Part III.—Bibliography and Epitome.*

ALLG. ZTSCHR. F. PSYCHIAT.

VOL. CXIV. 1940.

AM. IMAGO.

VOL. I. 1940.

AMER. J. ORTHO-PSYCHIAT.

VOL. X. 1940.

AMER. J. PSYCHIAT.

VOL. XCVII. JULY, 1940.

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

The Respiratory Response of Psychoneurotic Patients to Ideational and to Sensory Stimuli. Respiratory Response in Psychoneuroses.

1. A series of experiments was carried out on a group of psychoneurotic patients and of normal controls, in which was studied the effect on the respiration of the administration of a painful stimulus and of its subsequent recall. The changes in minute respiratory volume are reported as an index of respiratory response.

2. Of 32 experiments on 27 psychoneurotic patients (Group I) with diagnoses of hysteria, anxiety neurosis and phobia, an increase in minute respiratory volume appeared during the painful period in 79 per cent. of the experiments, and during the period of recall in 77 per cent. of the experiments. The increase obtained for both periods, especially for the pain period, was on the average significantly greater than the variability of this group of patients as shown in a preliminary period.

3. Of 14 similar experiments on 12 psychoneurotic patients (Group II) with diagnoses of hypochondriasis, compulsion neurosis, reactive depression, questionable schizophrenia, the changes in minute respiratory volume during the periods of pain and recall were not significantly greater than could be expected from the variability of this group during the preliminary period. Furthermore there were almost as many cases showing a decrease as showing an increase.

4. In 24 similar experiments on 15 control subjects, an increase for the periods of pain and recall appeared in about 80 per cent. of the cases. The increase found was greater than the variability of this group during the preliminary period.

5. The response of the three groups of subjects to a painful stimulus and its recall appeared to be closely parallel to the response to an unpleasant ideational stimulus as previously reported. (Authors' abstr.)

A Survey of Mental Illness Associated with Pregnancy and Childbirth.

(1) Contrary to many previous reports, the majority of the patients of this series were found to have manic-depressive psychoses, a large number were cases of dementia praecox, and only 3·6 per cent. were considered to be toxic-exhaustive deliria. The tendency in the last decade seems to have been to classify fewer of these cases as " psychosis with other somatic disease," as apparently the great majority vary little if at all from the usual pictures of the non-puerperal psychoses.

(2) The present writer failed to find as high a proportion of the depressive type of manic-depressive psychoses as did Kilpatrick and Tiebout, although this was the

most frequent type in the series studied. Also, their finding that the presence of physical factors related to childbirth makes for more frequent confusion in the depressive type was not substantiated.

(3) Contrary to Kilpatrick and Tiebout's finding that puerperal schizophrenias are all of paranoid reaction, this study shows a greater number of catatonics than of the paranoid type.

(4) The writer failed to substantiate the claim of Strecker and Ebaugh that something is added to the ordinary symptomatology of puerperal manic-depressive psychoses by the intrusion of low-grade infectious and exhaustive factors.

(5) However, this series does corroborate the findings of Strecker and Ebaugh that schizophrenic reactions associated with the puerperium frequently show pronounced manic-depressive symptoms, clouding of the sensorium, and a tendency to remissions; that these cases tend to slow deterioration, and that a high percentage of post-partum psychoses occur in the Jewish race. It seems probable that the slow deterioration noted is due to the predominance of catatonic types rather than to modification of the schizophrenic process itself by the reproductive process.

(6) The study shows a considerably greater morbidity in the heredity of the manic-depressive group than in the schizophrenic and toxic-exhaustive groups, and still greater morbidity in the heredity of the psychoneurotic and psychosis with psychopathic personality groups.

(7) The present series of toxic-exhaustive reactions, admittedly a small number from which to draw any conclusions, failed to show the comparatively large number of personality deviations reported by Strecker and Ebaugh in such cases, and considered by them to throw some doubt on the validity of infection and exhaustion as the sole specific etiological agents.

(8) Although hostility to the child, which Zilboorg considers to be the " nodal point " of puerperal depressive reactions, was noted in a high percentage of the manic-depressive cases in this study, and although it was twice as frequent in the manic-depressives as in the toxic-exhaustive group, it was not found to be any more characteristic of the depressive types than of the other forms of manic-depressive psychosis, or of the puerperal schizophrenias.

(9) The same finding was noted with regard to antagonism to the husband, as the percentage showing this character was even greater in the other types of manic-depressive psychosis than in the depressive forms.

(10) Ambivalence toward the husband, child and self also was found to be no more characteristic, in this series, of the depressive reactions than of the other forms of manic-depressive psychosis, although it was almost twice as frequent as in the schizophrenic series.

(11) The authors were unable to find a high percentage of the incest ideas and homo-sexuality considered so typical of the puerperal depressive reactions by Zilboorg.

(12) Chronic masturbation and excessive eroticism were noted commonly in the schizophrenias of the series, but by no means to the extent found by Zilboorg, who failed to find eroticism in only one of his cases.

(13) The same author's claim of evidence of an unresolved Oedipus situation in most puerperal schizophrenias was not entirely substantiated by this study; in fact, a slightly greater number of the cases seemed to show a mother preference.

(14) The study does tend to corroborate, at least to some degree, Zilboorg's claim that the aloof, shy woman with little previous contact with men and prolonged courtship tends to develop puerperal schizophrenia. His statements that these women marry in the latter part of the third decade of life, and that their persistent frigidity points to the impending development of puerperal schizophrenia could not, however, be completely verified from this survey.

(15) Although Zilboorg's findings regarding almost constant antagonism to the husband were confirmed by the present study, the writer found little evidence to support his claim that the women patients had become hyper-sexed for a short interval before resuming their frigidity post-partum; nor did this survey reveal

the claimed consistent happiness during pregnancy. The antagonism toward the child, as expected from Zilboorg's hypothesis, was present.

(16) Homosexual tendencies were rarely noted, in contrast to the findings of Zilboorg.

(17) With few exceptions, the psychoses did have their onset post-partum.

(18) The schizophrenias reported by Zilboorg developed predominantly in multiparae, while those of the present series were slightly more frequent in primiparae. In the multiparae here reported, his findings of an assumption of the masculine role in the interval between pregnancies was strikingly lacking.

(19) Again, a sense of guilt was found much more commonly than one was led to expect from Zilboorg's studies. (Author's abstr.)

Dynamic Disturbances in the Handwriting of Psychotics, with Reference to Schizophrenic, Paranoid and Manic-depressive Psychosis.

1. The handwriting of psychotic patients shows definite characteristics.

2. The basic disturbance in the psychotic handwriting is expressed by the drastic disturbance in the dynamic relationship.

3. The fundamental dynamic disturbance finds different modifications in the handwriting of the schizophrenic, the paranoid and the manic-depressive patients.

4. These different modifications are characterized by an emphasized disturbance in one of the graphic spheres.

(*a*) The dimension of breadth in schizophrenic writings.

(*b*) The dimension of depth in paranoid writings.

(*c*) The dynamic relationship implicating the dimension of height in manic-depressive condition writings. (Author's abstr.)

The Treatment of Delirium Tremens with Insulin in Sub-shock Doses.

Insulin with carbohydrates seems at this time to be the only method of treating delirium tremens which has improved upon the statistical results reported by Kraepelin, who used diet, support and paraldehyde for rest.

Insulin is effective because it rapidly re-establishes normal carbohydrate metabolism. It likewise quickly replaces deficient glycogen reserves in the liver. These two factors, which are part of the same process, re-vitalize the liver and re-establish normal protein and fat metabolism. During the period of deficient carbohydrate metabolism and deficient liver function, toxic intermediate products of abnormal protein and fat metabolism have become so concentrated that they have produced the pathology and symptoms of delirium tremens. Re-establishment of the liver function advances the progress of metabolism, and these products are carried forward to their ultimate normal, less noxious end products. This reduces toxic concentrations, removes the " irritative " factor, the cerebral pathology reverses itself by natural processes, and the delirium is quickly relieved.

Insulin therapy is rapid, effective and simple to administer. The series presented by Steck and by the author had a combined time for complete clearing of the delirium of 2·5 days. (Author's abstr.)

A Study of Insight of Psychiatric Patients.

1. The insight of 100 patients discharged from a private sanitarium has been studied.

2. Among those diagnosed as depressions there was a greater proportion of patients who showed good insight on admission than among those with other psychoses. Psychoneurotics all showed fair to good insight.

3. All but one of the patients discharged as " much improved " or " recovered " showed some insight and most of this group showed good insight.

4. Absence of insight on admission did not impair the prognosis for recovery, but patients with partial insight showed a poorer recovery rate than either those with no insight or those with good insight.

5. Lack of insight was frequently associated with such manifestations as disorientation, poor comprehension, irrelevance, memory impairment, hallucinations, delusions, conduct disorders and retardation. (Author's abstr.)

Prognostic Criteria in Dementia Paralytica.

1. One hundred cases of dementia paralytica treated at the Worcester State Hospital between the years 1925–1938 were studied to determine criteria useful in the prognosis. An inquiry into the cause of failure of one-half to two-thirds of paretics to undergo remission under pyretotherapy was also undertaken.

2. These patients were treated by one of four methods: malaria, standard diathermy, modified diathermy and tryparsamide. Thirty-three per cent. of the total group underwent remission.

3. The following criteria are found to be of value in the determination of the prognosis: age of the patient, duration of the paretic process, previous therapy, extent of neurological dysfunction, history of epileptiform seizures, degree of defects in sensorium, tendency toward spontaneous remission, type of psychopathology exhibited, and degree of adjustment of the preparetic personality.

4. Most important prognostic criterion is the degree of adjustment in the preparetic personality. All of the patients with well-integrated personalities prior to the onset of dementia paralytica underwent remission no matter what type of therapy they were given. Only three out of 63 patients with poorly adjusted personalities experienced remission.

5. Of the other criteria, the most significant are the extent of neurological dysfunction, degree of defect in sensorium and type of psychopathology. Patients in the delirious, apathetic and agitated groups had the best prognosis, those in the demented and schizophreniform the worst.

6. There is found to be a strong correlation between the degree of adjustment in the preparetic personality and the other prognostic criteria. Well-integrated individuals tended to have milder neurological and sensorium defects, slower progress of symptomatology before therapy, and a tendency to spontaneous remission as well as a better prognosis.

7. Three cases of dementia paralytica are cited to show how a relatively accurate prognosis can be formulated.

8. Causes for the greater resistance to the progress of the paretic process and the better response to therapy in the previously well-integrated individual are discussed. (Authors' abstr.)

A Comparative Study of Thinking in Schizophrenic Children and in Children of Pre-school Age.

An analogy is frequently drawn between schizophrenic and child thinking. In order to check the validity of such analogy, verbal productions from protocols of fifteen normal children of pre-school age (two to five years) and three schizophrenic children (with ages varying between seven years ten months and fourteen years seven months) are presented and compared. These productions were obtained under very similar conditions, i.e. favouring the spontaneous expression of phantasy, allowance being made for differences in ages, clinical needs and situational contingencies.

The systematic investigation of the phantasies of young normal children with regard to the evaluation of reality shows that responses fall within three categories: denial of character of reality, which is the most common type of response; evasion; and finally, reiteration with apparent belief. The latter category, containing the smallest number, includes those responses in which a strong emotional component is evident, chiefly fears, but also wishes. It is not possible to demonstrate in normal children true delusions and hallucinations or disorders characteristic of schizophrenic thinking. Experiences which come closest to these belong to the third category, i.e. reiteration with apparent belief, but are not appreciably different from similar experiences initiated in the adult by some strong emotional stimulus.

It is recognized, however, that the child shows a greater emotional lability and greater susceptibility to somatic changes than the adult. In one instance, where a confusion between reality and phantasy seemed apparent, the child showed emotional immaturity and a lack of social adaptation which point to a relation between the coincidence of such experience and a tendency toward faulty integration and adjustment in the future. Follow-up studies of the children's later adjustment should throw light on this point.

From the present records it appears evident that experiences which most closely resemble those found in the schizophrenic are dependent upon emotional factors and not upon characteristics inherent in child thinking. (Author's abstr.)

Set in the Schizophrenic as Measured by a Composite Reaction Time Index.

Twenty-five schizophrenic patients and ten normal subjects were used in an experiment on reaction time employing preparatory intervals of 1, 2, 4, 7·5, 15 and 25 seconds in length. Two procedures were used. In the regular warning procedure each particular interval was presented a number of times in succession. In the irregular warning procedure the various preparatory intervals were presented in a systematically random fashion. The principal findings were:

1. Normals showed significantly shorter reaction times than did the patients, although there was a small degree of overlap. The shortest reaction times of the normals occurred at the 2-second interval in both procedures. The patients on the other hand showed their minimum times with somewhat longer intervals.

2. In the normal subjects the reaction times of the regular procedure are significantly shorter than those of the irregular procedure at each interval except the 25-second, at which point the two curves crossed. The differences between the two procedures diminished with increase in length of interval. The schizophrenics gave shorter times in the regular procedure at only the 1-, 2- and 4-second intervals. At the longer intervals the times of the regular procedure were actually longer than those of the irregular procedure.

3. A composite index was constructed on the basis of these differences between patients and normals, which effectively separated the two groups with practically no overlap. This composite index, which can be expressed in terms of a single number, is more effective in differentiating the two groups than is simple reaction time level.

4. The suggestion is made that such an index has practical value as a clinical device. (Authors' abstr.)

ANNÉE PSYCHOL.

VOL. XXXIX. 1939.

ARQ. DO SERV. DE ASSISTENCIA A PSICOPATAS DO ESTADO DE SÃO PAULO.

VOL. IV. NO. 3. SEPTEMBER, 1939.

Pneumo-encephalography and Cerebro-spinal Fluid Reactions after Air Replacement in Epileptics.

Twelve cases were observed. In all cases an increased cell count followed air-replacement and was at its maximum after 24 hours. There was some protein increase in four cases, the increase affecting both the albumen and globulin fractions.

The Chlorides of the Cerebro-spinal Fluid.

Fifteen hundred determinations of the chlorides in normal liquors gave values between 7·02 and 7·55 gm. per thousand.

ARCH. ARGENT. DE NEUROL.

VOL. XXI. NOVEMBER–DECEMBER, 1939.

JANUARY–APRIL, 1940.

ARCH. DE NEUROL. DE BUCAREST.

VOL. III. NO. 4. 1939.

ARCH. NEUROL. PSYCHIAT.

VOL. XLIV. JULY, 1940.

ILLINOIS PSYCHIATRIC SOCIETY.

NEW YORK NEUROLOGICAL SOCIETY AND NEW YORK ACADEMY OF MEDICINE, SECTION OF NEUROLOGY AND PSYCHIATRY.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY.

Cystometric Studies in Cases of Neurologic Disease.

Objective study of bladder function in cases of neurologic disease adds greatly to an understanding of the various abnormalities of bladder function encountered. Such studies yield most information when made in the form of a continuous graphic record of bladder pressure during filling of the bladder.

In normal patients the desire to void usually occurs with from 100 to 300 c.c. of filling, the average being about 150 c.c. A bladder contraction usually occurs with between 300 and 500 c.c. of filling, the average being about 350 to 400 c.c. Voiding about the catheter may or may not be associated with the contraction.

Bladder contractions are essentially reflex, and the primary reflex centre is in the second, third and fourth sacral segments of the spinal cord. Normally they are inhibited until several hundred cubic centimetres of filling has been accomplished. In the infant a bladder contraction occurs with a relatively small amount of filling. This is also the case, but to a less marked degree, in cases of enuresis in children.

With complete chronic transverse lesions of the spinal cord an " automatic "

or, better, reflex bladder is developed, which essentially functions in the same manner as the bladder of the infant.

Diffuse lesions of the central nervous system above the sacral portion of the spinal cord produce a variety of types of bladder dysfunction. Examples of such lesions are tumour of the cord and brain, injuries of the brain, multiple sclerosis and vascular accidents.

Cystometrograms of patients under spinal anaesthesia or with acute transverse lesions of the spinal cord or cauda equina show a progressively higher peak of pressure with each injection and a progressively higher resting level after each injection. This is due to a neuromuscular reflex (stretch reflex), and depends on the activity of the post-ganglionic visceral motor neuron. A high resting level of pressure is maintained after filling in these cases. Patients with chronic lesions of the cauda equina show at some stage of filling small, irregular, poorly sustained bladder contractions.

In cases of tabes dorsalis and in some cases of chronic overdistension there is atonicity of the bladder wall with a late desire to void, and absence of bladder contractions or any rise in bladder pressure even with 1,000 c.c. or more of filling. There appears to be a marked reduction of afferent impulses from the bladder wall in these cases.

A constantly high resting level of pressure is seen in cases of hypertrophy of the bladder musculature due to obstructive lesions at the neck of the bladder. It is usually about 10 mm. of mercury and remains constant during filling. It depends on the degree of hypertrophy of the bladder musculature that is present and does not represent a neurologic lesion. (Authors' abstr.)

AUGUST, 1940.

PHILADELPHIA NEUROLOGICAL SOCIETY.

NEW YORK NEUROLOGICAL SOCIETY.

ILLINOIS PSYCHIATRIC SOCIETY.

NEW YORK ACADEMY OF MEDICINE, SECTION OF NEUROLOGY AND PSYCHIATRY, AND NEW YORK NEUROLOGICAL SOCIETY.

Primary Cortical Centres for Movements of Upper and Lower Limbs in Man.

It has long been commonly accepted in the literature and in the standard textbooks of anatomy that the primary cortical centres for the lower extremity in man were situated on the lateral convexity of the cerebral hemisphere. A critical review of the literature, however, indicates that this concept became established on the basis of a wholly inadequate number of observations made on the human brain—in fact, largely on observations made on the brains of experimental animals.

Observations made by the author as a result of electrical stimulation along the superior mesial border of the human cerebrum in 14 consecutive cases indicate that the primary motor area for the upper extremity commonly extends upward on the lateral surface of the cerebral hemisphere as far as its superior mesial border, while the leg, as a rule, is represented only on the mesial surface of the cerebrum.

An upward " migration " of the primary motor strip, unique in man, is implied by the observations reported here. It seems probable that this has been influenced by two factors: (1) " Liberation " of the upper extremity from the routine burden of locomotion, with its consequent elaboration of new and highly complex functions, and (2) acquisition of speech and other forms of symbolic expression. These new functional acquisitions have been accompanied by corresponding expansion of the cortical areas representing the tongue, mouth, lips and upper extremity, with the result that the cortical representation for the leg has been crowded farther and farther upward on the lateral surface of the hemisphere until it was finally pushed " over the top " on to the mesial surface of the hemisphere.

Focal contractions of the rectal sphincter, produced by stimulation of the mesial surface of the cerebral hemisphere, are here reported for the first time.

(Author's abstr.)

Relation of Intracranial Tumours and Symptomatic Epilepsy.

The slowly growing neoplasms have a higher incidence of secondary epilepsy than the rapidly-growing tumours, probably because death terminates the history sooner in cases of the latter type. Seizures form a first symptom also more frequently in cases of the slowly growing tumours. Infiltrating and encapsulated

tumours, if they are equally slow growing, have an incidence of seizure twice as often in cases of encapsulated tumours as in cases of infiltrating tumours. In our clinic the percentage of "cure" of seizures by operative removal of encapsulated tumours is about the same as that from excision of focal cerebral scars for the relief of epilepsy.

Abscesses of the brain are apt to produce seizures at an early stage and again after the formation of a healed scar. Subdural haematomas have a relatively low incidence of seizures, and the attacks even then seem to be due to cerebral injury that may have resulted from trauma rather than to the haematoma itself.

(Authors' abstr.)

Relation of Experimental Histamine Headache to Migraine and Non-migraine Headache.

(1) Headache may be produced by sudden intravenous injection of minute amounts of histamine phosphate in from 30 to 40 per cent. of patients subject to chronic recurrent headache.

(2) The same procedure fails to cause headache in those who are characteristically free from this complaint.

(3) Apparently the threshold for histamine headache is lower in persons subject to chronic recurrent headache than in those not so afflicted.

(4) The threshold for histamine headache is somewhat lower in patients subject to migraine headache than in those subject to non-migraine headache.

(5) In patients subject to migraine attacks the type of headache produced by histamine is frequently similar to migraine headache.

(6) In patients subject to other types of chronic recurrent headache the type of headache produced by histamine is only occasionally similar to the patient's habitual headache.

(7) No evidence was discovered that the cranial vascular tree in patients subject to hemicranial migraine headache is unilaterally hypersensitive to histamine.

(8) Further evidence has been presented linking migraine and histamine headache.

(Author's abstr.)

Inhibitory Functions of the Corpus Striatum.

(1) Stimulation of the caudate nucleus inhibits spontaneous movements of the skeletal muscles, probably induced by the cortico-spinal system. The effect is best noted on the ipsilateral side.

(2) Stimulation of the caudate nucleus inhibits bladder tone and tends to depress respiration and reduce activity of the sweat glands.

(3) Little evidence for somatic localization of these effects within the corpus striatum has been found. (Authors' abstr.)

Electro-encephalographic Studies of Injury to the Head.

Clinical and electro-encephalographic studies of 64 cases of cerebral trauma due to injury to the head are presented, in 37 of which the condition was acute. The principal results may be summarized as follows:

(1) In cases of acute injury to the head, cerebral trauma was indicated in the electro-encephalogram by (*a*) random or regular delta waves varying in frequency from less than 1 to 6 per second; (*b*) poor regulation or disorganization of the alpha rhythm; (*c*) epileptiform discharges.

(2) The severity, type and localization of cerebral traumas judged by the electro-encephalogram corresponded closely, in cases of more severe injury, with the results of clinical, roentgenologic and serologic studies and of examination of the spinal fluid, as well as with operative findings. In cases of mild injury the electro-encephalogram appeared to be the most sensitive indicator of cerebral injury.

(3) The electro-encephalogram provides a sensitive objective measure of recovery. Electro-encephalographic abnormalities were gradually replaced by normal activity

as the patient showed clinical improvement, but persisted longer in some cases than did other clinical signs of cerebral disorder.

(4) In some of the cases of more severe injury delta and epileptiform waves and disorganized activity were observed in the electro-encephalogram several years after the injury. These were associated clinically with changes in personality, epileptic seizure, irritability, disorder in thinking or, in a few cases, with no remarkable clinical abnormality.

(5) Post-traumatic syndromes due to malingering or hysteria are clearly evident from the electro-encephalographic examination, since in such cases none of the characteristic abnormalities associated with genuine cerebral trauma are obtained.

(6) Electro-encephalographic indications of subdural haematoma or effusion, epidural haematoma, intracerebral haemorrhage and focal as contrasted with generalized trauma provide an aid to surgical therapy. (Authors' abstr.)

Prevention of Dislocations and Fractures in Metrazol Convulsions.

Metrazol therapy has been threatened with abandonment because of fractures and dislocations which have been caused by the convulsions. These have consisted of injuries to the mandible, humerus, femur and thoracic vertebrae.

Prevention of these complications depends on knowledge of the anatomic mechanisms involved in their production. These are described. The preventive methods of other workers are discussed.

A technique to prevent mandibular dislocation and fractures of the humerus and femur is described. Vertebral injury is prevented by a method of spinal hyperextension.

By proper manual restraint, fractures and dislocations due to metrazol convulsions may be prevented. (Author's abstr.)

Relation of Age to Motor Impairment in Man and in Sub-human Primates.

In primate infants (man, chimpanzee or monkey) the development of paresis and spasticity has been shown to be related to defects in the functional and anatomic development of the central nervous system. Evidence obtained from experimentation on sub-human primates shows that the central nervous system of the infant is potentially different from that of the adult, as manifested by the motor deficits which appear after known cortical ablations. This is corroborated by clinical evidence obtained by the study of the human infant.

1. The absence of cortical motor areas is not accompanied by any marked and noticeable motor deficit in the infant before complex skilled motor activity has developed.

2. Paresis is first seen after ablation of motor cortical areas in the infant at a time when normally skilled co-ordinated movements should appear.

3. Spasticity (increased resistance to passive manipulation) begins to appear much later than paresis, possibly at the time when there is functional organization of certain subcortical motor pathways.

4. In the monkey the greater adequacy of motor function which develops after precentral ablations in infancy is due in part to reorganization of cortical function, since additional motor deficit appears in such animals after subsequent ablation of post-central or frontal association areas.

5. The paresis, and to a much greater extent the spasticity, is always less severe in all primates if the causative lesion occurred in infancy.

(Author's abstr.)

Human Behaviour after Extensive Bilateral Removal from the Frontal Lobes.

In the case reported a traumatic injury had destroyed somewhat less than one-third of each frontal lobe and left a scarred zone in each hemisphere, giving rise to continuing abnormal electrical potentials and to recurring epileptic seizures.

Surgical removal of scars and a zone of grossly normal cerebral tissue, in such a way as to insure a minimum of scar, resulted in comparative freedom from attacks (two seizures in the 15 months following operation, as compared with weekly seizure before). Although after operation a third, and possibly more, of the total volume of each frontal lobe was lacking, there was a striking post-operative improvement in personality and intellectual capacity, with the same medication as before the operation. After the initial post-operative period no clinical or psychometric evidence of deterioration was detected.

It is obvious that abnormal areas of brain may produce, in a positive sense, both decreased mental capacity and abnormalities of behaviour, and that absence of these areas may allow other parts of the brain to recover their normal functions. It is concluded that removal of a third of both frontal lobes, uncomplicated by pathologic change in the rest of the brain, need have no grossly deteriorating effect. The significance of this finding for the study of function of the frontal lobes is discussed. (Authors' abstr.)

BULL. MENNINGER CLIN.

VOL. IV. JULY, 1940.

CANAD. J. OCCUP. THER.

VOL. VII. APRIL, 1940.

War Neuroses and Psychoses.

A brief account is given of the aetiological factors and symptomatology of the various types of malingering, neuroses and psychoses met with in war-time. It is pointed out that in peace psychoses far outnumber neuroses (8 to 1, U.S. Army, 1915), while in war the relations are reversed, neurotic reactions making up 50 to 60 per cent. of the total nervous and mental disabilities. Regarding treatment it is insisted that success depends more upon the personality of the physician than on the method employed. S. M. Coleman.

Rehabilitation.

It is concluded that in dealing with the nervous invalid, the types of treatment and training must be determined not alone by the nature of the neurosis as such, and the work to which, suitably or unsuitably, the patient may have been accustomed; but pre-eminently by his original mental constitution, its capacity and mode of reaction. If the neurotic patient is also a defective or a psychopath or otherwise constitutionally handicapped, as is the case more often than not, it is useless to prescribe treatment or occupation for him simply as a patient suffering from a neurosis without regard to these fundamental and permanent mental limitations. S. M. Coleman.

CHARACTER AND PER.

VOL. VIII. 1940.

EVOLUT. PSYCHIAT.

NO. 2. 1939.

NO. 3.

INDIAN J. PSYCHOL.

VOL. XIV. 1939.

INT. J. PSYCHOANAL.

VOL. XXI. JULY, 1940.

INT. Z. PSYCHOANAL. IMAGO.

VOL. XXV. 1940.

J. ABNORM. SOC. PSYCHOL.

VOL. XXXV. 1940.

J. APP. PSYCHOL.

VOL. XXIV. 1940.

J. COMP. NEUR.
VOL. LXXIII. AUGUST 15, 1940.

The Medial Thalamic Nucleus: A Comparative Anatomical, Physiological and Clinical Study of the Nucleus Medialis Dorsalis Thalami.

1. The nucleus medialis dorsalis is composed of two well-defined parts, a parvicellular and a paralamellar, and a poorly defined medial portion, the nucleus medialis dorsalis pars magnocellularis.

2. The dorsomedial nucleus receives fibres from the adjacent lateral and ventral thalamic nuclei, and from the midline structures along the third ventricle. Cortico-thalamic fibres enter it from the prefrontal cortex.

3. A well-organized system of fibres passes from it to the cortex of the convexity and orbital surface of the prefrontal lobe.

4. Physiological studies of the nucleus have added little to the knowledge of its function.

5. Although softenings of both nuclei dorsalis mediales in the human have been associated with mental defects and dementia, it is doubtful whether the damage to the dorsomedial nuclei alone is responsible for this condition.

6. The probable function of the nucleus medialis dorsalis is to integrate the somatic and visceral impulses and to relay them on to the cerebral cortex.

(Author's abstr.)

Thalamic Connections of the Frontal Cortex of the Cat.

The positions of the areas of the frontal cortex of the cat in which end the axones of the cells of the main sensory nuclei of the dorsal thalamus have been determined by comparing the locations of cortical lesions with the disposition of the resulting thalamic degeneration. Twenty-five experiments were made with 19 cats.

The medial thalamic nucleus degenerated after lesions involving the gyrus proreus. Of the parts of the ventral nucleus, the arcuate is connected to the cortex about the lower end of the coronal sulcus, the ventrolateral to the cortex about the upper end of the coronal sulcus and the lateral part of the post-crucial gyrus, the ventral anterior to the motor area in the lateral part of the precrucial gyrus and in the crucial sulcus, the ventromedial to the cortex immediately lateral to the precrucial sulcus. (Author's abstr.).

J. COMP. PSYCHOL.

VOL. XXX. AUGUST, 1940.

J. EDUC. PSYCHOL.

VOL. XXXI. 1940.

J. EXP. PSYCHOL.

VOL. XXVI. 1940.

Facilitation of the Alpha Rhythm of the Electro-encephalogram.

In this study of occipital and pre-central alpha rhythms, facilitation was exhibited by an increase in amplitude and regularity of the potentials, usually appearing as a series of bursts. Stimuli eliciting facilitation were similar to those reported as eliciting the PGR. They were characterized by a change in the general psychological state of the subject from relaxation to readiness, attentiveness, or awareness, and from these states back to relaxation. The states were induced by putting sudden questions to the subject, presenting ready signals indicating the beginning of some task, giving instructions, etc. Facilitation was found to undergo a process of adaptation. Individual differences in ease and regularity of eliciting facilitation were obtained. Facilitation of the occipital and pre-central rhythms could at times be elicited independently. H. W. KARN (Psychol. Abstr.).

The Effect of Benzedrine Sulphate on Syllogistic Reasoning.

Twenty S's were given a syllogistic reasoning test at four different experimental sittings. At two of the sittings the S's were under the influence of 10 mg. of benzedrine sulphate: the other two sittings involved a capsule of lactose. Test scores were taken at each sitting, together with records of mood ratings, fatigue ratings, blood pressure, and heart rate. The following conclusions are drawn: (1) The drug had no statistically significant effect on the reasoning scores of the S's as a group in terms of either their accuracy, their speed, or their efficiency alone. However, all the changes were slightly in favour of the influence of the drug. (2) The drug had a slightly greater effect on the women's reasoning scores than on the men's. (3) The S's who were lighter in weight obtained a slight increase toward significance due to the drug, which change was not as well shown in the heavier S's. (4) Benzedrine had no statistically significant effect on the self-ratings of the S's as to mood and fatigue. (5) There was no statistically significant change in the rate of the heart beat due to the effects of the drug. (6) There was a significant rise in systolic blood pressure due to the effects of benzedrine.

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

J. GENET. PSYCHOL.

VOL. LVI. JUNE, 1940.

J. NERV. MENT. DIS.
VOL. XLI. JUNE, 1940.

Psycho-analytic Procedure in the Hospital.

In this paper some of the problems and difficulties encountered in establishing a hospital routine based on psycho-analytic concepts are considered. In order to provide for each individual patient the optimum conditions under which recovery may take place the following advice is given: (1) The fostering of a 24-hour a day appreciation of the patient's illness, (2) the provision of a teaching programme for all who come in contact with the patient, and (3) the analysis of nurses.

S. M. COLEMAN.

Paraphysial Cysts.

The writer suggests that not enough attention has been paid to the early symptoms of these tumours, whose presence may be suspected from a history of sudden onset with severe headache followed by hypersomnia, visual disturbances, epileptiform seizures, and frequently by the onset and relief of symptoms by a change in posture of the head. The diagnosis can be confirmed by ventricular air studies. It is pointed out that with earlier recognition it will be possible for a greater number to be successfully removed. S. M. COLEMAN.

The Treatment of Cryptorchidism.

The paper consists of psychiatric observations on 21 cases of cryptorchidism treated with gonadotropic hormones. Of these cases 11 were bilateral, 2 unilateral, 3 scrotal, and 5 were pseudocryptorchids. Antuitrin S and antophysin were used. These hormones were administered intramuscularly in doses of 200–300 units two or three times weekly.

It was concluded (1) that descent of the testicles does not mean necessarily change or improvement in the mental status. (2) The behaviour of the patient could not be ascribed to the cryptorchidism alone. (3) There are various types of conditions in which undescended testicles may occur and there is apparently no psychiatric entity associated with them. (4) The occasional improvement in the mental status could not be ascribed to the endocrine therapy alone. (5) When the total picture is evaluated, the restricted clinical value of the hormone therapy becomes apparent. (6) The pseudocryptorchids should be differentiated from the true. (7) In true cryptorchids descent was noted in only 3 of 13 cases.

S. M. COLEMAN.

Intradural Spinal Lipomas.

A case of intradural spinal lipoma is presented, upon which laminectomy and later autopsy were performed. The lipoma appeared histologically to arise from the pia arachnoid and to grow out from rather than to invade the cord substance. Reference is also made to another tumour of mixed mesodermal derivatives, one of which was fat, occurring between the two corpora mammillaria.

S. M. COLEMAN.

J. NEUROPHYSIOL.

VOL. III. JULY, 1940.

Hypothalamic Lesions and Pneumonia in Cats.

1. Forty cats were operated upon in three series. Bilaterally symmetrical lesions were placed in the rostral (5 cats), middle (26 cats) and caudal (9 cats) regions of the hypothalamus.

2. Characteristic changes in the motor behaviour and the emotional responses of the animals are described.

3. All animals with rostral lesions (anterior commissure to optic chiasm) survived. Sixteen of the 19 animals with middle destructions (chiasm into mammillary bodies) succumbed to bilateral bronchopneumonia in one to eight days. Two of the 8 animals with caudal lesions (mammillary bodies and portions of the mesencephalon) died of pneumonia on the 7th day.

4. Animals with rostral lesions retained the ability to prevent an abnormal fall in body temperature; those with caudal lesions showed occasional disturbances of temperature regulation; whereas animals with middle lesions showed marked poikilothermia. All animals responded to infection with fever, but those with middle lesions could not maintain the hyperthermia in the presence of fluctuating environmental temperatures. A close correlation existed between the degree of poikilothermia and the incidence of pneumonia, but important exceptions occurred.

5. The following possible contributory factors were studied and found to be of little or no significance in the aetiology of pneumonia in the animals with middle hypothalamic lesions; distemper, anaesthesia, basilar haemorrhage, peritonitis, aspiration, laryngeal obstruction, pulmonary emboli, gastro-intestinal disturbances and exposure to extremes of temperature. Destruction of the central region of the hypothalamus therefore causes a high incidence of fatal pneumonia in cats, but the specific aetiologic factors in this relationship require further investigation.

(Authors' abstr.)

Progression Movements Elicited by Subthalamic Stimulation.

In cats anaesthetized with nembutal, alternating movements of the legs similar to those of normal walking and running were elicited by 60-cycle alternating current stimulation of the subthalamus in the region dorsal to the mammillary body. The sharp localization and low threshold of the response indicate that the subthalamus contains a specific centre which directs the order of movement of the legs in locomotion. (Author's abstr.)

Electrical Activity of the Lateral Geniculate of Cats following Optic Nerve Stimuli.

1. Four groups of fibres in the optic nerve produce four potential waves after conduction. The geniculate and cortex are activated chiefly by the first group of fastest conduction, with one radiation spike only following each nerve volley. Paired shocks exciting these fibres in the optic nerve, even when maximal, show facilitation of the second responses at intervals of 2 to 15 or more msec. The same applies to successive synapses traversed in the cortex, the results being cumulative.

2. The homolateral response of the optic cortex in cats varies from 15 to 70 per cent. of the contralateral. No facilitation can be detected at the geniculate level by simultaneous or successive stimulation of the two optic nerves, and little, if any, at the cortical level.

3. Slow potentials of the order of after-potentials in their time relations can sometimes be demonstrated at electrodes thrust into the cell layers of the geniculate. They seem to be non-conducted, and are interpreted tentatively as slow decay of cell body or dendritic excitations.

4. The cortical activity shows a depression followed by facilitation having a phasic relationship to the alpha rhythm, after a single volley in the optic nerve. The short-period facilitation occurring at geniculate and cortex counteracts this depressive phase so that with light anaesthesia responses of the cortex will follow up to at least 100 per second. Fluctuations of amplitude in these responses still follow the alpha wave set up by the first stimulus of the train, until temporal dispersion of alpha processes occurs.

5. Fibres from the optic tract spread in a thin surface sheet over much of the area bounded by the medial and lateral geniculates, the pretectal area, and superior colliculus. From regions not usually assigned optic function, post-ganglionic responses can be recorded. In general, the larger fibres with faster conduction rate and lower threshold synapse are in the anterior regions of the optic tract distribution, the smaller in the posterior regions.

6. The chief conclusions we can draw from these findings lead to further hypotheses to be tested rather than to an explanation of visual function.

(Authors' abstr.)

Integration of Locomotor Behaviour Patterns of the Hagfish.

1. The California Hagfish, *Polistotrema stouti*, was subjected to operational procedures designed to illustrate the nature of the locomotor behaviour patterns. Visual impressions of the deficiencies produced were used for interpreting the results.

2. Simple cord section produces a disintegration of the total behaviour pattern which can be re-established under strong external stimulation.

3. That the behaviour studied is a total pattern is indicated by the fact that isolation of a segment of the cord causes an immediate formation of a new site of initiation of the waves, and also in that the wave length of the undulations integrated by isolated segments varies with the length of the segments.

4. The undulatory waves represent moving sites of nervous integration, and their speed and direction may be experimentally altered.

5. Stimulation of the posterior end of the body and particularly of the tail results in the usual head-to-tail undulations. Stimulation of the gill region initiates waves of reverse direction.

6. Single hemisections of the cord do not incapacitate the animal for forward

locomotion, though backward swimming becomes impossible. Paired contralateral hemisections act as complete sections except that with strong stimulation the pattern was more easily restored to normal.

7. It is possible, with properly placed hemisections, to dissociate the undulatory pattern into right and left-sided halves. Direct faradic stimulation of the sides of the cord also produced this fractionation. (Author's abstr.)

Effects of Heating Hypothalamus of Dogs by Diathermy.

Small gold foil electrodes, 3 by 6 mm. in size approximately with insulated thermocouple wires attached, were placed on either the anterior hypothalamus or the posterior hypothalamus of dogs by a subtemporal approach to the base of the brain. The free ends of the electrode wires were brought to a subcutaneous position on the skull, and the dog allowed not less than one month to recover from the operation. Tests were made to determine if the temperature regulatory functions of shivering, panting and peripheral vasoconstriction and vaso-dilation were normal. When these functions were normal the brain was heated locally by diathermy current from the brain electrode in a controlled environment. Heating the anterior hypothalamus caused inhibition of shivering and vasodilation. Heating the posterior hypothalamus produced sleep and a slight decrease of shivering intensity. Panting was not induced by local hypothalamic heating. The results prove the existence of centres for shivering inhibition and thermal vasodilation in the anterior hypothalamus which are motivated by local brain temperature changes without changes of general body temperature or peripheral temperatures. Post-mortem examination of the hypothalamus revealed that no hypothalamic structures had been injured in any way by the experimental procedures.

(Authors' abstr.)

Role of Neocortex in Regulating Postural Reactions of the Opossum (Didelphys virginiana).

Electrical stimulation of the neocortex in 17 opossums revealed various areas from which movements of the contralateral facial, fore leg and hind leg musculature could be obtained.

The placing and hopping responses of the opossum are much slower and less exact than those of phylogenetically higher forms.

These postural responses are controlled in part by the electrically excitable areas of the neocortex. Ablation of this sensori-motor area of one hemisphere produces deficiencies in the responses of the contralateral foreleg and hindleg.

The deficiencies in postural adjustment resulting from cortical lesions are less extensive than those resulting from ablation of similar areas of the cortex in higher forms.

Visual responses are affected by removal of the visual cortex, but with this exception lesions in non-excitable portions of the cortex cause no deficiency of the postural responses studied.

Extirpation of a portion of the sensori-motor area produces deficiencies which are less extensive than those resulting from ablation of the entire area. Bilateral ablation of electrically excitable cortical areas results in bilateral deficiencies.

Unilateral removal of the electrically excitable area alone produces just as great deficiencies in the placing and hopping responses of the contralateral legs as does ablation of the entire neocortex of one hemisphere. (Authors' abstr.)

Chemical Constitution and Anaesthetic Potency in Relation to Cortical Potentials.

The cortical electrical response to anaesthesia from eleven alcohols has been studied in cats in regard to the effects of an increase in carbon atoms in the alcohols and an increase in potency, to the total frequency per second of cortical waves: the frequency becomes progressively slower with increasing molecular weight (increased number of carbon atoms) of the alcohols.

The rate of change of the frequency curve is the reciprocal of that of the potency curve. That this slowing is due to an increase in anaesthetic potency rather than to an increase in molecular weight *per se* is shown by the fact that the total frequency is also slower when the secondary or tertiary forms of the alcohols are compared with the primary; thus frequency appears to bear a definite relationship to the anaesthetic potency of the alcohol, even when molecular weight and atomic composition (but not structure) are maintained unchanged. A new approach to study of the meaning of anaesthetic potency is presented. (Author's abstr.)

Ocular Movements from the Occipital Lobe in the Monkey.

Contralateral conjugate deviation of the eyes with lateral or with either upward or downward components was obtained by stimulation of the occipital cortex. When the exciting electrodes were applied to the cortex of area 17 superior to the calcarine fissure, the movements tended to be lateral and downward. When applied below the same landmarks, the deviation was lateral and upward. The relationship of this finding to the projection of the retina on the cerebral cortex is discussed. (Authors' abstr.)

Nature of the First Visible Contractions of the Forelimb Musculature in Rat Foetuses.

The earliest visible contractions of skeletal muscle in the living, intact rat foetus were produced by electrical stimulation during the 16th day of gestation. These involved a variety of forelimb movements.

The movements typically exhibited high threshold, relatively long duration (especially of the phase of relaxation), tendency toward rapid fatigue, and long time factor (suggestive of both long latent period and long chronaxie of the muscles).

The limb at this stage is in a state of early differentiation, including not only muscle-fibres, but also fascia, tendons and joints. This strongly suggests that extramuscular factors may be influencing the nature of the muscular response, whose visible properties thus may be more apparent than real. It is concluded, therefore, that the somatic movements cannot be unequivocally accepted as reflecting the physiological capacities of the muscles involved.

Evidence is presented indicating that potentially effective neuromuscular transmission, on the efferent side at least, exists in 16-day rat foetuses, although the nerve-endings themselves are primitive in form.

The theory of a "myogenic" developmental phase of muscular activity is discussed, and it is concluded that no valid evidence for such a phase exists. (Authors' abstr.)

J. NEUROL. PSYCHIAT.

VOL. III (N.S.). JULY, 1940.

Topographic Studies of Disturbances of Sweat Secretion after Complete Lesions of Peripheral Nerves.

Colorimetric investigation of sweat secretion shows that after total interruption of a peripheral nerve the loss of sweating is complete only within the autonomous zone of the nerve.

The mixed or intermediate zone is revealed by more or less marked hypohidrosis. Following the administration of pilocarpine this zone shows an area of hypohidrosis.

The maximal zone of a peripheral nerve may be demonstrated (*a*) after section of all adjacent nerves (the area of residual sweating), or (*b*) by incomplete lesions of the nerve, characterized by pain and cutaneous tenderness and spontaneous sweating.

In the area of residual sweating the autonomous and mixed zones can be distinguished from each other by differing degrees of sweating.

The demonstration of the different zones in the sweat picture shows that there is great variability in the area of autonomous supply of each peripheral nerve and in the extent of overlap of adjacent peripheral nerves with one another.

(Author's abstr.)

Alzheimer's Disease.

Six cases of Alzheimer's disease are recorded with pathological findings.

A plea is made for a wider conception of this disease, at any rate until such time as more is known about it, and that this conception should be founded on the pathological histology.

It is suggested that two factors may be involved in any given case, the one endogenous or constitutional and the other exogenous. The former is represented by familial cases; the latter by those examples of subacute toxic-infective psychosis with dementia which present the characteristic histology of Alzheimer's disease. Between these two all gradations may be expected, but most cases, and especially the classical type which presents a fairly typical clinical picture, approximate to the endogenous variety.

The importance is stressed for the need for more complete histological examinations of the other organs of the body. The possibility of extracerebral factors must ever be in mind. (Author's abstr.)

A Study of Pure Word-deafness.

A case has been described in which there was a syndrome consisting of pure word-deafness, and what has been described as asymbolia for pain, following a head injury. The inter-relationship of these two disorders has been discussed, and it has been pointed out that pure word-deafness and asymbolia for pain have the common feature of a disturbance in the relationship between the individual and his environment. The localization of the responsible lesions has been discussed. Consideration has been given to the problem of the position of pure word-deafness in the system of aphasias. (Authors' abstr.)

J. PARAPSYCHOL.

VOL. III. 1939.

J. PSYCHOL

VOL. X. JULY, 1940.

MAG. PSYCHOL. SZLE.

VOL. XII. 1939.

On Mass Psychoses.

Masses or crowds are formed mainly in periods of national or social tension. In the crowds individuals lose their personalities, and their moral or educational inhibitions disappear. The actions of crowds often manifest pathological signs. Mass psychosis is present when the mental basis of crowd formation is pathological, or when the behaviour of the crowds results in unreasonable exaggerations. The most frequent mass psychosis is mass hysteria. Among its manifestations there are vehement explosions caused sometimes by a single person's pathological reactions; primitive, unrestricted motions, similar to convulsions; blind imitations of peculiar habits; escapes into illness or even temporary deficiency of sense organs; belief in fantasy pictures as real existences; and uncritical worship of mysterious phenomena. The leader of the masses has a tremendous influence which can be used for construction as well as destruction. The lasting capacity of mass psychoses is different; explosive reactions are terrible, but they may quickly disappear; escapes and intentional neuroses stop when the aim is attained, or becomes hopeless; fantastic ideas generally last longer, at least for the duration of the basic excitement; and, finally, mystic suggestions can be suppressed only when their originators can be stopped. M. ERDÉLYI (Psychol. Abstr.).

MED. J. AUSTR.

VOL. XXVII. JUNE 29, 1940.

Cerebral Compression.

As an intracranial lesion expands, it does so primarily at the expense of the more easily compressible constituents of the brain, namely, the subjacent venous

and cerebro-spinal fluid channels. If the lesion is removed at this stage the brain will expand promptly, as it is forced out by the return of the blood and cerebro-spinal fluid to their normal channels and to a slight extent by the natural elasticity of the cerebral substance. If, however, the lesion should become very large and exert its pressure over a relatively long time, additional fluid is expressed from the interstitial tissue of the brain and perhaps also from the various cells. In such cases, when the lesion is removed there will be a certain degree of expansion due to the return of blood and cerebro-spinal fluid and to elasticity. Complete expansion will depend on how much interstitial fluid has been expressed by the lesion. If the amount is small the brain will soon resume its normal contour; but if it is large, several hours may elapse before the brain expands fully. The rapidity with which the lesion expands also seems to influence the rate of expansion. In the case of a slowly-expanding lesion, the brain apparently accommodates itself so that very little interstitial fluid is expressed, while if the lesion expands rapidly a relatively large amount of fluid is expressed from the interstitial tissues.

Thus it can be seen that the length of time the brain is compressed, the degree of pressure exerted and the rate of expansion of the lesion are the primary or indirect factors controlling the rate of expansion of the brain after the compressing agent has been removed. The loss of fluid from the interstitial tissues and possibly from the cellular elements is secondary to the influence of the above three factors, and is the direct factor influencing expansion of the brain.

It is not necessary that all three should be present to the same pronounced degree, for if one is slight the same result may occur when the other two factors are more pronounced. This is demonstrated in the two clinical cases that have been reviewed. In the first the lesion was very large, rapidly expanding, and exerted its pressure for less than two hours. In the second case the lesion was also large, but slightly less so than the first. It expanded slowly, but exerted its pressure for several hours longer.

The physico-chemical factors controlling this exchange of fluid as the result of pressure are another problem, and have not been considered in this study. Further presumptive evidence in support of the above conclusions may be obtained from the two clinical cases described. In each case the blood-pressure readings did not fall below normal until just before death, and the pressure of the cerebro-spinal fluid was elevated in both cases during the post-operative course; but even these factors were not sufficient to force the brain out to its normal contour when the lesions were removed.

This condition must be very uncommon, and to be brought about it seems necessary that the lesion should compress the brain for some hours, that it should be large and exert a considerable degree of pressure, and that it should expand rapidly. This study, applied clinically, supplies another reason for the surgical removal of an intracranial expanding lesion at the earliest opportunity in cases in which such a removal is possible. (Author's abstr.)

OCCUP. THER. AND REHABIL.

VOL. XIX. APRIL, 1940.

Conjuring and Occupational Therapy.

The value of conjuring in the field of occupational therapy is considered and the technical methods for teaching conjuring to patients in classes are indicated.

In an interesting section on the psychology of conjuring it is stated that 10 per cent. depends on manual dexterity, 10 per cent. on apparatus, and 80 per cent. upon the successful application of psychological principles. " Gestures, expressions and dramatic patter are intentionally planned, not only to entertain, but also to mislead deliberately the spectators' senses, and to confuse their perceptions." Despite the popular theory, it is the mind, not the eye that is deceived, for the hand is quicker than the eye only because the latter is engaged elsewhere. All magicians concede that a highly educated person is the easiest to fool, because he has learnt to reason logically. Children, on the other hand, are the most difficult because of inattention and undeveloped reasoning power.

The psychological principles involved include two main groups. The first concerns misdirection of attention and is discussed under the following subheadings: (1) diversion of attention, (2) distraction of attention, and (3) relaxation of attention. The second category is concerned with misdirection by the creation of illusions of perception, based upon the principle of association of ideas.

S. M. COLEMAN.

VOL. XIX. JUNE, 1940.

Outlets for the Propitiation of Guilt.

In this paper it is shown how occupational therapy is able to provide means for guilt atonement by offering acceptable means of self mutilation, lessening in this way the demands of the super-ego. S. M. COLEMAN.

PROC. AMER. ASSOC. STUD. MENT. DEF.

VOL. XLIV. 1939.

A Contribution to the Study of the Influence of Heredity on Mental Deficiency. The Genetics of Phenylpyruvic Oligophrenia.

Two hundred cases of phenylpyruvic oligophrenia were studied. The disease is characterized by an alteration of the metabolism of phenylalanine. Clinically, anomalies of the motor system are demonstrable and pronounced intellectual retardation is present in all cases. Over 20,000 inmates of 14 state institutions for the feeble-minded were examined. The family of each case of phenylpyruvia was visited and all living parents and siblings and relatives of some were examined. These data were examined to determine whether the disease was caused by environmental factors, but seemingly it was not. Then the material was examined for evidence of genetic mechanisms. The data were found to be consistent with the quantitative requirements of the theory of monomeric recessivity. Apparently the disease is determined by an autosomal recessive gene.

M. W. KUENZEL (Psychol. Abstr.).

Research in Progress upon the Electro-encephalogram in Mental Deficiency.

Studies have been directed principally to the determination of whether differences in intellectual level tend to be associated with differences in characteristics of the electro-encephalogram. To facilitate control of the chronological age variable one study was concerned with subjects over 16 years of age; another dealt with patients of the Mongolian type; a third with subjects of the non-differentiated familial type. Thirteen individuals with phenylpyruvic oligophrenia have been examined. Another mixed group of 30 individuals ranging in age from 2·5 to 10 years are being followed through at regular intervals in order to study the relation of developmental changes in the electro-encephalogram with other measurable changes in growth. Still another study is concerned with pairs of identical and fraternal twins. The new technique is said to be leading to the discovery of some of the physiological factors on which intelligence and its deficiencies depend.

M. W. KUENZEL (Psychol. abstr.)

The Conditioned Habit Treatment of Nocturnal Enuretics.

Six males and one female from an institutional population of mental defectives were selected for a preliminary investigation of the usefulness of Mowrer's technique for nocturnal enuretics. The experiment is described. Initial voluntary awakenings occurred as early as the fifth night in one case and as late as the twenty-first night in another. Successful therapeutic results were obtained in six of the seven cases.

M. W. KUENZEL (Psychol. Abstr.).

PROC. ASSOC. RES. NERV. MENT. DIS.

VOL. XIV. 1939.

The Electrical Activity of the Brain: Its Relation to Physiological States and to States of Impaired Consciousness.

A review of selected investigations in the field of electro-encephalography, with particular emphasis upon the author's research in individual differences and their inheritance, in the relation of alpha rhythm and personality type, in the modifications during sleep, and in the effects of abnormal conditions such as anoxia, various drugs, and pathological conditions. It is concluded that a general correlation exists between characteristics of the electrical activity of the brain and the state

of consciousness of the subject—"a closer relationship, it is believed, between consciousness and an objective physiological phenomenon than has been obtained by any previous method." D. G. MARQUIS (Psychol. Abstr.).

Effects of Vitamin Deficiency on Mental and Emotional Processes.

The role of vitamin deficiency in brain function is shown by the recently discovered relationship between nicotinic acid deficiency and pellagra, a syndrome characterized by nervous and mental manifestations. Evidence from a series of 51 patients with Korsakov psychosis indicates that recovery is many times more frequent under treatment with massive doses of vitamin B_1 (thiamin chloride), although definite conclusions must await more extensive evidence. Another series of patients with encephalopathic syndromes showed a reduction in mortality from 89 per cent. (47 cases) to 12 per cent. (16 cases) when treatment with nicotinic acid was introduced. In the recovered patients improvement was noted within 24 hours after treatment. D. G. MARQUIS (Psychol. Abstr.).

The Effects of Barbiturates and Bromides on Mental and Emotional Processes.

Bromide and barbiturate intoxications not only provoke characteristically different neurological syndromes, but also quite specific psychiatric pictures. Delirious and hallucinatory episodes with marked disorientation and confusional states are typical in bromide psychoses, which may also bring out deep castration fears and individual problems. In the barbiturate cases the stupor is followed only by a short period of confusion and there is a definite disturbance in the mood, usually in the direction of euphoria. Taken together with the known specific symptoms of alcohol, marihuana and mescal intoxication, these results indicate that drugs produce characteristic psychological changes which are specific to the nature of the drug, and presumably depend upon its site of action in the nervous system. D. G. MARQUIS (Psychol. Abstr.).

Effects of Benzedrine in Altering Mental and Emotional Processes.

Experimental investigations of the physiological, psychological, and clinical effects of benzedrine are reviewed. In speculating on its mechanism of action, the author suggests that benzedrine acts directly on central neurons in a manner antagonistic to acetylcholine, and is probably similar to, if not identical with, a substance which is elaborated within the body. Such a substance might be closely related to the sympathins. D. G. MARQUIS (Psychol. Abstr.).

The Effects of Marihuana.

The symptoms which follow the smoking of marihuana cigarettes are increase in motor activity, a feeling of exhilaration and excitement, or of languor, mental confusion, disorientation, accelerated perception, elementary visual illusions and hallucinations, euphoria and talkativeness. Subjectively there are feelings of accelerated thought processes and of intellectual brilliance, changes in time perception, various somatic feelings, dizziness, hunger, swelling of the head, lightness of the extremities, a sensation of walking on air, lengthening of the limbs, and sexual illusions and excitement. D. G. MARQUIS (Psychol. Abstr.).

Central Nervous Mechanisms for Emotional Behaviour Patterns in Animals.

A review of the experimental study of the mechanism of emotional behaviour leads to the conclusion that anger, fear, pleasure and sexual excitement in animals are specific kinds of behaviour which are distinguishable from one another and from all other forms of activity. With the possible exception of the full display of pleasure, each of these modes of response is effected by central neural mechanisms which are subcortical and suprabulbar. Future work should determine the various channels involved in the arousal of emotional behaviour. In the case of sexual

behaviour, one of the factors is definitely hormonal, and in the absence of the cortex the number of emotional stimuli is greatly reduced.

D. G. MARQUIS (Psychol. Abstr.).

Levels of Autonomic Function with Particular Reference to the Cerebral Cortex.

Redefinition of the autonomic nervous system so as to include the central mechanism of control permits the concept of functional levels to be applied to autonomic as well as somatic functions. The possibilities of reflex and integrated control of autonomic functions at the spinal, bulbar, hypothalamic and cortical levels are reviewed. Comparative studies in various animals indicate that there has been a progressive encephalization of mechanisms of emotional expression and of autonomic control in the ascending evolutionary scale.

D. G. MARQUIS (Psychol. Abstr.).

Behaviour of the Newborn Infant and Early Neuro-muscular Development.

The development during the first two years may be grouped into four stages: (1) The first four months period is marked by a diminution of the atavistic reflexes and rhythmical movements of the newborn. (2) The period between four and eight or nine months is characterized by the development of voluntary movements in the upper spinal region. (3) From eight to fourteen months there is increasing control of activities of the lower spinal region. (4) The remaining ten months are marked by the rapid development in associational processes, conditioning, and symbolic associations, including language. D. G. MARQUIS (Psychol. Abstr.).

The Brain Structure of the Newborn Infant and Consideration of the Senile Brain.

Experimental studies of the correlation between neural development and behaviour in animals are reviewed in relation to the author's investigations of the histological structure of the brain of the newborn infant. Whether any part of the cerebral cortex can function at birth is a matter of speculation. There is no myelin anywhere in the cortex, but animal studies have shown that myelin is not essential for neural activity. Throughout the cortex a neuropil is present in sufficient quantity to afford a means for contacts between afferent and efferent fibres.

D. G. MARQUIS (Psychol. Abstr.).

Physiological Changes in Emotional States.

The biological function of the acute emotional experience is the precipitation of an internal crisis, in which habit is interrupted and the primitive facilities for biological adjustment are mobilized—both the visceral and the intellectual facilities. The so-called emotional states of many neurotic and psychotic patients, on the other hand, represent merely the stereotyped and conventionalized expression of a pattern of behaviour sometimes associated with emotional experience. In studies of excited and "emotional" patients, no evidence of increased blood sugar or of cardiac acceleration was found. Emotional experiences, with the usual visceral accompaniment, can of course be induced acutely in such patients.

D. G. MARQUIS (Psychol. Abstr.).

PSYCHIAT. QUART.

VOL. XIV. JULY, 1940.

Psychometric Study of Insulin-treated Schizophrenics.

A comparative psychometric study of the mental efficiency of schizophrenic patients immediately before and after insulin treatment suggests the possibility of a psychological test battery capable of forecasting the probable effects of insulin therapy to a considerable degree. A test battery consisting of a vocational interest blank, tests of counting by 3's and naming words in three minutes, a similarities and a directions test, gave a correlation of ·73 and a percentage of correspondence of 87, with a clinical appraisal of the patient's condition 6 to 18 months after termination of treatment. This correspondence was closer than the correspondence between the psychiatrists' ratings at the time of termination of treatment with clinical findings recorded after a 6 to 18 month period. Analysis of the psychometric findings suggests the possibility that certain patients may be harmed rather than improved by the insulin treatment. (Authors' abstr.)

The Prevention of Metrazol Fractures by Beta-erythroidin Hydrochloride.

A group of 37 patients was treated, consisting of 17 schizophrenics, 10 manic-depressives, 7 suffering from involutional psychosis, and 3 from compulsive neuroses of long standing. A total of 156 separate treatments were given, with 139 resulting seizures.

Roentgenograms of the vertebral column were taken in 26 cases, and found to be entirely negative. In all the 11 remaining in which circumstances did not permit the expense of plates, careful clinical evaluation revealed no evidence of fractures. The important question whether the considerable modification of the severity of the convulsion interferes with the therapeutic efficacy of metrazol can be answered by stating that of the 37 patients treated, 29 have been discharged in satisfactory remission. The average number of treatments per patient was 4·2. The average hospital stay was 19·3 days. No fatalities occurred. Three patients who relapsed within a three month interval after therapy all responded well to further treatment. (Authors' abstr.)

The Mode of Action of Ergotamine Tartrate in Psychotic Patients.

One mgm. doses of ergotamine tartrate given daily to a group of long-standing aggressive and destructive patients were sufficient to restrain temporarily many of their troublesome symptoms, the result being shown in improved emotional response and thinking ability. Six of the cases that failed to retain their improvements with ergotamine later were insulin or metrazol failures likewise. There were only significant changes in peripheral autonomic effects, a slight depression of the sympathetic mechanisms being shown as is demonstrated by the increased weight, appetite and rectal temperature, and decreased pulse pressure, blood sugar and calcium. These physical changes are so slight that it does not seem possible that they could be in any way responsible for the great psychic and behaviour changes seen. In the one case which recovered, the autonomic effects were more marked. Because of the slight effects on the sympathetic mechanism seen in these cases under ergotamine therapy, it appears that the effect obtained in the behaviour of aggressive cases may be attributable to some action on the central nervous system, not related to its peripheral effect. (Author's abstr.)

Preliminary Report on the Results of the Treatment of Schizophrenia by Nitrogen Inhalation.

1. A group of 17 patients, 16 suffering from schizophrenia and one from manic-depressive psychosis, was treated by nitrogen inhalation.

2. The following results were noted: 5 completely remitted, 4 greatly improved, 1 improved (now in remission), which makes improvement in different degrees in 10 out of 17 (2 were slightly improved, 5 unimproved); one relapse after a five months' remission.

3. A follow-up study of cases in remission one year and longer indicated that these patients tend to remain improved.

4. The advantages of the nitrogen treatment are briefly as follows:

(1) The procedure is simple and does not always require hospitalization.

(2) It has been relatively free from complications in over 400 treatments.

(3) The method is constantly controllable. (Author's abstr.)

Report on 441 Cases Treated with Metrazol.

1. These results with metrazol therapy in schizophrenia have been much poorer than the results observed by many other authors. This may be due to the indiscriminate choice of patients, the lack of facilities for intensive psychotherapy, and the over-enthusiasm of early observers in interpreting their results.

2. Metrazol therapy gave no better results in this series than most observers have seen in non-specifically treated cases. In many instances the results with the latter method were much better.

3. Metrazol therapy has many inherent dangers, some of which are now known. It took four years to find such a simple condition as a fractured dorsal vertebra. In addition, there have been complicating fractures, dislocations, torn muscles and broncho-pneumonia.

4. Some cases of schizophrenia have shown dramatic improvement with metrazol therapy. It is difficult to predict which would show such improvement. It is apparent that in isolated instances and early in the disease, improvement may occur shortly after treatment. In some of these same cases, late follow-up results have shown regression to the original psychotic condition. (Author's abstr.)

Some Observations on Treatment of Institutional Epileptics with Dilantin.

1. Dilantin sodium seems to be a more effective anti-convulsant than drugs previously available.

2. There was little correlation between decrease or complete control of seizures and corresponding mental improvement.

3. A substantial percentage of patients showed an adverse reaction to the substitution of dilantin for phenobarbital, with marked increase in delusional trends and other psychotic manifestations.

4. Because of its potent anti-convulsive action, epileptic patients who are otherwise organically sound should be given the benefit of an adequate trial with dilantin.

5. Unless further investigation shows that this drug can act synergistically with a sedative such as luminal in controlling psychotic symptoms, its most satisfactory results will be obtained in non-psychotic rather than in mentally impaired individuals. (Authors' abstr.)

The Treatment of Epilepsy with Sodium Diphenyl Hydantoinate.

1. Sodium diphenyl hydantoinate is an effective anti-convulsant.

2. In a series of institutionalized chronic epileptics who had been receiving other anticonvulsant previously, it produced significant improvement in 50 per cent., some improvement in 26·3 per cent., and no improvement in 23·7 per cent.

3. Toxic reactions of various types are caused by dilantin. None of these seem to be serious in nature, and all can be controlled by decrease or withdrawal of the drug. However, careful observation of the patient during treatment is advisable.

4. A combination of phenobarbital and dilantin is advisable in some cases. (Authors' abstr.)

The Response of Various Types of Epilepsy to Dilantin Therapy.

Study of the above series seems to show that sodium diphenyl hydantoinate (dilantin) is a relatively non-toxic drug when used in doses up to 0·6 gm. a day. Frank cardiorenal disease appears to be the chief contra-indication to the use of this drug. Minor complications were found to clear up rapidly when the drug was withdrawn for two or three days. In most cases, even the rather frequent toxic dermatitis does not preclude further treatment after an adequate rest period. The complications are sufficiently severe, however, to call for an adequate and well-trained nursing personnel. Although the number of these cases is too small to draw infallible conclusions, the markedly different response of the various subgroups opens up interesting avenues for further clinical investigation. (Author's abstr.)

PSYCHOANAL QUART.

VOL. IX. 1940.

PSYCHOANAL REV.

VOL. XXVII. JULY, 1940.

PSYCHOMET.

VOL. IV. 1939.

VOL. V. 1940.

PSYCHOL. BULL.

VOL. XXXVII. JULY, 1940.

Hand Usage and Angleboard Dextrality Quotients of Adult Stutterers and Non-Stutterers.

This study was designed to check the hypothesis that stutterers are characterized by ambilaterality of central nervous system organization as indicated by measures of handedness. Two modifications of procedure differentiate the present

investigation from previously reported pertinent researches. First, the 98 stutterers, average age 21 years, and the 71 non-stutterers, average age 22 years, who served as subjects, were unselected with regard to hand usage. In previous studies by Van Riper, Jasper and others, unselected stutterers were compared with right-handed, left-handed and ambidextrous non-stutterers, selected on the basis of hand usage data. Second, the three tests of handedness which were used were scored by means of the dextrality quotient (DQ) formula, which makes possible the intercorrelation of tests and representation of relatively fine degrees of difference from 0·00 per cent. to 100 per cent. right-handedness. Two parts of the Van Riper angleboard test were used, and after these were administered each subject answered a hand usage questionnaire. Correlations between scores computed by two independent scorers for the two parts of the angleboard test, and for stutterers and non-stutterers, respectively, ranged from ·94 ± ·008 to ·99 ± ·002. Correlations between the various tests of handedness ranged from — ·15 ± ·08 to + ·29 ± ·06, with the exception of one coefficient of + ·62 ± ·05. Frequency distributions of DQ's were markedly similar for the stutterers and non-stutterers on each test; the distributions of the angleboard scores approximated a normal curve, and those for the hand usage DQ's were skewed to the left, but were essentially unimodal. No statistically significant differences between means were found. (Author's abstr.)

An Evaluation of the Postulates Underlying the Babcock Deterioration Test.

The standardization and the explanation for the validity of the Babcock deterioration scale have been based on the assumption that vocabulary is an old habit which fails to deteriorate in proportion to the acquisition of more recent material. This assumption, however, is untenable, since it has been shown that vocabulary develops up to the age of 18 years and is, therefore, in no manner an older habit than the abilities which the test measures on the items which show the effects of deterioration.

The thesis is advanced that the Babcock test for deterioration is valid not because recently acquired behaviour is compared with old habits, but because goal activity which can be carried to completion with only one set of acts is compared with goal activity where the end results can be achieved by a number of separate and qualitatively different acts of unequal difficulty. The memory, etc., items of the Babcock test require specific methods of completion, whereas on the vocabulary test the subject has a number of choices with which to define a word, and even if the more difficult conceptual organization has deteriorated, the correct response can still be given on a " lower " conceptual level. Analyses of qualitative studies of vocabulary tests presented in the literature show that the difficulty of defining a word is a function of the number and kinds of correct definitions which can be used.

To test the above hypothesis a one-alley maze has been devised which can be solved by seven appropriate, but different, methods. The results show that there is a qualitative difference in the methods used to solve the problem which is related to the general level of ability of the subjects. (Author's abstr.)

A Scale for Evaluating Prognosis in Schizophrenia.

The findings of the many psychiatric studies on prognosis in schizophrenia have been organized into a weighted scale and used in differentiating " process " schizophrenia from the schizophreniform psychoses. Differential weights were given to the various malignant and benign scale items in proportion to the importance ascribed to them and the frequency with which they were mentioned in the more than 50 psychiatric studies that have been made on prognosis in schizophrenia.

The initial use of the scale has been in classifying the schizophrenic patients treated with either metrazol or insulin therapy. The results clearly differentiated those who were classified as " in remission " or greatly improved at treatment staff conference from those who were considered only slightly improved or unchanged.

These findings suggest that the high percentage of " remissions " in schizophrenia reported for both metrazol and insulin therapies is related to the inclusion of a disproportionately large number of schizophrenic or so-called " dementia praecox " patients selected for therapy. This agrees with Langfeldt's speculation concerning shock therapy results, and also explains the individual differences in reaction to shock therapy among the schizophrenics treated.

(Authors' Abstr.).

A Comparison of Two Techniques for Measuring Intellectual Impairment and Deterioration.

This study was concerned with extending the method of measuring mental deterioration employed by Babcock. Her method is to contrast a relatively enduring function with a group of disintegrating ones. More specifically, she contrasts the patient's mental age as determined by the Terman vocabulary test with his mental age as determined by a group of memory, motor, and learning tests. Deterioration is indicated by the efficiency index, which represents the extent to which the latter falls short of the former.

With a view to enhancing the value of the method, the authors have been searching for even more rapidly disintegrating functions to contrast with vocabulary. The present study is concerned with an evaluation of the function of abstract thinking in this connection.

The Babcock examination and a pencil-and-paper test of abstract-thinking ability were given to 160 patients in a private mental hospital. The patients were then grouped according to degree of deterioration, as indicated by the Babcock efficiency index. Mean mental-age scores for the two tests were practically identical in the group showing no deterioration. In all the remaining groups the abstract-thinking scores were considerably the lower. The results indicate that the abstract thinking test, when used in conjunction with a vocabulary test, constitutes a sensitive measure of intellectual impairment. (Author's abstr.)

Differential Functional Loss in Certain Psychoses.

The Wechsler-Bellevue Intelligence Test was administered to 100 patients at Elgin State Hospital. The purpose of the study was to determine differential patterns of, and variability in functional loss for, various psychoses. Comparison is possible in terms of standard scores on the ten subtests of the scale. Scatter for patients was compared with Wechsler's norms and scores of another control group. Scatter was about 35 per cent. greater for the psychotics.

Intercorrelations for the psychotics were markedly different from those of the controls. Wechsler's highest intercorrelation was between " similarities " and " comprehension "—·721 ; the lowest, between " object-assembly " and " digit-span "—·155. Corresponding psychotic correlations were ·55 and ·17 respectively. The highest psychotic intercorrelation was ·70 (" digit-symbols " and " picture-arrangement "), and the lowest, ·13 (" digit-span " and " comprehension "). Wechsler's intercorrelations between these were, respectively, ·444 and ·372.

Therefore there are significant differences in variability and pattern of scores between psychotics and normals. (Author's abstr.)

Pathology of the Figure-background Relation in the Child.

Goldstein and Gelb have described a disturbance in the differentiation of figure and background in brain-injured adult patients. We have attempted, in various experimental situations, to demonstrate the presence of this disturbance in brain-injured children. Two groups of mentally-retarded children were used. The members of the one group showed symptoms of brain lesion, but these were not present in children of the motor and tactile-motor tests, and their reactions to patterns presented tachistoscopically. One of the tests consists of copying patterns made up of marbles placed in the holes of a cardboard background. Both the

marbles and the holes have a definite configuration. The child must construct the patterns in spite of the influence which the background (hole-) configuration exerts. A tactual-motor test was constructed on similar principles. The pictures used in the tachistoscopic test were drawings of objects embedded in a clearly structured homogeneous background. The child was asked to tell what he saw. The results of the various tests demonstrate that, for the brain-injured child, the characteristics of the background have strong stimulus value, whereas they exert little influence on the reactions of the children having no brain lesion.

(Authors' abstr.)

The Effect of Metrazol Shock upon Habit Systems.

The hypothesis tested was whether a single metrazol convulsion weakened more recently acquired habits to a greater extent than older habits which had previously been repressed or extinguished, with the result that the latter then became dominant. Twenty schizophrenics undergoing metrazol therapy were compared with a control group. The technique involved setting up a simple motor habit and then training in another habit which was similar to, but incompatible with, the first habit, thus necessitating the suppression of the first habit. The experimental group was then subjected to metrazol shock, and both groups tested for retention of the habits. It was found that a statistically significant higher number of reversals to the older habit occurred in the group subjected to metrazol shock than in the control group.

(Author's abstr.)

Emotional Factors in Gastric Neurosis and Peptic Ulcer.

The purpose of this investigation was to determine to what extent induced affective states were accompanied by changes in gastric function in patients suffering from gastric neurosis and peptic ulcer. While the subject rested, motility and secretion of the stomach, finger temperature and respiration were recorded. Affective states were induced by discussing emotionally charged life situations with the subjects over prolonged periods. To date, 55 experiments have been conducted on nine patients. In affective stress, particularly anger, the gastric motility increased ; the acidity values at times after an initial fall, rose ; respiration became more frequent and shallow, but with sighs ; the finger temperature fell, and in patients with peptic ulcers blood occasionally appeared in the stomach contents. Similar changes appeared in gastric function during sleep, if the subject, prior to the observation, was subjected to affective stress. (Authors' abstr.)

Studies in Electrically Induced Convulsions in Rats.

In several European countries schizophrenia is currently being treated by convulsions electrically induced. To obtain data on the possible effects of this type of treatment, and to study allied problems, a series of 50–100 convulsions were induced in a group of 55 white rats by passing a current of 4·5 milliamperes through the intact brain. The present report covers the four following points :

(1) Description of attack : Convulsions are of the typical "*grand mal*" type, and closely resemble the " neuroses " produced by air blasts and other methods.

(2) General behaviour changes : After 5–10 convulsions the rats become extremely passive, inactive and submissive. Many exhibit a waxlike flexibility. This behaviour is not limited to the experimental situation. Motility records indicate that after 50 convulsions rats are about 65 per cent. as active as control animals. Over a three-week period, convulsed animals show only one-half as great a gain in weight as control animals. Convulsion-free periods of from two to three weeks tend to " normalize " the experimental animals.

(3) Effect of drugs : Neither the subcutaneous injection of alcohol (·25–1·25 c.c.), nor of adrenalin (·10–50 c.c., concentration 1 in 1000) affected the threshold of shock necessary to produce a convulsion. Both drugs, however, resulted in behaviour changes.

(4) Conditioning : All animals gave evidence of some conditioning, but no

true " conditioned convulsion " was ever obtained. One possible explanation is the finding in human studies that convulsions produce a complete and permanent amnesia for events immediately preceding the attack. (Author's abstr.).

Electro-encephalographic Aspects of Migraine and of the Common Headache.

This is a first report on an electro-encephalographic study of the common and the migraine forms of headache.

Multiple-channel recording is employed, and the electro-encephalograms during headache episodes are compared with those taken during normal periods in the same subjects. Illustrative " brain wave " records of differing types will be shown of patients before and during headache episodes and during the course of development of an individual attack. The records seem to indicate that the migraine subjects thus far used give a characteristic wave-form differing from the general run of normal subjects. (Author's abstr.)

Brain Potentials during Sleep: An Investigation of Electro-encephalographic Individual Differences and their Constancy.

This study is an investigation of the degree to which constancy of individual differences in the EEG is exhibited in three general conditions, one during sleep and two during waking. In the sleep experiments multiple-area all-night EEG's were recorded from 20 individuals distributed throughout the alpha index range and were analysed categorically. As additional evidence, 82 samples of record were obtained from six of these subjects and were analysed as Fourier transforms with the Grass wave analyser.

The continuous all-night sleep records were analysed according to the amount of time any of several wave " categories " was present. Though rather marked individual differences were found to exist, these differences were apparently unrelated to any specific aspect of the waking record. Groups formed on the basis of per cent. time waking alpha similarity showed no consistent mean group trends for any of the sleep wave categories, although there was a tendency for subjects with a strong waking alpha rhythm to show more sleep alpha rhythm, and for subjects with a rare alpha rhythm to show more random sleep potentials. These differences were not great.

Rank difference correlations computed between alpha index when awake and any of the sleep categories, and between the several sleep categories, showed no significant relationship other than between waking and sleep alpha activity, and between spindles and spindles plus random.

The Fourier transforms also failed to reveal any distinguishable differences in the sleep records that could be related to the waking records. (Author's abstr.)

Differences in the Electro-encephalograms of Normal and Behaviour-problem Children.

Electro-encephalograms from occipital, central and frontal regions in 36 normal, 50 behaviour-problem and 22 " constitutionally inferior " children, and in a control group of 30 college students, were analysed in terms of frequency, amplitude, and per cent. time measurements.

Three abnormal factors in the electro-encephalograms differentiated the behaviour-problem cases from the normal children: greater prevalence of 2–5 per second waves, 5–8 per second waves, and the " hyperventilation effects." The " constitutionally inferior " children resembled the behaviour-problem children with respect to the two latter types of abnormality. The college students showed practically none of the abnormal characteristics.

The slow waves and the latent signs of abnormality induced by hyperventilation in the behaviour-problem children are interpreted as disturbances of cortical function which appear to be important factors in the inability of this group to adjust to environmental conditions, particularly when such conditions are unfavourable.

(Author's abstr.)

An Analysis of Frontal Lobe Function in Monkeys by Means of Two "Delayed Response" Methods.

An attempt has been made to delimit further the function of the frontal association areas (Brodmann's areas 9, 10, 11 and 12) through experimental analysis of two different delayed response situations in which adaptive behaviour in animals deprived of the frontal cortex can be demonstrated in the one case to be impaired, and in the other, to be maintained. Two monkeys were trained to delay response according to a method which allowed a complete, but unrewarded, run to one of two drawers on the pre-delay (presentation) trial. Following the attainment of a stable level of suprachance performance during 200 test trials, the animals were subjected to simultaneous bilateral frontal lobectomy. Post-operative results indicate, in accordance with the standard delayed response technique (Jacobsen), that performance in the present problem was completely abolished. Successful response was reinstated, however, by actually rewarding the subjects on the pre-delay trial for running to the presented drawer. Results obtained under this altered condition proved comparable in terms of accuracy and length of delay to those yielded by the same animals under preoperative conditions. The possibility of differentiating in terms of adaptation conditioned, respectively, by (1) a single unreinforced (unrewarded and unpunished) presentation, and (2) a single directly reinforced presentation, is considered. A "derived" reinforcing agency of the intact frontal areas is tentatively suggested. (Author's abstr.)

Some Personality Changes in Adolescence as Revealed by the Rorschach Method.

One hundred and fifty-two Rorschach records from 76 children participating in the long-term study of developmental growth at the Brush Foundation were selected for study. The children were tested at 12 and 15 years of age. Patterns which purport to reveal emotional stability, instability, adaptability, egocentricity, impulsiveness, inner living and fantasy life were subjected to statistical analysis to determine age and sex differences. Rorschach "Erlebnistypen" were analysed qualitatively to determine dominant personality trends from 12 to 15 years of age, and constancy or change in personality pattern.

It is concluded that the Rorschach method is highly serviceable in analysing and describing adolescent personality. Despite the small number of cases, age and sex differences are revealed in many patterns. Twelve-year-old children tend to be more extratensive than introversive. They are more impressionable to outside stimuli and more occupied with relationships to the outside world. Boys are, as a rule, more extratensive than girls at this age.

At 15 years of age children tend to be more introversive. They show more inner living and fantasy life and are more concerned with their subjective experiences. They are more emotionally stable and mature at this age. Girls show a greater development of all these tendencies than boys at both ages. However, they also show a surprising degree of excitability and impulsiveness.

The personality patterns studied tend to change from 12 to 15 years of age. The most constant patterns are the introversive ones. The two most characteristic trends noted are the introversial swing and contraction of both sides of the personality.

Differentiating Rorschach patterns are suggested with tentative norms for use in interpreting Rorschach results for similar age and sex groups.

(Author's abstr.)

Sources of Error in Rorschach Test Procedures.

The Rorschach test, as a sound method for studying personality, rests on three foundation stones: (1) Validity in depicting personality as a whole; (2) verifiability of the separate component Rorschach test factors; (3) accurate establishing of the relations between the whole personality and its component processes.

Errors in validating findings in whole personality derive from (*a*) undefined

concepts of the personality—the need for operational definitions of the Rorschach whole personality; (*b*) halo effect from E's observation of S—the blind "diagnosis" can correct this; but (*c*) this involves a uniformity in procedures which does not now obtain.

To verify scientifically the individual Rorschach factors requires consistent classifying of responses according to stable frames of reference. These are at present lacking. Since all Rorschach personality description derives from these factors, their verification by repeating the test is critical for any appraisal of its scientific foundations. The task here is (*a*) to define operationally the criteria whereby we classify each response, e.g. what differentiates a "common" detail (D) from a "rare" one (Dr), or a "good" form (F +) from a "poor" one (F —)? (*b*) to rubric each classification of each response for permanent reference; (*c*) to define operationally the psychological activity to which each Rorschach factor points.

Thirdly, since the psychological operation denoted by each Rorschach factor varies depending on the whole personality background, it is necessary to establish the relation between the whole personality and its separate behaviour manifestations. This requires working out the laws followed by the unit personality. The frames of reference developed for the separate processes cannot be expected to apply to the whole. Suggested leads on the relations involved are found in Gestalt experiments, psychoanalysis and neuropathology. They point to emergence of this supratrait phenomenon, the unit personality as a structure in more dimensions than its component processes, and following laws peculiar to itself.

(Author's abstr.)

PSYCHOL. REV.

VOL. XLVII. JULY, 1940.

REV. NEUROPSIQUIATR.

VOL. III. NO. 1. MARCH, 1940.

Meningo-encephalitis Due to a Neurotropic Virus.

An account of a case of meningo-encephalitis with a marked increase of cerebrospinal fluid with increased intracranial pressure.

Convulsions Induced by Cardiazol in Decerebrate Dogs.

In bulbar animals convulsions could not be elicited ; in mesencephalitic animals the fits resembled those of the intact animal, only differing by their lesser intensity. Diaschisis diminishes the convulsive reaction. The intensity of the fit bears a direct relation to the amount of nervous tissue left intact. There is no evidence of an epileptogenous centre and the epileptic reactions cannot be considered to be special isolated reactions, but rather the simultaneous reactions of the nervous system as a whole.

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

VOL. VI. NO. 1. 1940.

RIV. SPER. FRENIAT.

VOL. LXIII. NO. 3. SEPTEMBER, 1939.

On Disturbances of the Lumbosacral Innervation Due to Spinal Anaesthesia.

After a discussion of the recorded observations on the physiology and pathology of spinal anaesthesia the author gives an account of a patient who suffered from a permanent polyradicular syndrome of the right cauda equina after a novocain spinal anaesthesia induced for surgical purposes. He considers that this effect was due to the existence of septa in the subarachnoid space, preventing free diffusion of the anaesthetic and thus allowing its concentrated action for a considerable time on a few nerve roots.

Extra Medullary Tumours and the Secondary Reaction of the Arachnoid.

Two cases of extramedullary intradural tumours are described—one situated in the cervical region C. IV and V, the other in the region of the conus medullaris. The focal symptoms were not marked, but symptoms attributed by the author to perifocal arachnoiditis were conspicuous in the regions subtended by the spinal cord immediately above and below the tumour.

Trauma and Dementia.

Three cases are described in which the traumatic factor seems to be directly responsible for the occurrence of a progressive dementia. In the first patient an internal haemorrhagic pachymeningitis caused by an injury was the apparent sole cause of a simple dementia. In the second case severe injuries to the head and genitals were followed by symptoms of dementia praecox. The third case was one of sunstroke, which is regarded by the author as a pathogenetic agent in the development of dementia praecox.

Modification of Motor Chronaxie in Insulin Coma.

Motor chronaxic values were determined in ten patients treated by insulin therapy. In the coma produced by insulin there is a disturbance of motor chronaxie values.

VOL. LXIII. NO. 4. DECEMBER, 1939.

Choline Esterase Content of Normal and Pathological Human Brains.

In brains of dements which show signs of organic degeneration there is a marked diminution of choline esterase, especially in the caudate nucleus and the putamen.

On the Curves of the Spinal Cord of Men.

The author has examined the curves existing in the human spinal cord, and attributes their origin to the bands of elastic fibres of the meningeal membranes.

The Manifestations Occurring in Familial Types of Hereditary Diseases of the Nervous System.

The case of two brothers is recorded, one of them afflicted with retinitis pigmentosa and the other with amaurotic idiocy. The author considers that the same disease process is responsible for both cases, and points out the misleading conclusions that may be drawn in such cases if a group of symptoms is accorded the status of a specific disease.

The Shock Treatment of Schizophrenia by Ammonium Chloride.

Following the procedure of Bertolani the authors treated 24 schizophrenics by provoking convulsive attacks by intravenous injection of ammonium chloride. A rapid injection of 5 to 6 c.c. of a 5 per cent. solution of ammonium chloride was followed in a few seconds by a typical epileptic attack. The procedure appears to be without danger. Improvement was noted in 45 per cent. of the cases.

The Variations of the Choline Esterase of the Nervous System in Various Experimental Conditions.

In this state of cerebral excitation with tetanic discharges following the administration of strychnine and tetanus toxin, the choline esterase content of various portions of the central nervous system is increased. Pigeons suffering from beri-beri paralysis have decreased choline esterase.

Lingual Tics in General Paralysis.

A peculiar tic of the tongue with the movements resembling those executed in sucking and swallowing a sticky sweet has been described by Negro ("caramel tic"). It is particularly common as an early sign of general paralysis.

The Influence of Sodium Luminal on the Development of Animals.

Sodium luminal was given to white rats, guinea-pigs and rabbits during their developmental period. Guinea-pigs and rabbits were not affected, but rats showed retardation of development.

VOL. LXIV. NO. 1. MARCH, 1940.

A Clinical Study of Two Cases of Disseminated Encephalomyelitis.

After a brief review of the literature dealing with the differential diagnosis of encephalomyelitis from disseminated sclerosis the author describes two interesting cases, and comes to the conclusion that a clinical differentiation of the two diseases is at present impossible.

The Syndrome of Cotard.

Cotard described a syndrome in cases of melancholia characterized by negativism, ideas of grandeur, damnation and possession with disturbances of perception and hallucinatory reactions. The author describes such a case.

The Choroid Plexus and the Sylvian Aqueduct in a Case of Hydrocephalus Occlusus.

The pathological anatomy of a case of " hydrocephalus occlusus triventricularis " is described. The condition was secondary to a gliomatosis.

A Contribution to the Study of Adiposo-genital Dystrophy.

A case presenting this syndrome is described. It appeared after an infectious illness and recovered after pluriglandular therapy.

Painful Paralysis of the Inferior Brachial Plexus in a Case of Tumour of the Apex of the Lung.

A case of tumour of the apex of the left lung is described which first manifested itself clinically as a painful palsy of the brachial plexus with a Bernard-Horner syndrome.

Deficiency Factors in the Genesis of Primary Degenerations of the Spinal Cord.

Two brothers became ill at the age of 6 with pellagra and disturbances of gait. The elder brother presented a clinical picture of Friedreich's disease, together with pellagrous myelopathy. After a discussion on the aetiology of various types of tract lesion, the author concludes that vitamin deficiency must be considered to be an occasional aetiological factor.

A Case of Progressive Lipodystrophy.

The subject—a woman, aged 22—began at the age of 12 to show a slow and progressive diminution of adipose tissue in the upper part of the body whilst there was a progressive fat accumulation in the thighs and buttocks. X-rays showed a moderate enlargement of the sella turcica.

Whether Convulsive Attacks can be Produced in Epileptics by Preventing Sleep for Various Periods.

Epileptics prevented from sleeping for periods of 72, 96 and 120 hours showed a moderate increase in the number of fits.

SCHWEIZ. ARCH. NEUROL. PSYCHIAT.

VOL. XLV. 1940.

SOVIET. PSICHNEUROL.

VOL. XVI. NO. 1. 1940.

NO. 2.

1. Biochemistry, Pathology, etc.

Electrophoresis of the Products of Acid Hydrolysis of Protein in Nerve Disorders. Mints, P. P., and Mints, I. Ya. [*Sovet. Vrachebnyi Zhur.*, **42**, 277–88 (1938); *Chem. Zentr.*, **2**, 884–5 (1938).]

Nerve disorders were treated with acid hydrolyzates of proteins, which became effective in the region of the vertebral column through cataphoresis. The effect on sleep was very good, especially in the case of neurasthenic patients and those suffering from vegetative neurosis (hemicrania and acrocyanosis).

MARY G. MOORE (Chem. Abstr.).

Thyroid Gland and the Nervous System. Issekutz, Bela. [*Math. naturw. Anz. ungar. Akad. Wiss.*, **58**, 783–92 (1939).]

In decapitated or narcotized animals, thyroxine increases the sensitivity of nerve endings to adrenaline and thus increases the metabolism. The increased

activity of the centres governing metabolism causes an increasing activity in the thyroid gland. This is indicated by the decrease of iodine content of blood, and explains the therapeutic effect of these preparations.

S. S. DE FINALY (Chem. Abstr.).

Lipide Composition of Intracranial Tumours. *Lowell. O. Randall.* [*Am. J. Cancer*, **38**, 92–4 (1940); *cf. C.A.*, **32**, 9248[5].]

The average phospholipide, cerebroside and cholesterol contents are lowest in neuromas, intermediate in meningiomas and highest in gliomas. The lipide contents of neuromas and gliomas are less than those of normal nerve and brain tissue. The lipide content of neuromas is in the range found for benign tumours, while that of meningiomas and gliomas is in the range for malignant tumours. The neutral fat contents of the tumours show no significant differences.

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

Disturbance of the Central Regulating Mechanism of Sodium Chloride Metabolism. *Glatzel, H., and Wolf, H. J.* [*Deut. Arch. klin. Med.*, **183**, 243–63 (1939).]

A case is described of chronic "dermatitis" with periodic attacks of profuse sweating with a burning sensation in the skin, which was red and thickened. Basal metabolic rate was normal, with a lowered specific dynamic protein effect. An increase in the elimination of water by the kidneys (induced by salyrgan) caused a sharp increase in dermatitic symptoms. The ion-concentration ability of the kidneys was only $\frac{1}{5}$ to $\frac{1}{8}$ as great as normal; towards Na and K only $\frac{1}{10}$ to $\frac{1}{20}$. The NaCl and Ca accumulated over a period of days was eliminated in the perspiration within 2 hours. The disorder was attributed to a disturbance of the hypophysis-midbrain system.

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

Chemical and Metabolic Studies on Phenylalanine. II. The Phenylalanine Content of the Blood and Spinal Fluid in Phenylpyruvic Oligophrenia. *Jervis, Geo. A., Block, Richard J., Bolling, Diana and Kanze, Edna.* [*J. Biol. Chem.*, **134**, 105–13 (1940); *cf. C.A.*, **33**, 7285, 7287[9].]

Seven male and 9 female patients and 4 normal controls were studied. The ages of the patients varied between 4 and 40 years, and their intelligence quotients were between 5 and 50. The phenylalanine content of the blood varied from 15 to 41 mgm. per 100 c.c. and no phenylpyruvic acid was present. Significant increases followed the injection of proteins, phenylalanine and phenylpyruvic and phenyllactic acids, but no determinable amounts of the latter two substances appeared in the blood. The spinal fluid also contains phenylalanine but no phenylpyruvic acid, and its amount is also increased by ingestion of phenylalanine. Neither compound can be established in appreciable amounts in the blood of normal individuals.

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

Chronaxia. *Ando, Kiiti.* [*Nagoya Igakkai Zasshi*, **48**, 981 *et seq.* (1938); *Nagoya J. Med. Sci.*, **13**, *Abstracts* 180–1 (1939) (*in German*); *cf. C.A.*, **33**, 4680[1].]

The chronaxia of the four extremities was determined in healthy men, corpses, beri-beri sufferers and persons with CS_2 poisoning. Beri-beri and CS_2 poisoning distinctly diminished the chronaxia of muscle flexion. The results were not in agreement with the law of Bourguignon. In Pb and CS_2 poisoning, the changes in the chronaxia of the nerves and muscles of the four extremities are probably caused by changes in the mesencephalon.

W. C. TOBIE (Chem. Abstr.).

The Cerebro-spinal Fluid in Alkalosis. *Agar, Herbert, and Macpherson, Ian.* [*Lancet*, **1**, 171–3 (1940).]

The increase in urea and decrease in chloride content of the cerebro-spinal fluid observed in alkalosis appear to be sufficiently characteristic to be of aid in differential diagnosis.

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

Aneurin in Cerebro-spinal Fluid. Saker, A. [*Klin. Wochenschr.*, **19**, 99–102 (1940).]

In contrast to the negative results reported with the thiochrome method, the phycomyces test shows varied amounts of vitamin B_1 (traces to 18·5γ per cent.) to be present in the cerebro-spinal fluid. These values are unrelated to the vitamin content of the blood, pathological picture or the condition of the fluid. Following intravenous injection of 50 mgm. vitamin B_1, aneurin is found in the cerebro-spinal fluid (maximum 31γ per cent.). After intra-spinal injection, the vitamin diffuses only slightly in the upper spinal cord canal, and is very rapidly resorbed in the blood from the lumbar arachnoid space. Intraspinal injection has no practical advantage over the intravenous or subcutaneous route.

J. PINCHACK (Chem. Abstr.).

Psychoses Caused by Estrogenic Hormones and Circulatory Disturbances. Baruk, H., David, Racine and Leuret. [*Presse méd.*, **48**, 281–2 (1940).]

Vasomotor disturbances and psychoses show frequently parallelism pointing to a common source which is probably an over-production of estrogenic hormones. They produce peripheral vasodilatation, flushed face and humming in the ear. A dilatation of the cerebral blood vessels was directly observed in the rabbit.

A. E. MEYER (Chem. Abstr.).

Oxidation Processes in the Central Nervous System during Ontogenesis. I. Changes in Catalase and Peroxidase Activity. Rozenfeld, L. E., and Goldman, S. S. [*Biochem. J. (Ukraine)*, **14**, 125–41 (*in Russian*), 142–3; *in English*, 143–4 (1939).]

In all regions of the rabbit brain the catalase activity decreases with the age of the embryo and shows an abrupt drop 14 to 25 days after birth. The peroxidase activity fluctuates much more, and a certain amount of reciprocal behaviour is noted between the levels of catalase and peroxidase activity.

R. LEVINE (Chem. Abstr.).

Effect of Mechanical Trauma of the Head on the Nitrogen Composition of the Brain. Barmina, O. N. [*Biochem. J. (Ukraine)*, **14**, 69–82 (*in Russian*; *in English*, 82–3) (1939).]

After mechanical trauma of the head of rabbits by a freely falling weight, the total N content of the brain decreases. Various areas of the brain are affected to a greater or less extent. The rate of proteolysis is increased in the brain cortex, and decreased in the white matter and in the caudate nucleus. Normal chemical composition is restored only after 20–38 days following the initial trauma.

R. LEVINE (Chem. Abstr.).

Glycolysis of Nerve Tissue. IV. Glycolysis of Nerve Tissue after Freezing in Liquid Air. Lenti, C., and Fuortes, M. [*Atti accad. sci. Torino, Classe sci. fis., mat. nat.*, **74**, 558–62 (1939).

Nerve tissue after exposure for three hours to liquid air entirely loses its glycolytic activity. Muscle tissue and malt in which glycolysis is preceded by phosphorylization do not lose their glycolytic power in liquid air.

A. W. CONTIERI (Chem. Abstr.).

Glycolysis in Cell-free Extracts of Brain. Geiger, A. [*Biochem. J.*, **34**, 465–82 (1940); *cf. C.A.*, **33**, 8271[9].]

Aqueous extracts of brain tissue were prepared with and without the use of phosphate. The extracts without phosphate rapidly lost their activity at 37° unless they were diluted. The extracts had about four times the glycolytic activity of brain slices. Dialysis against water destroyed the activity, but dialysis against

0·6 per cent. NaCl caused no loss of activity. Mg. in a concentration of 0·013 M was necessary for optimum glycolysis. Hexose diphosphate caused a small increase in the glycolytic rate. Phosphocreatine had to be added to dialysed brain extracts to obtain glycolytic activity. In fresh extracts it was necessary when glucose was the substrate, but not when glycogen was. Glutathione activated brain glycolysis, but its effect was variable. Adenosine triphosphate and cozymase were coenzymes of brain glycolysis. There was also probably a third coenzyme which was not identified. Large amounts of lactic acid were formed from fructose, glucose and mannose. Other sugars gave little or no lactic acid. None was formed from the intermediary phosphorylated products of muscle glycolysis. The presence of inorganic phosphate was necessary for glycolysis in brain extracts. It was esterified during the glycolysis of lactic acid-forming sugars with the formation mainly of a monophosphate along with a pyrophosphate and hexose diphosphate. In the presence of NaF and pyruvic acid, phosphopyruvic acid accumulated. Extracts poisoned with iodoacetate transferred P from adenosine triphosphate to glucose, forming hexose diphosphate. E. W. Scott (Chem. Abstr.).

The Influence of Graded Doses of Vitamin A upon the Pathological Changes in the Central Nervous System of the Rat, with Suggestions for a Prophylactic Assay of the Vitamin. Irving, J. T., and Richards, M. B. [*Biochem. J.*, **34**, 198–201 (1940); *cf. C.A.*, **34**, 1362[5].]

Rats were placed at weaning on a vitamin A-free diet and given graded doses of vitamin A. They were killed after seven weeks and their medullas examined. Degeneration was found in the funiculus praedorsalis in those receiving 1 I.U. or less per day, but not in those getting 1·5 I.U. or more. The main source of error in the curative method, i.e., the pathological differences in the animals used would be avoided by using the above procedure for assay.
E. W. Scott (Chem. Abstr.).

Retention of Nicotinic Acid in the Body Fluids of Pellagra Patients and Healthy Subjects. Kuhnau, Wolfram W. [*Klin. Wochenschr.*, **18**, 1333–4 (1939).]

Normal subjects show 2·5–4·5 mgm. per cent. nicotinic acid in the blood; pellagra patients 0·75–1·8. The latter excrete 0·64–1·05 mgm. per cent. nicotinic acid in the urine, which is practically the normal amount (0·5–3 mgm. per cent.). After ingestion of nicotinic acid both groups excrete essentially the same amount of acid. Unexpectedly high values (1–1·4 mgm. per cent.) were found in the cerebro-spinal fluid of two pellagra patients with neurological symptoms and a low blood value (0·7 mgm. per cent.) in one pellagrin with anaemia and glossitis. These may be of diagnostic importance. J. Pinchack (Chem. Abstr.).

Vitamin B_1 and Acetylcholine Formation in Isolated Brain. Mann, P. J. G., and Quastel, J. H. [*Nature*, **145**, 856–7 (1940); *cf. C.A.*, **33**, 8271[4].]

Addition of vitamin B_1 to isolated polyneuritic pigeon brain increases the rate of synthesis of acetylcholine when the brain is incubated aerobically in a bicarbonate-pyruvate medium containing a relatively high concentration of K ions. No such increase occurs when it is added to normal pigeon brain examined under similar conditions. E. D. Walter (Chem. Abstr.).

Occurrence of Fits of an Epileptic Nature in Rats Maintained for Long Periods on a Diet Reprived of Vitamin B_6. Chick, Harriette, El Sadr, M. M., and Worden, Alastair N. [*Biochem. J.*, **34**, 595–600 (1940).]

Fits were observed in rats maintained for four to five months and over on a purified synthetic diet supplemented with cod-liver oil, pure vitamin B_1, riboflavin and purified yeast filtrate factor. The fits were prevented and cured by the administration of pure vitamin B_6, 10–15μ gm. daily. No fits occurred when purified rice starch was the carbohydrate in the diet, and the diet was cooked with water.

The nature of these fits and the circumstances in which they developed showed a very close resemblance to the epileptic fits previously observed in young pigs. The basal diets and the supplements given were similar in the two cases. Hence lack of vitamin B_6 was probably the cause of the fits in pigs.

The Incidence of Neuropathy in Pellagra. The Effect of Cocarboxylase upon its Neurologic Signs. Lewy, F. H., Spies, T. D., and Aring, C. D. [*Am. J. Med. Sci.*, **199**, 840–9 (1940); *cf. C.A.*, **33**, 7858[4].]

Improvement in neuropathologic symptoms in pellagrins resulted within one to four hours, from 50 mgm. or more of cocarboxylase (phosphorylated thiamine) given intravenously, was maintained one to five days and then disappeared. The clinical effect of cocarboxylase was identical with that previously found for binding substances and arterio-venous O difference paralleled clinical neurologic improvement. Patients who retained most of the injected cocarboxylase improved, in contrast to those who did not retain it. The injection of riboflavin did not affect the neurologic signs. Apparently the neuropathy common among pellagrins is due to lack of thiamine. FERRIN B. MORELAND (Chem. Abstr.).

Relation of Diet to a Type of Leg Weakness in Swine Induced by Nerve Degeneration. Ellis, N. R., and Madsen, L. L. [*Proc. Am. Soc. Animal Production*, **32**, 393–4 (1939).]

The disease is of frequent occurrence among pigs confined in small pens with concrete or board floors and fed on diets, such as used in record-of-performance (R.O.P.) tests, heretofore considered adequate for normal yellow corn trinity protein mixture and mineral mixture with the three parts self-fed, resulted in a wide range in incidence and severity of the lameness and inco-ordination. The disease can be produced at will in the usual case by the feeding of a heat-treated diet supplemented with cod-liver oil. It does not respond readily to curative treatment. The protective action of a number of supplements such as liver, whey and rice bran suggests that a factor or factors of the vitamin B complex other than thiamine, riboflavin and nicotinic acid may be involved.

K. D. JACOB (Chem. Abstr.).

The Nitrogen Metabolism of the Brain. Rubel, V. M. [*Bull. biol. med. exptl. U.R.S.S.*, **8**, 369–72 (1939) (*in English*).]

Emotional excitation in dogs is followed by an increased retention by the brain of NH_3-producing substances as indicated by the differences in the NH_3 values of arterial (inflowing) and sinusal (outflowing) blood. The adenylic acid (I) content of sinusal blood generally tends to follow the decreased NH_3 content, but the evidence that I is the source of NH_3 in the blood is not conclusive. The urea and lipoid amino N values of the blood increase during storage under petrolatum at 37° for 22 hours, so these compounds are apparently not responsible for liberation of NH_3. The addition of acetylcholine and choline to arterial sinusal and venous blood *in vitro* caused a definite increase in the NH_3 value only in arterial blood.

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

The Cerebellum and Carbohydrate Metabolism. Kaplan, P. M. [*Med. exptl. (Ukraine)*, No. **4**, 37–44 (1937); *Chem. Zentr.*, **2**, 2290–1 (1938).]

Using eight dogs as experimental animals, the blood sugar was determined after fasting, and again after feeding glucose. These determinations were made before and after removal of the cerebellum. Removal of this organ was without effect on the blood sugar of the fasting animals. On the other hand, the increase in the blood sugar after the feeding of glucose was much higher after the cerebellum had been removed than before the operation. This more pronounced reaction to glucose, however, was not stable; the normal reaction was shown once more after 18–20 days. M. G. MOORE (Chem. Abstr.).

Fructose Tolerance in Various Forms of Psychoses. Yuki, K. [*Fukuoka Acta Med.*, **32**, 42 (1939).]

In schizophrenics the maximum blood-sugar value is higher than in healthy persons, but the curve is otherwise normal. Manic depressives and patients with general paralysis of the insane exhibit a tendency towards a prolongation of the high blood sugar following the test. In tabes dorsalis, morphinism, alcoholism and senile dementia, the blood sugar rises to a very high level, but the curves are otherwise unremarkable. B. C. P. A. (Chem. Abstr.).

Liberation of Acetylcholine from the Perfused Cat Brain. Chute, A. L., Feldberg, W., and Smyth, D. H. [*Quart. J. Exptl. Physiol.*, **30**, 65–72 (1940).]

The almost completely isolated cat brain was perfused with 50 per cent. defibrinated blood. The addition to it of eserine produced increased reflex excitability with spontaneous movements followed by depression, and caused the appearance in the blood of small amounts of acetylcholine which were liberated from the brain. This liberation was temporarily increased by the injection of KCl.

RACHEL BROWN (Chem. Abstr.).

The Mechanism of Sensitization to Acetylcholine by Denervation. Lee, Lao-Ying. [*Chinese J. Physiol.*, **14**, 357–73 (1939).]

The increased sensitivity of skeletal muscle to acetylcholine (I) is correlated with a diminution of K. Diminution of muscle K brought about by other means, such as soaking in K-free Ringer solution, is also accompanied by an increased sensitivity to I. Conversely, when the muscle K is increased, its sensitivity to I is decreased. The normal sensitivity to I of the same muscle or different muscles appears to vary inversely with the K content. The change in sensitivity to I is correlated with changes in sensitivity to nicotine.

WALTER H. SEEGERS (Chem. Abstr.).

The Formation of an Acetylcholine-like Substance in Afferent Nerve Stems. Yachimovich, F. A. [*Bull. biol. med. exptl. U.R.S.S.*, **8**, 403–8 (1939) (*in German*).]

Severance of the N infra-orbitalis in rabbits causes the formation of a vagomimetic substance similar in behaviour to acetylcholine.

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

Effect of Acetylcholine on the Adrenaline Output in Cats. Taneiti, Yosiharu. [*Tohoku J. Exptl. Med.*, **38**, 147–51 (1940).]

Injection of acetylcholine in doses of 0·4 to 1 mgm. per kgm. body-weight into the coeliac artery of anaesthetized cats causes an acceleration of adrenaline output (2 to 8 times normal). Adrenaline concentration was measured on the isolated rabbit intestine. ZELMA BAKER (Chem. Abstr.).

Role of the Sympathetic Nervous System in Blood Regeneration. Somogyi, J. C. [*Magyar Orvosi Arch.*, **40**, 195–203 (1939).]

Ergotamine (0·2 mgm. per kgm. daily) inhibited blood regeneration after haemorrhage in cats. Partial sympathectomy caused a decrease of red corpuscles and haemoglobin, and an increase of leucocytes. Cervical sympathetic stimulation increased the red corpuscles and the haemoglobin, the latter effect disappearing when stimulation followed thyroidectomy. B. C. P. A. (Chem. Abstr.).

Haemato-encephalic Barrier. Stern, L. S. [*Trav. inst. recherches physiol. Moscou*, **2**, 12–26 (1936) (*in Russian*).]

The haemato-encephalic barrier refers to the mechanism which regulates the composition of the cerebro-spinal fluid, and protects the central nervous system from many substances which are not required by, or may be toxic to, the nervous tissue. Morphologically it is represented by the capillary endothelium, especially that of the choroid plexus, as well as by the mesoglia and the microglia, the latter

protecting the nerve cells from substances in the cerebro-spinal fluid. Certain correlations have been observed between local morphological changes and certain crystalloids, while changes in the capillary endothelium of the brain were correlated with an increase in permeability to some colloids. The function of the haemato-encephalic barrier was determined chiefly by the introduction of substances normally absent from the blood or from the cerebro-spinal fluid, or by the determination of permeability to Br. Inability to detect in the cerebro-spinal fluid certain substances introduced into the blood stream does not necessarily indicate impermeability of the haemato-encephalic barrier, since many of these substances may be adsorbed by the nerve cells. Such adsorption explains the inability to detect the cations of basic dyes in the cerebro-spinal fluid. The permeability properties of the endothelium vary in the capillaries of the different organs, as well as in different regions of the same organ. Moreover, various experimental and pathological changes influence the different capillary regions in a different direction. The nature of the haemato-encephalic barrier varies with different species, age and sex, and can be changed by various experimental procedures, such as the introduction into the blood stream of hormones, drugs, toxins, changes in blood constituents (pH, osmotic pressure) and infections. The distribution of normal constituents between the cerebro-spinal fluid and the blood cannot at present be explained by simple physico-chemical laws (such as ultrafiltration, Donnan equilibrium). For most of the normal constituents the permeability co-efficient (concentration in the cerebro-spinal fluid divided by the concentration in the blood plasma) is less than unity, with the exception of Cl for which the permeability coefficient is above 1. There is a correlation between the condition of the haemato-encephalic barrier and the functional changes in the central nervous system. Thus, in most cases an increase in the K/Ca ratio in the cerebro-spinal fluid was accompanied by increased excitability of the CNS, while a decrease in K/Ca corresponded to inhibition and a decreased tonus of the nervous system. That the change in the K/Ca ratio is the primary factor is indicated by the fact that injection of small doses of K into the cerebro-spinal fluid produced a marked increase in excitability, while Ca injection produced inhibition. Also, experimental epilepsy in dogs (produced by electrical stimulation of the brain) was not accompanied by changes in the composition of the cerebro-spinal fluid, except after prolonged repeated stimulation. Narcosis was accompanied by a decrease in K/Ca, while experimental stimulation often corresponded with an increase in K/Ca.

S. A. CORSON (Chem. Abstr.).

The Chemical Basis of Sleep: The Role of the Haemato-encephalic Barrier. Stern, L. A. [*Trav. inst. recherches physiol. Moscou*, **2**, 27–38 (1936) *in Russian*).]

Experiments were performed for a period of 1·5 years on dogs kept without sleep for 8–14 days, and on human subjects kept without sleep for 3–4 days. In all cases prolonged lack of sleep was accompanied by a decrease in the K/Ca ratio (from a value of about 2 to 1 or less) and in the concentration of K in the cerebro-spinal fluid. At the same time there was an increase in the concentration of sugar in the cerebro-spinal fluid and a general increase in the permeability of the haemato-encephalic barrier to a great many substances. In dogs there was an increase in the Ca concentration in the cerebro-spinal fluid (interpreted as an increase in permeability to Ca), while in the human subjects the Ca concentration was decreased. In all cases all the values returned to normal after the animal was permitted to sleep. Similar reversible changes in the haemato-encephalic barrier were observed during ether anaesthesia.

S. A. CORSON (Chem. Abstr.).

The Influence of Histamine and Peptone Shock on the Haemato-encephalic Barrier. Khvoles, G. Ya, Nikol'skaya, M. I., and Govorovich, E. A. [*Trav. inst. recherches physiol. Moscou*, **2**, 39–52 (1936) (*in Russian*).]

Shock was produced in dogs and cats by the injection of histamine (0·5–5·0 mgm./kgm. body weight) or peptone (0·2–0·8 grm./kgm. body weight). The shock lasted

for 10 min. to 4 hours. During the initial excitatory stage of the shock (characterized by increased reflex excitation) there was an increase in the K content of the cerebro-spinal fluid, while the K/Ca ratio was either increased or unchanged. During the longer inhibitory stage of the shock (characterized by decreased reflex excitation) the K, K/Ca ratio and inorganic P of the cerebro-spinal fluid were decreased, while the Ca concentration was increased. In the blood plasma the concentration of K was decreased and that of Ca increased, while the concentration of inorganic P was decreased in the beginning of the shock, and increased at the later stages. A shock of short duration was accompanied by an increase in the concentration of sugar, both in the cerebro-spinal fluid and in the blood plasma, while a shock of longer duration showed a decrease in the sugar concentration. The resistance of the haemato-encephalic barrier was increased in respect to K and P and decreased in relation to sugar, Ca and $Na_4Fe(CN)_6$ (which does not normally appear in the cerebro-spinal fluid). There was no change in the resistance to trypan blue or in the Cl content of the blood plasma or cerebro-spinal fluid. S. A. Corson (Chem. Abstr.).

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2. Pharmacology, Treatment, etc.

Benzedrine (β-phenylisopropylamine) and Brain Metabolism. Mann, P. J. G., and Quastel, J. H. [*Biochem. J.*, **34**, 414–31 (1940); *cf. C.A.*, **34**, 1400[1].]

When brain respiration in a glucose medium was measured in the presence of tyramine (I), β-indolethylamine or isoamylamine, a fall in respiration was noted. This could be neutralized by the addition of benzedrine (II) to the system. Both brain slices and mince were affected. I also caused a fall when glucose was replaced with Na succinate. The fall due to I was traced to the aldehyde formed by oxidation, or a further oxidation product, at least in part. Succinate protected the succinic dehydrogenase from the toxic acid of this oxidation product. II owed its stimulating influence to its ability to compete reversibly with other amines for the amine oxidase of the brain and other organs; thus the rate of formation of the oxidation products affecting the respiration is reduced. *l*-Ephedrine (III), 3, 4-methylenedioxy-(IV) and 3-methoxy-4-hydroxy-phenylisopropylamine (V) possessed the same ability as II (although III and V were much less active) in counteracting the effect of I on respiration. IV was about as active as II. Aldehydes such as isovaleraldehyde and *p*-hydroxybenzaldehyde were inhibitors of brain respiration, but their effects were not counteracted by II. II had no retarding influence on the fall of brain respiration produced by the addition of phenobarbital, chloretone or bulbocapnine. The effects of II, III and derivatives of II in these experiments parallel their effects *in vivo* on the central nervous system.

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

Experimental Studies on the Toxicity of Benzedrine Sulphate in Various Animals. Ehrlich, W. E., Lewy, F. H., and Krumbhaar, E. B. [*Am. J. Med. Sci.*, **198**, 785–803 (1939); *cf. C.A.*, **31**, 6739[5].]

The effects, minimum lethal dose, tolerance and greatest non-toxic dose of benzedrine sulphate were studied in guinea-pigs, rabbits, monkeys, dogs and sheep of varying ages. The minimum lethal doses in mgm./kgm. are: For young guinea-pigs, 40–150; adult, 50–100; young rabbits, 50; adult, 20; young monkeys, 5; adult, 20–25; adult dogs, 20; adult sheep, 15. Continued administration at first decreases tolerance, then increases it. The lowest maximum non-toxic dose obtained was 1–2 mgm./kgm. For humans, doses which do not raise blood pressure or cause loss in weight, anaemia or granulocytosis should be harmless even over long periods. Ferrin B. Moreland (Chem. Abstr.).

Insulin Sensitivity of Cats with Hypothalamic Lesions and Cats with Cervical Cord Section. Brobeck, John R. [*J. Lab. Clin. Med.*, **25**, 717–25 (1940).]

In normal cats subcutaneous injection of 0·5 unit of insulin per kgm. of body weight produced a hypoglucaemia which was more prolonged, and in some instances more marked, than that following the intravenous injection of the same amount of insulin. In a large group (76) of cats with lesions in various portions of the hypothalamus, normal fasting blood sugars and normal insulin reactions were obtained following the insulin test. Insulin hypersensitivity was observed in four cats with lesions in the medial part of the anterior tuberal portion of the hypothalamus. Spinal cats recovered as well as normal cats on receiving this dose of insulin. HOWARD W. ROBINSON (Chem. Abstr.).

A Note on the Level of Glucose and of Non-fermentable Reducing Substances in Therapeutic Insulin Shock. Forbes, W. H., and Czàrski, T. [*J. Lab. Clin. Med.*, **25**, 679–83 (1940).]

Glucose can be determined with a probable error of ± 2 mgm. by subtracting 4 mgm. from the blood sugar, as determined upon the filtrate of unlaked blood by the revised method of Folin and Wu (*C.A.*, **23**, 2998). In therapeutic insulin shock in schizophrenic patients the glucose (fermentable reducing substance) may fall below 10 mgm. per 100 c.c. of blood and remain there for periods up to an hour without any apparent harm to the patient. The non-fermentable reducing substances do not change in amount as the blood sugar falls.
HOWARD W. ROBINSON (Chem. Abstr.).

Decorticate and Decerebrate Preparations Produced by Insulin Shock. Ziskind, Eugene, and Tyler, David B. [*Proc. Soc. Exptl. Biol. Med.*, **43**, 734–5 (1940).]

Cats, fasted 18 hours, were given 15–20 units insulin per kgm. body weight. Persistent brain damage was produced. Some of the treated cats behaved like decorticate or decerebrate preparations. L. E. GILSON (Chem. Abstr.).

Action of Metrazol on Reflexes in the Frog. Kollensperger, Friedrich K. [*Klin. Wochenschr.*, **18**, 1521–4 (1939).]

Oral, intralymphatic or intramuscular administration of 1–5 mgm. metrazole results, after a short latency, in a sudden increase in reflexes, often with rise in tonus. Doses of 10 mgm. produce tonic rigidity of the legs and occasionally strychnine-like convulsions. Repeated small doses have an additive effect which is shown by the sudden recovery of animals paralysed by curare. Metrazole increases the irritability of the peripheral nervous system as well as that of the spinal cellular elements. J. PINCHACK (Chem. Abstr.).

Effect of Metrazole on Cerebral Vessels. Forbes, Henry S., and Nason, Gladys I. [*Proc. Soc. Exptl. Biol. Med.*, **43**, 762–5 (1940).]

In animals metrazole caused cerebral vasodilation. This was unrelated to changes in blood pressure or respiration, and showed no consistent relation to convulsive seizures. L. E. GILSON (Chem. Abstr.).

A Clinical Comparison of Picrotoxin, Metrazole and Coriamyrtin used as Analeptics and as Convulsants. Bleckwenn, W. J., Hodgson, E. R., and Herwick, R. P. [*J. Pharmacol.*, **69**, 81–8 (1940).]

Selected human subjects were used. The potency of the compounds decreases in the order coriamyrtin, picrotoxin and metrazol. But from the standpoint of effectiveness and safety, for counteracting barbiturates, they should be rated in the order, picrotoxin, metrazole and coriamyrtin. Metrazole is the best for inducing therapeutic convulsions. L. E. GILSON (Chem. Abstr.).

Convulsions Caused by Pentamethylenetetrazole. Glucaemia in the Treatment with Metrazole and its Combination with Insulin, Glucose and Adrenaline. Robuschi, L., and Simmons, G. [*Sperimentale*, **94**, 196–214 (1940).]

Metrazole produces immediately hyperglucaemia reaching a maximum after 30 minutes. A second injection reproduces shock and hyperglucaemia. Simultaneous injections of insulin do not affect the glucaemia. If repeated injections are so timed as to coincide with the maximal hypoglucaemic effect of the insulin, an increase of the blood sugar is still produced and it may exceed the normal value. Intravenous glucose injections have no noticeable influence. The hyperglucaemic effect of metrazole persists even if the blood sugar is already high as a consequence of preceding application of adrenaline. A. E. Meyer (Chem. Abstr.).

Modifications in Blood Sugar by Metrazole, Insulin-Metrazole, Adrenaline-Metrazole and Glucose-Metrazole. Robuschi, L., and Simmons, G. [*Boll. soc. ital. biol. sper.*, **15**, 418–19 (1940).]

In rabbits, metrazole injections were followed by an immediate hyperglucaemia, reaching a maximum in 30 minutes, and returning to normal in 3–5 hours. Insulin, preceding or with metrazole, did not substantially modify the hyperglucaemia. Metrazole injected after injections of glucose or adrenaline further increased the hyperglucaemia. Helen Lee Gruehl (Chem. Abstr.).

Detoxicating Hormone of the Liver (Yakriton). XCI. Effect of Removal of Cerebral Hemispheres in Rabbits with Varying Liver Function. Kuribayashi, Saburo. [*Tohoku J. Exptl. Med.*, **37**, 573–5 (1940).]

Rabbits with low liver ability for NH_3 detoxication develop convulsions in 24 hours after extirpation of cerebral hemispheres. The convulsions are not severe and occur at long intervals in the beginning, but become continuous toward death at 50 hours after the operation. Rabbits with high liver ability for NH_3 detoxication remain free from convulsions and survive for 68 hours.
C. R. Addinall (Chem. Abstr.).

XCII. Effect of Yakriton on Epilepsy in Children and Effect of Prominal on its Action. Takamatu, Akira, and Sato, Siu. [*Ibid.*, **37**, 576–88.]

On the basis of the cardiazole test, yakriton has, by itself, a curative effect on some cases of epilepsy. In some cases it exerts a favourable influence in combination with prominal (N-methylethylphenylmalonylurea).
C. R. Addinall (Chem. Abstr.).

Electrocortical Studies on Point of Action of Various Hypnotics. Drohocki, Z., and Drohocka, J. [*Klin. Wochenschr.*, **18**, 606–8 (1939); *cf. C.A.*, **33**, 2212[1], 9437[3]; **34**, 161[5].]

Nembutal, chloral hydrate and urethan produce changes in the electrogram in different parts of the brain, including the cortex and thalamus; hypnotics cannot be divided into cerebral and brain-stem groups. B. C. P. A. (Chem. Abstr.).

Effects of Cobra Venom and Other Analgesics on Mental Efficiency. Macht, David I., and Macht, Moses B. [*Arch. intern. pharmacodynamie*, **63**, 179–88 (1939).]

Various analgesics including morphine were compared with cobra venom in their effect on the ability to solve simple problems in mental arithmetic. Tests were given before and after the administration of the drugs. Morphine, codeine, dilaudid and heroine depressed mental performance and cobra venom definitely stimulated it. M. L. C. Bernheim (Chem. Abstr.).

Further Observations on the Action of Pyridine-β-Carboxydiethylamide (Coramine) on the Nervous System (Mammalian), with Special Reference to the Vagus. Burton, Andrew F. [*Arch. intern. pharmacodynamie*, **63**, 292–9 (1939); *cf. C.A.*, **33**, 4316⁴.]

In the cat and rabbit, large doses of coramine stimulate and then depress the cardiac vagus, but do not affect the sympathetic nervous system. In the cat the vagal depression is greater than in the rabbit, but the latter is more affected by terminal asphyxia and tremors from paralysis of the peripheral nerves.

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

The Detoxication of Local Anaesthetics. I. Measurements of the Anti-convulsive Action of Calcium Salts (and Various Other Substances). Wastl, H. [*Arch. intern. pharmacodynamie*, **63**, 145–78 (1939).]

Procaine-HCl and procaine-HCO_3 were compared by intramuscular injection in guinea-pigs, and the latter was found to give a greater percentage of convulsions, which are longer and more intense. The detoxifying and anticonvulsant effects of many Ca salts and sedatives were studied after procaine-HCl or butyn-SO_4. The best protection against procaine-HCl convulsions was Ca salicylate, then Ca levulinate, but the latter worked best for butyn-SO_4. Ca gluconate and the halides are less effective. In all, 3,800 experiments were performed.

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

The Condition of the Cerebro-spinal Fluid during Procaine Block in Septic Processes of Horses. Rasskazovskii, P. A. [*Sovet. Veterinariya, No.* **3**, 42–5 (1939); *Khim. Referat. Zhur. No.* **7**, 38 (1939).]

During procaine block the globulin fraction of the cerebro-spinal fluid increases, while the albumin fraction decreases. The content of sugar in the fluid and in blood increased during septic processes. W. R. HENN (Chem. Abstr.).

Neurohistological Tests on Pigeons Poisoned by Diseptal. Beck, E. [*Klin. Wochenschr.*, **18**, 1416–17 (1939).]

Pigeons poisoned by uliron or diseptal B exhibited no histological changes in the central or peripheral nervous system, or in the muscles, in spite of the clinical symptoms of polyneuritis. J. PINCHACK (Chem. Abstr.).

Cortical Hormone in the Treatment of Bromide Intoxication. Campbell, Coyne H. [*J. Okla. State Med. Assoc.*, **32**, 447–8 (1939).]

Seven patients were studied, having serum Br between 150 and 400 mgm. per cent. In six the daily administration of 6 to 10 gm. of NaCl was supplemented by injection of 2·5 c.c. of eschatin twice daily, and the serum Br reduced to 50–115 mgm. per cent. in one to four days; one patient required a longer time for recovery. The seventh patient with an original serum Br of 400 mgm. per cent. was given 8 to 10 gm. of NaCl daily for 18 days, and then showed a serum Br of 200 mgm. per cent. Empirically, cortical hormones may be helpful in the treatment of toxic psychoses. JAMES C. MUNCH (Chem. Abstr.).

Bromide Intoxication. Preu, Paul Wm. [*Rhode Is. Med. J.*, **22**, 179–82 (1939); *cf. C.A.*, **33**, 2990⁶.]

Bromide intoxication was encountered in 18 of 2,000 admissions to the New Haven Hospital. Treatment consisted of 10 gm. of NaCl in capsules daily, enemas, a high-caloric soft diet and large volumes of fluids. A blood-serum Br level of 250 mgm. per cent. is associated with delirium. Two case histories are presented, each patient showing 300 mgm. per cent. of serum Br. Br accumulates in the tissues, and should be used with care in patients with dehydration and dietary deficiency. JAMES C. MUNCH (Chem. Abstr.).

Side Effects of Barbiturate Sedation. Shelton, Prior. [*J. Missouri State Med. Assoc.*, **36**, 488–90 (1939).]

The distribution of various barbiturates as well as narcotics follows the Meyer-Overton law. Continued administration of barbiturates in sublethal doses to animals or humans leads to the development of a mucinoid material in the brain cells, developing simultaneously with the symptoms of chronic barbiturate poisoning. These changes do not follow a single sublethal dose. Therapeutic doses frequently administered may cause a moderate amount of tissue damage, especially in the higher centres of the central nervous system.

JAMES C. MUNCH (Chem. Abstr.).

The Cerebro-spinal Fluid of Morphinism. Mei, C., Ito, K., and Matuo, S. [*J. Chosen Med. Assoc.*, **30**, 352–62 (*German abstr.*, 24–5) (1940).]

The total protein, PO_4, NaCl, lactic acid and glucose contents are about the same in spinal fluids of normal persons (A), and those of morphine addicts during habitual (B) and abstinent periods (C). As compared to A, however, B give the Pandy reaction, show greater pressures and globulin ; albumin ratios, and slightly higher permeabilities, and have the same pressures and cell counts. C have greater cell counts, and globulin : albumin ratios than A ; and show lower pressures and greater globulin : albumin ratios and permeabilities than B. Cholesterol is absent in B and C.

S. TASHIRO (Chem. Abstr.).

Effects of Anaesthesia on the Blood Supply to the Hypothalamus. Laidlaw, Arthur E., and Kennard, Margaret A. [*Am. J. Physiol.*, **129**, 650–8 (1940).]

Focal changes in the state of the capillaries in the central nervous system after the administration of different anaesthetics can be observed after injection of indian ink and gelatin into the vascular system. After barbiturate anaesthesia many dilated capillaries are seen in the supra-optic and paraventricular nuclei of the hypothalamus ; but after ether relatively few capillaries are open and these appear constricted. In contrast the capillaries of the cortex are more dilated by ether than by the barbiturates. These findings are further evidence for a hypothalamic site of barbiturate action.

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

The Influence of Caffeine on the Autonomic Nervous System. Barry, D. T. [*Arch. intern. pharmacodynamie*, **63**, 129–44 (1939).]

Sensitization of the vagus and the renal splanchnic nerves was demonstrated in the dog after the injection of 20–50 mgm./kgm. caffeine. The rabbit vagus showed much less effect. Paralysis of the nerves occurred with widely different doses of caffeine, varying with the species, the individual and the rate of injection.

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