 to 20 years before they begin to maintain sobriety.
4. Dry drunks generally occur within the first year of sobriety (occasionally during the early months).
5. This symptom occurs irregularly and with diminishing intensity as the period of sobriety lengthens.
6. The dry drunk is characterized by a feeling of deep depression and frustration and by indecision regarding taking a drink.
7. "Inner life" is largely responsible for precipitating a dry drunk.
8. The dry drunk often is preceded by the same feelings.

* A number of abstracts in this section are reproduced from *Chemical Abstracts*. To the Editors of this Journal we extend our grateful thanks.

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

9. The principal feelings after a dry drunk are relief and thankfulness at not drinking during this period of craving.

10. Drugs are not used to combat the moods and feelings of a dry drunk nor to produce similar feelings.

11. Alcoholics are irritable, restless, and impatient during a dry drunk.

12. After a dry drunk one's thoughts, feelings, and behavior return to normal.

13. A.A. members are the persons most helpful during a dry drunk while spouses, other members of the family, and former drinking companions are the least helpful.

14. Dry drunks may be prevented by contacts with A.A. and efforts to keep the mind off the drinking problem.

15. Dry drunks are generally related to one's mood swings.

16. The financial status generally improves when sobriety is maintained over an extended period.

17. The dry drunks described by the authors' respondents have a number of the same characteristics as the "late withdrawal symptoms" described by Wellman.

The authors feel that this study has been useful in clarifying their thinking on the dry drunk, in indicating sources of help for persons who are experiencing or may suffer dry drunks, and in pointing out areas for further study. They are impressed with the thoughtful, painstaking way in which the questionnaires were answered and with the willingness of the respondents to elaborate in detail on their experiences.

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Evaluation of Combined Coramine-Electroshock Therapy in the Treatment of Schizophrenia

1. Thirteen schizophrenic female patients from among consecutive new admissions were given 5 c.c. coramine in conjunction with their regular series of EST, and a roughly comparable group of 13 patients received saline injections with their EST.

2. These patients were given the Wechsler-Bellevue Intelligence Scale and the Bender-Gestalt test just prior to their shock series and were retested 5 weeks following their last treatment.

3. Results indicate that EST used in conjunction with coramine significantly decreased the time spent in EST treatment. Patients receiving coramine returned to a higher level of intellectual functioning and more adequately perceived reality than did their controls as measured by psychological tests.

4. It is hypothesized that coramine-EST brings about an increased blood flow and thalamic stimulation occurs with most of the results being similar in quality, but greater in quantity, to those with standard EST. The one major qualitative difference noted in contrast with standard EST treatment was the lowering of inadequate defences. The use of coramine-EST makes "intensive-treatment EST" for excited patients unnecessary, thereby avoiding the undesirable post-treatment confusion and clinical organic symptoms.

5. Coramine-EST patients experience less fear and appear more receptive to psychotherapy. Acutely ill new admissions benefit most.

6. This is a pilot study and the results should be considered tentative in view of the size of the authors' sample. A 2-year follow-up of these patients would be necessary to draw any definite conclusions as to the permanency of the effects of coramine-EST. The marked tendency

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

in favor of the coramine-EST group does, however, warrant further investigation of coramine as a variation in EST.

(Authors' Abstr.)

Contribution to the Survey of Handwriting

1. By applying technical methods and mathematical principles to the survey of Gestalt in handwriting the shift from solely intuitional comprehension to scientific testing and practical evaluation is begun.

2. The tests are performed with the help of a map measure, a simple device which makes a quick integrative measuring possible.

3. On scripts of 27 apparently normal individuals the following hypothesis is tested and found to be justified: The total of the length of words, measured in the middle zone of letters, is related to the total length of lines according to the principle of the "Golden section".

4. Among 25 institutionalized mental patients were 9 cases whose scripts revealed proportions not conforming with the principle of the "golden section".

5. The results of this investigation, evaluated by tests of significance, advocate this method as a sort of graphometrical screening test. The author intends to supplement it with other tests, according to the principles of integrative survey.

(Author's Abstr.)

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Manifest Reactions of Patients and Interviewers to the Use of Sound Recording in the Psychiatric Interview. *Lamb, R., and Mahl, G. F.* 731

Clinical Evaluation of Azacyclonol, Chlorpromazine, and Reserpine on a Group of Chronic Psychotic Patients

1. Clinical evaluations of azacylonol, reserpine, and chlorpromazine were made in turn on the same group of chronic, moderately disturbed, psychotic patients, most of whom revealed schizophrenic reactions maintained through long hospitalization.

2. Beneficial results were obtained with each of the three drugs, but not necessarily in the same patients; nor were all patients helped by any one drug.

3. Consideration of the total number of patient improvements in the authors' limited series showed reserpine to be best, closely followed by chlorpromazine, and then by azacyclonol.

4. From the analysis of the results in relation to the different diagnostic categories, it would seem that the hebephrenic and hebephreno-catatonic patients were helped most by reserpine, next came azacylonol, while chlorpromazine was least effective. In the treatment of paranoid patients chlorpromazine was most beneficial, followed by reserpine, and then by azacyclonol. The schizo-affective patients exhibited best improvement with chlorpromazine. One case of involutional depression was strikingly benefited by reserpine.

5. Limiting the validity of these conclusions to the types of patients studied the authors find that it is possible to differentiate between the use of each of these drugs in different psychiatric categories and to indicate the choice of drug that may prove most useful in the treatment of a given case.

(Authors' Abstr.)

Use of Reserpine in Disturbed Psychotic Patients

1. Reserpine is definitely of value in the treatment of chronically disturbed psychotic patients. Twenty-one per cent. of a group of 150 such patients have improved sufficiently to leave the hospital. Eighty-four per cent. showed some degree of improvement and 70 per cent. did better on reserpine than on electroshock.

2. Long duration of hospitalization was an unfavorable factor, although 4 (5·6 per cent.) of those who had been continuously hospitalized for more than 5 years improved sufficiently to go home, and 80 per cent. showed some improvement.

3. Although certain toxic effects (including Parkinsonism and convulsions) have been observed, none was permanent; all of them disappeared when the dosage of reserpine was reduced.

4. There is evidence that in some patients the therapeutic effect of reserpine lasts only as long as the drug is being administered.

(Authors' Abstr.)

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A Comparison of Chlorpromazine and Reserpine in Chronic Psychosis

Improvement was found in 53 per cent. of cases of severe chronic schizophrenia treated with reserpine, in 58 per cent. of such cases treated with chlorpromazine, and in 24 per cent. of similar cases treated with placebos. Placebo cases also required about three times as much electroconvulsive therapy.

E.C.T. may be effectively combined with reserpine or chlorpromazine, and fewer treatments are required to achieve symptomatic benefit.

Chlorpromazine produced a slight, but significant, increase in the intelligence test scores of patients with chronic psychoses, presumably through diminishing anxiety.

Chlorpromazine and reserpine both tended to decrease muscle tension artifact in the EEG.

Chlorpromazine produced a sustained increase in serum bilirubin in many patients without overt jaundice.

Reserpine acts more slowly. Its side-effects are apt to be unpleasant, but seldom serious. It tends to diminish the quantitative intensity of pathological affects, rather than to change them qualitatively.

Chlorpromazine acts more rapidly. Side-effects are less unpleasant but may require stopping the medication. It is relatively ineffective in depression. It tends to induce qualitative and quantitative improvement in states of anxiety, tension, and hostility.

Chlorpromazine and reserpine produce essentially symptomatic improvement through less intense or impulsive expression of emotion; they influence the motor-affective more readily than the ideational sphere.

Results with these drugs are best in patients with persistent evidence of tension, strong affect, and efforts to maintain self-esteem.

Symptomatic use of these drugs cannot replace adequate therapeutic attention to the patient's underlying problems.

The opportunity to release emotion with less anxiety or impulsiveness is advantageous for psychotherapy with psychotics.

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Both drugs are of particular value for the patient with chronic, relapsing, but non-deteriorating schizophrenia who could not otherwise adjust successfully outside the hospital.
(Authors' Abstr.)

Reserpine

Four groups of eight severely disturbed, chronic schizophrenic patients were selected by the ward psychiatrist. One group received group psychotherapy and the new drug reserpine; another received psychotherapy and a placebo; the third group received only the drug, reserpine, and the fourth group acted as a control. After six months of treatment, behavioral changes were measured. No significant improvement occurred on the psychological tests. Marked improvement occurred with behavioral measures. The greatest improvement occurred when reserpine was used along with group psychotherapy.
(Authors' Abstr.)

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Presenile Dementia of the Jakob Type

The clinical and pathological features of two patients affected with a primary form of presenile dementia are described. The first patient, aged 59 years, showed, in addition to intellectual deterioration, neurological symptoms and signs similar to those of amyotrophic lateral sclerosis. In the second patient neurological signs were limited to occasional muscular twitchings, dysarthria, occasional tremors, and terminal inability to swallow. In both patients the mental symptomatology was of the type usually associated with diffuse structural lesions of the brain. The course of the disease, progressive and relatively rapid, was 16 months in the first patient and 14 months in the second. The pathological lesions consisted of widespread degenerative lesions of the neurons with concomitant neuroglia reaction. In the two patients morphologic changes were similar in type; in distribution they differed somewhat, the spinal cord and medulla bearing the brunt of the lesions in Case 1, while in Case 2 the cortex and thalamus were more severely involved.

These findings are compared with those reported in cases of presenile dementias, which have been labeled Jakob's, Creutzfeldt's, Heidenhain's or Kraepelin's disease. Since clinical and pathological features are similar in all these conditions, it is suggested that, in the absence of a better knowledge of etiologic factors, they be grouped into a single clinicopathologic syndrome under the term corticostriospinal degeneration, first proposed by Wilson.
(Authors' Abstr.)

The Psychophysics of Communication

Critical flicker fusion threshold (CFF) is a valid method for measuring the parameter of discriminatory awareness.

The (CFF) was measured in 131 healthy, fluent, control subjects and in 46 stutterers and was found to be significantly depressed in the latter group. Conditions of testing were identical; the possible influence of age and sex was insignificant.

The interrelationship of the communication process as an aspect of thinking, of the discriminatory component of consciousness, and of the neurological implications of the (CFF) is discussed.
(Authors' Abstr.)

Functional Localization in the Cerebellum

This paper supports the concept of functional organization of the cerebellum in longitudinal, corticonuclear zones and is opposed to that theory which localizes function in the various lobes defined by comparative and embryological data.

The previous evidence of functional organization, obtained by stimulation and ablation, has been interpreted chiefly on the basis of the distribution of cerebellar afferent systems. The present concept emphasizes the efferent projections, originally defined anatomically by Jansen and Brodal. Their specific corticonuclear connections, described in Marchi studies, are supported by selective nuclear gliosis following cortical lesions seen in Nissl preparations.

The vermal zone consists of two contiguous, but independent, halves, composed of cortex and fastigial nucleus, each of which controls the posture, tone, locomotion, and equilibrium of the entire body and functionally resembles closely the extrapyramidal portion of the cerebrum. No qualitative difference exists between the symptoms following ablation of the vermal cortex of the anterior lobe and the rostral one-half of the fastigial nuclei and those following the ablation of the posterior lobe of the vermis (and nodulus) and the caudal one-half of the fastigial nuclei. Somatotopic localization is present in the vermal cortex, with maximal involvement of the tail in the lingula; hindlegs and pelvic girdle, in the centralis and rostral culmen; forelegs, pectoral girdle, head, and neck, in the caudal culmen; head, neck, and forelegs, in the simplex and head, neck, and eyes in the tuber and folium. However,

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the entire body was involved to a less pronounced extent in each lesion. Localization in the fastigial nucleus had a similar orientation, but its minimal representation was limited to the fore- or hindparts of the body.

Vestibular function is not limited to the flocculonodular lobe, but is a function of the entire vermal zone. The vermis is an anatomical unit, based on its electrical stimulation and ablation.

Each paravermal, intermediate zone, consisting of paravermal cortex and nucleus interpositus, controls the postural placing and hopping reflexes, tone, and individual movements of the ipsilateral limbs, and functionally resembles the pyramidal part of the cerebrum. The function of this zone is similar in the anterior and the posterior lobe, being quantitatively greater in the former except that the regulation of tactile placing is a property of the anterior lobe only. Somatotopic localization in the cerebellum reaches its greatest discreteness in the paravermal cortex, especially that in the anterior lobe.

The cortex of the lateral zone in the cat does not appear to be involved in the regulation of posture or progression, whether this is tested by cerebellar lesion alone or such a lesion combined with destruction of the sensorimotor cortex of the cerebrum. The postural function of the dentate nucleus is limited at most to a regulation of placing and hopping reflexes and volitional movements of the ipsilateral limbs. No somatotopic localization was found in the lateral zone, although it has not been exhaustively explored.

The inclusion of the so-called middle lobe vermis (tuber and folium) and the paramedian lobule with Crura I and II as a functional unit is strongly opposed by the evidence presented here. The tuber and folium belong with the vermal zone; the paramedian lobule belongs with the paravermal zone. Likewise, the anterior lobe cannot be referred to as a single functional unit, nor can it properly be termed vermis alone.

The symptoms obtained from the nuclei of the vermal and paravermal zones are the reciprocal of those characteristic of their respective cortices. This reciprocality was obvious following even small cortical and nuclear lesions, which show precise somatotopic localization. This observation appears to demonstrate beyond question that these nuclei have both an afferent supply and a function independent of the cerebellar cortex.

(Authors' Abstr.)

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The Insula. Further Observations on its Function

Information, derived from the stimulation and removal of the insula of man, has accumulated during the past ten years since the publication of case J.C. whenever opportunity permitted. This evidence has now been reviewed by one of the authors and new methods of observation employed.

More than one-third of the positive sensory responses to stimulation of the insula consisted in sensations that resemble the responses to stimulation of the superior bank of the fissure of Sylvius, responses considered to be second-sensory. The decision as to whether this is any evidence of neighbourhood activation or whether some part of the insular cortex is involved in a somatic sensory mechanism must be left an open question.

Gastric recording, by means of an electrogastrograph and an intragastric rubber balloon during operation, has demonstrated clearly that, in conscious men, the island of Reil can exert a control over gastric motility and stomach tone.

Electrical stimulation of the insula produced, in 4 out of 6 cases, undoubted effects upon the stomach. These effects varied from complete inhibition of gastric motility to the production of violent activity with marked increase in tone. Tone changes might accompany, or appear independent of, alterations in rate of stomach contractions.

In this series of observations, whenever abdominal sensation was produced by stimulation during gastric recording, there was some concomitant change in gastric tone or motility, either inhibitory or acceleratory. On the other hand motor effects were sometimes produced without accompanying sensation.

It must also be left an open question as to whether abdominal and epigastric sensation has any representation in this region independent of the changes produced in motility and tone of the gastro-intestinal system. Somatic sensation and abdominal sensation may be

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

produced by stimulations of near-by points on the insula but they are not produced simultaneously during one application of the stimulating electrode.

Complete insulectomy produced inhibition of the previously existing 3 per minute pyloric contractions and a fall in gastric tone (case W.G.). This occurred toward the end of excision. A few minutes later, irregular 1 per minute contractions were set up, unlike any gastric activity previously recorded, and continued several hours up to the end of the recording. There were three other total insulectomies but gastric recording was not being carried out during the procedures.

Control studies of gastric motility during similar operations when other parts of the cerebral cortex were stimulated or removed gave no evidence of motor responses.

More than one-third of the positive sensory responses to stimulation of the insula consisted in an abdominal feeling of some sort and it is assumed that most, if not all, of these sensations are secondary to motor change in the gastro-intestinal tract.

(Authors' Abstr.)

Rhesus Incompatibility and Mental Deficiency

Nine cases of certified mental defect with a history of icterus neonatorum are presented. It is thought that the mental defect and brain damage are due to rhesus incompatibility. A tenth case with similar clinical features but probably not due to this cause and an eleventh where rhesus damage was complicated by lipoidosis are also reported.

The quality and extent of the damage varied very widely. A typical picture of athetosis, deafness and mental retardation could be recognized but may not be peculiar to this condition. Atypical pictures included ataxia and hemiplegia. The degree of mental impairment varied from complete idiocy to normal intelligence which was obscured by the multiple defect. Pathological studies showed widespread damage in the brain with emphasis on the globus pallidus but not sparing the cerebral cortex. The first 6 cases received no adequate treatment by modern standards and might have escaped brain damage if so treated. The last 3 affected at birth received modern treatment but for which they would probably have died. Three of the cases were potentially educable. Education of such cases needs much individual attention with special regard to deafness and ample opportunity for graded manual and general muscular training. The history of the study of rhesus factor incompatibility illustrates the preventability of certain forms of mental defect.

(Authors' Abstr.)

Lipid Chemistry of the Brain in Demyelinating Diseases

Phospholipids, cholesterol, various phosphorus-holding compounds, neutral fat and neuraminic acid have been estimated in 3 further cases of multiple sclerosis and 1 of diffuse sclerosis of the sudanophilic type and in other varieties of diffuse sclerosis and these results are given in full.

There is a generalized loss of phospholipids in the demyelinated areas in all conditions. The new cases of multiple sclerosis confirm previous findings not only as to the presence of cholesterol esters but also as to the slight abnormality of the apparently normal areas. Changes in phosphoprotein phosphorus levels are discussed and suggestions for future investigations are outlined.

Neuraminic acid has been found to be raised not only in amaurotic family idiocy but also in all the demyelinating conditions so far examined.

It is suggested that it may be possible to assist diagnosis by the chemical examination of biopsy specimens of cerebral material and an example of such an examination is given.

(Author's Abstr.)

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The Electroencephalogram in Forensic Alcoholism

1. The observation of electroencephalographic findings is reported in 60 patients who had an electroencephalogram before, during, and after the administration of alcohol.

2. Of the 60 patients, 12 showed electrical seizure discharges after the administration of alcohol.

3. Ten of the 12 patients who showed electrical seizure discharges had electroencephalographic instability before the administration of alcohol, suggesting predisposition to paroxysmal cerebral dysrhythmia.

4. Only four patients (of the 60) had clinical seizures following the administration of alcohol.

5. Factors responsible for producing electroencephalographic abnormalities similar to those activated by alcohol are discussed.

6. The mechanism by which alcohol produces convulsions in certain individuals is not clear.

7. The writer does not recommend the routine use of alcohol as an activator of electrical seizure discharges. However, this procedure may be useful only in specific patients in whom it is suspected that some criminal or unsocial act was performed while in a state of altered consciousness, a result of alcohol intake.

(Author's Abstr.)

Case Studies in Cerebral Anoxia

This brief report is concerned with characteristic clinical cerebral residuals in a case of prolonged respiratory failure incident to drowning in a girl of six years. She survived for a period of almost six days. On gross examination, the cortical and ganglionic gray matter appeared to be diffusely softened. Architectural and cellular changes characteristic of cerebral anoxia were found on microscopic examination in the form of minor focal arachnoidal thickening, laminar pallor and friability, early endothelial proliferation, acute severe changes in the cortical and lenticular nerve cells, calcareous deposits in the striatal blood vessels and foci of subcortical demyelination.

(Author's Abstr.)

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A Year's Experience with Frenquel in Clinical and Experimental Schizophrenic Psychoses

1. The therapeutic properties of Frenquel, alpha-(4-piperidyl) benzhydrol hydrochloride, have been under study for the past twelve months. The foregoing is an account of an exploratory adventure in therapeutics rather than a statistical study.

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

2. The therapeutic indication for the use of Frenquel appears to be confined to schizophrenic dissociation syndromes, and it is unique in this regard. It is not consistently successful in relieving such disorders.

3. It acts as a partial or complete blocking agent against the development of LSD-25 and mescaline experimental psychoses when it is given as a premedication to healthy subjects who ingest these hallucinogenic drugs. When injected intravenously during the height of such experimental psychoses it brings them to an abrupt end. Preliminary observations suggest that it fails to perform the same function in model psychoses produced by pyrahexyl, a cannabis-like drug.

4. In a small series of cases of acute schizophrenia, Frenquel has relieved the disorder rapidly in about a third of the cases. Electro-convulsive therapy increases the number of favorable responses in this group. After relief of symptoms it appears necessary to keep the patient on a maintenance dose of the drug to prevent relapse.

5. In chronic schizophrenia it is also of therapeutic value in a small number of cases, and its effectiveness appears to be enhanced by the simultaneous use of chlorpromazine and/or E.C.T. on occasion.

6. Preliminary observations suggest that it is also of therapeutic value in some of the psychotic reactions arising out of chronic alcoholism, but inconsistently so, especially in low doses.

7. The periodic dissociation reactions which occur in senile patients with organic brain syndromes have responded to Frenquel treatment in a small number of cases, and the authors are encouraged to enlarge their clinical observations on this group.

8. In high doses, given both intravenously and orally, the drug has also relieved post-operative confusional states, which in their opinion appear to be quite similar clinically to acute schizophrenic reactions. Larger experience may reveal that this is one of the more hopeful therapeutic indications for the use of the drug.

9. The authors have given Frenquel for a large assortment of other neurological and psychiatric disorders without benefit. The one possible exception is that of acute intermittent porphyria. In two cases of this disorder abdominal complaints have been minimized, but neurological and psychiatric components of the syndrome have remained unaltered during two months of treatment. A larger and more prolonged series of observations will be necessary to confirm this curious finding.

10. Review of the 115 cases in this study has led to the conclusion that Frenquel appears to be a wholly non-toxic compound, and no subjective complaints of side-reactions have arisen from its use. No incompatibilities with other drugs have been noted, with the possible exception of sulfonamides. In one case of post-operative confusion the authors gained the impression that Frenquel was inactivated by the simultaneous use of a sulfonamide.

11. As their experience has broadened, they have been emboldened to use Frenquel in higher doses both intravenously and orally. In the acute dissociation syndromes especially, they now give the drug intravenously in 100 mg. doses as soon as the diagnosis is established, and follow with as much as 300–400 mg. orally per day in divided doses. This appears to enhance the therapeutic benefit of the drug without jeopardizing the health of the patient.

12. Frenquel appears to have a place, though a limited one, along with chlorpromazine and reserpine, among the ataractic drugs, i.e. those which bring about ataraxy, or freedom from confusion. The drug is worthy of further study.

(Authors' Abstr.)

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An Evaluation of the Treatment of Schizophrenia with the Antidiuretic Hormone of the Posterior Pituitary

1. First admissions of schizophrenic patients to the State Hospital have been studied.

2. The patients have been subdivided into two groups, on the basis of treatment received; one group received Pitressin, one did not.

3. The groups are comparable for age, but show significant difference in prehospital duration of illness—the Pitressin group has the shorter duration. This has been discussed.

4. The results have been assessed on the basis of discharge and readmission, length of stay in hospital and length of remission.

5. The results are significantly better in the group not receiving Pitressin.

6. It is thought that antidiuretic hormone (Pitressin) is not an effective agent in the treatment of acute and moderately chronic schizophrenic illness.

(Author's Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

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Frenquel

Frenquel offers a new neuropharmacologic approach to certain acute psychotic states where delusions and hallucinations have been the primary symptoms. In certain selected cases, early results have been encouraging. In patients whose psychoses are associated with organic brain deterioration or chronic brain syndromes, the results have been poor, but the authors feel that the medication can safely be utilized for a trial of therapy in these patients. The authors are unable to explain why Frenquel is beneficial in some patients with organic psychoses and not in others. The most encouraging results have been in the treatment of acute toxic hallucinosis, where all but 3 of the patients were relieved of their symptoms within a few hours.

The authors offer this report only as a preliminary one. Further and more intensive studies are being carried out by them. Follow-up studies must be done in these patients before long-term evaluation of the drug can be presented.

(Authors' Abstr.)

FEBRUARY

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Studies of the Toxicity of Schizophrenic Blood Serum

There are many possible reasons for the failure of these experiments to demonstrate a toxic factor in the blood serum of schizophrenics as there are a number of factors not subject to control when dealing with such complex material. The known unpredictable viability of young tadpoles as demonstrated by spontaneous deaths occurring in groups not exposed to serum may be an important factor, but this really explains very little. Bufo valliceps tadpoles may have special metabolic processes which make them peculiarly unfit as test organisms, and for the Rana catesbiana series the conditions of the experiments by Lazell and Prince may not have been reduplicated. There is, however, no obvious reason why the experiments failed to demonstrate a toxic factor.

Objectively, the only conclusion warranted is that by employing a technique reported previously by several workers, a toxic factor in the blood serum of schizophrenics was not demonstrated using a large number of a new genus and species of tadpoles and one previously used, and using planaria. No definitive statement can be made about the toxicity of schizophrenic urine as the sample is too small.

(Author's Abstr.)

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Studies of Cerebral Circulation in Brain Injury. II. Cerebral Concussion

1. The EEG, SP, cortical temperature, oxygen availability, intracranial and jugular venous pressure, blood pressure and respirations have been recorded in experimental cerebral concussion produced by percussion concussion, compression concussion and acceleration concussion.

2. In experimental concussion there is a rapidly reversible cortical injury potential (SP) followed by a rapid rise in cortical oxygen availability (EPG) preceding any effects referable to changes in respiration and circulation. The intensity of this primary change is proportional to the objective signs of concussion (loss of corneal reflex, respiratory paralysis, rise in blood pressure and diminished EEG activity). Following the blow there is a rise in cortical temperature. It is concluded that this primary change occurs in all nerve cells that are affected, and that generalization of the phenomenon is due to the affection of all neurones by the stimulus. The essential process can be localized in one region by limiting the adequate physical stimulus to that region.

3. There is a threshold for the stimulus necessary to produce concussion. Progressively severe blows over the threshold stimulus produce more severe concussion. Repeated concussive blows tend to lower the threshold. A severe concussive blow may be fatal without signs of brain injury.

4. The cortical injury potential, rather than neuronal excitation, accounts for the large potentials recorded immediately following a concussive blow. The rise in cortical (EPG) and the surface negative (SP) potential are contrary to the changes induced by cortical paroxysmal activity, and their ability to summate with rapid repetition negates their origin from nerve impulses whether reflex or not.

5. The effect of localized percussive paralysis of the brain stem is contrasted with localized percussive paralysis of the cortex.

6. It is concluded that in cerebral concussion transient traumatic paralysis of neurones due to membrane damage is the essential effect. This membrane damage accounts for the prolonged after-effect on synaptic transmission.

(Authors' Abstr.)

The Electroencephalogram in Phenylpyruvic Oligophrenia

Electroencephalographic studies in the waking and sleeping state of 19 patients with phenylpyruvic oligophrenia reveal that waking activity in these patients is usually abnormal; it is of high voltage, slightly fast, slightly slow, or a mixture of fast and slow; seizure discharges of the petit mal type are common. Eleven patients showed seizure activity in the waking state and 18 had seizure activity during sleep. Thus the electroencephalogram confirms the clinical observation that epileptic disorder is a common complication in phenylpyruvic oligophrenia.

The occurrence of 3/sec. spike and wave discharges of the petit mal type in more than one-third of the present group of patients with phenylpyruvic oligophrenia is noteworthy because this pattern is rare in other types of symptomatic epilepsy. It suggests that there is some causal relation between the metabolic disorder which is present in phenylpyruvic oligophrenia and the wave and spike pattern.

The most consistent abnormality was a lack of well formed sleep patterns. Biparietal humps and spindles were either absent or poorly developed. Sleep activity was profoundly disorganized. In two cases mitten patterns were present.

These findings suggested a pathological process with a strong epileptic component, causing a profound disturbance of both cortical and thalamic function.

(Authors' Abstr.)

The Electroencephalogram in Patients with Tuberous Sclerosis

Twenty patients with tuberous sclerosis and 13 clinically healthy siblings of these patients have been examined electroencephalographically. Four out of 7 patients with severe cerebral affection (epilepsy and mental deficiency) showed an abnormal EEG; one out of 8 patients with epilepsy, but without mental deficiency, had an abnormal record; 5 patients with skin manifestations and no sign of affection of the CNS had normal records. Thirteen healthy siblings showed normal EEG's except in 2 cases. It must be remarked that only passive recording, with overbreathing as the only method of activation, has been studied. It is concluded that EEG examination is of no aid in revealing cerebral affection in patients without disorders sufficiently severe to cause mental deficiency. No diagnostic pattern is found.

(Authors' Abstr.)

Observations on the Diffuse Thalamic Projections

Extensive cortical ablations and focal lesions of the striatum were made in cats and monkeys, and the degeneration of the thalamic nuclei was studied in Nissl stain after survival periods of at least two months. Degeneration in the thalamus does not follow in an "all or

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

nothing" manner. Between the extremes of entirely normal appearance and complete degeneration with loss of ganglion cells and heavy gliosis, there exist an array of intermediate changes. Their significance in the organization of thalamic efferents is discussed.

Lesions restricted to the caudate nucleus or putamen did not produce degeneration in the thalamic nuclei. Lesions of the caudate nucleus which involved the adjacent portion of the internal capsule were followed by extensive cell loss and gliosis which involved the oral portion of the reticular nucleus, the nucleus ventralis anterior and the oral portions of the intralaminar nuclei. Lesions placed in different regions of the internal capsule and oral portion of the thalamus showed the presence of an anatomical rostral outflow.

Cortical removals consisted of hemidecortication, either complete or limited to the isocortex. In addition to degeneration of the specific projection nuclei, marked changes were present in the intralaminar nuclei. The changes were observed after removal of the isocortex alone with varying amounts of damage to the underlying white matter. In complete hemidecortication, the extent of degeneration of the intralaminar nuclei was only slightly modified. The details of these findings are presented and their significance discussed.

(Authors' Abstr.)

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Studies of Cerebral Circulation in Brain Injury. III. Cerebral Contusion, Laceration and Brain Stem Injury

1. Experimental cerebral contusion, laceration, herniation and brain stem injury have been studied in terms of local cortical oxygen availability, blood flow, and pH together with local EEG, SP, respiratory and blood pressure changes.

2. Contusion of the brain results in a local injury potential which is more prolonged and slower in development than the diffuse neuronal injury potential of concussion.

3. Within 1–3 minutes of the injury causing contusion evidence of localized impaired circulation and tissue hypoxia become evident. These changes coincide with the visible development of petechial hemorrhages. Such local ischemic and hypoxic changes may result in local EEG abnormalities.

4. Cerebral laceration results in the rapid onset of more extensive ischemia and hypoxia due to local reduction of arterial pressure and arterial spasm.

5. Brain stem ischemia results in a severe rise in blood pressure and increased cortical circulation.

6. Brain stem contusion results in a fall in blood pressure with resultant cerebral ischemia and hypoxia.

7. Brain trauma causes first a local transient paralysis of neurones complicated in later stages by the effects of ischemia, anoxia and resulting metabolic disturbances. In contusion these secondary effects over-shadow the paralytic effects.

(Author's Abstr.)

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The Formal Aspects of Schizophrenic Verbal Communication

It was the purpose of this study to make more precise the nature of the inadequacy of schizophrenic verbal communication. The hypothesis advanced was that schizophrenics, as compared with normal adults, manifest a lower, socially less differentiated level of communication.

The characteristic formal aspects of the schizophrenic's verbal communication were

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

systematically investigated by creating a relatively structured situation. The subject was told a short story and instructed to relate it to the interlocutor. The interlocutor, controlling the situation, purposely created an argumentative situation by disagreeing with the subject's story; they both were required to discuss these differences and arrive at an acceptable solution.

The subjects consisted of 30 male schizophrenics—10 hebephrenics, 10 catatonics, 10 paranoids—and 20 normal male adults. The two groups were compared with regard to three major aspects of verbal communication: Task Orientation; Social Reactivity; and Linguistic Thought.

The data, statistically analyzed in terms of a number of categories, yielded the following results:

(*a*) Task Orientation. The task orientation of the schizophrenics, as compared with the normals, was characteristically impaired, i.e. they were unable to focus their behavior consistently on the task. Closely related to this behavior was the concreteness of symbolic activity, viz. they were unable to assume the hypothetical attitude necessary for dealing with a task involving fictitious events.

(*b*) Social Reactivity. Typically, the discussion of the schizophrenics, as compared with the flexible communicative behavior of the normals, largely remained unmodified in the interpersonal situation.

(*c*) Linguistic Thought. The schizophrenics' verbal expressions of thinking, as compared with those of the normals, showed a certain degree of diffuseness and inarticulateness.

The findings suggest the following generalizations:

(*a*) The communicative activity of the schizophrenic is formally different from that of the normal adult. He is obliged to communicate on a lower socio-genetic, less differentiated level.

(*b*) The level of organization of the schizophrenic is relatively wide-ranged, i.e. he is not fixated at one particular point along the developmental scale; rather his activity is characterized by a predominance of behavior at a particular low level with higher, more mature levels occasionally manifesting themselves. Therefore, vestiges of adequate communicative activity are more or less retained.

(*c*) The hebephrenics evidence the greatest degree of undifferentiatedness in communicative activity due to their greater autistic involvement. The catatonics and the paranoids are somewhat closer to normals but show this difference with respect to one another: the catatonics tend to approximate normals more closely in their social behavior and task orientation whereas the paranoids tend to approximate normals more closely in their thinking.

The schizophrenic's low level of communicative activity brought out in this study may be interpreted in terms of the general genetic concept of undifferentiated ego-world relationships. Accordingly, the study suggests that the inadequacy in communicating with others is an expression of (*a*) the undifferentiatedness of inner and external speech, and (*b*) the inability to take the role of the "generalized other". With a heightening of autistic activity there is a lessening of the degree of differentiation between inner and external speech and between one's ego and his surrounding world.

(Author's Abstr.)

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Depressive Reactions Associated with Temporal Lobe Uncinate Seizures

1. Paroxysmal depressive reactions lasting for hours to weeks occurred in six subjects whose chief seizure manifestations consisted of uncinate attacks and temporal lobe automatisms.

2. Depressive episodes preceded or followed seizures or occurred paroxysmally in the "free interval" between seizures. These episodes had a rather sudden onset, were refractory to psychotherapy, and frequently disappeared abruptly under energetic anticonvulsant therapy or Metamphetamine hydrochloride (Desoxyn)/Dextroamphetamine sulfate (Dexedrine) medication.

3. Accompanying olfactory hallucinations also ceased once the depression subsided.

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

4. Two patients could be followed clinically and electroencephalographically over several years. A definite relationship between temporal lobe paroxysms in the EEG and depressive episodes clinically could be demonstrated.

5. It is postulated that this particular type of depressive reaction may be due to subclinical "hippocampal-amygdaloid-temporal lobe" epilepsy and/or due to after-discharges from the same structures following manifest seizure activation.

(Author's Abstr.)

The Capillary System in Patients with Psychiatric Disorder: the Ontogenetic Structural Determination of the Nailfold Capillaries as Observed by Photomicroscopy

1. Drawings and photomicrographs of the capillary structure of the nailfold skin of the ring fingers of both hands were examined in 332 subjects. Of these 96 were healthy controls, 40 were psychiatric patients with psychopathic personality, 73 patients with psychoneurosis, 15 patients with epilepsy, 58 patients with depression and 50 were patients with schizophrenia.

2. Nine distinct Categories of capillary structure are distinguished as representing stages in capillary maturation or dysplasia of the growth process. The incidence of each Category in eight diagnostic groups is evaluated and the results subjected to analyses of variance to assess their significance.

3. It was found that no significant differences existed between the records of the two hands and that age, within the range of 18 to 58 years, could be discounted as a variable.

4. Specific patterns of nailfold capillary structure were found to characterize the healthy subjects and patients with each of seven varieties of psychiatric disturbance. The results possessed statistical validity and a supplementary analysis by a second observer yielded adequate reliability.

5. It is inferred from the results that the nailfold capillary morphology is indicative of personality structure, liability to psychiatric breakdown and that it represents an index of constitutional maturation.

(Author's Abstr.)

Long Range Treatment of Multiple Sclerosis with Pancorphen

This article deals with the question whether a series of 5 Pancorphen injections which yielded a high percentage of partial remissions of non-permanent nature in a large number of cases should be repeated and how often. Can the author expect on repetition: (1) a cure of the disease? (2) prevention of new attacks? (3) lengthening of intervals between the attacks? (4) shortening or cure of new attacks?

He bases his conclusions on 7 cases of multiple (more than 3) treatments from Goldwater Memorial Hospital. To these cases he could add 6 more cases from his previously published series. All these cases were treated and followed for years.

His tentative conclusions from these thirteen cases are: (1) even old and advanced cases can still yield partial remissions of various degrees; (2) this result can often be repeated; (3) there is no doubt in most instances about the sequence and the probable causal nexus between treatment and remission; (4) repeated treatments given in time can favorably influence the course of the disease; (5) the treatment in the form hitherto described produces no cure; (6) a repetition of the treatment from 4 to 26 times in its present form does not arrest the disease or protect from relapses in the future; (7) very advanced cases give less favorable results than less advanced; (8) treatments started in the beginning of an attack give much better results than those started late in the attack; (9) treatments given 2 to 3 times per year are probably better than those given at longer intervals; (10) treatments given in a remission period probably further the progress of remission; (11) progressive type of remission is more frequent with Pancorphen treatment than without it; (12) the interval between bouts of disease is not shortened, but the total time spent in attacks is shortened; (13) the duration of an attack is shortened to a point that we can speak of "aborted attacks".

Should the treatment be continued indefinitely 3 times a year in series of five injections? More experience with much longer periods of treatment will be necessary to answer this question conclusively.

The author is convinced that the treatment should be given: (1) in every beginning attack; (2) in progressive (active) attacks no matter of what duration; (3) during inactive as well as progressive remissions. It is true that treatment in active stages requires more caution and still more individualization than in the inactive stages; it is also true that any aggravation of the disease in a progressive attack is likely to be interpreted not as absence of therapeutic effect but as iatrogenic aggravation. Nevertheless it is logical to assume and corroborated by experience that the active periods of disease, progressive or new attacks as well as progressive remissions, hold more promise for any therapy than the inactive periods of stabilized defenses which also yield therapeutic results.

For the time being he recommends therefore: continuous treatments with series of five intravenous injections, strictly individualized three to four times per year plus extra emergency treatment in case of appearance of new symptoms.

(Author's Abstr.)

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Plasma Tyrosine in Schizophrenia

1. Determinations of free fasting plasma tyrosine were made on 32 chronic male schizophrenics and 16 male controls of similar age.

2. There was no significant difference in the values for free fasting plasma tyrosine when the schizophrenic group was compared to the control group. Figures for both groups were in agreement with accepted values.

3. The Spectral-Transmittance (S-T) curves of chromophores obtained by the colorimetric method used were plotted for each subject between 400 and 700 mμ.

4. Mean S-T curves for schizophrenics and controls did not differ significantly, and no individual gave curves which differed significantly from the mean curve for his group. Since substituted phenols other than tyrosine, presumably representing intermediate metabolites of tyrosine, are involved in the reaction of the method used, producing colored compounds which affect the (S-T) curve specifically, the results suggest that the intermediate metabolism of tyrosine is not deranged in schizophrenia.

5. The results obtained do not support the hypothesis that schizophrenia may represent a state of disorder metabolism involving the chemistry of tyrosine.

(Author's Abstr.)

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The Copper Content of Brain and Liver in Hepatic Encephalopathy

Copper analyses of the lenticular nucleus of the brain (putamen) and the liver were made in 11 cases of chronic liver disease dying in coma, and in 11 control cases. The derangement of central nervous function known as hepatic encephalopathy (liver coma) does not appear to be associated with a consistent increase in the total copper content of either the brain or the liver.

(Author's Abstr.)

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An Evaluation of the Rorschach Method for the Study of Brain Injury

Using the configurational approach, the Rorschach method is able to differentiate between post-traumatically brain injured patients and schizophrenic and neurotic patients without organic pathology. The configurational approach in which Rorschach patterns are studied in their dynamic interrelationships within the individual record and in which the qualitative features of the record are considered, appears to be effective in describing the personality of the post-traumatic patient, detecting personality deviation and diagnosing organic cerebral dysfunction. These configurations are therefore offered for further study and verification by other Rorschach clinicians. The use of the configurational approach depends upon interpretive skill which comes with extensive experience and training. It is the authors' belief that the configurational approach can be made systematic and can attain a practical degree of objectivity.

(Authors' Abstr.)

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Chlorpromazine and Human Spasticity

The authors' original electromyographic observations on the effect of chlorpromazine on human spasticity have been expanded. In 15 of 18 patients dramatic abolition of spasticity for about two hours was obtained by the rapid intravenous injection of not more than 50 mg., with lesser effects in the other three. In a boy with cerebral palsy the effect lasted more than 20 hours.

Voluntary muscular activity was unaffected except in one quadriplegic who reported a brief transient paralysis of a partially-affected limb.

The effects are not related to the state of consciousness. Most patients remained highly co-operative, though some became quite sleepy.

No effect on the involuntary movements or the reflexes was recorded in five cases of choreoathetosis and no depression was seen in a normal subject's neuromuscular responses.

Two cases of parkinsonian tremor were relieved temporarily, in contrast to the occasional appearance of such a tremor in long term therapy for psychosis with chlorpromazine and reserpine.

The possible modes of action are discussed. The effect is apparently a depression of overbalanced facilitatory influences of the brainstem reticular nuclei.

(Authors' Abstr.)

Treatment of Bell's Palsy with Cortisone and Other Measures

1. Bell's palsy is an easily recognized illness, but before therapy is started the patient should be carefully examined to exclude other types of facial paralysis and other pathology.

2. The usual slow recovery and possible permanent disfigurement justify active, aggressive treatment if such treatment appears to be effective.

3. Surgical decompressive measures, plastic repairs, and nerve anastomoses are procedures of last resort and leave much to be desired in reliability and effectiveness.

4. From the data summarized above, oral cortisone appears to be an effective means of treatment if the following criteria are observed: Treatment must begin as soon as possible, at least in the first nine days. Treatment should be adequate; that is, minimum initial doses of 300 mg. per day for an adult, with gradual decrease over a seven to ten day period.

5. Further information should be collected on a large number of cases of Bell's palsy treated with cortisone and related substances with varying dosage schedules to determine the optimum therapy under varying circumstances.

(Author's Abstr.)

Treatment of Muscular Dystrophy with Amino Acids and Vitamins

Clinical evaluation of the Van Meter treatment for muscular dystrophy, consisting of amino acid, folic acid, and vitamin B_{12}, indicated no significant improvement in muscle performance in a series of patients studied with a control group. In addition, the Van Meter treatment did not alter the biochemical abnormalities of creatinine and creatine excretions in the urine of patients with muscular dystrophy.

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Therefore, it is the authors' opinion that treatment of muscular dystrophy with amino acid, folic acid, and vitamin B_{12} is of no value, either in a definitive or symptomatic sense.
(Authors' Abstr.)

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Nature and Significance of Pentosuria in Neuromuscular Disease. *Tower, D. B., et al.* 125

Craniovascular Studies in Headache

1. The supposed mechanism of extracranial arterial volume changes occurring during a migraine attack is in keeping with the authors' findings of the subjective or objective response to Dihydroergotamine, which succeeded in diminishing the volume pulse amplitude and easing the headache in a significant number of patients.

2. In patients with muscle contraction headache, a sufficiently significant number of patients evidenced such response to nicotinic acid as to postulate the belief that a local vascular insufficiency might play a definite part in the mechanism of pain. It may well be that such an insufficiency occurs secondarily to local muscle contraction.

3. The effects of drugs were felt by the patients before associated changes could be recorded objectively.

4. The field of pulse wave tracings and study is one in which understanding of the significance of the tracings is constantly growing. There are certain findings present in our recordings, the significance of which are not yet fully understood but which will be clarified by further experience.

(Authors' Abstr.)

Swelling of the Brain Induced by Anoxia

Fourteen dogs under pentobarbital sodium anesthesia survived respiratory anoxia severe enough to give a decrease in blood pressure below 40 mm. of mercury and as much as two minutes of cardiac arrest. These animals did not exhibit any noticeable swelling of their brains or increase in intracranial pressure clearly attributable to cerebral edema within several hours after the anoxic episode. But one animal surviving a longer period of cardiac arrest (six minutes) caused by inhalation of nitrogen later showed a progressive elevation of the intracranial pressure. Histologically there was evidence of cerebral edema.

Local anoxia of brain tissue, induced by oil or starch emboli, consistently caused a very rapid swelling of the brain and an increase in the intracranial pressure in the absence of any obvious systemic hemodynamic change (20 animals). A significant part of this swelling may be attributed to intracellular accumulation of fluid. There was, also, in some of these brains histologic evidence of extracellular cerebral edema.

(Authors' Abstr.)

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Effect of Mesencephalic Lesions on Metrazol-Induced Cortical Activity

The data presented suggest that Metrazol is a rapidly acting toxic substance which produces long lasting depression of the threshold of the cells of the central nervous system. The precise pattern of cerebral activity which results from such a depression depends on the nature of the available cellular interconnections. Where the cortex is isolated from the mesencephalic reticular formation, there results a loss of capacity for it to respond with

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

sustained high voltage hypersynchrony, irrespective of the nature of the seizure inducing agent used.

(Authors' Abstr.)

Experimental Production of Seizures in the Macaque by Temporal Lobe Lesions

Irritating lesions were created by placing alumina cream in the temporal lobes of five monkeys. Observations of temporal lobe seizures, and evidence for grand mal seizures in three of these animals are given. A discussion of these findings and some of their implications are presented.

(Author's Abstr.)

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https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Reaction of the Adrenal Cortex to Emotional Stress

Adrenocortical reaction to emotional stress was determined in groups of subjects who were studied during life situations of emotional perturbation, as well as under conditions of experimentally contrived emotional disturbances.

The level of the 17-hydroxycorticosteroids in the peripheral blood and 17-hydroxycorticosteroids conjugated as glucuronides in the urine served as the measures of adrenocortical function.

These emotional disturbances caused consistent but modest increases in the 17-hydroxycorticosteroids in the blood and urine. Plasma steroid values remained within the normal physiological range under the influence of emotional upset. These changes were less than those observed following the intravenous administration of ACTH, Piromen, insulin, or electroshock treatment and moderate exercise.

(Authors' Abstr.)

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1. Biochemistry, Physiology, Pathology, etc.

Experimental Psychiatry. Buscaino, V. M. [*Gazz. sanit.*, **20**, 417 (1949); *Excerpta Med.*, Sect. VIII, **3**, 635 (1950).]

In experiments on man and animals, mescaline, diethyllysergamide, and the alkaloid of Opuntia cylindrica cause syndromes resembling schizophrenia (I). Bulbocapnine produces a motor effect resembling catatonic (I). The possible toxic pathogenesis of spontaneous (I) by metabolic production of organic bases is discussed.

W. C. Tobie (Chem. Abstr.)

Ammonia Formation and Glutamic Acid in Brain Tissue. Takagaki, Genkichiro. [*J. Biochem.*, **42**, 131 (1955).]

When homogenate of guinea-pig brain in Krebs-Ringer phosphate solution (200 mg./ml.) is incubated at 37°, NH_3 formation increases with time and is accompanied by a rapid decrease in glutamic acid (I) as well as a gradual increase in glutamine (II); at the same time, there is a decrease of adenylic acid compounds (III), which are determined spectrophotometrically at 260 mμ. Addition of (I) to the homogenate causes no appreciable rise in NH_3 production, but gives a considerable increase in (II). The spectrophotometric estimation at 260 mμ indicates a predominant deaminative NH_3 formation from (I), especially in the initial 10 minutes of reaction. On addition of 10^{-3} M nucleotides to the brain slice, yield of NH_3 is as follows: inosine triphosphate (ITP) $\gg$ control $>$ adenosine monophosphate (AMP) $\gg$ inosine monophosphate (IMP); that of (II) is greater by AMP, control, IMP, ITP in order.

F. K. Anan (Chem. Abstr.)

Phosphorylation in Brain Tissue in the Chick. Gordon, O. M., et al. [*Experientia*, **11**, 194 (1955).]

Suspensions of chick brain and liver were incubated with adenosinetriphosphate (I) and $KH_2P^{32}O_4$ in a Dubnoff metabolic shaker. After incubation the labelled components were separated chromatographically; measurements of radioactivity and spectrophotometric analyses were then effected, the data being expressed as counts/min./optical d. unit at 260 mμ. In all cases the specific activity of the (I) was less in brain than in liver. The difference between the rate of exchange in brain and in liver appears to be greater in the hatched chick than in the embryo incubated for 17 days.

D. S. Farner (Chem. Abstr.)

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Nucleic Acids and Phospholipides of the Rabbit Brain in Ontogenesis. Manukyan, K. G. [*Doklady Akad. Nauk S.S.S.R.*, **101,** 1085 (1955).]

The content of nucleic acids and phospholipides in the rabbit brain in various stages of growth was determined. The results, which are shown graphically, indicate a gradual decline in the cerebral cortex of deoxyribonucleic acid, ribonucleic acid behaving similarly. In the cerebellum there is a mild rise of both components immediately after birth for some 15 days; in the medulla both components show a moderate decline with age, the spinal cord showing the same result. Phospholipides generally increase in concentration with age, although the cerebral cortex shows a sharp min. some 10 days after birth.

G. M. KOSOLAPOFF (Chem. Abstr.)

Phosphorus Metabolism in the Cortex of the Cerebrum in Dogs During Sleep and Wakefulness. Smirnov, A. A. [*Doklady Akad. Nauk. S.S.S.R.*, **101,** 913 (1955).]

P metabolism in dog brain was followed by P^{32} tracing. The rate of P renewal and penetration of phosphates from the blood is 3–4 times greater for the cerebral cortex than for midbrain; the motor and visual zones are 1·5 times more active in this respect than the auditory zone. In sleep the rate of phosphate renewal and penetration drops by some 25 per cent., except for the auditory zone which is but little affected.

G. M. KOSOLAPOFF (Chem. Abstr.)

Study of the Rate of Exchange of Phosphorus in the Brain of Rabbit in Various Stages of Ontogenesis with the Aid of Radioactive Phosphorus. Smirnov, A. A., and Chetverikov, D. A. [*Doklady Akad. Nauk. S.S.S.R.*, **90,** 631 (1953).]

P exchange was studied by intraperitoneal introduction of P^{32} after which in 12 hours the brain was examined after trepaning and freezing the specimens in dry ice. It was shown that P^{32} enters most rapidly the less complex acid-solution organic compounds of brain tissue, less rapidly it enters the P-containing proteins, while the least rate is found for phospholipides. The radioactivity of all fractions declines rapidly in the 1st weeks of postembryonic period of the animals. After 2 months of age the value remains nearly consistent with age. This is mainly caused by lesser exchange between the phosphates of blood and brain. The highest uptake of P^{32} occurs in medulla oblongata, other brain parts are similar to each other in this respect, in the acid solution and protein fractions. The medulla also shows the most rapid exchange of phosphates with the blood.

G. M. KOSOLAPOFF (Chem. Abstr.)

The Quantitative Determination of Some Metals in the Human Brain. Dorfman, S. I., and Shipitsyn, S. A. [*Biokhimiya*, **20,** 136 (1955).]

Samples of different parts of human brains of 50 persons who died of accidents and of certain somatic diseases were subjected to chemical analysis and the results evaluated statistically. Brain tissues were washed free from blood, weighed, dried to consistent weight, ashed, and tested for Pb, Cu, Si, Mn, Mg, Fe, and Ca. By means of a curve of concentrated distribution it was shown that the cortex of the cerebrum contained in mg. per cent. on the dry basis: Pb 0·16, Cu 2·7, Si 8·0, Ca 32, Mn 0·15, Fe 16, Mg 190; the cerebellum, Pb 0·25, Cu 2·8, Si 7·5, Ca 40, Mn 0·23, Fe 16, Mg 250; the hypophysis, Pb 1·5, Cu 3·4, Si 38, Ca 150, Mn 0·35, Fe 55, Mg 300. In the cerebral cortex values were practically the same for the pars posterior, central anterior convolution and the frontal pole.

B. S. LEVINE (Chem. Abstr.)

Cocarboxylase and the Excitability of the Nerve Centers. Di Stefano, E., and Previtera, L. [*Boll. soc. ital. biol. sper.*, **30,** 1324 (1954).]

The excitement of the nerve centers which is produced by cocarboxylase may be associated with an action on the synthesis of acetylcholine.

FELIX SAUNDERS (Chem. Abstr.)

The Presence of Mucopolysaccharides in the Central Nervous System. Benassi, G. [*Boll. soc. ital. biol. sper.*, **30,** 1258 (1954).]

Mucopolysaccharides and glycoproteins are found in central nervous system tissues.

FELIX SAUNDERS (Chem. Abstr.)

The Presence of Different Fractions of True Combined Creatine in the Central Nervous Substance. Mitolo, M., et al. [*Boll. soc. ital. biol. sper.*, **30,** 1083 (1954).]

Creatine occurs in nervous tissue bound with phosphate and other substances.

FELIX SAUNDERS (Chem. Abstr.)

The Role of Water Metabolism Impairments in the Etiology of Some Neurologic Symptoms. Effect of Cortisone and of Posterior Hypophysis Extract. Haguenau, J., and Weil, B. [*Bull. mem. soc. med. hop. Paris*, **70,** 753 (1954).]

A patient with paresis, tendinous hyperreflexivity and positive Babinski test, had hemoconcentration, total blood proteins 88 g./l, albumin/globulin 1·6, plasma cyroscopy $\Delta T - 0·60°$, Na 158, K 5 meq./l and urinary 17-keto steroids 9·5 mg./day. Treatment with adrenocorticotropic hormone (I), cortisone (II), and posterior hypophysis extract (III), suppressed

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the dehydration, and the neurologic symptoms regressed. The plasmic hypotonia stopped the antidiuretic hormone secretion thus provoking salt retention, and increased the adrenocortical hormone output resulting in dehydration. (I) and (II) treatments partially improved the dehydration, but the weight increased only after including (III) in the treatment. The neurologic syndrome disappeared only after rehydration of the cerebral cells.

GEO. SAG (Chem. Abstr.)

Neurological Aspects of Industrial Intoxication from Manganese. Boyer, J., and Rodin, J. [*Rev. neurol.*, **90**, 13 (1954).]

Chronic industrial poisoning from Mn produces disturbances of the central nervous system associated with endocrine and metabolic disorders. The electroencephalographic changes showed evidence of acute cortical atrophy. The histological findings are recorded.

H. W. GILLEN (Chem. Abstr.)

Phenylpyruvic Oligophrenia. Perrier, F. [*Gaz. med. France (Paris)*, **56**, 873 (1949).]

In this disease, the amounts of phenylpyruvic acid in the urine are approximately inversely proportional to the mental age. There is hypopigmentation, probably connected with the same metabolic disturbance which produces phenylpyruvic acid. The enzyme chemistry of the liver and kidneys is disturbed.

W. C. TOBIE (Chem. Abstr.)

Somatic Aspects of Mental Health and Disease. Richter, D. [*Brit. Med. Bull.*, **6**, 44 (1949).]

Biochemical, physiological, and neurological aspects are discussed, including the effects of hyperglycemia and anoxia.

W. C. TOBIE (Chem. Abstr.)

The Enteric Distribution of 5-hydroxytryptamine (Enteramine, Serotonin) in Some Large Domestic Mammals and the Appearance of 5-hydroxytryptamine and the Enterochromaffin Cell System in the Embryonic Calf. Faustini, Remo. [*Am. J. Vet. Research*, **16**, 397 (1955).]

This investigation of the occurrence and distribution of 5-hydroxytryptamine (I) in the gastrointestinal tract of farm animals confirms the thesis that (I) is the secretion or deposit product of the enterochromaffin cells and demonstrates that the substance circulates in fetal blood at least as early as in the 10th to 12th week of intrauterine life.

RUDOLPH SEIDEN (Chem. Abstr.)

Effects of Strychnine Application to the Ansiform Lobule on the Electric Activity of the Cerebral Cortex. Canestrari, Renzo, et al. [*Atti accad. nazl. Lincei, Rend., Classe sci. fis., mat. e nat.*, **18**, 332 (1955).]

Application of paper disks of 5-mm. diameter soaked with a 1 per cent. strychnine nitrate solution to one ansiform lobule of the cerebellum produced in the dog a marked increase in the electrical potentials of the contralateral cerebral motor cortex. The increases in the ipsilateral cortex were less significant. The effects in the cat were similar but less consistent. Electrical stimulation of the same area of the neocortex caused stimulation of electrical waves over a wide area of the cerebrum, whereas the effect of strychnine applied only to circumscribed areas. The possibility is discussed that some neurons function with a transmitter other than acetycholine, the cleavage of which is specifically inhibited by strychnine, whereas the electrical stimulation applies to neurons of both types of transmission.

A. E. MEYER (Chem. Abstr.)

Specific Changes in the Cerebellum in Chronic Mercuric Chloride Poisoning. Enders, A., and Noetzel, H. [*Naunyn-Schmiedebergs Arch. exptl. Pathol. Pharmakol.*, **225**, 346 (1955).]

Administration of 100 to 200 mg. $HgCl_2$ to rats over a period of various months causes specific neurological symptoms and Ca deposits in the cerebellum.

A. E. MEYER (Chem. Abstr.)

Mesomucinase and Brain Barrier. Ferrannini, A., and Mongelli Sciannameo, N. [*Boll. soc. ital. biol. sper.*, **29**, 760 (1953).]

Mesomucinase was administered intravenously to guinea pigs, 2–300 units in 2–3 cc. This was followed by various ways of parenteral application by a number of dyes, and the passage into the cerebrospinal fluid and to the surface of the brain was observed. There was no evident influence on the permeability of the protective brain barrier.

A. E. MEYER (Chem. Abstr.)

Content of Water and Residual Nitrogen in the Brain of Animals Under Conditions of Block and Stimulation. Manoilova, O. S., and Bakulina, N. D. [*Fiziol. Zhur. S.S.S.R.*, **41**, 262 (1955).]

Narcotics and sleep-producing substances lower the content of H_2O and residual N in

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the brain of animals (white mice, rats, cats) the results being shown on simple bar graphs. Cardiazole increased H_2O and residual N content of the brain in the same animals.

G. M. KOSOLAPOFF (Chem. Abstr.)

Hematoencephalic Barrier. III. The Effect of Barrier on Drugs Acting on the Parasympathetic Nervous System, with Special References to Antibiotics. Kelentei, B., and Foldes, I. [*Acta Physiol. Acad. Sci. Hung.*, **6**, 433 (1954).]

Acetylcholine (I) was injected intravenously into cats and rabbits followed by administration of penicillin (II). (II) appeared in cerebrospinal fluid in a concentration of 0·1–0·25 γ/ml. After simultaneous administration of physostigmine (III) and (I), the concentration of (II) in the cerebrospinal fluid reached much higher levels. Atropine had no effect on the permeability of the blood-brain barrier. Injection of streptomycin, chloramphenicol or Terramycin alone produced no demonstrable amounts in the brain or cerebrospinal fluid. After pretreatment with (I) and (III), each of these antibiotics could be detected.

HERMANN I. CHINN (Chem. Abstr.)

Carbohydrate Metabolism in Brain Disease. V. Effect of Adrenaline on Intermediary Carbohydrate Metabolism in Schizophrenic and Manic-depressive Psychoses. Henneman, Dorothy H., et al. [*Arch. Internal Med.*, **95**, 594 (1955).]

The carbohydrate metabolism after injection of adrenaline in doses of 0·01 mg./kg. body weight was studied in normal subjects, in patients with psychoses of recent onset, and in patients with chronic psychoses with and without previous lobotomy. The psychoses were schizophrenia and manic-depressive psychoses. The change in blood pyruvic, citric, and α-ketoglutaric acid concentrations were the same in all 3 groups of subjects. Rises in true blood glucose and lactic acid concentrations were normal in patients with psychoses of recent onset but were decreased in those patients with chronic psychoses who had not been lobotomized.

EDWARD J. VAN LOON (Chem. Abstr.)

Chemical Examination of Blood in Mentally Retarded Children. Hirsch, W., and Fischer, E. [*Harefuah*, **48**, 27 (1955).]

High carotene and low vitamin A values were found in hypothyroidism, cerebral palsy and certain cases of mental retardation not due to abnormally functioning thyroid gland. In malnutrition both carotene and vitamin A values were low or even absent. Deficient conversion of carotene to vitamin A may be due to liver damage, but the liver-function tests were normal.

A. S. MIRKIN (Chem. Abstr.)

Definite Identification of Choline in Cerebrospinal Fluid with Dipicrylamine by Preparative and Paper-chromatographic Methods. Ackermann, R., and Ackermann, D. [*Hoppe-Seyler's Z. physiol. Chem.*, **300**, 92 (1955).]

By precipitation with dipicrylamine 0·59 mg. choline was isolated/l. of cerebrospinal fluid. The derivative was identified by its m.p., by its m.p. in mixture with authentic derivative, and by paper chromatography of choline chloride.

ERICH HEFTMANN (Chem. Abstr.)

The Action of Lysergic Acid Diethylamide (LSD) on Mammalian Cholinesterases. Thompson, R. H. S., et al. [*Brit. J. Pharmacol.*, **10**, 61 (1955).]

(LSD) was a relatively powerful competitive, readily reversible inhibitor of pseudocholinesterase (I) in human serum and brain. True cholinesterase and tributyrinase of human brain were only slightly affected by concentrations of (LSD) which caused nearly complete inhibition of (I). (I) of rat, guinea pig, rabbit, chicken, and monkey brain were less sensitive to inhibition by (LSD) than (I) of human brain. (LSD) was a more powerful inhibitor of (I) than ergotoxine, ergotamine, dihydroergotamine, ergometrine, or methylergometrine.

RICHARD F. RILEY (Chem. Abstr.)

Production of Ethyl Alcohol Habituation. Fujita, Fujio. [*Folia Pharmacol. Japon.*, **50**, No. 3, 258 (1954).]

Cholinesterase activity in brain of normal rabbits and rabbits injected with 2 g./kg. alc. showed similar values, but the activity of rabbits habituated to alcohol by repeated administration for over 2 months showed a marked decrease (60 per cent.). Liver and blood serum cholinesterase activities showed similar results (40 per cent. and 50 per cent., respectively). In some cases these activities of the acutely intoxicated rabbit slightly increased. A discussion is given on the mechanism of alcohol habituation with reference to changes in enzymic systems.

SHOZABURO KITAOKA (Chem. Abstr.)

Arteriosclerotic Occlusion of Cerebral Arteries: Mechanism and Therapeutic Considerations. Bruetsch, Walter L. [*Circulation*, **9**, 909 (1955).]

The present concept of "cerebral thrombosis" may be incorrect, and a high cholesterol intake may not be the all-important causative factor. The cause of fibroplastic proliferation

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in the atherosclerotic plaque may not be initiated by a lipide deposit. In some cases, the lipide seems to depress rather than stimulate the formation of connective tissue in the plaque.

THERESA SEVERN (Chem. Abstr.)

The Cerebrospinal Fluid Caramelization Test. Solé, A. [*Deut. med. Wochschr.*, **80,** 869 (1955).]

Spinal fluid (3–5 ml.) was autoclaved for 1 hour at 1·5 atm, and the glucose content was estimated qualitatively from the degree of browning. No caramelization was obtained at or below 40 mg. per cent. glucose. The test was used in the diagnosis of tuberculous meningitis in which low glucose values were observed.

JAMES C. MATHIES (Chem. Abstr.)

Cerebrospinal Fluid Following Oral Administration of Cortisone Acetate or Hydrocortisone. Abelson, Denis, et al. [*J. Endocrinol.*, **12,** 87 (1955).]

No obvious differences in steroid pattern were found in cerebrospinal fluids obtained from patients with various neurological disorders. Fluids from similar patients up to 12 hours after oral administration of 200 mg. of either cortisone (I) acetate or hydrocortisone (II) were also examined. Extracts made from 50–100 ml. by modification of the method of Nelson and Samuels were subjected to paper chromatography by the system of Zaffaroni *et al.*, with 3- and 60-hour chromatograms. In controls (I) and (II) were identified in concentrations of 0·1–0·2 and 0·2–0·4 γ per 100 ml., respectively. (I) was not increased by ingestion of either steroid; (II) was increased after both, though less after (I). Maximum increases in (II) were seen after 4·5 hours. Other unidentified compounds also appeared on chromatograms.

K. KNOWLTON (Chem. Abstr.)

Family Periodic Paralysis in a Mentally Deficient Boy. Couston, Thomas A. [*Arch. Disease Childhood*, **30,** 193 (1955).]

After epileptic attacks had been brought under control in a boy 16 years old, fits of flaccid paralysis continued. They were associated with plasmo-serum K levels as low as 2·2 mg./l compared with his nonparalytic level of 4·5. They were ended by ingestion of K salts. Ingestion of large amounts of glucose produced only preliminary symptoms of these attacks, but the full syndrome appeared after 5 units of insulin were injected.

KATHRYN KNOWLTON (Chem. Abstr.)

Calcium and Magnesium in the Cerebrospinal Fluid. Harris, Wm. H., and Sonnenblick, Edmund H. [*Yale J. Biol. Med.*, **27,** 297 (1955).]

In a series of 40 patients with no signs of neurological, neurotic, or psychotic disorders, cerebrospinal fluid contained 4·95±0·11 mg. Ca/100 cc. and 3·01±0·06 mg. Mg/100 cc., with a ratio of 1·64±0·03. In 10 of these, serum Ca and Mg were also determined with a ratio of 4·1. A modification of the ethylenediaminetetraacetic acid procedure is described for the determination of Ca and Mg.

LEO LUTWAK (Chem. Abstr.)

Histochemistry of Cholinesterase. II. Distribution of Cholinesterase in the Central Nervous System. Toyota, Masateru. [*Nisshin Igaku*, **41,** 34 (1954).]

Distribution of cholinesterase (I) in the central nervous system of the dog was determined by the method of Koelle. Concentration of (I) was high in gray matter and low in white matter. Caudate nucleus, putamen, substantia nigra, and olivary body contained high concentrations of (I). (I) was found mainly in the cytoplasm of the cell. A little (I) was found also in myelinated nerve fibers.

TETSURO KONO (Chem. Abstr.)

Carbohydrate Metabolism of Normal Brain. Prokhorova, M. I. [*Uchenye Zapiski Leningrad, Gosudarst. Univ. im. A. A. Zhdanova, No. 164, Ser. Biol. Nauk., No. 32,* 362 (1954).]

Brain carbohydrate metabolism was studied by arteriovenous differences in sugar, lactic acid, and blood gases. Sugar, lactic acid, CO_2, and O_2 of blood flowing to and from the upper longitudinal sinus, without excitation of the animal were carried out, from 2 months to over 2 years. Sugar content of arterial blood fluctuated from 56 to 101 mg. per cent., and was lower (45–86 mg. per cent.) in blood flowing away from the brain, the fluctuation being greater for the more excitable dogs. In the normal state, brain used 6·0–15·0 mg. sugar/100 ml. blood, average 8–9 mg./100 ml. blood. Sugar fluctuation was 5–12 mg. per cent. for short time intervals of 1–3 hours. The brain yielded 6·4 ml. CO_2/100 ml. inflowing blood. Normal brain respiratory quotient (R.Q.) usually ranged from 0·50 to 1·25; the R.Q. approximated unity (average of 65 determinations). The wide range in R.Q. indicated that metabolism of compounds in the brain is a continuous process. Oxidizing processes of the brain over short intervals apparently occur at unequal intensities. Comparison of glucose and O_2 consumption with CO_2 indicated that most of the glucose is oxidized to CO_2 in the brain. Lactic acid values of blood for different dogs, particularly of the more excitable ones, fluctuated greatly; the arteriovenous difference was not consistent, amounting frequently to ±1·0 mg. per cent., which could be due to experimental error. The brain at times retains, and then gives up, lactic acid. Variability of lactic acid metabolism in the brain can be attributed to variability in oxidation processes of brain tissue within given time intervals. O_2 consumption by dog

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brain averaged 6·8 ml./100 ml. blood flowing through brain tissue, the CO_2 evolution being 6·4 ml., the R.Q. approximately 1. Comparison of glucose consumption by the brain with CO_2 evolution or retention of lactic acid, indicates that oxidizing processes account for not less than 80–90 per cent. of the carbohydrate consumption.

CLAYTON F. HOLOWAY (Chem. Abstr.)

The Feeding Center of the Hypothalamic Region of the Rat Brain. Forssberg, A., and Larsson, S. [*Experientia*, **11**, 158 (1955).]

Hungry rats (I) were injected intraperitoneally with 200 mg. $Na_2H^{32}PO_4$ at the end of a 24-hour hunger. Fed controls (II) were similarly treated. Animals were killed by plunging into liquid O 15–60 minutes after injection. The feeding center and 2 adjacent parts of the hypothalamus were prepared from frozen brain tissue; samples of cerebrum, blood, liver and muscles were taken for comparison of gross distribution in (I) and (II). The livers of (I) took up significantly more P^{32} than those of (II) whereas there were no significant differences between the muscles, cerebrum, and blood of (I) and (II). The feeding-center sample from (I) had more P^{32} than that from (II) whereas the opposite was true for the 2 adjacent parts. The distribution of adenosinetriphosphate and phosphocreatine combined was similar to that of P^{32}.

D. S. FARNER (Chem. Abstr.)

Metabolism of Acetylcholine. IV. Its Relation to Sulfhydryl Groups. Nakata, Fujio. [*Nisshin Igaku*, **41**, 43 (1954).]

Concentrations of SH groups in various organs of rat and dog were determined amperiometrically. The concentration of SH groups showed no relation to that of cholinesterase or the ability of the organ to produce acetylcholine.

V. Effect of Copper Sulfate. [*Ibid*, 78–80.]

When 100 mg. $CuSO_4$ was added to 2 ml. of diluted brain homogenate (diluted × 210 for the determination of cholinesterase (I), × 3 for SH groups (II), and × 13 for acetylcholinesterase (III)), the amount of (I), was 41 per cent., (II) was 62 per cent., and (III) was 79 per cent. of that of the controls.

TESURO KONO (Chem. Abstr.)

Action of Thromboplastinase on Human Brain Lipide Fractions. Feldman, Donald and Ginell, Robert. [*Proc. Soc. Exptl. Biol. Med.*, **89**, 13 (1955).]

The action of the bacterial thromboplastinase previously described on thromboplastically active lipide material is described. In all cases, loss in clotting potency was accompanied by a liberation of acid solution organic phosphate. An unidentified P compound was isolated from the reaction mixture after thromboplastinase action.

L. E. GILSON (Chem. Abstr.)

Experimental Psychosis Elicited by Lysergic Acid Diethylamide. Roubíček, Jiří and Srnec, Jan. [*Časopis Lékařu Ceskych*, **94**, 189 (1955).]

Lysergic acid diethylamide (I) was administered to 12 normal subjects. The picture was dominated by sensory aberrations, hypomanic behavior, and vegetative amphotony. Somatopsychic depersonalization occurred; K level increased slightly, glycemia showed no change, cephalincholersterol test was negative. The sensitivity of psychotic patients (30 cases) to (I) was somewhat decreased. (I) appears to cause a manifestation of latent symptoms. No lasting improvement was noted in depressive states. Electroencephalograms (EEG) were characterized by an acceleration of the α-rhythm (in 27 of 31 previously normal EEG) and by an increase of amplitude of the β-waves. Both diencephalon and cerebral cortex seem to be affected by (I).

I. M. HAIS (Chem. Abstr.)

Some Effects of the Peripheral Field on the Cytochemical Differentiation of Neurons. Mottet, Karle and Barron, Donald H. [*Yale J. Biol. and Med.*, **26**, 275 (1954).]

The right posterior limb bud and adjacent tissue were removed from 70 chick embryos before 3 days' incubation leaving the left side unoperated as control. Nuclear deoxyribonucleic acid (I), measured by Feulgen staining, was diminished on the control sides in spinal cord cells differentiating into neurons, while cytoplasmic ribonucleic acid (II), measured by Nissl staining, and acid phosphatase (III), demonstrated by Gomori staining, became more intense. These cytochemical changes paralleled the morphological. On the operated side, the anterior horn and spinal ganglion cells that normally differentiate into motor and sensory neurons remained cytochemically indistinguishable from indifferent cells. Thus, the concentration of (I), (II), and (III) was shown to be affected by the peripheral field.

LEO LUTWAK (Chem. Abstr.)

Preliminary Studies on the Hormones of the Brain and of the Postcerebral Complex of the Phasmes, Carausius morosus and Cuniculina cuniculina. L'Hélias, Colette. [*Compt. rend.*, **240**, 1141 (1955).]

Brains (I) of phasmes were subjected to paper electrophoresis. At pH 7·4, (I) gave a band which provoked darkening in an animal deprived of the corpora cardiaca (II). (II) at

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this pH yielded a more mobile compound which did not cause darkening. The corpora allata (III) gave a band analogous to that of (I) but which led to less darkening. At pH 3·2, (II) gave a band leading to darkening and essentially identical to the hormone of (I). Injections of extractions of (I), (II), and(III) at pH 3·2 provoked melanization in animals without (II). In normal animals, or those without (III), such injections led to the development of an orange color. The (II) appeared to have an inhibitory role on the last stage of melanization. The hormone of (II) was a thermostable substance that did not dialyze through collodion membranes. Smaller, dialyzable compounds with hormone activity were present in the extractions. Under a fluorescence microscope, various areas of the (I) of C. cuniculina, after ultraviolet irradiation at pH 3·2, showed a blue fluorescence characteristic of pteridines and which did not appear in H_2O, MeOH, or HOAc. The injection of synthetic pteroylglutamic acid (IV) into these animals gave the same results as that of eluates from the electrophoresis of (I). Eluates of (I), (II) and (III) stimulated the growth of Lactobacillus casei as did (IV).

LEO LUTWAK (Chem. Abstr.)

Cholinesterase Activity of Cerebrospinal Fluid. Jefferson, Michael. [*Clin. Sci.*, **13,** 599 (1954).]

When the protein content of spinal fluid is abnormally high, pseudocholinesterase activity is increased, probably related to the rise in the globulin component. True cholinesterase activity may decrease with high spinal fluid protein levels. There is a significant correlation between spinal fluid protein and the ratio: true/pseudo cholinesterase activity.

BERNARD KLEIN (Chem. Abstr.)

Effect of Niacin Avitaminosis on Conditioned Reflexes in Dogs. Efremov, V. V., et al. [*Voprosy Pitaniya*, **13,** No. 3, 10 (1954).]

In dogs fed a niacin (I)- and tryptophan (II)-deficient diet (a corn diet containing some (II)-free casein hydrolyzates) the amount of N-methylnicotinamide (III) excreted with the urine decreased from 6–12 (control) to 1·2–0·2 mg./day. During the restoring therapy (addition of (I) to the diet) the amount of the (III) excreted increased rapidly. The amounts of dipyridine nucleotides (IV) and proteins in blood did not change significantly (9–14 γ and 7·5–6·8 g./100 ml. blood, respectively) during the experiment. The normal wt. was restored and the amount of (IV) in blood was increased (up to 20γ/100 ml. blood) after the experimental dogs have received a 50-mg. dose of (I). The avitaminosis was developed within 50–60 days of the feeding. During the avitaminosis the conditional reflexes were rapidly distorted: the disturbance of the higher nervous system (cerebral cortex) occurs much sooner than the appearance of the clinical symptoms of the avitaminosis.

E. WIERBICKI (Chem. Abstr.)

Effect of Potassium Ion on Brain Slices. Tsukada, Yazuzo and Takagaki, Genkichiro. [*Nature*, **175,** 752 (1955).]

The effects were determined of various substrates and inhibitors on the alterations of the metabolism of guinea-pig cortex slices induced by an increased KCl concentration. The O_2 consumption (I) of the slices was determined manometrically in Krebs-Ringer at 37°. Dilution of Na ion to less than 15 millimoles by the addition of choline prevented the usual increase of (I) caused by 50 millimoles KCl (the K effect). A Na-free solution also caused a 3-fold increase in anaerobic lactate production (II), relatively independently of the K concentration. 2-4-Dinitrophenol (KNP) 5×10^{-5}M) increased (I) even in Na-free solutions, whether the substrate was glucose or pyruvate at 10 millimoles. With the latter substrate, the (II) was slight and not increased by high K or (DNP). Malonate (III) at 10 millimoles prevented the K effect whether pyruvate 1, lactate 5, or glucose 10 millimoles served as substrate. Fumarate or oxalacetate reversed this inhibition of the K effect by (III). In normal K concentrations, although the (III) did not greatly affect (I) or (II), it markedly reduced the glucose consumption. High K solutions increase (I), (II), and substrate consumption. The addition of (III) further increases (II), but (I) and substrate consumption are reduced toward normal values. (III) also partially prevented the decrease of phosphocreatine caused by high K, even though (III) alone had no effect on the phosphocreatine. Fluorocitrate and Na azide partially prevented the K effect on (I). The authors conclude the K ion may affect 2 enzymic points: the glycolytic system and the pyruvate oxidation system, probably the condensing enzyme.

H. P. J. (Chem. Abstr.)

Stimulation of Secretion of Oxytocin by the Hypothalamus by the Application of Adrenaline to the Cerebral Cortex. Chamorro, Antonio and Minz, Bruno. [*Compte. rend.*, **240,** 1368 (1955).]

Application of adrenaline to the frontoparietal region of the cerebral cortex of female rabbits (previously treated with subcutaneous estradiol benzoate) provoked secretion of oxytocin by the hypothalamus as indicated by uterine contraction. Oxytocin seemed to originate in the posterior hypothalamus and vasopressin in the anterior hypothalamus; this indicates a possible dual function of a single region of the cerebral cortex.

VERA C. GLOCKLIN (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Movements of Cations During Recovery in Nerve. Hodgkin, A. L., and Keynes, R. D. [*Symposia Soc. Exptl. Biol.*, **8**, *Active Transport and Secretion*, 423 (1954).]

At each impulse a stimulated nerve gains Na and loses K. Following stimulation Na is slowly excreted from squid axons. Tracer experiments show a nearly equal flux of Na in and out of the axon. The secretory work is about 10 per cent. of the resting O consumption. Dinitrophenol (DNP) reduces Na efflux almost to zero. Cyanide and azide have similar effects. (DNP) has a negligible effect on the excitability membrane potentials and Na influx of stimulated squid axons confirming the theory that Na movement into the nerve during excitation is passive and the result of flow along existing ion gradients. Na efflux is reduced to one-third in K-free media but is unchanged by polarization currents which increase the membrane potential by 28 mv. Na efflux is slightly increased in an ion-free isotonic media but is still blocked by (DNP). A part of the K influx into nerves after stimulation is active and may be coupled with Na secretion.

ROBERT B. DEAN (Chem. Abstr.)

Visceral Functions of the Nervous System. Burn, J. H. [*Ann. Rev. Physiol.*, **17**, 293 (1955).]

The review covers hypothalamic and posterior lobe extracts, paraventricular nucleus and oxytocin, release of hormones from the pituitary, the pituitary and renal circulation, function of pseudocholinesterase, cholinesterase in glial tumors, sympathin in the brain, action of acetylcholine on Na transport, acetylcholine as a local hormone, transmission of sensory impulses, the function of 5-hydroxysecretion, effect of adrenaline on ganglion cells, gastric secretion, substances causing pain, blood histamine and the adrenals, histamine liberation and lymphagogue action, gastrin as a histamine liberator, histamine inhibitors, and amine oxidase. Eighty-eight references.

RACHEL BROWN (Chem. Abstr.)

Conduction and Transmission of the Nervous System. Crescitelli, Frederick (*Univ. of California, Los Angeles*). [*Ann. Rev. Physiol.*, **17**, 243 (1955).]

Researches employing the technique of intracellular recording with microelectrodes are featured in this review. One hundred and sixty-three references.

RACHEL BROWN (Chem. Abstr.)

Influence of Exogenous Hormones on the Acetylcholine Content of the Middle Hypothalamus in Rats. II. The Effect of Adrenocorticotropic Hormone (ACTH), Deoxycorticosterone Acetate (DOCA), Adrenosuprarenal Extract, and the Adrenosuprarenal on the Diencephalic Acetylcholine Content. Gitsch, E., and Reitinger, J. [*Zentr. Gynakol.*, **75**, 373 (1953).]

Adrenalectomy has no effect on the acetylcholine content of the region of the tuber cinereum in female rats. In intact female rats (ACTH) and adrenosuprarenal extract cause an increase in acetylcholine content; (DOCA), however, does not cause an increase comparable to that of (ACTH) or adrenosuprarenal extract. The increase observed 4 weeks after ovariectomy is not due to adrenosuprarenal activity.

R. D. H. (Chem. Abstr.)

Effect of Controlled Hypotension on Cerebral Function and Circulation. Saunders, J. W. [*Lancet*, **266**, 1156 (1954).]

Hypotension was produced by hexamethonium bromide and pneumatic suction applied to the legs. The arterio-venous O difference (4·8 vol. per cent.) was less than normal and the estimated cerebral blood flow (46·9 ml./100 g. brain/min.) was about normal. Cerebral blood flow and oxygenation remain adequate during hypotension when the patient is kept horizontal or nearly so if the systolic pressure does not fall below 55–60 mm. Hg.

BARBARA MURRAY (Chem. Abstr.)

Cupremia in Nervous System Diseases. Hammerschmidt, R. Violeta. [*Anales fac. farm. y. bioquim., Univ. nacl. mayor San Marcos*, **4**, 224 (1953).]

The blood Cu level was raised in chorea, athetosis, post-encephalitic parkinsonism, and parkinsonian syndrome.

ALFREDO LEVY (Chem. Abstr.)

Pyruvemia in Experimental Pigeon Polyneuritis. Chiong Ch, Rosa. [*Anales fac. farm. y bioquim., Univ. nacl. mayor San Marcos*, **4**, 215 (1953).]

Polyneuritis raises the pyruvic acid (I) blood level in pigeons, while with healing it returns to normal. The normal blood level of (I) is 1·72 mg./100 g. in male pigeons, and 1·42 mg./100 g. in females.

ALFREDO LEVY (Chem. Abstr.)

Composition of Brain Pentosenucleic Acid in Normal and Poliomyelitis Virus-infected Mice. Siegel, Benjamin V., and Kuusi, Taina K. [*Proc. Soc. Exptl. Biol. Med.*, **89**, 305 (1955).]

Two different methods of hydrolysis and chromatography were applied to isolated and purified pentosenucleic acid preparations from brains of control mice and mice inoculated

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intracerebrally with poliomyelitis virus MEF_1 strain (Type 2) for study of the purine and pyrimidine compound. A small but apparently significant increase in uracil content was observed in the preparations from infected mice; that showed paralytic symptoms of central nervous system involvement.

L. E. GILSON (Chem. Abstr.)

Hematological Changes in the Course of Multiple Sclerosis. Persson, I. [*Nord. Med.*, **49**, 646 (1953).]

In a young patient the fibrinogen content of the plasma was high (maximum 450 mg./100 ml.) in relation to the sedimentation rate (10 mm. and less) during 2 periods of disease activity; the number of thrombocytes was decreased. Addition of cerebrospinal fluid caused agglutination of the thrombocytes. These biochemical changes are believed to support the theory of thrombosis as the cause of plaque formation.

P. M. B. (Chem. Abstr.)

The Constitution of the Highly Unsaturated C_{20} and C_{22} Fatty Acids of Brain Glycerophosphatides. Klenk, E., and Bongard, W. [*Congr. intern. biochim., Résumés communs., 2^e Congr., Paris*, 1952, 160–1 (in English).]

Commentary on the data of another paper. All unsaturated C_{20} and C_{22} fatty acids of brain phosphatides have the 1st double bond from the terminal Me group in the same position as in oleic, linoleic, and linolenic acids.

W. C. TOBIE (Chem. Abstr.)

The Effect of Mental Arithmetic on Cerebral Circulation and Metabolism. Sokoloff, Louis, et al. [*J. Clin. Invest.*, **34**, 1101 (1955).]

Studies of cerebral circulation and metabolism at rest and during the mental exertion required in solving problems in arithmetic were made in 13 university students and faculty members. There were no changes in cerebral blood flow, cerebral O consumption, cerebral vascular resistance, and cerebral respiratory quotient from the control levels during the performance of mental arithmetic. Except for a slight increase in arterial O content, mental arithmetic was not accompanied by any change in the blood O concentration, CO_2 tension, pH, or arterial hemoglobin concentration. Comparison of the subjects in the mental arithmetic study and an independent group of normal controls revealed significantly higher cerebral blood flow and O consumption.

JOHN T. MYERS (Chem. Abstr.)

The Effects of Sleep and Lack of Sleep on the Cerebral Circulation and Metabolism of Normal Young Men. Mangold, Renward, et al. [*J. Clin. Invest.*, **34**, 1092 (1955).]

Studies of cerebral blood flow, cerebral vascular resistance, cerebral O consumption, blood gases, hemoglobin concentration, and blood pH were made. The mean values for the rested subjects were almost identical with normal values previously reported for the method. Fatigued subjects showed no differences from the resting controls except for an elevation in cerebral blood flow. During natural sleep there were no changes in cerebral O consumption, blood hemoglobin concentration, and arterial O content. The fatigued subjects who slept were distinguished from those unable to sleep by higher values in CO_2 tension and lower values of pH in arterial and cerebral venous blood even during the control period. These findings suggest some relation between respiratory acidosis and the process of falling asleep.

JOHN T. MYERS (Chem. Abstr.)

A Mucopolysaccharide from Human Cerebral Cortex. Ejima, Tatsunori. [*Tohoku J. Exptl. Med.*, **61**, 163 (1955).]

The mucopolysaccharide was extracted with 23 volumes NaCl from 6 minced, dried, defatted cerebral cortices. Impurities were removed by precipitation at pH 1·5 with HCl and at 4·2 with AcOH, at pH 5·6 with 20 per cent. $Ba(OAc)_2$, at pH 9·0 with $Ba(OH)_2$, at pH 5·8 by saturation with $(NH_4)_2SO_4$, and at pH 5·6 with 10 per cent. $Pb(OAc)_2$. The mucopolysaccharide was precipitated with 10 volumes EtOH, yielding 126 mg. After hydrolysis, a paper chromatogram showed spots corresponding to chondrosamine, glucosamine, and galactose and weak spots corresponding to mannose and L-fucose. The optical rotation in water was $(\alpha)^2D^1 = -31·9°$. A N-glycoside linkage is probable. It had no blood group activity.

M. HETRICK (Chem. Abstr.)

III. The Effect of Androgen, Chorionic Gonadotropin, and Arterenol on the Diencephalic Acetylcholine Content. [*Ibid*, 734.]

In intact as well as in ovariectomized rat testosterone propionate causes an increase in the diencephalic acetylcholine content. Chorionic gonadotropin has no effect in ovariectomized animals. Arterenol has no effect in intact females, but does cause a decrease in ovariectomized animals. Through *Excerpta Med., Sect. III*, **8**, 120 (1954).

R. D. H. (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Morphological Changes in the Motor Cells of the Anterior Cornu of Frogs and Toads After Application of Trypaflavine. Wehling, Harald. [*Z. Zellforsch. u. mikroskop. Anat.*, **36,** 171 (1951); *Chem. Zentr.*, **11,** 3340–1 (1951).]

A study was made on the motor anterior cornu cells of the frog and toad to determine the effect of trypaflavine (I) on the plasma nucleotides and the cell organelles concerned in their formation. From 0·4 to 30 mg. of a 1–2 per cent. solution of (I) was injected into the dorsal lymph sac of the animals. The motor ganglion cells of the spinal cord, which were high in plasma nucleotides and no longer able to undergo division, showed changes which are regarded as indicating interference with the ribonucleotide metabolism. Characteristic changes observed were the simultaneous appearance of nucleolus variations in form, size, and number; the formation of nuclear capsules; variability of the nuclei as to form, size, and position; and changes in the tigroid substance. Changes in the Nissl substance were much more difficult to establish than those in the nucleolar apparatus. Corresponding deviations from normal could also be produced by electrical stimulation. In the (I) experiments the results varied with time and dosage. The probable point of attack of (I) on the nucleotides of the nucleus and of the plasma is discussed.

M. G. Moore (Chem. Abstr.)

Metabolic Disturbances in Wilson Disease. Gilsanz, V., et al. [*Arch. med. exptl.* (*Madrid*), **17,** 247 (1954).]

The effects of BAL and ACTH on Cu excretion, NH_3 production, and amino acid excretion by the kidney and plasma phosphatases before and after vitamin D administration were studied in 2 cases of Wilson's disease (hepatolenticular degeneration), and in 3 normal relatives of these patients. NH_3 production and alkaline phosphatase are increased in the disease; vitamin D does not affect alkaline phosphatase. Cu excretion is unaffected by ACTH although amino-aciduria increases. BAL affects Cu excretion but not amino acids. It is suggested that Cu excretion is not associated with amino acid excretion.

L. A. Sapirstein (Chem. Abstr.)

Nadi Reaction in the Substance of the Central Nervous System. Mitolo, M., and Ruccia, D. [*Arch. sci. biol.*, **39,** 132 (1955).]

In the brain substance of the rat with blocked cytochrome oxidase activity, which is effected by treating the brain pulp with a 5 per cent. aqueous solution of Me_2CO for 45 minutes at 45°, it is still possible to obtain a positive Nadi reaction (synthesis of blue indophenol catalyzed by a nonenzymic process from α-naphthol and p-phenylene- diamine at pH 11 and 22-8°). This indophenol reaction is not obtained with the H_2O-Me_2CO extract containing fractions of free cholesterol and parts of the phosphatides and unsaturated cerebrosides, nervone and hydroxynervone. The H_2O-Me_2CO extract contains substances inhibiting the Nadi reaction. A H_2O-pyridine extract of the pre-extracted or fresh material is Nadi-positive. The reaction seems to be bound to the saturated cerebrosides. Extraction with pyridine of the unextracted material gives a weaker positive extract than the pre-extracted pulp, proving the interference by an inhibitor.

A. E. Meyer (Chem. Abstr.)

Relation Between Diencephalon and Carbohydrate Metabolism. Changes in Blood Sugar Caused in Normal Persons by Administration of Lipide Fraction from Diencephalic Nuclei. Fedeli, S., et al. [*Arch. sci. med.*, **99,** 357–76 (1955).]

Persons treated for 15 days with a lipide fraction from hypothalamic nuclei (com. preparation of undeclared strength) at a dose of 2 cc. injected intravenously or intramuscularly showed uniformly a gain in body weight and a decrease in carbohydrate and insulin tolerance.

A. E. Meyer (Chem. Abstr.)

Behavior of Rabbit Brain (EEG Observations) in Ischemia and Anoxia After Adaptation for Altitude. Opitz, E., and Kreuzer, F. [*Pflügers Arch. ges. Physiol.*, **260,** 480 (1955).]

The electroencephalogram of unanesthetized rabbits was recorded during acute ischemia or anoxia and during the recovery periods. These recordings were made before and after adaptation for altitude. When rabbits were kept in a low-pressure chamber at an equivalent altitude of 7,500 m. for 1–2 months, their hemoglobin increased to about 200 per cent. of the control level and their time of symptoms of ischemia to 160 per cent. and of symptoms of anoxia to 180 per cent. of the control values. Ten minutes in 6·5–7 per cent. O (equivalent to 7,500-m. altitude) reduced the time of onset of symptoms of ischemia or anoxia. When the hemoglobin level of the adapted animals was reduced by bleeding to the control hemoglobin level, the animals reacted to ischemia or anoxia as unadapted animals. It is concluded that the adaptation with regard to ischemia could be attributed to aerobic factors, but with regard to anoxia some anaerobic factors might be involved.

S. Ellis (Chem. Abstr.)

Pantothenic Acid Deficiency Induced in Human Subjects. Bean, William B., et al. [*J. Clin. Invest.*, **34,** 1073 (1955).]

Subjects on a diet devoid of pantothenic acid, and with an antagonist β-methylpantothenic

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acid developed: (1) a neuromotor disorder; (2) cardiovascular instability especially in the upright position; (3) complaints referable to the alimentary canal; (4) repeated infections; and (5) physical and mental depression. They were not all relieved promptly by adding pantothenic acid to the diet. The biochemical changes included a fall in acetylation, carbohydrate metabolism, blood cholesterol esters, and steroid hormone excretion, and faiiure of adrenocorticotropic hormone to induce eosinopenia. Individual variations were large.

JOHN T. MYERS (Chem. Abstr.)

Technique for Demonstrating Neurosecretory Material in the Human Hypothalamus. Adams, C. W. M., and Sloper, J. C. [*Lancet*, **268**, 651 (1955).]

The method devised is applicable to paraffin-embedded formalin-fixed tissue and involves oxidation of tissues by performic acid and subsequent demonstration of sulfonate radicals derived from cystine or cysteine with Alcian Blue at pH 2·0. The reaction is intensified if the section is first immersed in a reducing agent such as Na hydrosulfite. In 5 humans and animals including the dog, material through the neurohypophysis and in the supraoptic nuclei was stained a bright blue, indicating a high content of cystine or cysteine. This material may be considered posterior pituitary hormone; its histochemical localization in the human hypothalamus confirms the hypothesis that these hormones are elaborated in the hypothalamus.

BARBARA MURRAY (Chem. Abstr.)

Glucolysis in the Brain. Lenti, C., and Bargoni, N. [*Boll. soc. ital. biol., sper.*, **31**, 60 (1955).]

Acetylglucosamine, xylose, lyxose, glucose-6-phosphate, and extracts of nerve or placenta do not inhibit the anaerobic glucolysis of a suspension of brain in which glucose is the substrate. Adenosinediphosphate is also without effect on the glucolysis.

FELIX SAUNDERS (Chem. Abstr.)

Anaerobic Inhibition and Reactivation of Glucolysis in the Brain. Lenti, C., and Bargoni, N. [*Boll. soc. ital. biol. sper.*, **31**, 56 (1955).]

Addition of monoiodoacetate, iodoacetamide, p-chloromercuribenzoate, and o-iodosobenzoate abolish the formation of lactic acid in an extract of brain homogenate. Ascorbic acid partially abolishes the anaerobic inhibition of glucolysis produced by o-iodosobenzoate, 2,3-Dimercaptopropanol and glutathione (especially the former) reactivate the process inhibited by p-chloromercuribenzoate. Lactic acid formation is inhibited by ethylenediaminetetraacetate and the effect is overcome by the addition of Mg.

FELIX SAUNDERS (Chem. Abstr.)

Phenylketonuria. IV. Serum Proteins in Phenylketonuria. Brown, Douglas M., et al. [*Proc. Soc. Exptl. Biol. Med.*, **89**, 367 (1955).]

The greatly increased blood levels of phenylalanine that occur in phenylketonuria do not cause a significant quantitative alteration of the serum electrophoretic pattern from normal. Occasional serums of children with phenylketonuria contain abnormal β-globulins. These abnormalities disappear when the children are fed phenylalanine-low diets and the blood phenylalanine is lowered to normal. There appears to be no correlation between the presence of the abnormal β-globulins and the degree of mental impairment. Possibly the abnormal globulins are manifestations of slight liver dysfunction.

L. E. GILSON (Chem. Abstr.)

Metabolism of Nucleoside and Nucleotide Purines in Brain Homogenate. Orunesu, M., et al. [*Giorn. biochim.*, **3**, 183 (1954).]

In experiments on the degradation of adenylic acid (I) (0·003 M 1 cc., in veronal-acetate buffer 0·14 M 2 cc.) by brain homogenate (1:20 1 cc.), total pentose and ribose 5-phosphate (II) disappeared, respectively, by 0·09–0·48 and 0·57–3·0 micromoles within 3–30 minutes without further decrease (for liver homogenate these figures were 0·55–2·14 and 2·20–3·0 within 3–60 and 3–12 minutes respectively). In degradation of (II) the above figures were 0·18–1·80 and 0·33–2·40 within 3–60 minutes for brain, and 1·76–2·34 and 2·10–3·0 micromoles within 3–12 and 3–30 minutes respectively for liver. Further additions of substrate in (I) degradation tests showed the total pentose disappearance to continue at the same rate; this agreed perfectly with the disappearance of purine-ribose. In degradation experiments on guanosine, adenosine, and inosinic acid (conditions as above), the total pentose and the purine-ribose disappearances were, respectively 0·50–0·96 and 1·05–1·72, 0–0 and 0–0·1, and 0·55–1·22 and 0·96–1·59 micromoles within 15–60 minutes. It is concluded that the cessation of adenylic acid degradation by brain homogenate after the first 30 minutes of incubation is not due to enzyme exhaustion but to absence of adenosine deaminase in the brain tissue, and the degradation itself is due to the presence of a deaminase of adenylic acid which transforms it to inosinic acid (normally degraded by brain).

C. SCANDURA (Chem. Abstr.)

Action of Acetylcholine, Eserine, and Atropine on the Isolated Gyrus of the Cerebral Cortex of the Cat. Infantellina, F. [*Arch. sci. biol.*, **39**, 209 (1955).]

The local application of 1 per cent. eserine solution followed by 1 per cent. acetylcholine solution to the gyrus free of spontaneous pulsations causes the appearance of an intensive

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rhythmic electric activity, which in some cases lasts for 1 hour. Application of eserine or acetylcholine alone causes a change of the response of the preparation to electric stimulation but does not cause spontaneous discharges. Injection into the carotid of 0·01–0·2 γ acetylcholine causes the appearance of spontaneous activity. Treating the gyrus with 0·2 to 1 per cent. solution of atropine causes inhibition of the cortical effects of eserine and acetylcholine applied locally.

A. E. MEYER (Chem. Abstr.)

Cytochemical Study on the Nerve Cells of the Anterior Horn of the Spinal Cord. Tagawa, Takasuke. [*Kyushu Mem. Med. Sci.*, **5**, 149 (1955).]

Nerve cells nontreated or treated with 10 per cent. salt solution, 10 per cent. perchloric acid, and 5 per cent. trichloroacetic acid were stained with hematoxylineosin or toluidine blue. The nucleolus and Nissl's bodies after treatment became acidophilic and stained with eosin. Changes in the ultraviolet light absorption of chromatin following treatment corresponded for the most part to those in the Feulgen reaction.

M. J. C. (Chem. Abstr.)

The Mechanism of the Potassium Loss from Brain Slices Induced by Cholinesterase Inhibitors. Strickland, K. P., and Thompson, R. H. S. [*Biochem. J.*, **60**, 468 (1955).]

The anticholinesterases diisopropyl phosphorofluoride (DFP), eserine, and N-(p-chlorophenyl)-N-methylcarbamate of m-hydroxyphenyltrimethylammonium bromide (Nu 1250), when present in concentrations of 2×10^{-2}M, 2×10^{-3}M, and 2×10^{-4}M, respectively, cause a loss of K from respiring brain slices. The loss of K does not correlate with the anticholinesterase properties of these inhibitors, since a virtually complete inhibition of cholinesterase in the slices occurred with concentrations of DFP, eserine, and Nu 1250 that were, respectively, 1/200, 1/200, 1/20 of those concentrations just capable of causing K loss. It seems that the permeability of the nerve cell to K is dependent on the energy-producing reactions of the cell rather than on the presence of an active acetylcholine-cholinesterase system.

ROLAND F. BEERS, JR. (Chem. Abstr.)

Depression in Brain Potassium in Ovine Pregnancy Toxemia. Setchell, B. P., and McClymont, G. L. [*Nature*, **175**, 998 (1955).]

The mean K content of brain slices from pregnancy toxemia cases was significantly lower than that of normal brains, and that of the brains of insulinized sheep significantly lower than that of either of the other 2 groups. The association of a lower brain K in both pregnancy toxemia and prolonged insulin hypoglycemia is consistent with the hypothesis identifying ovine pregnancy as a hypoglycemic encephalopathy. The more marked depression of brain K in insulinized sheep reflects the more marked hypoglycemia seen in these sheep compared with developing pregnancy toxemia cases.

A. E. TEERI (Chem. Abstr.)

Metabolic Disorders in Head Injury. Survey of 76 Consecutive Cases. Higgins, G., et. al. [*Lancet*, **266**, 61 (1954).]

Only 11 per cent. of 76 patients who were unconscious for more than 12 hours remained biochemically normal. Fifty patients exhibited one or more transient metabolic disorders (including proteinuria, hyperglycemia, renal glycosuria, raised blood urea level, and low total plasma-protein levels). Eighteen persons developed major metabolic changes which were persistent and progressive unless reversed by specific treatment. These included hyperchloremia-hypochloruria, hypochloremia-hyperchloruria, water deprivation, respiratory alkalosis, and renal uremia.

BARBARA R. MURRAY (Chem. Abstr.)

Study and Documentation of the Neurocrinia of the Hypothalamohypophyseal System With the Latest Methods. Stigliani, R., and Monaci, M. [*Arch, "De Vecchi" anat. patol.*, **17**, 655 (1952).]

A study of the principal findings regarding the relation between hypothalamus and hypophysis, with reference to the problem of secretion. Attention is drawn to the fact that even now there is no reliable information as to the origin of this secretion. The study of the hypophysis and hypothalamus of dogs, guinea pigs, and rats revealed: (1) presence of colloid substance (pos. McManus test) in the anterior lobe and pars intermedia, inconstantly present or absent in the diencephalic nuclei; difference in color of the colloid substance in the hypophysis and hypothalamus; (2) intense production of proteins in the cells of the anterior lobe and in the ganglion cells of the subthalamic nuclei; (3) alkaline phosphatase activity of the cells of the anterior lobe and the subthalamic nuclei; (4) presence of abundant quantities of Gomori-pos. substance in the neurohypophysis and in the cells of the subthalamic nuclei, also demonstrable along the axons; (5) particular topographical relations between the cells of the subthalamic nuclei containing few neuro-endocrine granules and the blood capillaries, with features indicative of processes of hemocrinia. In view of the morphological findings the ganglion cells of the subthalamic nuclei are regarded as neuro-endocrine cells with an increased synthetic activity. In addition, it is believed that part of the secretion may be solely hypothalamic, although the possibility of a hypophyseal secretion, reaching the subthalamic

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centers as a stimulus to or regulating mechanism of the activity of the latter, is not excluded as the hypothalamus and hypophysis were found to constitute a definite functional entity.

R. D. H. (Chem. Abstr.)

2. Pharmacology and Treatment

Chlorpromazine and the Autonomic Nervous System. Jourdan, F., et al. [*Arch. intern. pharmacodynamie*, **101,** 253 (1955).]

In dogs and rabbits, 5 mg./kg. chlorpromazine (4560 RP) causes hypotension and decreases or reverses adrenaline hypertension. It increases the heart rate, both in the denervated heart and after adrenaline. It has little effect on sympathetic stimulation, and at first decreases and then increases the effect of stimulation of the vagus. The hypotension is of central origin.

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

Dual Mechanism of Antiemetic Action of Chlorpromazine in Dogs. Glaviano, Vincent V., and Wang, S. C. [*J. Pharmacol. Exptl. Therap.*, **114,** 358 (1955).]

Chlorpromazine (I) in subcutaneous doses of 2 mg./kg. is effective in dogs in raising the threshold of emesis induced by apomorphine or hydergin approx. 10-fold. With this dosage, the oral dose of $CuSO_2$ required to evoke vomiting is not appreciably increased. The experimental findings suggest that the primary mechanism of the antiemetic property of (I) is a selective action on the chemoceptive emetic trigger zone, possibly by competitive affinity for receptors at this site. The more potent antiemetic effect of larger doses of (I) stems also from its depression of the reticular vomiting mechanism. (I) affords only moderate protection against vomiting induced by morphine and is not at all effective against that induced by lanatoside C, although these emetic agents act specifically through the trigger mechanism.

L. E. GILSON (Chem. Abstr.)

Chlorpromazine and the Adrenaline-secretory Centers. Donnet, V., et al. [*Compt. rend. soc. biol.*, **148,** 2033 (1954).]

Cross-circulation experiments on dogs showed that intravenously injected chlorpromazine slightly attenuated but did not suspend the activity of the adrenaline-secretory centers.

L. E. GILSON (Chem. Abstr.)

Determination of Chlorpromazine in Different Tissues. Gouzon, B., et al. [*Compt. rend. soc. biol.*, **148,** 2039 (1954).]

Determinations of chlorpromazine in tissues were made by the method of Dubost and Pascal (*Ann. pharm. Franç.*, **11,** 615 (1953)). After intravenous injection of various doses in dogs chlorpromazine rapidly disappears from the blood. There is elective fixation in the central nervous system. The highest concentration is in the brain cortex with very little in the medulla and small amounts in the cerebellum. Much is found in the kidneys and small amounts in the liver and muscles.

L. E. GILSON (Chem. Abstr.)

Oxygen Consumption, Blood Supply, and Vulnerability of the Brain of Warm-blooded Animals Under the Influence of Chlorpromazine. Frowein, R. A., et al. [*Naunyn-Schmiedebergs Arch. exptl. Pathol. Pharmakol.*, **226,** 62 (1955).]

Measurements of oxygen consumption and blood flow in the brain of dogs in chloralose anesthesia showed no changes after the administration of 2–10 mg. chlorpromazine/kg. If the blood pressure dropped below a critical level, a nonspecific reduction became manifest. The ability of recovery of the brain after acute total ischemia was influenced by variation in temperature and blood pressure in the same way in the controls as in the chlorpromazine-treated animals. The production of a hypo-oxidation by a toxic effect of chlorpromazine to the tissues in warm-blooded animals does not seem to occur.

A. E. MEYER (Chem. Abstr.)

Analogy of Action of Substances With a Different Point of Attack on the Neurovegatative System. Bein, J. H. [*Ibid.*, 422–8.]

A discussion of the different pharmacological actions of sympathicolytic substances (ergot alkaloids, dioxane compounds), parasympathicolytics (atropine, banthine, Anthrenil, regitine), of ganglioplegics proper (hexamethonium compounds), and of the less specific group comprising Apresoline, Rauwolfia alkaloids, and chlorpromazine. The testing methods are briefly discussed.

A. E. MEYER (Chem. Abstr.

Effect of Chlorpromazine on the (Human) Electroencephalogram and Electrodermogram. Turner, M., and Bérard, E. [*Rev. soc. argentina biol.*, **30,** 163 (1954).]

Tracings and discussion. The results are interpreted as indicating a lytic effect in structures of the mesodiencephalic level which control the states of consciousness, the cortical electrical activity, and the central sympathetic discharges.

L. E. GILSON (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Action of Some Phenothiazine Derivatives on the Central Nervous System. Balestrieri, A., and Fadiga, E. [*Arch. sci. biol.*, **38**, 620 (1954).]

The effect of largactil and antipar was studied in the cat by electroencephalic registration of responses to direct stimulation of the reticular substance and of the sciatic nerve, and to auditory stimulations. Largactil increases the threshold of response, antipar has no such evident effect. The higher threshold is more easily observed by stimulation of the reticular substance than the sciatic nerve. Neither drug has an influence on the response to acoustic cortical stimulation.

A. E. MEYER (Chem. Abstr.)

Action of Chlorpromazine on the Central Nervous System. Dasgupta, S. R., et al. [*Bull. Calcutta School Trop. Med.*, **1**, No. 3, 14 (1954).]

The action of 2-chloro-10-(3-dimethylaminopropyl)phenothiazine (chlorpromazine, largactil) is markedly increased in animals after the removal of the cerebral cortex. In the normal animal 1·0–3·0 mg./kg. Bilateral superficial incisions on the bases of the frontal lobes just in front of the optical chiasm cause no enhancement in drug sensitivity. This is obtained only after additional 5 mm. deep incisions are applied to the dorsolateral surface of the frontal lobes.

DORIT L. NOETHER (Chem. Abstr.)

Effects of Reserpine on the Electro-encephalic and Motor Reactions Elicited by Hypothalamic Stimulation. Longo, V. G., and Napolitano, L. [*Il Farmaco* (*Pavia*) *Ed. sci.*, **10**, 297 (1955).]

The 1st phase after administration of reserpine to rabbits consists in excitation as evidenced in the electro-encephalogram by decrease of the periods of rest, prolonged activity periods, and occasionally by the appearance of spike bursts. The following phase is characterized by a block of the stimulation usually elicited by sensory perceptions. The motor and emotional reactions produced by electrical stimulation of hypothalamic centers through permanently implanted electrodes are attenuated or abolished by the drug. Reserpine influences equally the emotional responses and the electro-encephalographic reaction to hypothalamic stimuli. The drug depresses the reactions of the ascending and descending parts of the reticular system. The only reaction that is not influenced even by large doses of the alkaloid is the pressor effect. While barbiturates in hypnotic doses also inhibit the emotional responses to hypothalamic stimulation, reserpine produces this block with doses having only a slight sedative effect. Conclusion: reserpine has a point of attack in the diencephalic nuclei.

A. E. MEYER (Chem. Abstr.)

Further Characterization of Central Effects of Reserpine (*Serpasil*). *Schneider, Jurg A., et al.* [*Am. J. Physiol.*, **181**, 64 (1955).]

Reserpine (serpasil) counteracts the manifestation of sham rage in cats. The blood pressure rise after direct electrical stimulation of the diencephalon in anesthetized cats was not decreased after reserpine, whereas the carotid occlusion reflex was lessened. The experiments support the theory that reserpine causes a central block or inhibition of afferent impulses which normally stimulate the sympathetic activity rather than a direct depression of diencephalic sympathetic centers.

E. D. WALTER (Chem. Abstr.)

Significance of Selected Central Mechanisms for the Analysis of the Action of Reserpine. Bein, H. J. [*Ann. N.Y. Acad. Sci.*, **61**, 4 (1955).]

Pressor carotid sinus reflexes and accompanying reflex respiratory changes were diminished by 10–20 γ/kg. doses of reserpine given intravenously to anesthetized cats. Various experiments showed that reserpine did not influence respiration by acting on the vagal respiratory reflexes, the medullary inspiratory and expiratory substrates, or the motor pathway and neuromuscular transmission, respectively. Hyperventilation apnea was markedly shortened or eliminated by intravenous 70 γ/kg. doses of reserpine in rabbits, but this effect was found in only 1 of 8 cats similarly treated. Thirty-seven references.

F. N. LEBARON (Chem. Abstr.)

Neuropharmacological Aspects of Reserpine. Schneider, Jurg A., et al. [*Ann. N.Y. Acad. Sci.*, **61**, 17 (1955).]

The effect of 5 mg./kg. doses of reserpine on synaptic transmission in the spinal cord was investigated. Reserpine caused a facilitation of the knee jerk in spinal cats and an increase in the height of the monosynaptic spike measured in the ventral root of the spinal cord of a decerebrate cat when the dorsal root was stimulated electrically. Similar measurements of polysynaptic spikes gave equivocal results. The authors suggest that reserpine acts by increasing cortical inhibition on diencephalic structures. Forty-four references.

F. N. LEBARON (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

A Comparison of Effects of Reserpine and Some Barbiturates on the Electrical Activity of Cortical and Subcortical Structures of the Brain of Rabbits. Rinaldi, Franco and Himwich, Harold E. [*Ann. N.Y. Acad. Sci.*, **61**, 27 (1955).]

Reserpine administered intravenously to unanesthetized, curarized rabbits in doses up to 0·5 mg./kg. caused no change in the electrical activity of the brain. With doses of 1·5–2·0 mg./kg. a continuous electrographic alertness pattern was obtained which was indistinguishable from the spontaneous alertness pattern. Intermediate doses increased the incidence of spontaneous alertness patterns. Barbiturates caused a pattern which was similar to, but not identical with the normal sleep pattern. The authors concluded that reserpine stimulated and barbiturates depressed the mesodiencephalic activating system.

F. N. LeBaron (Chem. Abstr.)

Effects of Parenteral Reserpine on Cerebral Blood Flow, Oxygen, and Glucose Metabolism, and Electroencephalograms of Patients with Essential Hypertension. Hafkenschiel, J. H., et al. [*Ann. N.Y. Acad. Sci.*, **61**, 78 (1955).]

Doses of 40–108 γ/kg. of reserpine reduced the arterial blood pressure of 5 patients with essential hypertension by 20 per cent. but caused no significant changes in cerebral blood flow, glucose uptake, O uptake, venous O tension, or electroencephalograms.

F. N. LeBaron (Chem. Abstr.)

Ethanol Metabolism and the Action of Antabuse. (II). Fujiwara, Eiichi. [*Folia Pharmacol. Japon.*, **50**, 402 (1954).]

Rabbits were injected intraperitoneally with 100 cc. 3 per cent. EtOH per kg. daily. This caused marked decrease of body weight and strong intoxication which lessened with acquirement of habituation. A single injection increased the respiration rate with a maximum after 30 minutes and returning to normal after 2 hours. It decreased the body temperature considerably and sometimes recovery was very slow. Habituation to EtOH was obtained by continuing the above injection for 1 and 2 weeks. The EtOH in the blood was: non-habituated 1·31; non-habituated with administration of antabuse, orally 0·5 g./kg., 1·39; habituated for 1 week 2·39; habituated for 2 weeks 5·32; and habituated for 2 weeks with administration of antabuse 5·86 mg. per cent. Injection of EtOH into these groups caused an increase of EtOH maximum after 2 hours in non-habituated and 1 week habituated rabbits and after 30 minutes in 2 week habituated ones. Returning to the normal state was faster in the habituated animals. Those previously administered antabuse retained EtOH longer with a slow return to normal level; in this case the habituated animals recovered faster. In habituated rabbits the AcH contents in the blood were large for a longer period after injection of EtOH. When antabuse was given, this delay of AcH metabolism was more marked. Influence of EtOH habituation on brain waves was examined. EtOH injection induced disappearance of the fast wave and the appearance of a prominent slow wave in the brain waves of non-habituated rabbits, indicating the inhibitory effect of EtOH. The fast wave was apt to increase on EtOH injection as habituation proceeded. Previous administration of antabuse hardly affected the brain waves. In habituated animals, administration of antabuse followed by injection of EtOH resulted in the appearance of the fast wave in succession with intermittent spikes or convulsive waves. Spleen was markedly deformed by habituation and antabuse treatment; brain, eye, lung, liver and kidney were not affected.

Shozaburo Kitaoka (Chem. Abstr.)

Pyridoxine Hydrochloride in Acute Alcoholic Intoxication. Small, M. D., et al. [*J. Lab. Clin. Med.*, **46**, 12 (1955).]

The effect of 0·5 to 2·0 g. of pyridoxine hydrochloride on acutely alcoholic subjects was evaluated by using objective tests of mental and neurological coordination. Apparently, there is no prompt or consistent effect of intravenous pyridoxine on alcoholic intoxication.

Frank Iber (Chem. Abstr.)

The Influence of Antabuse and Alkozol on the Blood Alcohol Level. Portheine, Friedrich. [*Zentr. Arbetismed. Arbeits-schutz*, **1**, 84 (1951); *Chem. Zentr.*, 1951, **11**, 3205.]

The aversion preparations, Antabuse and Abstinyl, which have as their base tetraethylthiuram disulfide, do not affect the blood alcohol curve when used for the treatment of chronic alcoholism. Inhaling the fumes of the motor fuel, Alkozol (gasoline 50, alc. 36, and benzene 14 per cent.), does produce symptoms of intoxication. Results reported indicate that these symptoms must be due to acute benzene poisoning, since the course of the blood alcohol curve is not affected.

M. G. Moore (Chem. Abstr.)

New Chemotherapeutics for Alcoholism. Delay, J., et al. [*Ann. médico-psychol.*, **2**, 427 (1949).]

Pharmacological effects of various drugs are described. In the amphetamine group, d-methyl-amphetamine-HCl (30 mg. intravenously) is effective in producing therapeutic shock in acute alcoholism. Daily doses of 5–10 mg. orally disintoxicate chronic alcoholics, with little danger of producing a new addiction.

W. C. Tobie (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Role of the Nervous System in the Hypothermic Action of Pentamethylenetetrazole. Obal, F., et al. [*Acta Physiol. Acad. Sci. Hung.*, **7**, 211–21 (1955).]

Pentamethylenetetrazole (I) caused hypothermia in rats and guinea pigs. Low doses of (I) caused a greater hyperthermia in the guinea pig. The conditioned reflex which was developed with hypothermic doses of (I) was a rise in temperature.

S. Ellis (Chem. Abstr.)

Blood Cholesterol in Electroshock. Lippi, M., and Argiolas, N. [*Rass. med. sarda*, **50**, 409 (1948).]

In 20 psychotic patients given electro-shock, blood cholesterol increased in 45 per cent. after the seizure, decreased in 40 per cent., and did not change in 15 per cent. In 12 cases, an immediate change in level was followed by a reversal after 90 minutes. Each individual reacts in a different way (especially in cholesterol metabolism (I)) to a given stimulus. (I) is regulated by the reticulo-endothelial system and the endocrine glands (especially the gonads) which are variable in action.

W. C. Tobie (Chem. Abstr.)

Effect of Electric Shock on Some Experimental Blood-sugar Curves. Isaja, M. [*Schizofrenie*, 1949, 83–96; *Excerpta Med., Sect. VIII*, **3**, 483 (1950).]

In 10 schizophrenics, electric-shock therapy was used in combination with insulin (I), adrenaline (II), and glucose tolerance test (III). In combined (I) treatment, the hyperglycemic peak of shock was counteracted by the insulin to give prolonged hypoglycemia. With (II), the adrenaline synergized the shock to give intense and prolonged hyperglycemia. With (III), there was a summation of the 2 hyperglycemic effects. Since some workers think that electric shock acts by producing hyperglycemia, further trials of combined (II) treatment should be made.

W. C. Tobie (Chem. Abstr.)

Correlations Between Drug Action and Specific Cholinesterase (ChE) Activity of Brain Tissue· Tagaki, H. [*Folia Pharmacol. Japon.*, **48**, 300 (1953).]

Mice were treated with convulsant or anticonvulsant drugs and after toxic signs or death had resulted the specific ChE activities of their brains were determined by the method of Hall and Lucas. The results did not indicate a close correlation between the action of these drugs and ChE activity.

R. D. H. (Chem. Abstr.)

The Content of Acid-soluble Pentoses in the Entire Brain of Guinea Pigs Treated with Electric Shock. Fazio, C., et al. [*Boll. soc. ital. biol. sper.*, **30**, 795 (1954).]

In guinea pigs treated with electric shock the value of the acid-solution pentoses of the entire brain was moderately increased above that of the controls. The increase was observed both in brains from animals killed in the convulsive phase immediately after the shock and in those killed 24 hours after the shock. The increase was not observed in those killed 50 hours after the shock. There was no difference between animals which received a single shock and those which received repeated shocks every other day.

Felix Saunders (Chem. Abstr.)

Histaminase Activity of Serum in Individuals Subjected to Electroshock. Prassoli, Armando. [*Minerva ginecol.*, **6**, 753 (1954).]

A considerable drop of the histaminase activity (I) of serum occurred 15 minutes after electroshock in women with mental diseases and in full sexual activity. (I) began to increase after 60 minutes.

C. Scandura (Chem. Abstr.)

Influence of Metrazole, Strychnine, and Curare on the Electrical Activity of the Brain and Cord of the Salamander (Triturus viridescens). Peters, J. J., et al. [*J. Pharmacol. Exptl. Therap.*, **114**, 225 (1955).]

Electroencephalograph tracings and discussion.

L. E. Gilson (Chem. Abstr.)

Treatment of Migraine. Santiso, R. Pascual. [*Rev. clín. espań.*, **57**, 116 (1955).]

A review including drug and hormone therapy.

L. E. Gilson (Chem. Abstr.)

Role of the Nervous System in the Hypothermic Action of Procaine. Kelemen, A., et al. [*Acta Physiol. Acad. Sci. Hung.*, **7**, 229 (1955).]

In guinea pigs and rats procaine caused hypothermia. The conditioned reflex was hypothermia. With small daily doses the conditioning led to a reduced hypothermia or even hyperthermia in response to procaine.

S. Ellis (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Role of the Nervous System in the Action of Sympatholytic Natural and Reduced Ergot Alkaoilds. Fall, S., et al. [*Acta Physiol. Acad. Sci. Hung.*, **7**, 223 (1955).]

A conditioned reflex involving hyperthermia was developed with hypothermic doses of ergotoxine or dihydroergotoxine.

S. Ellis (Chem. Abstr.)

Changes in Spinal Reflexes in Man after Oral Administration of a Moderate Dose of Caffeine. Gualtierotti, Torquato and Margaria, Rodolfo. [*Atti accad. nazl. Lincei Rend., Classe sci. fis., mat. e nat.*, **18**, 16 (1955).]

Administration of 0·25 g. caffeine to normal men, showing uniform neurological reactions produced within 1 hour the following effect: muscular potentials increased suddenly in amplitude to twice the original values. The effect lasted to the 5th hour then returned to normal within 30 minutes. The reflex time decreased by about 10 per cent. of its normal value. The duration of the electric manifestation was not changed. The muscular conduction time was unchanged.

A. E. Meyer (Chem. Abstr.)

Sodium Succinate, an Analeptic for Barbiturate Poisoning in Man. Barrett, R. H. [*Ann. Internal Med.*, **31**, 739 (1949); *Excerpta Med. Sect. VIII*, **3**, 557 (1950).]

The mechanism of analeptic action is probably closely connected with tissue respiration and the role of succinic oxidase (and presumably that of cytochrome oxidase). There may also be an additional reflex mechanism connected with the hypertonic effect. Pharmacological results in 14 cases of probable barbiturate poisoning are described.

W. C. Tobie (Chem. Abstr.)

Notes on the Use of Pentothal as an Electroencephalograph Activator. Plisson, M., and Rémond, A. [*Rev. neurol.*, **81**, 509 (1949); *Excerpta Med., Sect. VIII*, **3**, 580 (1950).]

Data are given on the action of the drug on electric brain waves in normal subjects, epileptics, and cases of cerebral tumor and focal cerebral lesions. The more rapidly an adequate dose is injected, the more satisfactory the reactions.

W. C. Tobie (Chem. Abstr.)

Gravitol and the Autonomic Nervous System. Wyss, R. [*Praxis (Bern)*, **39**, 33 (1950); *Excerpta Med. Sect. VIII*, **3**, 508 (1950).]

Gravitol has anticholine activity and shows partial action on the adrenaline and histamine effects.

W. C. Tobie (Chem. Abstr.)

Action of Succinic Acid in Barbiturate Intoxication. Kohler, Denyse and Barbe, Monique. [*Compt. rend. soc. biol.*, **149**, 43 (1955).]

Although Na succinate is an antagonist of the action of barbiturates on the nervous system, its injection in rabbits prior to injection of somnifen augments rather than prevents the production of pulmonary edema by the somnifen.

L. E. Gilson (Chem. Abstr.)

Pharmacodynamics of Ganglioplegic Substances. Symposium on Ganglioplegics. Zaimis, J. [*Atti soc. lombarda sci. med. biol.*, **9**, 417 (1954).]

A general discussion on classification of ganglioplegic compounds with special emphasis on the action of hexamethonium, pendiomide, and Pentapyrrolidinium.

A. E. Meyer (Chem. Abstr.)

Application of Hexamethonium in the Treatment of Hypertension in Man. Rosenheim, M. L. [*Ibid.*, 429–32.]

A general discussion. The drug is not satisfactory as a treatment.

A. E. Meyer (Chem. Abstr.)

Clinical Results of Treatment of Essential Hypertension with Ganglioplegic Drugs; the Inconvenience of the Treatment. Bartorelli, C. [*Ibid.*, 433–51.]

Discussion mainly of hexamethonium. Extensive bibliography.

A. E. Meyer (Chem. Abstr.)

Ganglion Paralysis in Anesthesia. Hale Enderby, G. E. [*Ibid.*, 452–6.]

Description of the use of pentolinium to obtain a uniform low blood pressure during anesthesia. The purpose, advantages, and dangers are explained.

A. E. Meyer (Chem. Abstr.)

Application of Ganglioplegic Drugs in General Surgery. Oselladore, G., and Damia, G. [*Ibid.*, 457–5.]

The hemostatics of blood circulation in surgery and the influence of ganglioplegic agents are discussed.

A. E. Meyer (Chem. Abstr.)

https://doi.org/10.1192/bjp.102.428.630 Published online by Cambridge University Press

Ganglioplegic Drugs in Neurosurgery. Bozza, M. [*Ibid.*, 466–74.]

Discussion of the rationale of blood pressure lowering drugs and experience with thiazine compounds. One hundred and twenty-four references.

A. E. MEYER (Chem. Abstr.)

Ganglioplegic Compounds in Shock, Visceral Pain, and Peripheral Arterial Disease. Donati, G. S. [*Ibid.*, 475–90.]

Clinical. Seventy-eight references. Discussions: *ibid.*, 490–501.

A. E. MEYER (Chem. Abstr.)

Variations in the Frog's Spinal Reflexes Caused by the Action on the Brain of Large Doses of Caffeine. Gualtierotti, T. [*J. Physiol.* (*London*), **128**, 320 (1955).]

Three minutes after intraperitoneal injection of caffeine (I) (20–30 mg./kg.) a notable increase occurred in the number and amplitude of the reflex responses in curarized intact or mesencephalic or diencephalic frogs, with no tendency towards an increased synchronization. Ten minutes after injection a negative shift occurred and action potentials began to synchronize (Strychnine-like) in groups; 15 minutes after injection this negative shift and synchronization had reached a peak value and synaptic potentials were also increased in amplitude. These persisted unchanged for 2–3 hours and reverted to normal by 4 hours after injection. Twice these doses of (I) produced spontaneous motor potential discharges. Local application of 0·5 per cent. solution of (I) to the brain produced only an increase in amplitude of the normal reflex response and a negative shift of the potential level. The latter responses are, therefore, considered to be the result of brain action only, whereas synchronization of rapid activity increase in amplitude of synaptic potentials must involve a spinal component.

MORRIS ROCKSTEIN (Chem. Abstr.)

Contribution of Spinal Centers to the Action of Caffeine on Frog's Spinal Reflexes. Gualtierotti, T. [*J. Physiol.*, **128**, 326 (1955).]

Intraperitoneal injection of caffeine (I) caused synchronization but not elevation of action potentials (II) of the nerve cord of the spinal curarized frog at 3 minutes, to a maximum at 18 minutes after addition of (I). This effect persisted for 40 minutes. If the animal was made spinal (15 minutes) after (I) injection, the synaptic motor (II) became larger than normal for 3–5 minutes before the cut and fell to normal after decerebration. Such augmentation of (II) is directly related to the anticholinesterase activity of (I). Addition of (I) to Ringer solution bathing the exposed nerve cord preparation, but not local application of filter paper bits soaked in (I), produced results similar to injection of (I). Because sensory synaptic (II) of spinal frogs became elevated by (I), it is suggested that the effects of (I) are direct for sensory, but require a brain component for motor synaptic (II).

MORRIS ROCKSTEIN (Chem. Abstr.)

Overcoming Conditions of Exhaustion by the Use of Sex Hormones. Duker, Heinrich. [*Psychiat., Neurol. Med. Psychol.*, **3**, 104 (1951).]

States of exhaustion (even high-grade) could be overcome by treatment with sex hormones. The effect was permanent rather than temporary. Preparations used were Testoviron (1–4 mg. daily) and Progynon (0·1–0·35 mg. daily). Both sex hormones of the same sex as the patient and those of opposite sex were used.

M. G. MOORE (Chem. Abstr.)

The Effect of Compound 48/80 on Ganglionic Transmission. Gertner, S. B. [*Brit. J. Pharmacol.*, **10**, 103 (1955).]

Both compound 48/80 and propamidine caused ganglionic block in the perfused superior cervical ganglion of the cat. Compound 48/80 did not decrease the amount of acetylcholine (I) released from the preganglionic endings but rendered the ganglion less sensitive to released (I). Compound 48/80 released histamine from the perfused ganglion but this could not be related to the blocking action.

R. F. RILEY (Chem. Abstr.)

Effectiveness of β-pyridyl Carbinol on Cerebral Vessels. Gross, H., and Hackl, H. [*Wein. klin. Wochschr.*, **67**, 10 (1955).]

In animal experiments and histologic tissue preparation a dilating effect on intracerebral vessels was perceived.

AMELIE L. GRAUER (Chem. Abstr.)

Effect on the Central Nervous System of Intravenously Injected Procaine. I. The Depression of Cerebrospinal Reflexes by Procaine. Kaverina, N. V., and Khayutin, V. M. [*Bykull. Eksptl. Biol. i Med.*, **38**, No. 10, 49 (1954).]

Cats were narcotized by administration of urethan. The central end of the tibial nerve was stimulated by induction current, and the height of the response of the bending reflex of the hind leg was estimated from the degree of contraction of the anterior tibial muscle. Other reflex-evoking methods were also employed. The injection of 20–30 mg./kg. of procaine (I)

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completely depressed the reflex contractions of the anterior tibial muscle. (I) 5–7 mg./kg. injected via the jugular vein generally lessened the contraction amplitude of the muscle before and after severing the spinal cord, indicating that (I) affects some undetermined elements of the cerebrospinal reflex arc. After injection of (I) in some instances the contraction of the anterior tibial muscle disappeared first, followed by that of the semitendinosus muscle; in other instances this succession was reversed. The indications are that the depression of muscular contractions under the experimental conditions is not related to the effect of (I) on the afferent fibers of the peripheral nerve trunk; thus, it appears that (I) acts either on the central or on the motor part of the reflex arc. Injection of 5·5 mg./kg. of (I) caused a barely observed depression of the reflex contractions of the anterior tibial muscle, but slightly enhanced the amplitude of the knee reflex. This is not related to the direct effect of (I) on the elements of the knee reflex arc, but rather it is an expression of the acute spasmodic contractions of the flexor muscles of the leg. The motor part of the knee and cross reflex arc is common to both, yet (I) in doses of 4–7 mg./kg. completely depressed only the cross reflex, affecting the knee reflex only slightly. It would seem, therefore, that the motor neurons could not constitute the basic site of the action of (I). A method is presented for the calculation of (I) concentration which causes depression of reflex contraction of the anterior tibial muscle.

B. S. LEVINE (Chem. Abstr.)

The Effect of Glutamic Acid Upon Phosphorus Compounds of Brains. Ivanov, V. I., and Rozenberg, P. A. [*Byull. Eksptl. Biol. i Med.*, **39**, No. 2, 33 (1955).]

Glutamic acid has a stimulating effect upon adenosinetriphosphate (ATP) the first few hours after its administration. The effect is decreased at the end of 24 hours. Repeated administrations of glutamic acid increased again the amount of (ATP) during the first 3 days but declined beyond this period, remaining however higher than that of control animals.

A. S. MIRKIN (Chem. Abstr.)

Influence of Several Kinds of Anesthetic Upon the Brain Wave of Cats. Muramatsu, Masami [*Folia Pharmacol. Japon.*, **50**, 443 (1954).]

The brain waves were conducted from both gyrus sigmoides posterior and gyrus lateralis of cat brain. The α-wave was defined to be 7–13 per second, and the β-wave to be faster than that, a slow wave means one slower than the α-wave. In normal cat brain, both α- and β-waves overlapped. Anesthetizing with ether made the β-wave more distinct with disappearance of the α-wave and marked decrease of the brain wave amplitude suggesting its brain wave-suppressing action. No difference was found between the shapes of the waves from both conduction sites. With awakening of cat, the brain waves recovered the normal shape in 60 minutes. $CHCl_3$ and morphine hydrochloride showed a similar effect. $CHCl_3$ produced in addition a slow wave with large amplitude. Phenobarbital caused slowing of the brain wave and increased the wave amplitude. Seconal-Na and amytal-Na also slowed the brain wave and increased the amplitude immediately after their injection; the α-wave also disappeared immediately. $MgSO_4$ made the β-wave markedly distinct and the wave amplitude smaller. By anesthetizing with paraldehyde the amplitude of the brain wave became smaller and the α-wave disappeared, resulting in a flat wave shape. When Luminal-Na was injected intravenously, the α-wave immediately became distinct and the amplitude increased, but with time the α-wave gradually decreased with gradual overlapping with the slow wave. The α-wave, however, never disappeared completely in the deepest anesthesia. The difference of the effects of these anesthetics upon the cat brain wave was suggested to be due to the difference of their site of action.

SHOZABURO KITAOKA (Chem. Abstr.)

Effects of Drugs on the Electroencephalogram (EEG). Isenschmid, R. [*Therap. Umschau.*, **9**, 77 (1952).]

A review of EEG modifications produced by various drugs acting on the central nervous system, especially those with hypnotic and stimulating effects.

A. M. M. (Chem. Abstr.)

Two Pictures of the Nervous System (Hydrocephalus Internus and Radiculitis) After Exposure to Carbon Monoxide, in Addition to an Explanation of Poisoning by Carbon Monoxide. Schilf, E. [*Psychiat., Neurol. Med. Psychol.*, **3**, 193 (1951).]

Two cases of CO poisoning are reported: one, a case of hydrocephalus internus developed by a worker removing slag and the other a case of radiculitis of the arm resulting from attempted suicide by illuminating gas. In both, the CO is regarded as the triggering agent rather than the true cause of the symptoms. The effective factor in CO poisoning, which appears after the fixing of the CO by the hemoglobin, is the secondarily developed anoxemia with subsequent disturbance of the permeability of the capillaries, exudation into the surrounding tissue in the sense of a serous inflammation and damage (O_2 and nutritional deficiency) of the parenchyma. All of the experimental findings offered in support of a specific CO poisoning are based upon work in which the CO is introduced into the site of action by nonphysiological means or the differences occasionally observed between anoxemia induced by CO and other anoxemias are over emphasized. The anoxemia produced by CO naturally varies

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with the degree of exposure to the gas. An argument against the possibility of a true CO poisoning is the fact that animals with CO-saturated blood can be kept alive under an excess O pressure.

M. G. MOORE (Chem. Abstr.)

Effects of Diplatsin on Nerve Transmission in Various Parts of the Reflex Path. Val'dman, A. V., et al. [*Farmakol. i Toksikol.*, **18**, No. 2 (1955).]

Diplatsin (e.g. at 4–5 mg./kg. in cats) lessens the lability of neuromuscular synapses. At 2–5 mg./kg. it shows no histamine-sensitizing effect. It impedes nerve impulse transmission to the cardiovascular system, and causes bronchospasmodic effects which are intensified by proserine. But even at 50–100 mg./kg. diplatsin does not significantly alter the character or amplitude of spinal cord reflexes.

JULIAN F. SMITH (Chem. Abstr.)

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