Part III.—Bibliography and Epitome.*

AN attempt is being made to provide as far as possible a complete bibliography compiled from the specialist journals dealing only with Psychiatry and Neurology (which are really inseparable) and their ancillary subjects, psychology, anatomy of the nervous system, criminology, etc.

A number of titles may appear to have a very remote relation to psychiatry, but they are included for the sake of completeness.

If any reader can add the names of journals to the following list, which it is hoped to publish each year in the January number, the addition will be gratefully received and acknowledged.

Those journals which are available in the Library of the Royal Medico-Psychological Association are marked " 1," those available in the Library of the Royal Society of Medicine are marked " 2," those in the Library of the British Psychological Society are marked " 3," and those in the Library of the British Medical Association are marked " 4."

The titles of these journals are mostly in the form given by the Board of Editors of Publications of the American Psychological Association, January, 1939. Contributors are requested to use the exact form given below.

PSYCHIATRIC JOURNALS.†

Abh. Neur. Psychiat.
Abh. Psychother.
Acta Espanola Neur. y Psiquiat, Kbh.
2, 4 *Acta Psychiat. et Neurol.*
3 *Acta Psychol., Hague.*
Acta Psychol., Keijo.
Aliéniste Français.
2 *Allg. Ztschr. f. Psychiat.*
Altersprobleme.
Am. Imago.
Am. J. ment. Def.
2, 3 *Am. J. Orthopsychiat.*
1, 2, 3, 4 *Am. J. Psychiat.*
2, 3 *Am. J. Psychol.*
An. Bras. Hig. Ment.
An. Inst. Psicol. Univ. B. Aires.
An. Psicotec., Rosario.
Anal. Istit. Neurol., Montevideo.
Analele Psihol. (Rumania).
Anales de psicologia, Buenos A.
2, 3 *Année Psychol.*
2 *Ann. Méd. Psychol.*
2 *Ann. Osp. psichiatri., Perugia.*
Arb. Psychiat. Inst., Sendai.
Arch. Anthrop. crim.
2 *Arch. Argent. de Neurol.*
Arch. Argent. Psicol. norm. pat.
2 *Arch. Bras. de Neur. e Psiquiat.*
Arch. Brasil Hig. Ment.
Arch. Chilenos de Crim.
Arch. Ital. di Studi Neuropsich.
1, 2 *Arch. Neurobiol.*
4 *Arch. Neurol., Paris.*
Arch. de Neurol. de Bucarest.
1 *Arch. de Neurol.*
2 *Arch. di Antropol. Crim.*
Arch. di Criminol. Neuropsiquiatria Disciplina y Conexas, Quito.

* 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.

† Some of these Journals may have ceased to exist.

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2, 4 *Arch. f. Psychiat.*
2, 3 *Arch. ges. Psychol.*
Arch. Internationale de Neurol.
Arch. Ital. Psicol.
Arch. Krim. Anthrop.
1, 2, 3, 4 *Arch. Neurol. Psychiat.*
Arch. Neur. Psychiat., Mex.
2, 3 *Arch. Psicol. Neurol. Psichiat. e Psicoter.*
2, 3 *Arch. Psychol., Genève.*
3 *Arch. Psychol., N.Y.*
Arch. Relig. psychol.
Arch. Speech.
Arquivos da Assist. a Psicopatas de Pernambuco.
3 *Austr. J. Psychol. Phil.*

Beih. Z. angew. Psychol.
Beih. Zbl. Psychother.
Bol. Inst. Psiquiatria, Rosario.
2, 4 *Brain.*
3 *Brit. J. Educ. Psychol.*
2, 4 *Brit. J. Inebriety.*
2, 3, 4 *Brit. J. Med. Psychol.*
2, 3, 4 *Brit. J. Psychol.*
3, 4 *Brit. J. Psychol. Monogr. Suppl.*
Bull. Canad. Psychol. Ass.
2, 4 *Bull. de la Soc. de Psychiatrie de Bucarest.*
2 *Bull. de la Soc. Roumaine Neur. Psychiat. Psychol. Endocrin.*
Bull. du Groupement Français d'études de neuro-psychopathologie infantile.
2 *Bull. Los Angeles Neur. Soc.*
Bull. Menninger Clin.
Bull. Soc. Psihol. med., Sibiu.

4 *Canad. Journ. Occup. Ther.*
3 *Cath. Univ. of Amer. Studies in Psychol. and Psychiat.*
2 *Cervello.*
2, 3, 4 *Character and Per.*
2 *Child Develpm.*
Child Develpm. Abstr.
Child Develpm. Monogr.
Child Study.
Chin. J. Psychol.
3 *Comp. Psychol. Monogr.*
2 *Confinia Neurol.*
Contr. del Lab. di Psichologia.
Contr. psychol. Theor.

2 *Deutsche Ztschr. f. Nervenh.*
Dis. Nerv. Syst.

Educ. psychol. Measmt.
1, 2, 3, 4 *L'Encéphale.*
2 *Epilepsia.*
Evolut. Psychiat.

Fiziol. Th. S.S.S.R.
2 *Folia Neuropath. Esthon.*
2 *Folia Psychiat. et Neurol. Japonica.*
2 *Fortsch. Neur. Psychiat.*

3 *Genet. Psychol. Monogr.*
Giornale di Psich. e di Neuropat.

4 *Hum. Factor.*
2, 3, 4 *Hyg. Ment.*

Illinois Psychiat. J.
Index Neurol. y Psiquiat, Buenos Aires.
3 *Indian J. Psychol.*
Industr. Psychol.
Industr. Psychotech.

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1, 2, 3, 4 *Int. J. Psychoanal.*
2, 3 *Int. Z. Psychoanal. u. Imago.*

Jap. J. appl. Psychol.
Jap. J. Exp. Psychol.
Jap. J. Psychol.
1, 2, 3 *J. Abnorm. Soc. Psychol.*
J. Am. Soc. Psychic Res.
3 *J. App. Psychol.*
2, 4 *J. Belge Neur. Psychiat.*
2 *J. Comp. Neur.*
1, 3 *J. Comp. Psychol.*
J. Consult. Psychol.
J. Crim. Law and Criminol.
J. Crim. Psychopathol.
J. de Psychiatrie Infantile.
3 *J. Educ. Psychol.*
J. Except. Child.
3, 4 *J. Exp. Psychol.*
2 *J. f. Psychol. u. Neurol.*
3 *J. Gen. Psychol.*
J. Genet. Psychol.
J. Juvenile Res.
1, 2, 3, 4 *J. Ment. Sci.*
1, 2, 3 *J. Nerv. Ment. Dis.*
1, 2, 3, 4 *J. Neurol. Psychiat.*
J. Neuropath. and Psychiat., Leningrad.
J. Neuropath. Ex. Path.
2, 4 *J. Neurophysiol.*
J. Neuropsychiatrique du Pacifique.
J. Parapsychol.
J. of Psychical Research.
J. Psihoteh.
2 *J. Psycho-Asthenics.*
3 *J. Psychol.*
J. Psychol., Moscou.
J. Psychol. Neurol., Leipzig.
2 *J. Psychol. Norm. Path.*
J. Soc. for Psychical Research.
3 *J. Soc. Psychol.*
J. Speech Disorders.

Kriminalistik.
3 *Kwart. Psychol.*

Mag. psychol. Szle.
Ment. Health.
Ment. Health Obs.
2, 4 *Ment. Hyg., Lond.*
Ment. Hyg., N.Y.
Ment. Hyg. Rev.
Ment. Hyg. Bull., Indiana.
3 *Mind.*
Mschr. Krim. Biol.
2 *Mschr. Psychiat. Neurol.*

Ned. Tijdschr. Psychol.
2 *Neopsychiatrica.*
2 *Nervenarzt.*
3 *Neue psychol. Stud.*
Neurbiol., Pernambuco.
Nevrasse.
Nevropath. i. Psikhiat.
Note e Riv. di Psichiat.
Nowiny Psychjaryczne.
Nuova Riv. di Clin. ed Assistenza Psichiatrica.

Obshch. Klin. Nevropat.
3 *Occup. Psychol.*
2 *Occup. Ther. and Rehabil.*

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2 *Onderzoekingen Psychiat-Neur. Klin., Utrecht.*
2 *Ospedale Psichiatrico.*

Person. J.
Pisani.
Polsk. Arch. Psychol.
Prace Psychol.
Proc. Amer. Assoc. Stud. Ment. Def.
Proc. A. Research Nerv. and Ment. Dis.
Psichotec.
Psicoterapia (*Cordoba*).
Psyche.
Psychiat. Monogr.
2 *Psychiat. en Neurol. Bl., Utrecht.*
2 *Psychiat. et Neurol. Japonica.*
2 *Psychiat. Neurol. Wchnschr.*
Psychiatry.
1, 2, 4 *Psychiat. Quart.*
2, 3 *Psychoanal. Quart.*
1, 2, 3 *Psychoanal Rev.*
2, 3 *Psychol. Abstr.*
3 *Psychol. Bull.*
Psychol. Clin.
Psychol. Exch.
3 *Psychol. Forsch.*
Psychol. Index.
Psychol. Monogr.
Psychol. Rec.
3, 4 *Psychol. Rev.*
3 *Psychol. Rev. Monographs.*
Psychol. Stud. Univ. Bp.
Psychol. wychow.
3 *Psychometrika.*
Psychometr. Monogr.
Psychosom. Med.
Psychosom. Med. Monogr.

Quart. J. Speech.
Quart. J. Stud. Alcohol.

Rass. Neurol. Veget.
Rass. Studi Psichiat.
Rev. Argent. Neurol. Psiquiat.
Rev. di Neur. e Psychiat., S. Paolo.
Rev. di Psiquiatria, Chile.
Rev. di Psiquiatria y Crim.
3 *Rev. Franç. Psychoanal.*
Rev. Ibero-Amer. de Anal. Biblio. de Neurol. y Psiquiat.
Rev. Mex. Neurol. Psiquiat.
1, 2, 4 *Rev. Neurol.*
Rev. Neurol. di Buenos-Aires.
Rev. Neurol. Psychiat., Praha.
Rev. Neuro-psiquiatr., Lima.
Rev. Neuropsiquiatr.
Rev. Psicol. Pädag.
Rev. Psihol.
Rev. Psiquiat. Crim., B. Aires.
Rev. Psiquiat., Uruguay.
Rev. Psiquiat. y Disc. Con., Chile.
Rev. Sudam. Psicol. Pedag.
Rev. Tchèque de Neurol. et de Psychiat.
La Ricerca Psichica.
2, 3, 4 *Riv. di Neurol.*
Riv. di Neuro-psiquiatria, Peru.
3 *Riv. di Psichologia.*
Riv. Ital. di Endocrin. e Neurochir.
2 *Riv. Patol. nerv. ment.*
Riv. Psichol. Norm. Pat.
2, 4 *Riv. Sper. Freniat.*
1 *Rocznik Psychjatryczny.*
Rorschach Res. Exch.

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1 *Schizofrenic.*
2 *Schweiz. Arch. Neurol. Psychiat.*
Skand. Arch. Psychol.
Sovet. nevropatol., psichiatri, psichoguoguia.
Sovet. Psichoneurol.
Sovet. Psikhotekh.
Speech Monogr.

Tohoku Psychol. Folia.
Tr. Am. Neurol. A.
Tr. Beritov. Inst., Tiflis.
Tr. Kostchenko Ment. Hosp., Moscow.
Trud. fiziol. Lab. Pavlova.
Trud. tsentral. psikhonevrol. Inst.

Univ. Calif. Publ. Psychol.
Univ. Iowa Stud. Psychol.
Untersuch. Psychol. Phil.

3 *Z. angew. Psychol.*
Z. Arb. Psychologie.
Z. Berufsbildung des Pflegepersonals.
Z. Individ. Psychologie.
2, 4 *Z. ges. Neurol. Psychiat.*
3 *Z. Pädag. Psychol.*
Z. Parapsychol.
Z. Psych. Hyg.
Z. Psychoanalyse (Tokyo).
3 *Z. psychoanal. pädag.*
2, 3 *Z. Psychol.*
Z. Psychother. med. Psychol.
Z. Tierspsychol.
2 *Zbl. Neurochir.*
1, 2 *Zbl. ges. Neurol. Psychiat.*
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*The Blood Sugar during and after the Hypoglycemic Coma of Insulin Shock Therapy, with Special Reference to the "Aftershock." *Heiman, M.* 863
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*Recurrent Convulsion Seizures in Animals Produced by Immunologic and Chemical Means. *Kopeloff, L. M., Barrera, S. E., and Kopeloff, N.* 881

Prognosis in Manic-Depressive Psychoses:

A follow-up study of 208 manic-depressive conditions is reported. Analysis of such conditions permits the following summary :

Positive heredity is common—chiefly depressions, and more commonly in the direct line of heredity. This shows more consistently in the manic cases. Characteristic personality type is outgoing. Unexplainable psychosis is rare (20 per cent.). Most have disturbing circumstances at the time of onset. Oldest and youngest siblings may more frequently develop psychoses. Somatic handicaps frequently contribute to or help to precipitate the illness. Abrupt onset is rare except in manics. The condition usually requires one to six months to develop. Suicidal risk or attempt occurred in 30 per cent. of all cases. The affective picture is often mixed, not purely as sadness or elation. Psychoneurotic (not often as anxiety), schizophrenic, and arteriosclerotic components are frequent (79 cases) (33·1 per cent.). Thinking disturbances are present in one-fourth of the cases (manic and depressive phases). Capacity for rapport is fair or good in 41 per cent. of the manics and in 70 per cent. of the depressions. Some insight is present in 47 per cent. of the manics and in 54 per cent. of the depressions. Remissions of 10–20 years are common (67 cases, 32·2 per cent.). Depression may begin early but rarely (3·8 per cent., 8 cases), or late (65 + 11 cases, 5·2 per cent.). The largest incidence occurs in the decade 45–55. Course is a matter of months ; on the average 2½ months in the hospital. Three-fourths of the cases are well or improved at the time of discharge ; 93 per cent. recover from the first attack. Chronic cases are rare (16, 7·7 per cent.). Cyclothymic cases tend oftener to chronicity. Single attacks are rare (21 per cent.). Recurrence is likely. Long-term follow-up convinces us that caution is necessary in pronouncing recovery for the future. Seventy-nine per cent. had recurrences. This is particularly true for cyclothymic cases. Many variations in course and phases occur. Depression following elation is more common than vice versa. Depression almost always lurks behind elation. Manic patients may suicide. Depressive or paranoid content occurred in 14 of the manic cases (77·7 per cent.). Depressive cases may show definite manic features (spurts of elation in the morning, rhyming and flight with sadness). Single attacks of manic psychosis are very rare. Single attacks of depression occurred in 40 cases (19·2 per cent.). Fourteen of these became chronic (35 per cent. of 40 and 6·8 per cent. of 208). The unfavourable depressions may develop a schizophrenic picture. Deterioration may occur in depression. Stupor in depression occurs—catatonic in appearance. First attacks on the average last 6½ months. Recovery from first attack is almost invariable (93 per cent.). Twenty-one per cent. had single attacks ; 79 per cent. had recurrent illnesses ; 63·5 per cent. had third attacks and 45·1 per cent. had fourth attacks. Attacks tend to become prolonged as they recur, especially after 45. Best prospect for recovery for patients having first attack is between 21 and 30, poorer after 40, worst after 50. Recovered patients show small number of attacks (2·7) and shortening of the course in subsequent attacks. The more frequent the attacks the less chance for ultimate recovery. Depth of psychosis is not significantly important. Negative heredity is not an outstanding factor in recovery. Out-going make-up is a factor in recovered cases. (Author's abstr.)

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Hypochondriacal Complaints with Special Reference to Personality and Environment.

1. The issue of hypochondriasis has been confused through its identification, on one hand, with somatic delusions in psychoses and, on the other, with any and all somatic disorders of functional origin. This study supports the thesis that there exists a clinical nosological entity, called hypochondriasis, as here defined.

2. Hypochondriacal patients, with very few exceptions, have numerous complaints. These involve organs, systems of organs, the whole or parts of the body not referable to any special organs. In contrast to their usual diffuseness, the complaints in a few of our patients are circumscribed, warranting the term monosymptomatic hypochondriasis.

3. The only common and very outstanding characteristic of hypochondriacal individuals is their unusual, peculiar hypochondriacal attitude towards health and sickness. The consistency of such an attitude and its persistence more or less overtly throughout life leads one to speak of constitutional hypochondriasis. However, aside from the hypochondriacal attitude, both male and female patients with hypochondriacal reactions do not, all of them, otherwise show distinctly characteristic personality traits. They rather present a rich collection of varied human specimens.

4. It is granted that in the hypochondriacal reactions of our patients, their special personality make-up played the all-prevalent part. Yet from our material it is also clear that environmental influences, including iatrogenic factors of long and short duration, equally contributed their share. (Author's abstr.)

The Relationship of Vitamin C Deficiency to Dental and Gingival Conditions in Mental Patients.

(1) Quantitative vitamin C studies done on mental patients reveal levels considerably lower than normal.

(2) These low levels have been, at least partially, traced to the low vitamin C allowances in most institutional diets, but undoubtedly also on the unusual food habits of mental patients, depending on their delusions regarding food.

(3) A definite correlation has been found between the frequency of dental and gingival conditions in mental patients and their low ascorbic acid levels.

(4) No significant differences were found in the various diagnostic groups, except that the lowest findings were in the alcoholic psychoses.

(5) It is recommended that hospital diets be supplemented by an adequate vitamin C supply. (Authors' abstr.)

Postural Reactions to Vestibular Stimulation in Schizophrenic and Normal Subjects.

(1) Postural reactions to caloric stimulation of the vestibular organ were measured in a group of 20 chronic schizophrenic patients and in a group of 20 normal persons. The blindfolded subjects were instructed to mark time in place, and the reaction was measured by the degree of rotation about the vertical axis of the body.

(2) The test was first administered without vestibular stimulation in order to determine the amount and direction of the rotation, which is an expression of the dominance of one side of the body. Such " basal trends," which were present in all subjects, were taken into account when calculating the amount of vestibular reaction.

(3) The mean total vestibular reaction measured in degrees of rotation was, in the patients, less than one-half that of the normal subjects. In spite of the great variability of the phenomenon studied, this difference is statistically highly significant.

(4) The total duration of the reaction, as well as the degree of rotation per time unit, was found to be significantly less in the patients than in the normal controls. That is, the reaction of the patients was more fleeting and less intense than that of the normal controls.

(5) It is suggested that the difference found may be due either to the depressed activity of the nervous mechanisms involved or to a diminished muscle tonus of the schizophrenic patients. (Authors' abstr.)

The Blood Sugar during and after the Hypoglycemic Coma of Insulin Shock Therapy, with Special Reference to the "Aftershock."

(1) Coma due to administered insulin does not generally occur while the blood sugar drops.

(2) The blood sugar remains at about the same level after the lowest point has been reached throughout the coma.

(3) Following the termination of the insulin coma, the blood sugar describes a characteristic curve with a sharp ascending and descending branch. In a majority of patients the blood sugar drops to hypoglycemic levels.

(4) "Aftershock" occurs a definite time, 4 to 6 hours, following the termination of the insulin coma, more frequently in female patients.

(5) The " aftershock " is due to a spontaneous hypoglycemia and occurs suddenly, probably simultaneously with the dropping of the blood sugar.

(6) The spontaneous hypoglycemia is due either to a depletion of glycogen in the liver, or to a functional disturbance in the carbohydrate metabolism. This disturbance is of a temporary nature, as found in patients with faulty dietary habits.

(7) The spontaneous hypoglycemia calls forth the same response as the hypoglycemia due to administered insulin, namely, a stimulation of the adreno-sympathetic system.

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(8) The "aftershock" not infrequently has appeared to produce a marked clinical improvement. This improvement may be utilized for practical purposes.

(9) The "aftershock" can be avoided by administration of carbohydrates three to four hours following the termination of the insulin coma. (Author's abstr.)

Recurrent Convulsive Seizures in Animals Produced by Immunologic and Chemical Means.

Acute, intermittent and recurrent convulsive seizures have been induced in monkeys by the application of discs containing various immunologically and chemically active substances to the cerebral cortex overlying the motor area. Acute seizures were either single attacks, or a series which usually terminated within one week of onset. Intermittent seizures occurred at widely-spaced intervals over a period of weeks or months. Recurrent seizures were frequent in occurrence (often daily) and persisted for many months. The seizures induced were either typically Jacksonian in nature, or generalized, and usually lasted one-half to two minutes. During unilateral seizures the attack was confined to the muscle groups on the side of the body contralateral to the treated cerebral hemisphere. Seizures occurred either spontaneously, or were induced by external stimuli.

Egg-white placed on the brain of monkeys generally sensitized to egg-white, or egg-white injected intravenously into animals in which egg-white had previously been applied to the cortex, yielded acute seizures. Egg-white, egg-white followed by anti-egg-white rabbit serum, specific antigen-antibody precipitates and typhoid vaccine proved to be effective agents in the production of intermittent seizures.

Hydrous oxides of aluminium, alone or in combination with various proteins, invariably produced convulsive seizures, often recurring for many months (in one instance for more than one year to date). These recurrent seizures were of special interest, since they represented a state of chronic convulsive reactivity.

Control preparations of aquaphor, alone or in combination with rabbit serum, monkey serum or gelatin, or empty discs failed to induce seizures.

Electric shock revealed a lowered threshold of convulsive reactivity of one motor area as compared with the other in monkeys exhibiting either unilateral or predominantly unilateral seizures.

Electroencephalography indicated that the greatest degree of abnormality in monkeys with convulsive seizures was observed in the precentral cortex and the immediately surrounding area. The recordings also established differences between the two motor areas which were correlated with differences in the clinical manifestations observed on the opposite sides of the body.

Luminal and dilantin were found to reduce the incidence of the recurrent seizures produced.

Serologic studies revealed no correlation between the concentration of serum precipitins or agglutinins and the occurrence of seizures. Brain antibodies were not demonstrable.

The histopathologic findings were of two main types: (1) an acute, destructive process; (2) a chronic, proliferative type of response. The acute lesion was usually associated with the acute or intermittent convulsive seizures produced by immunologic agents. The chronic pathologic response was found in monkeys treated with alumina, aquaphor preparations or empty discs, and was not pathognomonic of the convulsive state.

Repeated convulsive seizures have been produced by a single application of various types of substances to the cerebral cortex. Although the mechanism remains obscure, the methods employed may prove useful in further studies of the nature of the convulsive state.

(Authors' abstr.)

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Latah : An Exotic Psychoneurosis.

Natives in subservient positions in Java and Arabs living in Africa sometimes develop a neurosis in which they imitate quick movements and speech, usually of their masters. Instead of obeying instructions, they merely repeat them. Latah differs from hysteria found in occidental countries in that the patient shows great resistance and anguish and often becomes very angry when he feels compelled to imitate. It differs from catatonia in the good contact the patient has with his environment. While the natives tend to worship psychotics in general, they make fun of latah sufferers. Latah seems to be a very personal relationship ; the symptoms can be evoked in only one patient at a time, and a patient will imitate only one person at a time. M. B. MITCHELL (Psychol. Abstr.).

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Regulation of Cerebral Carbon Dioxide.

The response to overventilation and to breathing an increased concentration of carbon dioxide was studied in 13 subjects with normal electroencephalograms and no clinical evidence of cerebral disorder. Two of the subjects were chosen because they showed an unusually rapid increase in amplitude and decrease in frequency of cortical potentials with overventilation. Simultaneous samples of blood were taken from the femoral artery and the internal jugular vein, and the values obtained for carbon dioxide content, pH carbon dioxide tension and oxygen saturation were compared and correlated with simultaneously obtained samples of the electroencephalogram.

1. The dilatation or constriction of cerebral arterioles which follows an increase or decrease of carbon dioxide in the arterial blood serves to protect the brain against undue shifts in carbon dioxide tension.

2. The slow waves that appear in the electroencephalogram with overventilation are caused by a drop in cerebral carbon dioxide, and not by anoxia secondary to cerebral vasoconstriction.

3. The ease with which such slow waves can be produced with overventilation is a rough index of the relative incompetence of the cerebral vasoconstrictor response to low carbon dioxide tension.

4. In some supposedly healthy adults and in most persons with *petit mal* epilepsy, the cerebral vasoconstrictor response to low carbon dioxide tension is defective, this defect resulting in abnormal slowing of the electrical activity of the cortex during overventilation.

5. The cerebral vasoconstrictor response to low carbon dioxide tension disappears when a critically low level of oxygen tension is reached. (Authors' abstr.)

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Pathologic Changes in the Central Nervous System in Experimental Electric Shock.

Twenty-eight rabbits and ten rats were subjected to electric shock treatment simulating the treatment of patients with " functional psychoses."

Sixteen rabbits were paralyzed in the course of this treatment, seven of them after the first shock. In only three of the remaining twelve rabbits was no pathologic change found on microscopic examination In all the others hemorrhages were present within the meninges of the brain and spinal cord and within the brain stem and the spinal cord. These hemorrhages were usually confined to the immediate neighbourhood of capillaries and small veins and were produced by the rupture of the walls of these vessels. A combination of causes was responsible for these ruptures: the sudden rise of the arterial blood pressure during the forceful contraction of the musculature, the vasospasm of the peripheral arteries following cessation of the electric stimulation and the stasis in the venous system, which was aggravated by cessation of respiration for several seconds. Hemorrhages also were present in the lungs of six and in the kidneys of three out of ten rats subjected to electric shock.

No generalized ganglion cell disease or generalized proliferative glial reaction was observed. Such phenomena were confined to the immediate proximity of the hemorrhages, and were usually combined with a somewhat farther-reaching edema of the surrounding tissue.

(Authors' abstr.)

An Encephalographic Ratio for Estimating Ventricular Enlargement and Cerebral Atrophy.

The ratio of the transverse diameter of the anterior horns to the internal diameter of the skull as measured on encephalograms (or ventriculograms) exposed in the antero-posterior projection with the posterior part of the head down is proposed as an index of the size of the cerebral ventricles.

The average value of the ratio for a " normal " group was found to be 0·23, with extreme values of 0·16 and 0·29. There is a significant correlation between the size of the ventricles and the size of the skull, and the ratio has the same average value for small and large skulls and for the skulls of infants, children and adults.

The great majority of normal values fall between 0·20 and 0·25 ; values above 0·30 indicate definite ventricular enlargement, and provide a quantitative estimation of the degree of cerebral atrophy.

Serial studies may give an indication of the course of the brain lesion and a basis for prognosis.

(Author's abstr.)

Familial Mental Deficiency Akin to Amaurotic Idiocy and Gargoylism.

Six cases of an apparently new type of familial mental deficiency are described. The clinical features consist of severe idiocy, stunted growth, characteristic facies and peculiar changes in the bones of the skull. Pathologically there is ubiquitous swelling of the nerve cells with cytoplasmic infiltration of lipoid granules.

The relation of this condition to juvenile amaurotic idiocy and gargoylism is discussed. Differences are indicated which appear to justify a separation of this type of mental deficiency. It is pointed out, however, that amaurotic idiocy, gargoylism and the condition in the cases here reported show obvious similarities which warrant their inclusion in the same group of diseases.

The pathogenesis of this condition is discussed, the morbid process being considered an instance of localized lipoidosis. From the etiologic aspect, the disease is considered to be genetically determined, and probably inherited as a recessive. (Author's abstr.)

Alternating Tremor and its Relation to Cortical Pathways.

A case is reported of bilateral paralysis agitans which had been present for twelve years when thrombosis of the right middle cerebral artery developed, with resulting left spastic hemiplegia, from which the patient recovered during the next three years with about 60 per cent. of voluntary motor power. The tremor (of paralysis agitans) never returned to the affected extremities, however. The rigidity, previously present, was not altered. Post-mortem examination revealed complete destruction of the head of the caudate nucleus, the putamen, part of the globus pallidus and portions of the internal capsule. Three-fifths of the pyramidal tract, the whole frontopontile system and a part of the temporopontile system, the frontothalamic fibers to the anterior lateral thalamic nucleus, the corticorubral and the corticonigral fibers were affected. (Author's abstr.)

Disturbances in Brain Function following Convulsive Shock Therapy.

A series of 23 patients with affective reactions treated with metrazol induced and electrically induced convulsions were studied clinically and electroencephalographically to determine the presence and extent of post-therapeutic disturbances in cerebral function.

Of 23 patients, 14 recovered or improved and 9 did not improve. Early recurrences were included in the category of no improvement. In contrast to previous forms of treatment the striking feature was the spectacular rapidity of recovery of the patients who were cured.

Evidence of disturbed cerebral function was present in 50 per cent. of the patients as indicated by changes in the electroencephalogram and in 45 per cent. of the patients as shown by changes in intellectual function.

In the most severely affected patients epileptoid disturbances in the electroencephalogram

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developed, consisting of three per second waves, bicuspid and dicrotic waves, spike and wave formations and greatly increased amplitude. The post-therapeutic clinical evidences of impaired cerebral function consisted of an " organic " type of sensorial and intellectual impairment.

Recovery from these disturbances of cerebral function occurred in most patients in a few weeks. In the more severely affected patients evidences of impaired cerebral function sometimes lasted as long as six months.

Recovery or improvement is apparently not dependent on the presence of such changes in cerebral function as are shown by our methods of electroencephalographic examination and tests for mental status. (Authors' abstr.)

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Central Autonomic Paralysis.

The cases of six patients with lesions of the brain stem due to vascular thrombosis are described. Five of the six patients had a more or less typical lateral medullary syndrome due to occlusion of the posterior inferior cerebellar artery. The lesion in the sixth patient was probably due to thrombosis of a lateral branch of the superior cerebellar artery.

In four cases there were minimal evidences of Horner's syndrome or sweating disturbances. In the two cases reported in detail sweating on heating the body and vasoconstriction on cooling the body were seriously disturbed, but vasodilatation on heating the body and vasoconstriction from a full inspiration or from sensory stimuli were normal.

This study indicates that the efferent tracts concerned with various functions of the autonomic nervous system are at least in part anatomically distinct in the medulla, so that a lesion may destroy the tracts concerned with one or more functions of the autonomic system without interfering with the remainder.

Central lesions of the autonomic nervous system produce signs that are different from those caused by the removal of the sympathetic ganglia or nerves, just as lesions in the sensory cortex produce signs that differ from those caused by sectioning a peripheral nerve or the posterior roots. (Authors' abstr.)

AUGUST.

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Metastatic Tumors of the Brain.

The clinical manifestations and the anatomic observations in 57 cases of metastatic tumor of the brain are analyzed.

(A) On the clinical side, observations on the evolution of the symptoms and signs in cases of metastatic tumor of the brain point to the following conclusions:

The onset of cerebral manifestations is most commonly acute and often precipitate, with symptoms of increased intracranial tension, such as headache, nausea and vomiting. These symptoms, appearing early in the disease, manifest themselves in an intensity out of proportion to the then present meager objective neurologic signs.

Papilledema is absent in a large number of instances (34 cases, or 59·6 per cent. in this series); moderate in some (16 cases, or 28 per cent.), and pronounced only in a few (7 cases, or 12 per cent.).

The presence or absence of meningeal signs does not seem to bear any relation to the position of the tumor in the brain.

Mental alterations are found in a somewhat greater number of cases of metastatic than of primary tumor of the brain (23 cases in this series).

The evolution of the clinical course is characterized by a rapid transition from the early stage, in which the cerebral signs are few and vague, to a stage in which manifestations of an existing focal lesion of the brain are prominent. In a large number of instances these may be of a disseminated character, and in an equal number of instances they may point to the presence of a single circumscribed process. The rapid unfolding of the clinical picture is marked by an equally rapid decline in the general condition of the patient.

The laboratory investigations pertaining to the cerebro-spinal fluid contribute little to the diagnosis. While the cell count of the cerebro-spinal fluid at times may be above normal, or even very high, tumor cells are rarely discovered in the fluid. The increase in the globulin and the slight increase in the sugar content of the cerebrospinal fluid noted in a few cases are not pathognomonic of metastasis.

Thus, it may be said that an acute onset of symptoms of increased intracranial tension, such as headache and vomiting, followed by rapidly progressive development of neurologic signs of either disseminated or more localized character, accompanied by slow development of papilledema in the absence of positive serologic reactions and febrile manifestations, points strongly to an expanding lesion of a metastatic character. Such a suspicion demands search for a primary lesion by all available clinical and laboratory methods, since the therapeutic indications depend on recognition of the character of the neoplastic process.

In some instances the knowledge thus obtained may point to the advisability of intracranial surgical intervention, with promise in some instances of temporary relief from the more disabling and painful symptoms and prolongation of life, and in rare instances still better results. Surgical treatment was attempted in a limited number of cases in this series. In some cases this was done because the metastatic character of the lesion was not recognized. The result of successful removal of the tumor somewhat lengthened life with comfort beyond the probable life expectancy.

(B) The anatomic features may be summarized as follows:

In the larger number of cases (52·6 per cent. of the total series) multiple tumors, variable in

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size and distribution, were revealed, while in a somewhat smaller group (38·6 per cent.) the metastatic lesion was single and massive. Finally, there was a third, very small, group, constituting 8·8 per cent. of the total number, characterized by diffuse, microscopic infiltrations. The great majority of the tumors in this series were observed in the brain substance. Only in one case was the lesion restricted to the dura, and in one case to the leptomeninges.

In 49 of the 57 cases the metastatic lesion was in the nature of a carcinoma, leaving only eight cases to be distributed among tumors of other types; the Grawitz tumor (two cases) and neuroblastoma, lymphosarcoma, spindle-cell sarcoma, melanosarcoma, chorionepithelioma and Ewing's sarcoma (one case each). This observation seems to indicate that in the predominant number of instances the primary focus is most likely in some part of the respiratory or gastro-intestinal tract and serves to direct the search for a suspected primary seat of the disease to these two systems.

In all of the cases in which full post-mortem examination was made metastasis to the brain was found to be but an expression of a generalized process of dissemination, as other viscera were coincident sites of the metastases. The lungs, when not the primary seat of the malignant growth, were spared of recognizable metastatic lesions in only six cases. Of 23 cases in which autopsy was restricted to the brain, roentgen studies suggested the presence of metastases in the lungs in seven cases. This observation also serves as a guide in distinguishing between the primary and the secondary character of an intracranial neoplasm, and points to the need for a clinical investigation in almost every instance of brain tumor by every available method (gastric analysis and roentgenographic and pyelographic studies) in order to establish a probable source of metastasis.

Our material presents strong evidence that the metastatic cells are brought to the brain by the blood stream and no evidence of transportation of neoplastic cells to the brain by true lymphatics.

The growth of the metastatic tumor in the brain takes place at the expense of adjacent brain tissue. Its extension is by way of the perivascular spaces and probably also by actual transportation of small cell groups through the vascular channels.

In spite of its invasive character, a discrete line of demarcation between the metastatic tumor and the adjacent tissue is maintained, and only mild reactive changes, such as a narrow zone of condensation, gliosis and occasional lymphocytic infiltration in nearby brain tissue, are present. In rare instances a narrow belt of hemorrhage is observed, and this is particularly true of metastases from the so-called Grawitz type of tumor, or hypernephroma. Relatively wide areas of oedema of surrounding brain tissue are common.

The tumor tissue itself is usually rich in blood vessels, occasionally shows extravasation, but most frequently contains relatively large areas of necrobiosis. A fairly large number of such tumors contain cysts filled with gelatinous material. In a small group of cases of metastatic invasion of the brain the lesions are widespread in distribution but are restricted to infiltrations about blood vessels. These lesions are recognized only microscopically and are occasionally described as miliary carcinomas.

The choroid plexus, which was studied with a view to determining its role in the transportation of tumor cells to the nervous system, was the seat of metastatic invasion in only 1 of 57 cases. (Authors' abstr.)

Pathology of Senile Brains: (1) *Silver-reducing Structures in the Hippocampus.*

The present communication is devoted to the study of the hippocampal formation in senile brains. The characteristic pathologic change is the presence of intracellular and extracellular substance or substances capable of reducing ammoniacal silver solutions without further chemical treatment. The staining method employed in the present study differs from the usual histologic methods in clearly differentiating such material from technical artefacts and from silver deposits of unknown nature, as well as from normal tissue constituents. The Alzheimer fibrillary change is a generic name for various types of intracellular alteration, all of which have in common this property of a reducing substance. The Alzheimer change represents at least two different processes, in one of which the reducing substance is associated with neurofibrils and in the other of which it is not so associated.

Several types of each process are illustrated and described. Special interest is centred on the pyriform cells in the pyramidal layer, in which the fibrils are sometimes of extreme delicacy, even though the cells may be undergoing dissolution. Pericellular argyrophilic structures, in intimate relation to many pyriform cells, are described. Some of this pericellular material is indistinguishable from that form of senile plaque known as the fine-fibered, hairlike type. Examples of transitional stages between pyriform cells and fine-fibered plaques are described, but these form only a small proportion of all plaques. No transition between any other type of plaque and any other type of cell change has been observed. Glia cells do not form or elaborate the material constituting senile plaques. Other types of silver-reducing substances observed in senile brains include short stretches of nerve and glial fibers, often in small groups and clusters; corpora amylacea; granulovacuolar degeneration of neurons, an argyrophilic change in blood-vessel walls and an intraepithelial network of fibers in ependymal cells. The interrelation of different types of pathologic silver-reducing substances is briefly discussed.

(Author's abstr.)

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Pathologic Anatomy of Human Nervous System in Avitaminosis.

The literature dealing with neuropathologic studies on both human and experimental deficiency of vitamin B_1 and the P-P factor is reviewed.

An endemic of so-called secondary B complex avitaminosis was encountered in a group of 13 Chinese soldiers who had suffered primarily from dysentery and tuberculosis. Besides an inadequate supply, the factors of poor absorption and an excessive loss of the vitamins also played an important role in the production of avitaminosis in these patients.

The diagnosis of beriberi and pellagra was based on the demonstration of a uniform, characteristic neuropathologic picture.

The possible histopathogenesis of the outstanding individual nerve lesions is discussed.

The neuropathologic process was degenerative and involved both the sensorimotor and the autonomic nervous system.

The neuropathy of the peripheral nerves was the anatomic substratum of beriberi, while primary irritation of the Betz cells was a constant morphologic manifestation in pellagra.

The neuropathologic process tended to proceed centripetally in beriberi and centrifugally in pellagra.

The involvement of the peripheral nerve trunks and the nerve roots was predominantly confined to the sensory fibers, their distal portions being more severely damaged than their proximal portions.

The lesions of the spinal cord were characterized by frequent sclerosis of the posterior columns, especially the fasciculus gracilis, and occasional involvement of the pyramidal and the lateral sensory tracts.

The degeneration of the ascending fibers of the spinal cord was chiefly of Wallerian type secondary to a neuropathy of the posterior nerve roots. There was, however, evidence to suggest an independent process. Therefore the spinal funicular disease in the present cases was not exactly systemic.

The frequency of the funicular involvement was apparently related to the duration and the severity of the deficiency.

A typical cutaneous lesion of pellagra was noted in one case.

The exact mode by which the vitamins act on the nerve tissue is not known. A mere morphologic approach seemed to be futile in any attempt to solve this problem.

Further neuropathologic studies on human beriberi and pellagra should include a study of the neuromuscular end organ and the glycogen content, the mitochondria and the oxidase reaction (Dutcher) of the nerve cells in selected cases.

A careful neuropsychiatric examination is indicated in cases of disturbance of the gastrointestinal tract.

No pathologic examination in cases of lesions of the gastrointestinal tract is considered satisfactory without an adequate study of the nerve tissue.

It is necessary to supply adequate vitamins in cases of gastrointestinal trouble, especially by the parenteral route, even though no frank signs of neuropsychiatric disorder can be detected clinically. (Author's abstr.)

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The Relation of Various Hypothalmic Lesions to Adiposity in the Rat.

Obesity is not produced in rats by lesions which destroy (1) the fornix bilaterally with small damage to surrounding tissue in the anterior hypothalmus; (2) large portions of the caudai halves of the anterior hypothalmic areas symmetrically; (3) most of the mammillary body; (4) most of one side of the hypothalamus; (5) the midline structures in and close to the floor of the third ventricle, including the median eminence, and the arcuate and suprachiasmatic nuclei.

Obesity can be produced by fairly symmetrical lesions which destroy bilaterally (1) most of the ventromedial hypothalamic nuclei together with some of the tissue immediately around them, especially on their lateral sides; (2) the caudal ends of the ventromedial hypothalamic nuclei, the premammillary area, and a considerable part of the lateral hypothalamic areas adjacent to it; (3) in the caudal hypothalamus the areas which lie dorsolateral to the mammillary body. These pairs of lesions appear merely to represent interruptions at successive levels of paired systems (one on each side of the hypothalamus, and each one capable of acting more or less independently).

The systems in question seem to arise rostrally in, or in the neighbourhood of, the ventromedial hypothalamic nucleus, and to proceed caudally into the midbrain in the company of the medial forebrain bundle. The descending pathway may of course consist of chains of short neurons.

Ordinarily, adiposity in male rats is associated with some degree of stunting, in respect to body length, but the same is not true of females. It has also been found that adiposity caused by hypothalamic lesions lying caudal to the infundibulum is not usually accompanied by persistent vaginal estrus in the female. There likewise appears to be no significant correlation between the occurrence of adiposity and diabetes insipidus, the lesions which cause them being apparently fundamentally different.

The hypophyses of the obese rats which have been examined are in most cases quite clear of involvement in the destruction at the base of the brain. (Authors' abstr.)

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IQ Correlated with EQ.

715 children at a mental hygiene clinic were examined with the Stanford-Binet and the New Stanford Achievement Test and IQs and EQs obtained. "The correlation obtained on the whole (group) . . . does not differ from correlations obtained in groups described by other persons. However, when it is broken down in diagnostic groups there appears to be a negative correlation among the mental defectives, persons of borderline intelligence and persons of dull normal intelligence, a slight correlation among persons having high normal general intelligence, and a substantial correlation among the persons having normal and superior general intelligence. Significant differences were found between the mean performances of males and females on both intelligence and educational tests. . . . There appears to be a perceptible rise in correlation with the rise of IQ, although the high normals are an exception to this. From the evidence on hand the EQ cannot be substituted for the IQ."

J. W. MACMILAN (Psychol. Abstr.).

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Some Electroencephalographic Correlates of Intelligence in Eight-year and Twelve-year-old Children.

(1) The relationship between occipital area alpha frequency, alpha index, and intelligence level has been investigated in a sample of forty-eight eight-year-old children especially selected to represent a wide range of intelligence levels. The relationship between occipital and motor area alpha frequency and intelligence level has been investigated in a sample of 42 twelve-year-old children similarly selected but having a slightly narrower range of intelligence levels.

(2) At the eight-year level the correlation between alpha frequency and intelligence level was + ·50; that between alpha index and intelligence level was + ·23. Only the first of these is statistically significant.

(3) At the twelve-year level the correlations between occipital alpha frequency, motor alpha frequency, and intelligence level were + ·12 and — ·08 respectively. Neither of these is statistically significant.

(4) Three hypotheses have been suggested to account for the conflicting results. The first two suggest that sampling error may be equally responsible for the "significant" and the "non-significant" correlations. The third suggests that at the twelve-year level organic changes associated with adolescence may alter an otherwise significant positive correlation.

(5) These hypotheses may be tested by further research; and it is to be urgently suggested that any present conclusions regarding the relationship of EEG variables and intelligence level be regarded as tentative until full exploration and attendant confirmation or rejection of these hypotheses be accomplished. (Authors' abstr.)

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Mental Efficiency Levels before and after Shock Therapy.

496 mental hospital patients were tested before and after shock therapy (insulin, metrazol, or a combination of both), with information and memory tests; attitude ratings and test reactions were also secured. The average scores of all groups improved after therapy on the several functions studied. The data are analyzed in terms of the percentage of each group showing improvement and still showing improvement a year later. The percentage of cases improved was higher for the metrazol and insulin groups than for the mixed therapy groups. Data on improvement for each psychosis are presented. Various inter-relationships of the data, such as test intercorrelations and psychiatric versus test ratings of improvement, are discussed. The attitude of the patient after therapy is perhaps the most significant change, probably being much involved in the improvement in test scores. Duration of psychosis was found to be related to this improvement. Cases showing lower test scores after than before therapy also showed a decline in attitude rating. C. N. COFER (Psychol. Abstr.).

The Intelligence of the Narcotic Drug Addict.

The Wechsler-Bellevue intelligence scale was administered to 371 native, white, male narcotic drug (opium or derivatives) addicts who had experienced drug withdrawal and recovery from physical dependence and were ready for occupational assignment. Most of the addicts were in the average or superior intelligence groups, although some were found over the whole range. There was no suggestion of an abnormal decline with age and no discrepancy between verbal and performance scores. Matched addict and attendant groups did not differ significantly in scores on the sub-tests of the scale. Volunteer patients were slightly superior to prisoner patients in total and verbal IQ. C. N. COFER (Psychol. Abstr.).

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*The Treatment of " Metrazol Failures " with Insulin. *Weinberg, J., and Goldstein, H. H.* 597

The Neuromuscular Hypertension.

It is concluded that a systematic investigation of the muscle sense in nervous persons reveals that patients differ widely from each other in that respect. Further, it helps in detecting tonically fixed or hyperactive muscle groups, so enabling the clinician to attain a direct understanding of pains and fatigue in patients, whose symptoms might otherwise have been described as subjective. The therapeutic technique, aiming at relaxation, will have the effect of bringing forth information which extends and differentiates the anamnesis. The text includes two illustrative cases. S. M. COLEMAN.

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Diagnosis of Convulsions in Brain Tumors.

In 14 cases of verified brain tumour, under observation for several years, convulsive phenomena were the only objective symptoms. The epileptoid manifestations presented special characteristics in onset, in distribution, in the accompanying signs, in the mutual relationship of the latter, in the manifestations following the motor phenomena, in the mutual relationship of motor and subjective sensory disorders before, during and after the seizure. The above enumerated features of epileptic convulsions appear to be sufficiently characteristic for the diagnosis of brain tumour in the very early stages of the disease. S. M. COLEMAN.

Neurological Aspects of Simple Mastoiditis.

112 patients with uncomplicated mastoiditis were reviewed. Neurological signs and symptoms were carefully looked for and only a few patients presented pathological involvement. Lumbar puncture findings were recorded in 74 patients and only a few had abnormal spinal fluid. These negative findings are in sharp contrast to the observations of Nielson and Courville in a seemingly comparable series of patients. S. M. COLEMAN.

Prognosis in Paranoid Disorders.

Evidence is brought forward to show that the prognosis in paranoid disorders is not so uniformly bad as was formerly believed. Of 290 cases, 72, or almost a quarter, had a relatively good outcome. There is a careful analysis of the factors which the recovered patients appeared to have in common. S. M. COLEMAN.

Psychotic Manifestations in Encephalitis.

Five patients suffering from chronic encephalitis and showing psychotic manifestations are described. The authors do not advocate hospitalization for all cases, yet they feel that generally those cases who show asocial or anti-social behaviour disorders with or without psychotic manifestations should be confined to institutions. This should be done for the good of the patient as well as for the family and community. S. M. COLEMAN.

Treatment of "Metrazol Failures" with Insulin.

100 patients were treated with insulin following their failure to respond to metrazol treatment. Out of these, 32 showed good improvement, 37 showed some improvement, and 30 failed to respond. Of patients ill more than 18 months, there were 64; only 12 responded favourably. S. M. COLEMAN.

VOL. XCV. JUNE, 1942.

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The Pyramidal Tract. *Lassek, A. M.* 721
*Anancastic Depression. *Lion, E. G.* 730

Cerebrospinal Fluid in Dementia Praecox.

In 1,281 dementia praecox patients (new and old cases) an increase of the spinal fluid protein, ranging between 46 and 166 mgm. per cent. c.c., was found in 5·0 per cent. of the male and in 3·2 per cent. of the female patients. In only four instances was the protein over 100 mgm. In the remaining cases the total protein varied between 46 and 99 mgm. A few of the schizophrenic patients with an increased fluid protein had a parentage suspicious of syphilis. In most patients the pathological spinal fluid findings could not be explained. S. M. COLEMAN.

Ataxia and Charcot-Marie-Tooth Atrophy.

Two brothers are described, each exhibiting a combination of Friedreich's ataxia and Charcot-Marie-Tooth's muscular atrophy. One sister has Friedreich's ataxia and one cousin a spastic paraplegia. The interweaving of patterns in certain of the heredodegenerative diseases is illustrated, notably the Friedreich's complex, Charcot-Marie-Tooth disease, Roussy-Lévy syndrome and the familial spastic paraplegias. There is transmitted in some families a common genetic vulnerability of certain tracts in the nervous system, the degeneration of which may occur in simple or in complex fashion and produce mild or complicated neurological disorder. S. M. COLEMAN.

Non-Organic Epilepsy.

63 out-patients with non-organic epilepsy, 49 of whom were on bromides for periods ranging from six months to five years with blood bromides of 75 to 250 mgm./c.c. serum, 9 on luminal, and 5 on no sedative, were tested with the Stanford-Binet intelligence test at intervals of one to three years. Each patient was tested from two to four times, and the interval between the

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first and final tests ranged from one to seven years. Under these conditions bromides have no deteriorating effects, since there was no change in the intelligence quotients associated either with the amount or the length of the bromide treatment. The number of patients on luminal was not large enough for definite conclusions, although the data agree with other experimental results that luminal causes no deterioration. Eight patients showed significant increases of the intelligence quotients between the first and final tests, and seven patients showed significant decreases. Some of these changes must be accounted for on the basis of chance fluctuations which are characteristic of the epileptic. If only progressive changes of the intelligence quotients are taken as indicating a real trend in the direction of improvement or deterioration, then only one patient (1·6 per cent.) improved and three patients (4·8 per cent.) deteriorated. There appears to be no relation between the reduction in the number or severity of the fits and the changes of the intelligence quotients. S. M. COLEMAN.

Electro-therapy in Schizophrenia.

Ten patients were treated and they received an aggregate of 174 treatments (86 convulsions, the remainder subconvulsive). Only two of the cases were recent admissions; nine showed moderate to slight improvement, one showed no improvement. Beyond a dislocation of the jaw there were no complications. S. M. COLEMAN.

Aphasia with Brain Tumours.

The initial symptoms of aphasia in cases of brain tumours are likely to take the form of difficulty in word-finding. Investigation of the subject of amnesic aphasia and a review of the literature show that fundamental problems are still unsolved. It appears that amnesic aphasia represents a mild disturbance affecting the association functions of language. There is clinical evidence that two regions of the brain, namely, Broca's area and the zone adjacent to the sensory centre for sound in the temporal lobe of the dominant cerebral hemisphere, are particularly involved in this disorder. Both regions may be part of a more extensive common language area about the fissure of Sylvius. S. M. COLEMAN.

Anancastic Depressions.

Clinical observations on 16 patients with obsessive-compulsive symptoms occurring in a setting of depression are reported, two representative cases being used for illustration.

The personality previous to the onset of the present illness was that of a rigid, anancastic individual. The clinical characteristics of these anancastic depressions are discussed, and special problems associated with management, course and treatment elucidated.

S. M. COLEMAN.

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The Catatonic Pupil.

The catatonic pupil is a frequent finding in psychotic patients, and is characterized by inequality of size, inconstancy in reaction, and sluggishness or complete abolition of the light reflex. The theory is advanced that the catatonic pupil is due to an imbalance of the sympathetic-parasympathetic system as the result of inhibition of the parasympathetic. The catatonic features may represent an intermediate stage before complete fixation of the pupil occurs.

S. M. COLEMAN.

Psychiatry and Culture.

In this paper the writer surveys the contributions of psychiatry to the world of science, literature and art. S. M. COLEMAN.

Deterioration in Organic Epilepsy.

Twenty-seven out-patients suffering from organic epilepsy were tested with the Stanford-Binet intelligence test at intervals from one to nine years, with two to five tests on each patient. The number of years between the first and final tests ranged fron one to ten years.

Considered as a group, there was definite deterioration with an average decrease of 6·0 I.Q. points between the first and last tests. These patients as a group differed from patients with non-organic epilepsy in that their initial intelligence scores were lower than those of the non-organic group. There appears to be no difference as to the degree of deterioration associated with different organic aetiological factors for the epilepsy. In 11 per cent. of the cases there was a significant increase of the intelligence scores, and in 37 per cent. a decrease, as compared to 5 or 6 per cent. in idiopathic epilepsy (see previous paper). S. M. COLEMAN.

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Electrostimulated Convulsive Doses.

A method and apparatus for delivering various types of unidirectional electrical stimulation are described together with a method for estimating the amounts of current at the time of administration. S. M. COLEMAN.

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*Electroencephalographic Studies of Psychopathic Personalities. *Hill, D., and Watterson, D.* 47

Lissauer's Dementia Paralytica.

The evidence supports the original view of Lissauer and Alzheimer that the circumscribed lesions are essentially due to a local intensification of the paretic process. It demonstrates that the absence of apoplectiform or epileptic convulsions on the clinical side, and of macroscopic atrophy and status spongiosus from the pathological aspect, do not necessarily exclude a diagnosis of Lissauer's dementia paralytica. (Authors' abstr.)

Chemical Changes in the Blood and the Occurrence of Uraemia Following Head Injury.

It is shown that plasma inorganic phosphate is raised in severe cerebral lesions, and that in a few cases uraemia follows rapidly on cerebral injury. Such patients show raised blood urea and phosphate levels with a normal volume of urine, but with a high excretion of urea in an acid urine. Alkalis caused a clinical improvement in one patient with a raised blood urea. Alterations in chemical content of phosphate and uric acid were found in the kidneys from two of the patients who died of uraemia. (Author's abstr.)

Electro-encephalographic Studies of Psychopathic Personalities.

Forty-eight per cent. of 151 psychopathic personalities have abnormal EEGs. Fifteen per cent. of 52 normal controls had abnormal EEGs. Sixty-five per cent. of 66 aggressive psychopaths have abnormal EEGs. The more aggressive the patient the more likely is the EEG to be positive. Thirty-two per cent. of 38 inadequate psychopaths have abnormal EEGs. Where epilepsy is associated with aggressive psychopathy, the percentage abnormal is probably much higher (82 per cent.).

Delinquency alone does not appear to be associated with an abnormal EEG. Among inadequate psychopaths, head injury may account for a percentage of EEG abnormality; there is no evidence that it is responsible to the same degree among aggressive psychopaths. Examination of family histories shows that aggressive bad temper is found nearly three times as frequently among the first-degree relatives of aggressive psychopaths as among those of the inadequate group. Epilepsy is not found to the same extent. The presence of epileptoid conditions in the parents and siblings does not increase the chance of an abnormal EEG in either group of patients. (Authors' abstr.)

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J. NEUROPHYSIOL.

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*Responses during Refractory Period at Myoneural Junction in Isolated Nerve-muscle Fibre Preparation. *Kuffler, S. W.* 199
*Effects of Eserine on Neuromuscular Transmission. *Eccles, J. C., Katz, B., and Kuffler, S. W.* 211
*Excitability of Cerebral Cortex in Infant *Macaca mulatta*. *Kennard, M. A., and McCulloch, W. S.* 231
*Effects of Presynaptic Volleys on Spread of Impulses over the Soma of the Motoneuron. *Renshaw, B.* 235

Impedance Changes in Frog's Muscle Associated with Electrotonic and "Endplate" Potentials.

1. Transverse impedance measurements are made, during direct and nerve stimulation, on the isolated sartorius muscle of the frog.

2. The electric impedance of the muscle is altered at anode and cathode, following the application of a brief subthreshold current pulse. There is an impedance loss at the cathode, and a smaller impedance increase at the anode.

3. These changes decline slowly after the applied current pulse has disappeared. The time course of decay is approximately the same as that of the endplate potential of muscle.

4. With threshold currents, propagated spikes start at the cathode at a moment when the impedance loss reaches its peak.

5. Impedance changes set up by a nerve volley are recorded at the junctional region of the frog's sartorius. The propagated spike in normal muscle, and the endplate potential (e.p.p.) in completely curarized muscle are both accompanied by an impedance decrease. Measuring with alternating current of 5,000 c.p.s., the overall impedance loss during the spike potential (60 mV) amounts to about 10 per cent., that during the e.p.p. (2–3 mV) to only 0·1 per cent.

6. The impedance change in completely curarized muscle has the same latency and lasts as long as the e.p.p. The rising period of the impedance change is shorter (slightly more than half), and its initial fall more rapid than that of the e.p.p.; during the later phase of decay the time course of the impedance change is identical with that of the e.p.p.

7. The prolonged phase of the impedance loss during the e.p.p. is analogous to that produced at the cathode by a direct subthreshold current pulse. The rapid phase of impedance change which occurs during the building-up period of the e.p.p. is discussed in relation to the problem of neuro-muscular transmission. (Author's abstr.)

Some Physiological Aspects of Audiogenic Seizures in Rats.

Electroencephalographic and heart-rate changes have been studied in rats during stimulation with high-pitched tones which produced seizures and other abnormal behavioral manifestations. Seizures occurred in approximately one-half of the unrestrained rats, but no attacks were induced in restrained, curarized or vagotomized animals. Various phases of an audiogenic attack were associated with abnormalities of the EEG similar to those observed in epileptics during an attack; in non-seizure stimulation trials the EEG and heart rate changes were not noted, except in unrestrained animals, where it was noted that heart-rate changes were frequently accompanied by some form of "substitute behavior." Following the onset of stimulation but prior to an attack marked increases and/or decreases in heart-rate occurred; these were interpreted as evidence of dual action of the autonomic system preceding audiogenic attacks, in which both sympathetic and parasympathetic systems participated, but with the former tending to predominate.

On the basis of the results an attempt has been made to outline the temporal course of physiological events leading to the development of an audiogenic seizure. (Authors' abstr.)

Responses during Refractory Period at Myoneural Junction in Isolated Nerve-muscle Fibre Preparation.

Electrical responses set up by a nerve impulse at the junctional region during the refractory period have been investigated in the single nerve-muscle fibre preparation of the M. adductor longus of frog (*Hyla aurea*).

1. Three types of responses can be recorded at the junctional region during refractoriness: (*a*) an endplate potential (e.p.p.); (*b*) "abortive" impulses (local responses); (*c*) fully propagated impulses.

2. During the slow propagation of an impulse away from the endplate zone in the refractory muscle the impulse may either "grow up" to its full size and speed, or die out (abortive impulses). The dying out and the "growing up" process occurs over 1 or 2 mm., according as the conditioning muscle impulse is set up by a nerve impulse or by direct stimulation. The abortive impulses may attain about 30 per cent. of the full spike potential height.

3. The e.p.p. set up by a conditioning nerve impulse lengthens the muscle refractory period.

4. The effect of the e.p.p. in setting up muscle impulses and in modifying their spread from the myoneural region is discussed. (Author's abstr.)

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Effects of Eserine on Neuromuscular Transmission.

Both in cat's and frog's muscles eserine increases and lengthens the local negative potential change (the endplate potential, e.p.p.) set up by one or more nerve volleys at the myoneural junction.

In addition, repetitive nerve volleys produce a delayed "slow wave" (height up to 40 per cent. of spike, duration up to several seconds) at the junctional region of eserinized muscle. The onset of the slow wave merges more or less with the decaying phase of the e.p.p.

Curare antagonizes the eserine effect: it greatly reduces the slow wave component and shortens and diminishes the e.p.p. Even in fully curarized muscle eserine causes a prolongation of the e.p.p.; the rising phase is lengthened up to threefold, the e.p.p. thus building up to a greater height. Both in normal and curarized muscle increase of eserine beyond a certain high concentration (about 3 by 10^{-5} in the frog) causes no further prolongation of the negative potentials, and actually diminishes their size.

The junctional potentials of eserinized muscle give the typical effects of an increased and prolonged catelectrotonus: (i) repetitive muscle spikes, when above threshold size; and (ii) lengthening of refractory period, and, during very intense depolarization, a complete block of impulse propagation.

The production of nerve after-discharge in the eserinized cat has been further investigated. Repetitive muscle impulses can arise from the junctional potentials independently of nerve after-discharge. In the cat, during prolonged eserine potentials, retrograde propagation of impulses from muscle to nerve was observed.

The principal effect of eserine is a lengthening of the action of the neuromuscular transmitter, thus leading to prolonged junctional negativity with consequent catelectrotonic effects.

In an attempted analysis of the curare-eserine antagonism it is shown that (i) curare does not antagonize the inhibition of cholinesterase by eserine; (ii) curare has little or no effect in quickening the adaption of muscle to acetylcholine.

By making plausible assumptions it is shown that the observed curare and eserine actions are reconcilable with the hypothesis that ACh is responsible for all the local potential changes set up by nerve impulses. (Authors' abstr.)

Excitability of Cerebral Cortex in Infant Macaca mulatta.

The cerebral cortex of the three-week-old (infant) *Macaca mulatta*, when stimulated electrically, produces movement contralaterally.

The stimulable motor foci are confined to area 4, and no responses are elicitable from area 6 or the post-central convolution.

Facilitation and extinction of motor response are easily demonstrable. Relatively high voltages are required to elicit responses and these, like the spontaneous motions, are less discrete and slower in onset, execution and cessation than those of the adult. This may indicate either higher threshold in an as yet undeveloped cortex or less adequate corticospinal conduction.

Responses are more easily elicited in the face, less in the hand, and not at all in the leg.

Lack of response from area 6 is correlated with the forceful, sustained and easily elicited forced grasping normal for that age.

That suppression of motor response is elicitable from 8 and 4's at this age when removal of 4's does not yet produce spasticity suggests the functional immaturity of that structure whose unsuppressed activity would give rise to spasticity in older animals. (Authors' abstr.)

Effects of Presynaptic Volleys on Spread of Impulses over the Soma of the Motoneuron.

A centripetal volley of impulses which arrives at the spinal cord over ventral root fibers of cats and rabbits produces a series of potential changes in the ventral horn. A brief initial positive potential-change signals the approach of the impulses in ventral root axons. A negative deflection of a duration of 1–2 msec. follows. It is due to the invasion of the motoneuron soma (cell body and dendrites) by the centripetal impulses. The negativity passes over into a much more prolonged and smaller positive phase. A rapid series of essentially identical centripetal volleys evokes negative deflections of diminishing size. It is concluded that the response of the motoneuron soma is modified by frequencies of stimulation (e.g. 300 per sec.) which the motor axons follow readily. These observations on spinal motoneurons confirm Lorente de Nó's findings for cranial motoneurons.

Conditioning dorsal root volleys alter the motoneuron soma response to centripetal testing volleys in motor axons. The negative potential-change in the ventral horn due to the motoneuron somas is increased, or as the case may be, depressed. The result depends upon the conditioning dorsal root fibers, the tested motoneurons and the interval between the arrival at the cord of the conditioning and the testing volleys.

It is concluded that retrograde conduction in the motoneurons occurs with a decrement. The degree of penetration into the cell body and dendrites can be augmented or decreased by the consequences of activity in sensory and premotor neurons. (Author's abstr.)

JULY.

*Positional Nystagmus in Cerebellar Lesions. *Spiegel, E. A., and Scala, N. P.* . . . 247
*Effects of Alkalosis and Acidosis on Cortical Electrical Activity and Blood-flow. *Lubin, A. J., and Price, J. C.* 261

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*A Deficiency in the Phrenic Respiratory Discharges Parallel to Retrograde Degeneration. *Acheson, G. H., Lee, E. S., and Morison, R. S.* 269
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Positional Nystagmus in Cerebellar Lesions.

After lesion of parts of the cerebellum of cats, particularly of the lobus posterior medianus, nystagmus was observed in abnormal positions of the head, particularly in supine position with the vertex downward. A weak nystagmus in normal position of the head was increased, sometimes also its direction was changed, in abnormal positions; or nystagmus appeared in abnormal positions only. This phenomenon is transient. Electrolytic lesions of nuclei tecti had a similar effect. In analyzing the receptor mechanism, neck reflexes and retinal reflexes could be excluded. Bilateral labyrinthectomy abolished this effect of position, while a weak spontaneous nystagmus following cerebellar lesions is a phenomenon of release of parts of the vestibulo-ocular reflex arcs, since it is associated with increase of the experimental postrotatory nystagmus. The experiments suggest that the existence of positional nystagmus should routinely be tested in suspected cerebellar lesions. (Authors' abstr.)

Effects of Alkalosis and Acidosis on Cortical Electrical Activity and Blood Flow.

1. The minimal amount of acid (HCl) or alkali (Na_2CO_3) injected intravenously necessary to produce changes in the respiratory rate of the anesthetized cat does not disrupt the cortical potentials.

2. Changes in the electrical activity of the cortex following acidosis or alkalosis occur only if near-fatal amounts are injected or, in the case of alkalosis, if an abnormal pattern has already been established as in insulin hypoglycemia.

3. While intravenous injection of acid causes dilatation of the pial arteries in most cases and intravenous injection of alkali causes constriction in most cases, these changes are not obviously related to the alterations of cortical potentials. (Authors' abstr.)

A Deficiency in the Phrenic Respiratory Discharges Parallel to Retrograde Degeneration.

After section of the phrenic nerve the respiratory discharges recorded central to the cut undergo a temporary deficiency with a time course parallel to that described for retrograde degeneration in other neurons. Yet the phrenic cell bodies may show little or no anatomical change even when this deficiency is extreme. The deficiency is not due to failure of conduction in the phrenic axons. (Authors' abstr.)

Origin, Conduction and Termination of Impulses in the Dorsal Spino-cerebellar Tract of Cats.

By following the electrical responses set up in the dorsal spino-cerebellar tract of the cat, information has been obtained on the anatomy and physiology of the tract, on the synaptology of their cells of origin, presumably lying in Clarke's column, and on the activity which is initiated within the cerebellar cortex by impulses afferent to it in Flechsig's tract. Activity in the tract has been caused either by stimulation of the afferent fibers of peripheral nerves of the hind limb or by direct stimulation of the tract.

Flechsig's tract extends from the fourth lumbar level of the spinal cord into the vermis of the cerebellum. It is set into activity by impulses in the primary neurons of ipsilateral nerves which are afferent for muscle proprioceptors.

Impulses are conducted in Flechsig's tract nearly twice as rapidly as in the fasciculus gracilis. The greater conduction velocities in the tract are correlated with the presence of larger fibers.

Activity arises in Flechsig's tract after a delay of 0·5 to 0·9 msec. following the arrival of the primary impulses in the collaterals to Clarke's column. As a consequence of the greater conduction velocity in the tract, however, the delayed impulses overtake and pass the impulses which ascend in the fasciculus gracilis. They arrive at the medulla more than one millisecond earlier than the latter.

The responses of fibers of the tract are spikes lasting about 0·5 msec. To a single afferent volley the response is often a series of such spikes. The fibers are able to respond again within 2·0 msec. after the beginning of an earlier response. The response evoked on stimulation of one afferent pathway frequently is conditioned by activity resulting from stimulation of another afferent nerve. The conditioning effect may take the form of inhibition, or the afferent impulses may sum their excitatory effects. The electrical data indicate that the cells of origin of the fibers of the tract receive collaterals from more than one primary sensory neuron, and evidence also points to their activation by internuncial chains of varying degrees of complexity.

In the cerebellar cortex the fibers of Flechsig's tract are distributed to the lobolus centralis and to the adjacent folia of the culmen, principally on the same side, but with an overlap across the midline to the opposite side.

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Impulses which reach the cerebellar cortex via fibers of Flechsig's tract initiate considerable electrical activity in the cerebellum. Early components of the cerebellar response to all the afferent systems activated by a volley to the tibial or peroneal nerve have been identified as largely or entirely due to the mediation of impulses from Flechsig's tract. Another component has been shown to be produced independently of activity introduced via Flechsig's tract.
(Authors' abstr.)

Interference Factors in Delayed Response in Monkeys after Removal of Frontal Lobes.

After bilateral removal of the frontal association areas, monkeys succeeded in delayed response performance when darkness was maintained during the delay interval. Unlike normal animals, however, the operated animals failed when a bright light was turned on in the cage during the delay interval. The indirect method of delayed response was used throughout the experiment: that is, light, instead of food, was used as the cue stimulus.

These results make necessary the revision of previous hypotheses concerning the functions of the frontal association areas. The hypothesis is suggested that removal of the frontal association areas in primates leads to a marked impairment in their general capacities for memory, because the loss of these areas renders them more susceptible to retroactive inhibition.
(Author's abstr.)

Further Study on Transmission in an Isolated Nerve-muscle Fibre Preparation.

Experiments were carried out on isolated nerve-muscle fibre preparations from the M. adductor longus of the frog (*Hyla aurea*).

1. The transmitter action, i.e., the action of the depolarizing agent producing the endplate-potential (e.p.p.), has been further investigated in curarized and normal muscle. In normal muscle the intensity of the "active" depolarization decreases rapidly after about 2·5 msec., and has disappeared at about 5 msec. (18–20° C.). These durations are diminished by curarine.

2. During the greater part of the rising and falling phase of a propagating muscle impulse the membrane cannot be further depolarized, i.e., no appreciable additional potential can be added during that period by (i) an e.p.p., (ii) a sub- or superthreshold constant current pulse. It is therefore concluded that the polarizability of the muscle membrane is abolished during activity.

3. A propagating muscle impulse approaching the endplate region is speeded up by the e.p.p. in curarized or non-curarized muscle, in agreement with earlier work on the whole muscle.

4. The effects of subthreshold and superthreshold catelectrotonic potentials, produced by constant current pulses, are shown to resemble those due to the e.p.p. in normal and curarized muscle.

5. Local responses are set up in normal muscle when the stimulus is near threshold.

6. Some findings regarding multiple innervation of the muscle fibres in the M. adductor longus are described. (Author's abstr.)

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Frustration Reactions of Normal and Neurotic Persons.

This study was designed to investigate the problem of the standardization of experimental conditions for producing and measuring frustration in children and adults. Ten adults and 48 children (18 of the latter diagnosed as neurotic) were used. The Freeman Puzzle Box, Kohs' Block Design Test, simple learning situations, and bright lights, loud noises and painful pinches were employed in such a manner as to produce frustration. EEG, respiration, P.G.R., pulse rate, etc., were measured, emotional stability and general overt activity rated, and the scores correlated. Whereas the individual physiological reactions did not show any difference between the two groups sufficiently large to justify diagnosis, the pattern of physiological reaction did. Among the more significant measures were percent. change in P.G.R. resistance, muscle tension as revealed by hand tremors, number of respiratory movements per minute, and dominance of the alpha rhythm. In spite of variations, these measures are more adequate in determining differences of emotional reactivity than overt activity or the evaluation of verbal material.

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

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The Role of Vitamins in Neuropathology.

In this discussion of the common problems of neuropathology and vitamin research the author reviews recent work on the normal distribution of B_1 and C in the nervous system, the nervous and mental symptoms of B_1 hypo- and avitaminosis, the possible connection of B_1 with immunizing and protective mechanisms in the nervous system (destruction of neurotropic viruses), and the relation of A to demyelinization. No definite connection has as yet been demonstrated between vitamin C deficiency and mental disease. M. E. Morse (Psychol. Abstr.).

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Treatment of Schizophrenia of Childhood.

This paper reports treatment methods employed, and an evaluation of results obtained, for 20 schizophrenic children with the onset of psychosis under the age of 12 (15 under the age of 10), who have been observed on the Children's Psychiatric Ward at Bellevue. Treatment has included socialization, shock therapy, and a variety of psychotherapeutic methods. The results are discouraging in comparison with other psychiatric disorders in children, but indicate that, if treated, many of these children have possibilities of further development. A detailed case-history is included to illustrate development. G. S. SPEER (Psychol. Abstr.).

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Hyposensitivity to Foreign Protein in Schizophrenic Patients.

(1) The cutaneous responses to intradermal injections of guinea-pig serum, repeated weekly for 13 weeks, have been studied in a group of 12 schizophrenic male patients and in a group of 12 unselected male control subjects.

(2) In all patients and in all normal controls, a process of sensitization was developed by the successive injections.

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(3) It was found that the mean areas of maximum erythematous skin reaction of the patients to the successive injections were significantly less than those of the normal control subjects.

(4) One must distinguish between immediate and delayed skin reaction. The former indicates greater sensitivity. All control subjects had immediate reaction to the last four injections, whereas three patients did not have immediate reaction to any of the 13 injections.

(5) In order to determine whether the difference between patients and normal controls is due to a difference in their local vascular mechanisms or to their sensitivity to foreign proteins specifically, an intracutaneous injection of histamine was given to each patient. No positive correlation was found between the reaction to histamine and the reaction to guinea-pig serum. This finding suggests that the differences found between patients and control subjects are actually differences of immunological reactions.

(6) The hyposensitivity of the schizophrenic patients to foreign protein is a special manifestation of their general hyporeactivity.

(7) It is suggested that the comparison of immunological responses may be profitably used in the study of biological antagonism between various pathological conditions.

(Author's abstr.)

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The Validity of the Concept of Psychopathic Personality.

The concept of psychopathic personality is an ill-defined and very broad one. There is a strong tendency to use " psychopathic personality " as an exclusion diagnosis in those cases where a patient cannot be readily placed into the category of psychosis, neurosis or mental deficiency. This is particularly so if the patient has manifested striking anti-social behavior. A close analysis of the histories of 35 male patients diagnosed as " psychopathic personality without psychosis " reveals that the majority show a developmental picture which, psychodynamically considered, is that of a neurosis. This takes the form of a paraphiliac, alcoholic, hysterical or anxiety neurosis. In all these cases psychopathy represents the neurotic resolution of a personality conflict. Somewhat less numerous are those patients who are essentially schizoid or cyclothymic in make-up and show in their behavior the larval phases of a schizophrenic or manic-depressive psychosis. Least numerous are those individuals, not showing schizoid or cyclothymic coloring, in whom diligent search reveals little if anything of psychogenic significance with respect to their psychopathy. This last group is the only one to whom the term " psychopathic personality " can with some validity be applied. Case material in illustration of the above and a suggested narrower and more precise definition of " psychopathic personality " are discussed. (Author's abstr.)

Rigidity.

In normal behavior every performance is executed in " adequate " time. Shifts in performances are made as required by the task. Rigidity means abnormal fixation upon the performance in action and is frequently pathological.

We may distinguish primary and secondary rigidity.

Primary rigidity involves sequelae of an abnormality of the " Einstellung " mechanism, most frequently observed in lesions of the subcortical ganglia. The performance in action immediately becomes so rigid that responses to extraneous stimuli cease.

Secondary rigidity is due to a primary defect of the higher mental processes; in cortical

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damage and cortical malformations, such as feeble-mindedness. Only tasks beyond the individual's capabilities are affected. Feeble-minded children show rigidity when confronted by a task requiring the abstract attitude which in their cases is impaired.

The following theoretical interpretation will be offered : (1) Rigidity occurs when an organism is unable to come to terms with " its " environment in an " adequate " way. It is a means of protecting the individual from catastrophic conditions. (2) It is one type of reaction to a situation to which the individual is inadequate. Other types of reactions result in catastrophic conditions and distractability. Rigidity is a consequence of a mental deficiency, especially the impairment of the abstract attitude.

Normal individuals may also exhibit rigidity under certain conditions, namely, in performances beyond their scope. The implications of this theory for education of feeble-minded children will be discussed. (Author's abstr.)

The Structure of Agnostic Symptoms in a Case of Post-Traumatic Dementia.

A patient who showed agnostic symptoms as part of the picture of a post-traumatic dementia was studied through prolonged observations in free and controlled situations. One of the purposes of this study was to discover the factors determining correct recognition of objects in some situations and lack of recognition in others. It was found that living beings in action were better recognized by the patient than inanimate objects. Real objects which the patient was permitted to manipulate and use were recognized more readily than the pictured ones. Objects presented in an appropriate setting (fork with plate, pencil with paper) had an advantage over the same objects presented in isolation. Recognition was always preceded or accompanied by real or imaginary acting out of a situation relating to the object involved (eating, writing, etc.). Recognition of colors was extremely uncertain and faulty. Agnostic phenomena were found not to be limited to any one sensory field.

From these and other observations it was concluded that the patient was unable to recognize objects *in abstracto*, apart from the concrete action situation in which they could be meaningfully used. The agnostic symptoms were thus found to have the same basic structure as the aphasic symptoms and the disturbances of performance found in patients with brain lesions, and to reflect the general concretization of behaviour which Goldstein found to be typical of these patients. (Authors' abstr.)

The Role of the Father in the Development of the Personality of the Stutterer.

A study of 35 male stutterers suggests that there are certain relationships operating in the home which determine the type of personality that the male stutterer develops. Fifteen boys were selected for intensive study because the history and hours of therapy were more informative and because the author had personal contact with them. Although these boys are usually above average in intelligence with good school achievement, there is little striving in any other direction. They are passive, showing neither strong masculine nor marked feminine characteristics. Their interests and attitudes suggest, however, femininity.

The relationship with the mother is marked with change ; much hostility is shown at four years, diminishing to marked benevolence and dependence around eight years, and a suggestion that hostility recurs in adolescence. The attitude towards the father, while relatively without significance during the pre-school years, emerges clearly at about seven years. This consists of a feeling of dissatisfaction with him as a father, and a tendency to regard the mother as more adequate. In spite of his inadequacy, he is also pictured in a severely punishing role, and the mother becomes relatively an easier person with whom the boy may identify. In spite of repressed hostility towards her, she is less threatening to him than the father.

An hypothesis is developed in which stuttering is considered as evidence of a conflict in which the father is the cause of the boy's inability to resolve that conflict. The boy represses early his hostility towards a somewhat punishing mother because he finds her relatively more adequate to give him support. The father's inadequacy makes it easier for him to identify with the mother, but the ever-present threat of punishment for supplanting the father prevents complete identification. Caught between the two, he wavers passively without developing strongly either masculine or feminine characteristics. (Author's abstr.)

Hyperactivity in the Cat after Ablation of the Frontal Lobes and its Relation to Visually Controlled Aspects of Behavior.

This study is based upon the investigation of some 36 animals. In the cat, localized extirpation of the most rostral part of the cerebral hemispheres, i.e., the cortex anterior to the cruciate sulcus, produces generally marked hyperactivity. Limited lesions within this area may bring about temporary alterations of activity, following which the animal may return to its normal status. Extirpation of the cortex posterior to the cruciate sulcus within and including the boundaries of the so-called motor cortex does not produce these changes in activity, and if the motor areas are removed along with the frontal areas, the hyperactivity is no greater than that found with the frontal cortex removed alone.

Cats which display an increase in activity, as measured both by a stabilimeter and a rotating cage method, invariably portray forced following-responses to visual stimuli. This reaction consists of a very persistent tropistic-like following of moving objects or of a moving person.

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Animals which do not display this behavior do not show marked levels of hyperactivity. Accordingly, it is believed that the hyperactivity occurring after removal of the frontal lobes involves, in part at least, the modification of the inhibitory mechanisms of control of visual orientation. It is also concluded that the hyperactivity of the cat following removal of the frontal lobes may be accounted for in terms of a generalized modification of the same order in the sensory-motor system, for the same type of forced reactions to other stimuli may also be observed in the operated animals. (Author's abstr.)

Modification of Perceptual Responses in Patients with Unilateral Lesions of the Frontal Lobes.

To study the behavior of patients with unilateral frontal lobe lesions produced surgically 20 different experimental methods were used. The only positive results were obtained on tests which measured perceptual responses. The changes in perception are of such nature that they cannot be understood by postulating one basic principle, nor are the concepts which have thus far been advanced to explain the functions of the frontal lobes sufficiently comprehensive to interpret all of our results.

Five patients, four with a right frontal lobe lesion and one with a left, differed from the controls in the following ways: (1) The threshold of perception was raised so that the time to apprehend either a word or a geometrical figure was increased. (2) The number of objects perceived in ambiguous figures, resembling the Rorschach test, was decreased. (3) Visual illusions which are normally seen by everyone were either not perceived, or, in the case of the Muller-Lyer illusion, the illusion was exaggerated. (4) Memory for visually presented objects was decreased, which, interpreted in conjunction with other test results, may be due to a disturbance of attention. (5) The reversals of figures with reversible perspectives, such as Rubin's figures, the staircase, etc., were either absent or decreased, which may also be due to a function of attention.

In one patient a restitution of the reversals of figures with reversible perspectives was observed six months after the operation, and more completely a year later.

It is suggested that the elation of some patients with frontal lobe lesions may be due to the disturbed perceptual processes in which the ordinary inhibitory stimuli are no longer perceived as such. (Authors' abstr.)

Modifications of Design Block Performance Before and after Corpus Callosum Section.

This report discusses results of tests made on 18 epileptics before and after section of the corpus callosum. Psychological studies have been made by the Division of Psychiatry on these patients from the Division of Neurosurgery, pre-operative tests beginning in 1939–40. In the cases reported here no uniform Kohs' block design response pattern was found, but some post-operative performances resemble the type of response reported by other workers as accompanying known cerebral lesions. Persistence of the "organic" response is discussed in relation to intelligence test level, extent of post-operative apraxia, and psychiatric history. As periodic retests now continue, many patients reach pre-operative levels. (Author's abstr.)

Perceptual and Intellectual Factors in the Production of Concepts.

This paper reports part of a study on the production of concepts. The study as a whole investigates the hypothesis that the perception of objects is the dominant (neither the simplest nor the most primitive) mode of human cognition, and that the production of concepts is a variant of this dominant mode which may be regarded as the distinctive (though not dominant) mode of human cognition. Data from previously reported parts of the study indicate a regular and positive relationship between the length of time required for the production of a concept and the extent of the departure from perceptual modes of response its production involves.

The method used throughout the study is a modified form of Hull's procedure, which in turn is a modified form of a memory experiment. The subject's task is to learn the names (nonsense syllables) of successive series of drawings, presented at a uniform rate and in a systematically random order, and so arranged that it is possible, but not necessary, for the subject to respond to similarities from series to series, and eventually to identify each drawing by a name indicating its membership in a class. The procedure provides objective measures of the points in the experiment at which concepts are produced. The subjects were 173 college students, each of whom was studied individually. Each subject, if successful, produced nine concepts.

This paper concerns concepts produced under two contrasting sets of conditions. One set may be described as complex and concrete, the other as simple and abstract. Concepts were more readily produced under the first set of conditions. (Author's abstr.)

Normal vs. *Schizophrenic Perception of Similarities.*

The following study is based upon the hypothesis that it is possible to distinguish between normals and schizophrenics on the basis of differences in their conceptualization of similarities. It was believed that schizophrenics tended to categorize as similar those items which look alike, that is, have point-to-point similarities. Normals, it was thought, tended to see as similar those things having the same meaning, that is, functional rather than peripheral similarities.

Sets of pictures were designed to test this hypothesis. Fifty normal college sophomores and 50 schizophrenic subjects were given opportunity to match each of eight master pictures with either (*a*) pictures peripherally but not functionally similar to the master picture, or (*b*) pictures

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functionally but not peripherally similar to it, or (*c*) pictures neither functionally nor peripherally similar to it.

Scoring reported here is based on the frequency with which functionally similar pictures were matched to the master.

Odd-even reliability of the choices was ·914 ± ·01.

(1) Normals made significantly more choices of the functionally similar type than did the schizophrenics. Out of a maximum score of eight, the mean score of the normals was 7·45; of the schizophrenics was 3·57.

(2) Within the paranoid and hebephrenic groups of schizophrenics there is a marked correlation between absence of deterioration and frequency of matching based on functional similarity.

(3) Related to this, patients with superior prognosis made more functionally similar choices than did patients with poor prognosis. Thus, on the basis of psychiatrists' judgment, patients expected to be discharged within the month had a mean score of 5·43; patients expected to be discharged within a year had a mean score of 3·33; patients classified as probably incurable a mean score of 2·80. (Author's abstr.)

Deterioration in Schizophrenia as Reflected in Performance on a Variety of Psychological Tests.

This report is concerned mainly with the analysis of the relationship between two ratings of deterioration and the performance on several psychological tests of 25 schizophrenic patients. The psychological studies, carried out ten years ago, include the Stanford-Binet scale, the Army Alpha test, the Kent-Rosanoff Association test, the Rorschach test, and various aspects of motor function, including steadiness, speed of tapping, reaction time and learning. The first of the ratings, "contemporary deterioration," is based on the average of three ratings given independently by psychiatrists at the period of the psychological studies. The second of the ratings, "present deterioration," was obtained by averaging the rank orders in which the patients were placed by a group of six experienced persons on the basis of present status.

The correlation between the two measures of deterioration, after the lapse of approximately ten years, is ·73. Certain variables derived from the devices employed give coefficients in the range from ·45 to ·70 for both measures of deterioration. These are: Mental age and vocabulary on the Binet, Alpha sub-test, 3·0 + per cent. in the Rorschach test and simple auditory reaction time. Others give correlations of this magnitude for present deterioration alone; Alpha total score, discrimination visual reaction time and prod learning time. No variables give correlations of this magnitude for contemporary deterioration alone.

The implications of the above relationships for the understanding of deterioration, the light which the present findings throw on some previously proposed measures of deterioration and the suggestions which arise from the study for the construction of prognostic devices of deterioration in schizophrenia are considered. (Author's abstr.)

A Laboratory Method for Diagnosing Manic-Depressive Depression.

In a previous report it was shown that the parotid gland secretory rate of patients with manic-depressive depressions was lower than that of the lowest "average normal" individual. The present investigation set out to determine if this low rate was found in all types of depressions, or whether it was characteristic of only the manic-depressive depressions. A preliminary study on 50 cases was reported. This is a continuation of the investigation on an additional group where all the tests were performed by a technician as a part of the routine in the New York State Psychiatric Institute.

The findings can be summarized as follows: (1) Parotid gland rate determinations were made on a series of undifferentiated depressions before they were clinically studied. If the readings were below an average of ·01 c.c. per five minutes over a test of a half-hour duration the depression was recorded tentatively, in the experiment records, as a manic-depressive depression. No other differentiation was attempted. The results were then filed away for comparison with clinical diagnosis. (2) The clinical diagnosis in each instance was later made by two psychiatrists working independently. The diagnoses of the two psychiatrists were then compared. When an agreement on the diagnosis occurred, the case was included for report in this communication. These clinical diagnoses were then compared with the laboratory diagnoses based on the parotid secretory rate. (3) It was found that the laboratory diagnosis based on the parotid gland determination offered a quick objective means of making a diagnosis. (4) The parotid secretory rate is inhibited in the very early stages of the disorder before it is possible to make a definite diagnosis of manic-depressive depression by the usual psychiatric procedures. (5) Secretory inhibition prevails during the daily mood fluctuations of the patient, but the rate does return to the normal range when the patient recovers from the depression. (6) The rise of the secretory rate when the depression abates may be very sudden. (7) The parotid secretory test can be accomplished within an hour with simple inexpensive apparatus, involving little technical training. (Authors' abstr.)

A Study of the Use of Recent Memory Tests in the Measurement of Intellectual Deterioration.

In order to determine the extent to which objective test of recent memory might be used as an aid in the diagnosis and measurement of intellectual deterioration, a battery of seven

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recent memory tests was devised. The series consisted of tests making use of blocks, objects, a story, paired associates, photographs of faces, color order reconstruction, and a figure-ground test. The series required 30 minutes' administration time. The average intercorrelation of the seven tests was + ·30.

This battery of memory tests along with the Stanford-Binet vocabulary test (1937) was given to a group of 50 patients with diagnoses of organic brain disease of types generally believed to involve intellectual deterioration, and to a group of 50 normal control cases matched with the deteriorates on the basis of age, education and occupational level.

The scores on the sub-tests were weighted according to the extent to which each of the tests discriminated the two groups of subjects. In order to take into account the factors of age and former general intellectual level in interpreting the score on the memory test as a whole, the multiple regression equation for the total memory test score on age, grade level and vocabulary was computed for the control group. The discrepancy between the predicted memory test score and that actually obtained was then determined for each of the 100 subjects. Taking this discrepancy as a measure of deterioration, it was possible to set a critical score such that the deteriorated cases could be differentiated from the control subjects with an accuracy of better than 95 per cent. The data also showed significant differences between certain of the diagnostic sub-groups of subjects. (Author's abstr.)

Wechsler-Bellevue Test Results in Senile and Arteriosclerotic Patients.

Wechsler's list of tests which do and do not hold up with age is largely based upon cursory observation, since his standardization data did not include norms for the older age ranges (60 +).

The present study attempts to check the test-score pattern in senility as such, and compare it with the pattern observed in patients with cerebral arteriosclerosis in whom there is evidence of " interference with cerebral circulation."

The data were obtained from 84 records on patients between the ages of 60 and 80. Thirty-seven of this group were sclerotic.

The following tentative conclusions seem to be warranted: (1) The object assembly and picture completion tests, contrary to Wechsler, do not hold up with age. (2) Arithmetic and memory for digits are more affected in arteriosclerosis than in the other senile conditions. (3) The arteriosclerotic group shows a comparatively well-preserved " abstract " (Goldstein) approach as evidenced by the results on the block design and similarities tests.

(Author's abstr.)

Audiogenic Seizures Elicited in Rats by Tones of Low Frequency.

It has previously been shown that pure tones can elicit audiogenic seizures in rats, but that high frequencies in the neighbourhood of 20,000 cps are more effective than low ones. The threshold of audibility has also been shown to be lowest at these high frequencies. One might expect, therefore, that the elicitation of seizures is a function of intensity above the rat's threshold of hearing. This hypothesis was attacked in the present experiments by studying seizures elicited at low frequencies.

Pure tones of low frequency (500 to 10,000 cps) and high intensity, it was found, elicit from rats typical audiogenic seizures after a latent period of about 45 seconds. In every respect the behavior is like that following stimulation with keys, air-blasts, etc. The effectiveness of the different tones varies; 4,000 cps is most effective (14·9 per cent.), 500 cps is next (6·7 per cent.), but no pure tone is as effective as noises with high-frequency components (i.e., keys). Considering these results in relation to the acoustic intensities at which they occurred and to the rat's auditory threshold at different frequencies, one can draw the conclusion that sensation-level, not frequency, is the important aspect of the stimulus for eliciting epileptoid behavior in rats.

Further experiments with steady *vs.* interrupted tones (4,000 cps) gave the following results: Interrupted tones ($\frac{1}{8}$ second on, $\frac{1}{8}$ second off) are as effective as steady tones, but increasing the silent period ($\frac{1}{8}$ second on, $\frac{3}{8}$ second off) reduces the number of seizures obtained. The latent period before the epileptoid behavior appears is the same, however, regardless of whether the tone is interrupted or steady.

These two experiments, together with other findings, lead to a general theory of the neural processes underlying the seizures. (Authors' abstr.)

The Relation of Audiogenic Seizure to Blood Cholesterol, Sugar, Protein and Opacity.

Reports in the psychiatric literature indicate that mental disorder is dependent in some degree upon blood composition. The striking similarity of the behavior of the rat during audiogenic seizure to certain psychotic symptoms suggests that susceptibility to seizure may likewise be a function of the constitution of the blood.

An investigation of this possibility was undertaken by comparison of seizure-susceptible and non-susceptible animals with respect to level and variability of blood cholesterol, sugar, protein and red cell concentration.

The results point to three differences in level of blood constituents between the two groups of animals. The susceptible animals were higher than normal in blood-sugar and red-cell concentration, and lower in total protein. The groups differed in variability with respect to choles-

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terol, sugar and protein. In each of these three substances the variation of the seizure-susceptible animals was greater than that of the non-susceptible group. The significance of these results will be discussed. (Author's abstr.)

The Effect of Electroshock Therapy on "Interference" in Memory.

In a previous study we reported that the saving method shows no retention while the recognition method shows almost unimpaired retention after shock. In order to examine the discrepancy between these two methods a study of the interference effect was undertaken. Paired associates (household commodities paired with pseudobrand names) were taught before shock and again after shock and direct interference was introduced by utilizing the same commodities each time. Under control conditions the interference is marked, and we had expected that when shock is interpolated the interference would disappear. Instead it was accentuated. Our tentative conclusion is that electroshock treatment disorganizes but does not destroy the memory traces. (Author's abstr.)

Stability of the Personality Structure.

This investigation is concerned with the problem of permanence or fluidity of personality structure in adults. Personality patterns were studied in individuals examined more than once with the Rorschach test, and observed clinically over periods of time. Distribution: Shock treatment in schizophrenia, nine patients, 20 Rorschachs; in other conditions, eight patients, 17 Rorschachs; without shock but receiving adjustive therapy from psychiatrists or psychiatric social workers, 18 patients, 40 Rorschachs. Among the latter are included (*a*) extreme manic excitement and depressed states (one patient); (*b*) before outbreak of schizophrenia and in the psychosis (two patients); (*c*) in the psychosis and later in remission; (*d*) neurosis; (*e*) before psychoanalysis and in an interrupted phase of it in an adult of very superior level. Total: Patients, 35; Rorschachs, 77. Intervals between Rorschachs ranged from 8 days to 30 months. Ages: from 15 years, 5 months; only six were under 20.

Results: Except in the manic-depressive case, main outlines of the Rorschach patterns are always recognizable as belonging to the same individuals, but there are always changes in important features. E.g., following shock, most patients improve in intellectual control, usually at the cost of richness in mental life (impoverished content, reduced productivity, less affect and fantasy expression). The changes are thus at the "periphery" rather than the "core" of the personality. The two Rorschachs of the manic-depressive patient were as from two totally different persons.

Conclusion: The personality at the ages indicated follows permanently grooved-out channels. Even such dramatic treatment as shock does not refashion it basically. (Author's abstr.)

The Effect of Morphine upon the Rorschach Pattern in Post-addicts.

The Rorschach test was administered under morphine and non-morphine conditions to 22 drug addict patients who had been abstinent from morphine for at least six months. Patients were in good physical health and of average intelligence. Morphine was administered in amount sufficient to produce a satisfactory psychological state as judged by the individual subjects. The average dose was 34 milligrams, with a range from 15 to 70. It was found that the response total, details, rare details, and human movement responses were increased. Responses to color were also slightly increased, but the erlebnistypus shifted in the direction of introversion. Neurotic signs were reduced by morphine. Signs of intellectual control, organizational energy and originality were not affected. It therefore appears that under morphine the personality of post-addicts changes in the direction of introversion in the sense of increased fantasy living, with attention being directed toward inner more than to outer stimuli. (Author's abstr.)

"Signs," "Syndromes," and Individuality Patterns in Rorschach Reactions of Schizophrenics.

During the last five years various attempts were made to facilitate a clinical diagnosis based on the Rorschach reactions of various clinical subjects through the use of "signs," i.e., Rorschach characteristics, which occurred significantly more frequently in a specified group of clinical subjects than in any control group.

Five such "sign" patterns have been published and discussed in the literature: organic, neurotic, schizophrenic, general maladjustment and general adjustment "signs." These five "sign" patterns were applied to the Rorschach records of 20 diagnosed schizophrenics, 10 of whom were paranoid schizophrenics and 10 catatonic or hebephrenic schizophrenics.

The possibilities and limits of the "sign" approach are discussed in the light of the results of this application. An attempt is made to determine what qualitative Rorschach elements beyond the traditional "signs" in these records are characteristic for schizophrenics in general and for the two sub-groups in particular. The term "syndrome" is proposed for these Rorschach elements parallel to the clinical use of this term. (Authors' abstr.)

The Validity of the Rorschach Group Method.

An experiment is in progress at the Brush Foundation to convert the Rorschach method into a practical, reliable, and valid group method. The test has been administered individually and

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as a group technique by means of lantern-slides to two classes of college girls, 73 subjects to date. Report has been made elsewhere on the technical aspects of group procedure. The present paper discusses results on validity.

Validity is judged by the extent of agreement between group and individual records, and by the success of the group test in distinguishing the more neurotic, unstable, inhibited, and anxious types of personality.

Scores based on formulae developed for various traits—intellectual control, stereotype-originality, combinative, abstractive and generalizing ability, analysis-synthesis, control-spontaneity, emotional stability, extratensive adaptability, extratensiveness-introversiveness, and dilation-constriction—tend to fall in similar ranges for individual and group tests. Profiles of adjusted and maladjusted types of personality likewise show high percentage of agreement. Thus anxious personalities revealed by individual tests are likewise shown by group tests. In the former, however, there may be 8 indicators, while in the latter, only 5. Finally, total personality pictures developed independently from individual and group records show agreement in many general traits of personality.

Thus preliminary results with college girls warrant the expectation that certain important aspects of personality can be revealed in a group record. The group technique can classify college girls according to dominant personality traits and can differentiate the more neurotic, anxious, richly expansive and controlled personality. Group results cannot be viewed as unequivocal determination of the subject's personality, however, but only as a rough characterization. Where gross deviations are revealed, an individual examination can be given and the more subtle and finer nuances of personality ascertained. (Author's abstr.)

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The Treatment of Alcohol Addiction: A Review of the Literature.

Psychological methods of treatment include: Compulsory and punitive measures, generally effective with only 15–35 per cent.; psychosocial therapy; religious appeal, successful apparently in 30–70 per cent.; conventional psychotherapy in a controlled environment, such as farm or institution, giving 25–75 per cent. of cures, with adequate therapy including 20–100 hours of treatment; psychoanalysis, which so far has a lack of encouraging results; and hypnosis, for which there are no encouraging statistics. Physiological methods include conditioned reflex therapy, which with proper application gives 60–70 per cent. of cures; elevation of blood-sugar levels; spinal drainage; convulsive therapy; serotherapy; and autohemotherapy. Pharmacological methods are reviewed and adjuvant methods mentioned.

W. L. WILKINS (Psychol. Abstr.).

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Locomotor Movements in the Decerebrate Cat.

Six groups of decerebrate cats were prepared by sectioning the brain stem at various regions from the pons to the thalamus. On recovery, doses of coramine were administered, producing graduations of locomotor movements. No such reactions were obtained from the "bulbar" cats, while thalamic cats were capable of locomotion. Thus, the intermediate groups were studied more closely. Tables and curves are presented showing the degrees of response. The coramine method (cardiazol was used at first) is superior to that of electrical stimulation or of compression, since response patterns may be more closely observed. It is concluded that several integrated local centers are needed to produce integrated responses. Extirpation of the cerebellum did not substantially alter the results. H. D. SPOERL (Psychol. Abstr.).

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The Contents of the Interpretations in the Rorschach Test and Their Relationships to the Subject.

This study is concerned with the nature and intensity of the affective reaction to Rorschach pictures, its influence on interpretations, and the possibility of repressing it in favour of the rational form factor. Experiments (questionnaire following the test) on normals, neurotics, and psychotics demonstrate that interpretations, superficially not unusual, often reveal themselves as complexes or symbols. The first orientation toward a picture is affective. Symbol answers are very frequent. A given picture evokes similar affects in various persons. If the connection between affect and interpretation is close, as in the case of complexes, the form is less clear. If affect is less persistent, a symbol or a masked complex is revealed. Schizophrenics can give little information about their affects. M. E. Morse (Psychol. Abstr.).

The Question of Refusal of Military Service on Religious Grounds.

Psychiatric literature on conscientious objectors is scanty. Moos gives Swiss references and relates his experiences with Jehovah's Witnesses. More than half of Maier's conscientious objectors (1933) were schizoid psychopaths; some were feebleminded; all had grandiose ideas. Moos believes that refusal of military service constitutes revolutionary behavior aimed at weakening the army, but the autistic tendencies of most objectors prevent them from proselyting. Even in peacetime the mentally abnormal should be rejected. There are, however, distinctions among objectors. Everyone's religious experience conflicts somewhat with realistic legal, social, and ethical duties. The sharper the conflict, the greater the probability that the person is not only peculiar, but that his religious thought is absolutely fixed and that he is inaccessible. A man who is willing to serve in any capacity except killing is still within the bounds of reality. If court-martialled, an objector is entitled to psychiatric study and recommendation.

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

VOL. XLVIII. 1942.

*Retrograde Amnesia following Electric Shock. *Flescher, G.* 1
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Retrograde Amnesia following Electric Shock: A Contribution to the General Problem of Amnesia.

In 18 early schizophrenics Flescher studied the reproduction of engrams of various memory tests given just before the shock. The amnesia extended from a few minutes previous to the shock to 4–7 hours afterward. What does not appear spontaneously or through association or recognition at the end of this time is permanently lost. The amnesia consists exclusively in a disturbance of evocation. It is ascribed to a global, organic, reversible perturbation of mnemonic function due to the current but not otherwise definable. Certain psychological mechanisms which depend on the basic principles of memory function are also involved; the pleasure principle importance (physiological amnesia), and the biodynamic principle (importance for life), which may neutralize the pleasure principle or be manifested negatively as repression.

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

Mirror Writing in Disturbances of the Instincts.

Among 138 right-handed mental patients (schizophrenics, mental defectives, psychopaths), 16 spontaneously produced mirror-writing with the left hand. All the patients had some instinctive disturbances. Among 77 pupils in special classes, 6 were left-handed, but there was only 1 mirror-writer, a right-handed child. Mirror-writing is essentially one example of incapacity, due to immaturity or congenital or acquired limitation, to harmonize intelligence and instinct as expressed through motility. The normal subordination of instinct to certain intellectual demands is disturbed. In left-handed persons this maladaptation relates only to the left hand and is direct, simple, and isolated, without effect on the personality, whereas, in the right-handed, it usually betrays a disharmony of the entire personality. Another cause of mirror-writing is acquired organic lesions of the brain. In addition, for children of kindergarten age who have not yet learned systematically to write, script has a pictorial character, and they often, as a transitory stage, copy it in reverse.

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

TRUD. FIZIOL. LAB. PAVLOVA.

VOL. X. 1941.

*An Analysis of the Highest Nervous Activities of Dogs by Complex Secretory and Motor CR Methods. *Skipin, O. V.* . . . . . 5 and 17
*The Physiology of Conditioned Motor Defense Reflexes. *Hazratian, E. A.* . . . 25
*Materials Towards an Understanding of the Physiological Mechanisms of Voluntary Movements. *Petrova, M. K.* 41

An Analysis of the Highest Nervous Activities of Dogs by Complex Secretory and Motor CR Methods.

One dog, "Leda," was used. The conditioned stimulus was a hissing sound to which was added, after 5 seconds, a passive flexion of the right foreleg. The salivary CR first appeared after 5 trials, while after the 8th trial the mere application of the sound resulted in the dog flexing his leg unaided. When the CR to the compound sound flexion stimulus was well established (106 reinforced trials), the animal would flex his leg to all other conditioned stimuli in his repertory—metronome, light, whirligig, scratching and the like. A conditioned inhibition to a passive flexion of the dog's right hind leg was then attempted. This inhibition was very slow in development as the dog would again and again flex his foreleg to the conditioned inhibitor. It was further observed that (1) flexing of the right foreleg would stop during the action of the unconditioned stimulus of feeding, (2) flexing would be resumed "voluntarily" after the feeding, (3) after-feeding flexing would occur even if no conditioned stimulus was applied before the feeding. The results are interpreted in terms of irradiation; positive, negative, and auto-induction; and interaction of cortical and subcortical elements.

G. H. S. Razran (Psychol. Abstr.).

An Analysis of the Highest Nervous Activities of Dogs by Complex Secretory and Motor CR Methods.

Two dogs, "Pishka" and "Kutzy," neither of whom had any previous CR's, were used. The conditioned stimulus in the first dog consisted of the sound of a metronome of 120 beats per minute to which was added, after 5 seconds, a passive flexion of the right foreleg (proprioceptive stimulus). In the second dog the CS was a light of 50 c.p. plus a similar flexion of the right foreleg. The CR to the compound stimuli developed quickly in both dogs, but the formation of an association between its two components (the animals' flexing their right forelegs upon the application of the sound or the light) was fraught with difficulties. In the first dog the association was attained only occasionally and only when, either the metronome was converted into a trace stimulus through a pause between its application and the subsequent flexing, or the flexing was performed by the experimenter and not by an instrument. In the second dog conditioned flexing was also irregular, and occurred only either when the light was increased in intensity or when the flexion was repeated a few times without reinforcement. The relative intensities of the components is the most determining factor for the association.

G. H. S. Razran (Psychol. Abstr.).

The Physiology of Conditioned Motor Defense Reflexes.

A series of experiments on three dogs clearly indicates that, with the usual technique of electric shock as the unconditioned stimulus, defense motor CR's manifest essentially the same

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attributes as those of salivary CR's, and may well be interpreted by the usual Pavlovian mechanisms. Beritov's contention that defense differential stimuli do not exhibit irradiation and concentration of inhibition and induction is disputed by a number of kymographic records. Thus, conditioned stimuli applied at various intervals after differential stimuli were first augmented (induction), then suffered decrements (irradiation of inhibition), and then returned to normal (concentration of inhibition). Again, mutual induction was found between conditioned and unconditioned defense stimuli contrary to Beritov's claims. Finally, conditioned defense responses could be extinguished controverting Beritov's statements. Extinction was easy when the non-reinforced trials were given at intervals of 1–2 minutes, but was very slow when the intervals were either too long (5 minutes) or too short (10–20 seconds).

G. H. S. RAZRAN (Pyschol. Abstr.).

Materials towards an Understanding of the Physiological Mechanisms of Voluntary Movements.

Two 9-year-old dogs and one 1-year-old dog were used to see whether they would flex their legs to a preceding conditioned stimulus if the flexion, produced by means of a special instrument, was followed by feeding (Miller-Konorski technique). The first two dogs failed in the task although the flexion acquired salivary CR properties. The third dog succeeded. At first the conditioned stimulus was the experimenter's verbal stimulus nogu (foot, leg) accompanying the flexing, but later a metronome at 144 beats per minute became just as effective. Conditioned inhibition was tried in two ways. (1) Metronome and the flexion were not accompanied by food for the left hindleg, but were continually reinforced for the right hind leg. (2) Flexion of the right hind leg was combined with a stimulus other than the metronome and the combination not reinforced with food. In both situations the animal developed resistance or sleep. The failure of the first two dogs is attributed to old age and to the possession of too many old CR's.

G. H. S. RAZRAN (Psychol. Abstr.).

Z. ANGEW PSYCHOL.

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Z. ARBEITSPSYCHOL.

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Z. KINDERPSYCHIAT.

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1. Biochemistry, Anatomy, Physiology, Psychology, etc.

Biochemistry in Relation to Psychiatry. Gildea, Edwin F. [*Yale J. Biol. Med.*, **14**, 505–17 (1942).]
G. H. W. Lucas (Chem. Abstr.).

Pyruvic Acid Test for Vitamin B_1 Deficiency in Children. Wilson, E. Ellis C. [*Lancet*, (1), 199 (1942).]

The average pyruvic acid content of the blood in 35 children on home diets was 0·99 mgm. per cent.; that of 30 children on a hospital diet for 7–30 days following surgical operations was 1·05 mgm. per cent. The values do not suggest a vitamin B_1 deficiency. Higher values were found in children with gastro-enteritis, nephritis and convulsions, although no clinical signs of vitamin B_1 deficiency were present. Pyruvic acid was determined by the method of Klein (*C. A.*, **35**, 10791). E. R. Main (Chem. Abstr.).

The Occurrence of Fits in Pyridoxine-deficient Rats. Lepkovsky, Samuel, Krause, Myrtise E., and Dimick, Mildred K. [*Science*, **95**, 331–2 (1942).]

Pyridoxine-deficient rats show epileptic-like fits which may be due to disturbed water metabolism. Felix Saunders (Chem. Abstr.).

Rice Diets and Beriberi. Aykroyd, W. R., and Krishnan, B. G. [*Indian J. Med. Research*, **29**, 551–5 (1941); *cf. Yang* (*C. A.*, **35**, 4857[8].)]

The incidence of beriberi in the Godavari district is lowest in the winter months when some parboiled rice is consumed, highest in August, September and October, after raw rice has been consumed for several months. The vitamin B_1 calorie ratios of the diets consumed in September were less than 0·25, below which according to Williams and Spies ("Vitamin B_1 and Its Use in Medicine," *C. A.*, **32**, 7085[4]), there is danger of development of beriberi.
M. H. Power (Chem. Abstr.).

A Case of Nicotinic Acid Deficiency. Villaret, Maurice, Justin-Besancon, L., Inbona, J. M., and Courchet. [*Bull. mém. soc. méd. hôp. Paris*, **56**, 615–17 (1940).]

In the case of this 39-year-old woman, who had been on a diet low in meat, milk and eggs, the blood nicotinamide, determined by the method of Lwoff and Querido (*C. A.*, **33**, 2928[9]), three days before beginning the treatment was 6·2 mgm./l.; this value is below normal and lies in the danger zone. After daily administration of nicotinamide alone or combined with nicotinic acid for four days, the blood nicotinamide rose to the normal value of 7·1 mgm./l. This increase in blood nicotinamide was accompanied by rapid clinical recovery.
Ruth Berggren (Chem. Abstr.).

Clinical and Pathogenic Analysis of Pellagra. Villaret, Maurice, Justin-Besancon, L., and Inbona, J. M. [*Bull. mém. soc. méd. hôp. Paris*, **56**, 617–19 (1940).]

The role of the different avitaminoses in the symptomatology of pellagra is given schematically. This analysis constitutes the first stage in the description of nicotinic acid deficiencies other than pellagra. Ruth Berggren (Chem. Abstr.).

Pellagra and Internal Secretions. Hellwig, C. Alexander, and Forman, Louis H. [*Am. J. Clin. Path.*, **12**, 210–17 (1942).]

A fatal case of pellagra associated with severe endocrine symptoms was observed in a 38-year-old female. It was difficult during life to differentiate between pellagra and Addison's disease. The autopsy revealed marked atrophy of the adrenal cortex with loss of lipoid. The clinical and anatomic findings in pellagra cases suggest a relationship between the pellagra-preventing vitamin and the hormone from the adrenal cortex.
John T. Myers (Chem. Abstr.).

Studies of the B Vitamins in the Human Subject. IV. Mental Changes in Experimental Deficiency. O'Shea, Harriet E., Elsom, K. O'Shea, and Higbe, Ruth V. [*Am. J. Med. Sci.*, **203**, 388–97 (1942).]

Foresight and judgment, as measured by performance on maze tests, are impaired when the subjects are deficient in the B vitamins and are improved after therapy with thiamine or with the B complex. General intelligence, reasoning ability (reading) and speed of hand muscle co-ordination (tapping) show no measurable deterioration when the subjects are deficient in the B vitamins and no improvement after therapy with thiamine or with the B complex.

V. The Normal Requirement for Thiamine; Some Factors Influencing its utilization and Excretion. Elsom, K. O'Shea, Reinhold, John G., Nicholson, Joseph T. L., and Chornock, Charlotte. [*Ibid.*, 569–77).]

Six women with body weights of 95 to 202 lb. without previous evidence of deficiency subsisted on a constant daily diet containing thiamine in amounts just sufficient to meet the theoretical requirements as calculated by the Cowgill formula. Three other subjects received the same diet in amounts also adequate calorically, but supplying only about half the theoretical requirement of thiamine. Of the first group, three developed deficiency and three did not. Since it was the smaller members of the group who developed deficiency, the failure of the Cowgill formula to predict adequately the normal requirement is probably due to too great emphasis on body weight. The minimal thiamine intake adequate for health was for this group about 650 γ/day or about 0·35 γ/cal. The output of thiamine in the urine was directly correlated with the intake

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and not related to body weight, calorie intake or clinical deficiency. It was lowered in one case in the presence of infection and returned to normal when the infection subsided.

FERRIN B. MORELAND (Chem. Abstr.).

The Effect of Vitamin E (α-tocopherol) on Nervous Excitability. Chauchard, Paul. [*Compt. rend. soc. biol.*, **135**, 248–51 (1941).]

Vitamin E in the normal animal has at first an exciting action, followed by a depressing action on the nervous centres, especially the medulla. FELIX SAUNDERS (Chem. Abstr.).

Humoral Activity in the Central Nervous System. Alcalde, S. Obrador. [*Ciencia (Mex.)*, **2**, 337–44 (1941).]

A review with 50 references. E. H. (Chem. Abstr.).

Chemical Changes in Cerebral Cortex following Local Thermocoagulation and Local Freezing. Marshall, Clyde, Nims, Leslie F., and Stone, William E. [*Yale J. Biol. Med.*, **13**, 485–8 (1941).]

Thermocoagulation in an area in the cerebral cortex of cats anesthetized with pentobarbital promptly obliterated electric activity, creating a marked and lasting decrease in pH. Lactic acid and inorganic phosphate increased considerably, but phosphocreatine and hexo-phosphates decreased. After freezing, an area recovered somewhat as it was warmed up. The pH changes were slight and chemical changes small as compared with those following thermocoagulation.

G. H. W. LUCAS (Chem. Abstr.).

The Influence of Radioactive Substances on the Nervous System. Horst, L. van der. [*Deut. Z. Nervenheilk.*, **151**, 63 (1940); *Zentr. Gewerbehyg. Unfallverhüt*, **27**, 230 (1940).]

Ra D is found in the breakdown of radioactive substances in the human body. The blood damage was studied in rats and cats after the administration of radioactive water for long periods. Microscopically damage of the nerve cells was found which resembled that in Pb poisoning. Injuries of the central and peripheral nervous system through radioactivity or the Pb are, however, not to be expected with radioactive water of normal strength. The amount of Pb which reacted was not large enough to cause a Pb injury of the brain.

RUTH BERGGREN (Chem. Abstr.).

Brain Purpura in Poisoning with Nitrous Gases and a Study of the Morphology and Pathogenesis of Capillary Cerebral Hemorrhages. Winblad, St. [*Deut. Z. ges. gerichtl. Med.*, **33**, 73 (1940); *Zentr. Gewerbehyg. Unfallverhüt*, **27**, 177 (1940).]

RUTH BERGGREN (Chem. Abstr.).

Effect of Malonate and Iodoacetate on Respiration of Brains of Rats of Various Ages. Tyler, David B. [*Proc. Soc. Exptl. Biol. Med.*, **49**, 537–9 (1942).]

The brain of a newborn rat is comparatively insensitive to malonate. Full sensitivity develops during the first ten days of life. The results with iodoacetate seem to indicate that the brain of the newborn rat depends, for its aerobic metabolism, on some of the degradation products of glucolysis to a greater degree than does the brain of the adult.

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

Some Observations on Sleep. Dikshit, B. B. [*Calcutta Med. J.*, **38**, 98–9 (1941); *cf. C. A.*, **29**, 6651[2].]

An address on acetylcholine, which may be the "sleep-producing hormone."

RUTH BERGGREN (Chem. Abstr.).

Neuropathologic Findings in Experimental Starvation: Preliminary Report. Ferraro, A., and Roizin, L. [*Trans. Am. Neurol. Assoc.*, **67**, 177–81 (1941).]

Eight cats subjected to experimental total starvation, some however given water, showed global shrinkage of the central nervous system, with evidence of hyperemia of the soft meninges and brain parenchyma, but no grossly apparent hemorrhages. Histological examination of the nervous system showed an increase in the number of blood vessels and thickening of their walls; this phenomenon varied greatly in the eight cases studied. Other effects of inanition were marked hypertrophy and hyperplasia of astrocytes, lipoid accumulation in the liver and adrenal cortex, and vascular proliferation in the intestinal submucosa. The studies are being continued in an attempt to establish the influence of vitamins B_1 and B_2 and other vitamins on the life and pathological findings in animals subjected to inanition. MARION HORN (Chem. Abstr.).

The Choline Esterase Activity of Blood Serum in the Stages of Neuromuscular Transmission. Salvestrini, H., Luco, J. V., and Huidobro, F. [*Ciencia (Mex.)*, **2**, 351–2 (1941).]

An increase in the amount of acetylcholine is accompanied by an increase in choline esterase. Direct stimulation of denervated or curarized muscles does not increase the choline esterase of the blood. Indirect stimulation of normal muscles with low frequency (17 per second) increases the amount of choline esterase by about 100 per cent. The value returns to normal in about 20 minutes. A similar effect is seen when the frequency is about 85 per second.

FELIX SAUNDERS (Chem. Abstr.).

The Effect of Acetylcholine on the Electrical Activity of the Cerebral Cortex. Merritt, H. Houston, and Brenner, Charles. [*Trans. Am. Neurol. Assoc.*, **67**, 152–4 (1941).]

Application of acetylcholine chloride to the cerebral cortex of the cat produces a temporary

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marked increase in the electrical activity of the cortical neurons, strikingly similar to the electrical changes occurring in *grand mal* seizures in man. It is suggested that disorders of acetylcholine metabolism may be concerned in the mechanism of human convulsive seizures. The fact that application of the anticonvulsant compound dilantin sodium produces a prompt and marked reduction in electrical response to acetylcholine lends some support to this hypothesis. Evidence that acetylcholine is normally rapidly destroyed by the cholinesterase of the brain is afforded by the fact that prostigmine methyl sulfate (which is known to inactivate the cholinesterase of the cortex) greatly increases and prolongs the electrical effect of acetylcholine. Similarly, acetyl-β-methylcholine and carbamyl-choline, which are relatively or completely resistant to cholinesterase, have a more marked and prolonged electrical effect on the brain than has acetylcholine. MARION HORN (Chem. Abstr.).

The Effect of Ventriculocentesis on some Humoral Substances. Ansaldi, Inocencio B., and Camoirano, Jorge E. [*Bol. inst. psiquiat., Facultad cienc. med. Rosario (Argentina)*, **5**, *Pt. 2, No. 27*, 39–48 (1941).]

After the extraction of a certain quantity of cerebro-spinal fluid from the ventricle there is an increase in the concentration of glucose and cholesterol in the blood and a decrease in Cl. When the fluid is extracted by lumbar puncture the variations are not constant.

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

Vitamin C Level in Cerebro-spinal Fluid. Kasahara, M., and Gammo, I. [*Z. ges. Neurol. Psychiat.*, **163**, 551–3 (1938); *cf. C. A.*, **33**, 5048[8]; **34**, 1721[8].]

When 30 or 70 mgm. of ascorbic acid per kgm. body weight was injected subcutaneously in human infants or monkeys, respectively, cerebro-spinal fluid obtained 4 and 24 hours after the injection showed an increase in vitamin C content. B. C. P. A. (Chem. Abstr.).

Choline Level in Cerebrospinal Fluid in Organic Nervous and in Mental Diseases. Yūki, K. [*Arch. Psychiat. Nervenkrankh.*, **109**, 235-46 (1939).]

A modification of Takayama and Wada's micro test for choline is described and comparative findings are given of this method and of biology assay. Increase in cerebrospinal fluid choline was found in 21 out of 31 cases of general paralysis of the insane, in epilepsy (6 out of 9 cases), manic-depressive insanity (11 out of 23), schizophrenia (9 out of 20), but in only 1 of 8 cases of neurosyphilis or tabes dorsalis. B. C. P. A. (Chem. Abstr.).

Tryptophan in Cerebrospinal Fluid of Patients with Tuberculous Meningitis. Jequier, M., and Roten, J. L. [*Schweiz. med. Wochschr.*, **71**, 95–7 (1941).]

Fifteen c.c. of concentrated HCl and 2–3 drops of 2 per cent. formaldehyde are added to 3 c.c. of cerebrospinal fluid; after five minutes, 2 c.c. of 0·06 per cent. $NaNO_2$ is added; tryptophan is present if a violet ring forms. The reaction was positive in 78 per cent. out of 51 patients suffering from tuberculous meningitis; in these cases the diagnosis was already certain from other clinical and serological signs. It was also positive in other neurological diseases (e.g. cerebral tumour, polyneuritis). B. C. P. A. (Chem. Abstr.).

The Antigenic and Anaphylactogenic Properties of the Cerebrospinal Fluid. Mogilevskiĭ, M., and Sil'd, I. [*Z. Mikrobiol. Epidemiol. Immunitätsforsch.* (*U.S.S.R.*), No. 4, 101–4 (1941), (*in German*, 101.)]

Immunization experiments on rabbits with the cerebrospinal fluid of cattle and dogs indicate that the cerebrospinal fluid possesses antigenic and anaphylactogenic properties. The fluid does not possess an organic specificity, but exhibits a type specificity inherent to the proteins of the blood serum. This indicates that the normal proteins of the fluid originate in the blood.

W. R. HENN (Chem. Abstr.).

Phosphatides in Cerebrospinal Fluid in Schizophrenia. Roeder, F. [*Allgem. Z. Psychiat.*, **112**, 44–50 (1939); *cf. C. A.*, **34**, 8036[8].]

Low values were found in early and late stages of schizophrenia.

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

The Electro-encephalogram in Addison's Disease. Hoffman, W. Christie, Lewis, Roger A., and Thorn, Geo. W. [*Bull. Johns Hopkins Hosp.*, **70**, 335–61 (1942).]

In 18 of 25 patients with Addison's disease, definite abnormalities were observed in the resting patterns of the electro-encephalogram. These changes were characterized by: (1) the presence of oscillations which were slower than the normal α rhythm, which had a predilection for the frontal area of the cerebral cortex, and which were refractory to the usual effect of opening the eyes; (2) an unusual sensitivity of the electro-encephalogram to voluntary hyper-ventilation; (3) a reduction in incidence of low voltage high frequency activity (β waves). The abnormalities during rest may progress during therapy with synthetic hormone. Treatment with desoxycorticosterone acetate, aqueous adrenal cortical hormone, crystalline components of the vitamin B complex and a diet high in readily available carbohydrate failed to correct the abnormality of the resting pattern. However, adrenal cortical extract therapy and intravenous injection of glucose in certain patients markedly reduced the sensitivity to hyperventilation.

ZELMA BAKER MILLER (Chem. Abstr.).

Spontaneous Beriberi of the Monkey as Compared with Experimental Avitaminosis. Leblond, C. P., and Chaulin-Servinière, J. [*Am. J. Med. Sci.*, **203**, 100–9 (1942).]

Twenty cases of beriberi were observed in a *Macacus sylvanus* colony on a diet partially

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deficient in vitamin B_1. Treatment with crystalline thiamine produced incomplete cures, suggesting that a prolonged deficiency produces permanent lesions. In complete experimental B_1 deficiency, death occurred before any marked symptoms set in. The observations suggest that only a partial thiamine deficiency results in beriberi.

FERRIN B. MORELAND (Chem. Abstr.).

Investigation of the Occurrence of Polypeptidases in the Central and Peripheral Nervous Systems. Abderhalden, Emil, and Caesar, Günther. [*Fermentforschung*, **16**, 255–62 (1940); *Chem. Zentr.*, 1940 (**1**), 2956–7; *cf. C. A.*, **31**, 3083[8].]

Experiments were carried out to detect the presence of enzyme systems, especially of polypeptidases, in the central and peripheral nervous systems. The first work was done with dry powdered nerve tissue which had been prepared with the use of acetone and ether. The dry powder was extracted with glycerol or 0·9 per cent. NaCl solution. The results obtained were not uniform, since several times inactive extracts were obtained. In the second series of experiments extracts of fresh tissue were used. Fresh brain tissue was triturated with sand and kieselguhr and subsequently extracted as above. Work was also done with the expressed fluids. With the fluids so obtained tests were made in the usual manner on the absorption and elution of the enzymes. In this way it was shown that dipeptidases, aminopolypeptidases, prolinase and acylase are present in the brain. The dipeptides used were dl-leucylglycine, glycyl-dl-leucine, glycyl-l-tyrosine and l-alanyl-l-tyrosine, the last of which was not split up. The cleavage of both dl-leucylglycine and dl-leucyglycylglycine from extracts of the white brain matter was greater than that of the same compounds extracted from the gray matter. The stability of the enzyme solutions used was low. After as little as 24 hours there was a distinct decrease in activity while the activity disappeared almost entirely after 96 hours. The expressed fluids behaved similarly. It was found that when the ability to split up dl-leucylglycine had been completely lost, enzyme solutions which had been stored for a long time nevertheless hydrolyzed the tripeptide, dl-leucylglycylglycine. Experiments were carried out to determine whether the addition of certain substances had any effect on the enzyme activity. Acetylcholine and aneurine produced no definite effect. Negative results were likewise obtained with HCN and with $MgCl_2$. Other experiments were carried out to test for the presence of polypeptidases in the peripheral nerves. It was shown that leucylglycine, glycyl-l-tyrosine, dl-leucylglycylglycine and silk peptone were hydrolyzed. The microscopic method was used to detect the action of enzymes by following the hydrolysis of polypeptides and peptones having tyrosine as a constituent of the molecule. Glycyltyrosine and tyrosine-rich silk peptone were used as substrates. The separation of tyrosine could be seen under the microscope even when no evidence of cleavage could be detected by titration of the solutions. Thin sections of fresh rat brain were used for these experiments. These were placed with a drop of the substrate solution on a microscope slide, covered with a cover glass, and incubated in a moist atmosphere at 37°. After 12 hours, tyrosine crystals could be seen separated in typical clusters. These results were obtained with a saturated solution of glycyl-l-tyrosine, a 20 per cent. silk peptone solution or a saturated solution of chloroacetyl-l-tyrosine. No separation of crystals occurred when l-alanyl-l-tyrosine was used. When glycyl-l-tryptophan was used as substrate the splitting off of tryptophan could be followed under the microscope by the use of the Br water reaction. Autolysis experiments with brain tissue under various conditions gave negative results. W. A. MOORE (Chem. Abstr.).

Neuraminic Acid, the Cleavage Product of a New Brain Lipoid. Klenk, E. [*Z. physiol. Chem.*, **268**, 50–8 (1941).]

A new N-containing organic acid has been isolated by cleavage of the brain lipoid obtained from the cerebroside fractions of the $CHCl_3$–MeOH extract (*C. A.*, **35**, 3225[6]) and the name neuraminic acid is proposed by Klenk. The lipoid is separated from the recrystalized P-free cerebrosides by repeated extractions with acetone containing 5 per cent. by volume H_2O. The lipoid remains as insoluble residue, is dissolved in $CHCl_3$–MeOH and filtered. The filtrate which has been concentrated *in vacuo* is precipitated with acetone, yielding a pure-white or slightly yellow substance (10–14 gm. from 100 gm. cerebroside fraction) with a sugar contant of 25–27 per cent., calculated as galactose (Loening and Thierfelder method, *C.A.*, **6**, 881), P O 3–0·6 per cent. (impurities), N 2–2·5 per cent., ash of alkaline reaction 2–2·5 per cent. The lipoid is soluble in H_2O (clear solution), $CHCl_3$–MeOH (4 : 1 by volume), C_6H_6–EtOH (10 : 1 by volume), pyridine, slightly soluble in EtOH and MeOH, insoluble in acetone and Et_2O. Five gm. of the lipoid is decomposed by heating to 105° for three hours with 125 c.c. of MeOH–HCl (5 per cent.) in a sealed tube. The solution is extracted repeatedly with petroleum ether to remove the fat acid methyl esters, freed from the solvent by careful distillation *in vacuo* and the residue is dissolved in 75 c.c. of MeOH, freed from HCl by a hot solution of $Pb(OAc)_2$ in MeOH (excess Pb is removed by H_2S) and evaporated *in vacuo*; 100 c.c. of Et_2O is added to the residue, the Et_2O solution is extracted with 20 c.c. of H_2O, the aqueous solution which gives a strongly positive reaction with Bial reagent for orcinol in made alkaline with $Ba(OH)_2$ and the voluminous precipitate is extracted with Et_2O to which a small amount of MeOH might be added. The alkaline aqueous solution and the aqueous solution of the syrupy, Et_2O-insoluble part of the residue, made alkaline with $Ba(OH)_2$, are freed from the excess $Ba(OH)_2$ by CO_2, concentrated on the steam bath (any very noticeable discoloration should be avoided), and the remaining 5–10 c.c. of solution is dried in a desiccator over H_2SO_4, suspended in 5–10 c.c. of MeOH and treated with about 100 c.c. of acetone; the precipitated white Ba salt of neuraminic acid is washed with acetone,

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suspended in a little MeOH and precipitated with acetone, filtered, transferred immediately to a desiccator and dried over H_2SO_4. Excess Ba-$(OAc)_2$ is removed by precipitation of the aqueous solution (15 c.c. of H_2O) with a slight excess of H_2SO_4 (1 N) and filtration over kieselguhr; AcOH is removed by extraction in a Linde apparatus with hydrated lime in the boiling flask, and Et_2O is removed by CO_2. The solution is decolorized by activated charcoal, made alkaline with $Ba(OH)_2$, the excess removed with CO_2, the solution concentrated freed from $BaSO_4$ and $BaCO_3$, concentrated again and dried in the desiccator to avoid yellow discoloration. The dried material is dissolved in MeOH and the Ba salt of neuraminic acid is obtained by precipitation with acetone (yield 1·2 gm.). The P-containing impurities (0·15–0·16 per cent. P) are removed by heating 1·0 gm. of the substance in a closed flask with 25 c.c. of a concentrated solution of $Ba(OH)_2$ (containing 8 gm. $Ba(OH)_2$) in a N_2 atmosphere for 90 minutes in a boiling water bath. Chloride ions are removed by Ag_2SO_4 and silver ions by H_2S. The almost colorless solution is concentrated at 40° *in vacuo* to 1–2 c.c., the solution is decolorized with charcoal and the last traces of Ba are precipitated diluting with H_2SO_4. Alcohol is added (2–3 volumes) to the clear, colorless solution and the free neuraminic acid crystallizes on rubbing with a glass rod. The yield is increased by the addition of more alcohol and standing overnight at 0°. The pure-white substance gives off water of crystallization on warming to 50° in high vacuum and the anhydrous substance is somewhat hygroscopic; it chars at 200° without melting; it is very soluble at H_2O, slightly soluble in MeOH, insoluble in EtOH and Et_2O and shows a strongly acid reaction toward litmus. On titration with phenolphthalein as indicator it behaves as a monobasic acid but the color change of the indicator is not sharp. The purified acid (recrystallized from H_2O) corresponds to $C_{10}H_{19}NO_8$ or $C_{11}H_{21}NO_9$ and has $[\alpha]_D^{20} = -54{\cdot}91°$; N is present as amino N only. The acid is decomposed by diluting strong acids but is stable in neutral or alkaline solutions even when heated. The neutral solution gives a positive ninhydrin reaction, negative Trommer reaction, strongly positive reaction with Ehrlich reagent for aldehydes and, in very small concentrations on boiling, an intensive-red color with Bial reagent. The test for aminohexoses was negative. HANS SCHINDLER (Chem. Abstr.).

A Micromethod for the Estimation of Cerebrosides in Nerve Tissue. Edman, P. V. [*J. Biol. Chem.*, **143**, 219–21 (1942).]

A colorimetric method is given for the quantitative estimation of cerebrosides by use of the carbazole reaction of Dische (*C. A.*, **24**, 1879). After hydrolysis of the cerebrosides the fat acids and the glycerol are removed. The fat acids are separated through their insolubility in water and the glycerol is taken up in EtOAc. The method can be applied to 0·2–0·6 mgm. of cerebrosides. FELIX SAUNDERS (Chem. Abstr.).

Metabolism of Brain Suspensions. (1) *Oxygen Uptake. Elliott, K. A. C., and Libet, B.* [*J. Biol. Chem.*, **143**, 227–46 (1942); *cf. C. A.*, **35**, 786[7], 7491[4].]

Suspensions of brain tissue, prepared by homogenization in media made isotonic with salts, sucrose or glucose, respire up to 400 per cent. faster than suspensions prepared in hypotonic medium. Additions of salt or sucrose to suspensions homogenized in hypotonic medium cause increases up to 65 per cent. in the respiration rate. Isotonic urea solution behaves like hypotonic medium. The initial respiration of glucose containing NaCl-isotonic brain suspensions is considerably decreased by small amounts of Ca or Mg, but these ions improve the maintenance of activity. Mg has little effect in the absence of glucose or in hypotonic suspensions. The presence or absence of bicarbonate has no effect. NaCl, Na_2SO_4 and Na phosphate have specific stimulating effects. K is inhibitory. Suspensions respire initially at the same rate in air as in O. After an hour the respiration is progressively inhibited by O. O inhibition can also be shown with slices of cortex. Dilution of isotonic suspensions with isotonic medium has little effect on the activity per unit weight of tissue. The activity of hypotonic suspensions decreases somewhat on dilution. Homogenization in hypotonic medium causes brain largely to lose the power of oxidizing glucose. Small additions of citrate to glucose containing isotonic suspensions cause increases in the initial respiration rate which are dependent on the presence of Mg. With or without Mg, citrate improves the maintenance of rate. In the absence of glucose and in hypotonic suspensions, citrate has no effect or inhibits slightly. Malate causes an initial acceleration of respiration, followed by some inhibition in the presence or absence of glucose and Mg. Its accelerating effect is larger with hypotonic suspensions. Fumarate slightly accelerates the initial respiration of isotonic suspensions and improves maintenance of rate. With hypotonic suspensions, fumarate causes considerable initial acceleration, but less than malate does and inhibition does not set in. Heated liver extract causes considerable initial increase in respiration, especially with hypotonic suspensions, followed by an inhibition. Insulin has no effect. Metrazole, in relatively high concentration, inhibits respiration. The respiratory activities of slices of cortex and suspensions of whole brain are compared. Slices and suspensions behave in most respects in the same way, and isotonic suspensions are possibly more suitable, and are much more useful preparations for brain metabolism studies. FELIX SAUNDERS (Chem. Abstr.).

Retroactive Inhibition as a Function of the Relative Serial Positions of the Original and Interpolated Items. Irion, A. L. [*Proc. Ia Acad. Sci.*, **48**, 325–9 (1941).]

The experiment was intended to investigate the effects of identical and changed serial order between the original and interpolated lists when the lists were composed of synonyms and when

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they were composed of identical words. The inhibitory action of changed serial position was found to be to a large extent a function of the material to be learned. The interpolated learning of the original material in a changed order was capable of producing as much inhibition as the interpolation of synonyms either in the same or in a changed order.

B. WELLMAN (Psychol. Abstr.).

A Post-repeal Study of 300 Chronic Alcoholics. Lowry, J. V., and Ebaugh, F. G. [*Amer. J. med. Sci.*, **203**, 120–4 (1942).]

In the six years following repeal (1933) the average number of admissions per year for chronic alcoholism at the Colorado Psychopathic Hospital was 147 per cent. higher than the average for the two years preceding repeal. The New York State Hospitals had a similar experience. Only a few of the Colorado patients seriously wished to be cured. One-third were psychotic. Chronic alcoholism began before the age of 30 in most of the cases. Many were reared in family situations complicated by alcoholic or otherwise inadequate relatives and showed poor emotional reactions during childhood. Only 10 per cent. had made good adult economic and marital adjustments. Only 6 per cent. had a good prognosis at discharge. As far as could be determined, 20 per cent. remained sober for a minimum of six months after discharge, 30 per cent. returned to their pre-hospitalization status, and no information was available on the remainder.

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

Rorschach Tests and Native Personality in Alor, Dutch East Indies. Dubois, C., and Oberholzer, E. [*Trans. N.Y. Acad. Sci.*, **4**, 168–70 (1942).]

The Rorschach responses of the Alorese differ from the typical responses of the normal European or American in their lack of movement answers and form color reactions. Certain specific Alorese responses are found elsewhere only in certain pathological states of mind, especially in the defective states of the traumatic constitution. It is inferred from these data that " the personality and emotional character of the Alorese are very different from normal Europeans and Americans," and observation bears this supposition out. F. W. FINGER (Psychol. Abstr.).

Chronic Alcoholism and Suicide; A Contribution to Bandel's Theory of the Influence of Alcoholism on Suicide Mortality. Shimshony, Z. [*Schweiz. med. Wschr.*, **71**, 1429–33 (1941).]

Bandel demonstrated a connection between fluctuations of alcohol consumption in Germany and Italy and male mortality and male suicide incidence. Shimshony confirms this theory by Swiss statistics from 1876 to 1930. The suicide rate of alcoholics exceeds that of non-alcoholics. The greatest number of male suicides and the heaviest alcoholism both fall in the sixth decade. Alcoholism is bound up with suicide because it increases economic stress, inferiority feelings, and therefore disgust with life. A sudden welling-up of remorse, bitterness, or rage may lead to an impulsive suicide, or alcohol may be taken to facilitate a planned suicide.

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

Prognosis of Mental Instability; Adolescent and Service Cases. Hull, S. B., and Hall, M. B. [*Lancet*, **242**, 376–8 (1942).]

The prognosis of mental instability is considered in the light of experience gained from (*a*) intensive study of more than 1,500 adolescent patients and follow-up records in a consecutive series of 317 of these; (*b*) detailed psychiatric investigation of 330 service cases referred to an E.M.S. neurosis centre. An attempt has been made to assess the significance of the problem from the community standpoint, in four of its main aspects—mental defect, psychoneurosis, psychopathic personality, delinquency. The relative seriousness of the problem of psychoneurosis is stressed. Whether reaction to mental conflict will take the form of psychoneurosis or of delinquency depends on fundamental differences of personality structure. When the reaction takes the form of delinquency, the prognosis seems to be more favorable. Our experience had a practical application if the problems which have arisen in connection with the conscription of men are to be avoided among conscripted women. C. K. TRUEBLOOD (Psychol. Abstr.).

2. Pharmacology and Treatment.

Pathophysiology of Periodic Catatonia. IV. Therapeutic Results. Gjessing, R. [*Arch. Psychiat. Nervenkrankh.*, **109**, 525–95 (1939); *cf. C.A.*, **33**, 8279[1].]

Control of Fatigue through Physiological Agents. Morell, Th. [*Deut. med. Wochschr.*, **1**, 398 (1940); *Zentr. Gewerbehyg. Unfallverhüt.*, **28**, 42 (1941).]

Mental fatigue is believed to result from chemical changes in the reactivity of the central nervous system. This reactivity can again become normal through the administration of chemical substances of physiological nature, as vitamin C. Other such substances which act on the oxidation-reduction processes of the cells also enter in. Such physiological agents can increase the performance for rather long periods. On the basis of these considerations, a preparation (vitamultin) has been developed which contains vitamin C and the B complex (vitamins B_1 and B_2 and nicotinic acid) and dextrose, which is the most important nutrient molecule, if the vitamin B and C metabolism proceeds within physiological limits. The administration of vitamultin can control symptoms of physical and mental fatigue without danger of unpleasant side or after reactions upon prolonged consumption. Simultaneously the performance is increased. These results are of special significance for workmen, as long-distance truck drivers and fliers, who may suffer from severe fatigue which can cause accidents.

RUTH BERGGREN (Chem. Abstr.)

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The Effect of Carbon Monoxide on the Inner Ear and its Nucleus in the Medulla Oblongata. Popov, N. F. [*Vestn. Otol. i t. d., No.* 5, 471 (1938) (*in Russian*); *Zentr. Gewerbehyg. Unfallverhüt.*, **27**, 107 (1940).]

In addition to other organs, both the peripheral receptors and the central portions of the inner ear in the medulla oblongata (tuberculum acusticum, triangular nucleus, Deiters' nucleus) are affected in CO poisoning. The changes are initially caused by functional circulatory disturbances with simultaneous anoxemia and disturbances in the nutrition of the structural elements of the inner ear through the histotoxic action of CO. Almost all the clinical symptoms referable to the inner ear in man after CO poisoning can be explained by the changes found in experimental animals (mice, cats, dogs). There are circulatory disturbances with extravasations of blood by frank hemorrhage and by diapedesis and alterations of the nerve cells, part of which are reversible. RUTH BERGGREN (Chem. Abstr.).

Insulin and Metrazole Shock in Rabbits. Lohmann, R. [*Allgem. Z. Psychiat.*, **118**, 185–209 (1939).]

In animals that had died from insulin or metrazole shock and in others that had recovered from 15 or 20 shocks, weight of dried substance, total P, phospholipins, total N, residual N, glycogen, Cl, Ca and K were determined in brain, muscle and serum. Increase in cerebral and muscle glycogen in the latter series was the only uniform finding.

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

Action of Phenylcinchoninic Acid in Preventing Experimentally-produced Convulsions in Rabbits. Pollock, L. J., Finkelman, I., and Tigay, E. L. [*J. Pharmacol.*, **74**, 365–8 (1942).]

Suitable doses of phenylcinchoninic acid, given orally or intravenously, significantly reduce the severity or prevent the occurrence of convulsions after intravenous injection of convulsant doses of metrazole. L. E. GILSON (Chem. Abstr.).

Action of Diphenylhydantoin on the Central Nervous System. Gley, P. [*Compt. rend. soc. biol.*, **135**, 307–8 (1941).]

Diphenylhydantoin is distinguished from barbiturates by the absence of depression of the excitability of the motor cortex, the existence of motor phenomena during general intoxication and lack of antagonism towards convulsant poisons. FELIX SAUNDERS (Chem. Abstr.).

Untoward Effects of Phenytoin-sodium in Epilepsy. Finkelman, Isidore, and Arieff, A. J. [*J. Am. Med. Assoc.*, **118**, 1209–12 (1942).]

Forty-one patients were treated with phenytoin-sodium (Na diphenylhydantoinate). It produced a variety of serious side effects involving the nervous system and also the heart. Toxic effects on the gastro-intestinal tract and skin were likewise observed.

S. MORGULIS (Chem. Abstr.).

Recent Research on Experimental Alcoholism. Lhermitte. [*Bull. mém. soc. méd. hôp. Paris*, **56**, 390–2 (1940); *cf. C.A.*, **32**, 6739[6].]

Female rabbits received the following diets: Group I a normal diet of bran, bread and abundant fresh vegetables; Group II, a deficient diet consisting only of bread; Group III, the deficient diet together with subcutaneous injections of vitamin B_1. All the animals received a daily oral dose of 2–5 c.c. absinth (Pernod 40°). Group II rabbits died on the 42nd–44th days of poisoning; they had received, on an average, 305 c.c. absinth. Histological examination revealed highly significant degenerative lesions of the central nervous system, in contrast to the almost complete integrity of the peripheral nerves, and hepatic changes, as moderate periportal sclerosis, foci of insular necrosis and degeneration of the hepatic cells. Group I rabbits died on the 242nd–327th days. The nervous degenerative lesions were much more discrete while the liver showed degeneration and sclerous lesions, which were at times very marked. One Group I rabbit which had also been given intravenous injections of heterogeneous serum (hémostyl) died after it had received 560 c.c. absinth in 112 days; histological examination revealed a very marked cirrhogenous hepatitis associated with diffuse degeneration of the hepatic cells. In two animals, in which alcohol intoxication was combined with P poisoning, the liver showed very extensive fatty degeneration, while the cirrhogenous reaction was mild; these rabbits died after 81 and 130 days. Vitamin therapy prolonged the survival period notably (three months in one case), compared with that of the Group II rabbits, and protected the liver and central nervous system, but increased the sensitivity of the peripheral nervous system. The livers of the offspring of rabbits which had been given absinth also showed profound alterations.

RUTH BERGGREN (Chem. Abstr.).

Effect of 2, 4-Dinitrophenol on Rat Brain Respiration at 25 and 37·5°. Fuhrman, Frederick A., and Field, John, 2nd. [*Proc. Soc. Exptl. Biol. Med.*, **49**, 504–7, (1942).]

The optimum concentration of 2, 4-dinitrophenol for stimulation of O consumption in excised rat cerebral cortex is approximately the same as 25 and 37·5°, but the maximum value of the stimulation ratio and the minimum inhibitory concentration are considerably greater at 25° than at 37·5°. L. E. GILSON (Chem. Abstr.).

Action of Several Poisons of the Autonomous System on the Vascular Effects of Trinitrin. Bariéty, Maurice, and Kohler, Denyse. [*Compt. rend. soc. biol.*, **135**, 484–7 (1941); *cf. C.A.*, **36**, 2928[9].]

Ephedrine and norephedrine augment the vasodilatation and hypotension produced by small

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quantities of trinitrin. This augmentation persists after, and is even reinforced by the administration of atropine and sympatholytic substances. Atropine and the greater part of the sympatholytic substances studied exercise a distinctive action on the vascular effects of trinitrin, which they augment to a slight though definite degree. The action of these poisons toward trinitrin is the same as that toward histamine. FELIX SAUNDERS (Chem. Abstr.).

Yohimbine and the Vasomotor System. Action of the Alkaloid on the Vasomotor Centers. Tournade, A., Chardon, G., and Calleja, Alb. [*Compt. rend. soc. biol.*, **135**, 544–5 (1941); *cf. C.A.*, **36**, 3266[8].]

According to the dose which is injected into the blood, yohimbine paralyzes more or less the vasomotor endings and the sinus receptors. It spares the general vasomotor centers.

FELIX SAUNDERS (Chem. Abstr.).

The Vasomotor System and Yohimbine. Action of the Alkaloid on the Periphery of Vasomotor Nerves of the Foot of the Dog under Chloralose. Tournade, A., Chardon, G., and Calleja, Alb. [*Compt. rend. soc. biol.*, **135**, 444–6 (1941); *cf. C.A.*, **36**, 3266.[8]]

Injection of yohimbine into the femoral artery produces a vasodilatation of the muscles of the foot. The greater the dose, the greater the effect. After sufficient yohimbinization (5–10 mgm. of the local circulation, direct intra-arterial injection of adrenaline produces a vasodilatation if the dose is weak, but a stronger dose produces a vasoconstriction. Faradization of the sympathetic chain produces a vaso-constriction in the yohimbinized foot, but adrenaline produces the opposite effect.

Action of the Alkaloid on the Sinucarotid Receptors. [*Ibid.*, 446–8.]

In addition to the effect which it has on the endings of the vasomotor system, yohimbine paralyses the sinucarotid receptors. FELIX SAUNDERS (Chem. Abstr.).

Modification of the Conditioned Response under Nembutal. Headlee, C. R. [*Proc. Int. Acad. Sci.*, **50**, 193–8 (1941).]

Six dogs were conditioned to lift the right rear leg by the buzz-shock method. "Each dog was given training on four different days, separated by from one to two weeks, totalling 400 trials." A hypnotic dosage of nembutal, administered interperitoneally, was given to three dogs on the first and third days, to the three other dogs on the second and fourth session of 100 trials each. "Recordings were made of the movements of all four limbs, and the conditioned lifts of each of these limbs were measured and tabulated according to absolute frequency, total amplitude, and several other measures." Some qualitative observations are reported and two pairs of learning curves presented. "The learning process could take place even under the inhibiting influence of a depressing drug, though at a lower level and rate. . . . The learning curve here found approximates the typical conditioning sigmoid curve."

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

Narcotic Potency of Biurets containing Piperidine. Anderson, Hamilton H., Ch'eng, Charles H., P'an, Shih-Yi, Sah, Peter P. T., and Lu, Ch'ing Shan. [*Science*, **95**, 254–6 (1942); *cf. C.A.*, **35**, 4491[6].]

1-Diphenyl-5-phenylbiuret (m. 134°), 1-phenyl-5, 5-pentamethylenebiuret (m. 153°), 5, 5-pentamethylenebiuret (I) (m. 121°) and 1, 1-pentamethylene-5, 5-pentamethylenebiure (II) (m. 198°) were prepared. All are crystalline and (except (I) slightly soluble in water and alcohol. (I) is less toxic for mice than are Na barbital, Na pentobarbital and Na 5, 5-diphenylhydantoin, but more toxic than paraldehyde. The LD_{50} for mice is 600 mgm./kgm. on intraperitoneal injection. This amount antagonizes a surely fatal dose of picrotoxin and usually of strychnine, but does not protect mice against cocaine. Hypnotic doses of (I) in rabbits (60 mgm./kgm. given intravenously) slightly depress blood pressure and cardiac rate during the injection only, but do not affect respiration or uterine activity. Inhibition of human and rabbit uterine strips occurs in dilutions of 1 : 2,500 to 1 : 5,000 given *in vitro*. (I) depresses O uptake by rat liver by 35 per cent. during a 60-minute period. (II) is less toxic for mice. It antagonizes cocaine convulsions but does not save mice given lethal amounts. No protection against strychnine convulsions is provided, and all picrotoxin-treated mice had convulsions after an LD_{50} dose of (II) but none of them died. Smaller doses of (II) than of (I) are inhibitory of uterine strips *in vitro*. O consumption of rat liver is depressed more by (II). Narcosis of mice, rats and rabbits produced. by (II) resembles that of pentobarbital. FELIX SAUNDERS (Chem. Abstr.)

The Relation between the Intensity of a Narcotic Effect and Physicochemical Properties of Substances. Shekhter, E. S. [*Farmakol. i. Toksikol.*, **3**, Nos. 1–2, 14–17 (1940); *Chem.Zentr.* (**11**), 1172 (1940).]

The adsorption of toluene, benzene, ether and acetone by activated charcoal was compared to the partition coefficient between oil and water. It was found that narcotic effect, adsorption, and partition coefficient of the investigated narcotics behave analogously.

M. HOSEH (Chem. Abstr.).

The Hypnotic Action of 2-Iminobarbituric Acids. Barré, Roger, and Jacques, Adrien. [*Rev. can. biol.* (**1**), 454–63 (1942).]

The starting-point of the syntheses was 2-thio-5, 5-diethylbarbituric acid (I), very slightly yellow needles, m. 177°, soluble in 88 times its weight of H_2O, soluble in the cold in ETOH, $CHCl_3$, Et_2O and Me_2CO, sparingly soluble in C_7H_8, insoluble in C_6H_6, obtained in total yield

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of 45 per cent. by the following unpublished modification (devised by Gosselin and Court for the preparation of thioamytal) of Fischer and Diethey's method (*Ann.*, **335**, 334–68 [1904]) for the preparation of symmetrical dialkyl alcohols: To 60 gm. ethyl diethylmalonate and 24 gm. dry powdered thiourea add 180 c.c. absolute alcohol, reflux to dissolve the thiourea, add EtONa (13 gm. very pure Na dissolved in absolute alcohol), reflux 5–6 hours, neutralize as exactly as possible with concentrated HCl, remove most of the alcohol at low temperature under reduced pressure, dilute the residue, make strongly acid, let stand a few hours in the cold, filter, wash with H_2O, drain and recrystallize from H_2O. A large number of additional very fine crystals are obtained by diluting the filtrate with a large volume of H_2O and cooling, and a further quantity by concentrating the mother liquor and washings. 2-Butylimino-5, 5-diethylbarbituric acid, needles m. 159–60° very soluble in cold alcohol, Me_2CO and NaOH solution, insoluble in H_2O, Et_2O, C_6H_6, $CHCl_3$ and CCl_4, was obtained in 52 per cent. yield as follows: to 5 gm. (I) add 3 gm. $BuNH_2$ which dissolves (I) with evolution of heat, reflux till evolution of H_2S ceases, cool, treat the brown highly viscous reaction product with CCl_4 which starts preparation, filter, wash with CCl_4 and then with Et_2O. A further crop of crystals can be obtained from the filtrate by removing CCl_4 and taking up the gelatinous residue in hot H_2O-alcoholic mixture. The same yield can be obtained by refluxing (I) with $BuNH_2$ in absolute alcohol. Attempts to prepare 2-imino-5, 5-diethylbarbituric acid by passing NH_3 through a saturated solution of (I) in absolute alcohol gave rise to an equilibrium resulting in very poor yields. It was obtained in 63 per cent. yield (m.p. above 300° without decomposition) from diethylmalonate and guanidine carbonate by a method similar to that used for the preparation of (I). 2-Thio-5-ethyl-5-isoamylbarbituric acid (thioamytal), m. 175–6° was obtained in 45 per cent. yield from ethyl ethylisoamylmalonate and thiourea by a method similar to that used for (1). 2-Imino-5-ethyl-5-isoamylbarbituric acid (iminoamytal), m. without decomposition above 300°, insoluble in the ordinary solvents, very soluble in NaOH solution, was obtained in 55·7 per cent. yield by condensation of ethyl ethylisoamylmalonate and guanidine carbonate in presence of EtONa. 2-Imino-5, 5-dipropylbarbituric acid was obtained in 65 per cent. yield by condensation of ethyl dipropylmalonate and guanidine carbonate in presence of EtONa. 2-Phenylimino-5, 5-diethylbarbituric acid (II). m. 251–2°, was obtained by Einhorn's method (*C.A.*, **2**, 1696) by heating (I) and freshly distilled $PhNH_2$ for 12–14 hours at 120–30°, extracting the phenylimino acid with 95 per cent. EtOH and purifying by fractional crystallization in alcohol. The five 2-iminobarbituric acids were tested on rats. Only (II) showed hypnotic properties. Introduction of an imino radical in the 2-position of 5, 5-diethylbarbituric acid destroys the hypnotic power, which is not restored by introduction of Bu in the imino group. The hypnotic action of (II) seems to be due to its greater ease of hydrolysis into 5, 5-diethylbarbituric acid. A. PAPINEAU-COUTURE (Chem. Abstr.).

Electroencephalographic Changes Induced by Intravenous Sodium Amytal. Cohn, R., and Katzenelbogen, S. [*Proc. soc. exp. Biol., N.Y.*, **49**, 560–3 (1942).]

Thirty-six electro-encephalograms were made on 25 young dementia praecox patients before and after injection of an average dose of 0·3 gm. of sodium amytal. "There is a definite and characteristic change in the human electro-encephalogram following the slow intravenous administration of sodium amytal. The change is marked by the early appearance of a rhythmic oscillation, with a frequency of approximately 20 waves per second, in place of the individual's 'spontaneous,' or control pattern. This action is not specific for the barbiturate derivatives. It is a general concomitant of early 'depressed' cortical activity."

H. PEAK (Psychol. Abstr.).

Action of Narcotics on the Chemical Excitability of the Frog (Türck Reflex). Barbital and Chloral. Lapicque, L., and Lapicque, M. [*Compt. rend. soc. biol.*, **135**, 244–8 (1941); *cf. C.A.*, **36**, 2632[8].]

Barbital suppresses the inhibitory action of the brain, just as does section of the medulla. At first chloral has the same action, but later there is an effect on the medulla which in turn decreases the chemical excitability. FELIX SAUNDERS (Chem. Abstr.).

Effects of Testosterone Acetate and Propionate and of Estradiol Dipropionate upon the Resistance of the Rat to Evipalsodium, Nostal, Pernoston and Pentobarbital-sodium. Holck, Harald G. O., Mathieson, Donald R., Smith, Edwin L., and Fink, Lewis D. [*J. Am. Pharm. Assoc.*, **31**, 116–24 (1942).]

Testosterone acetate in a dosage of 0·125 mgm. per rat daily for two weeks or 0·500 mgm. for one week significantly shortened the response of the rat to the barbiturate pernoston. Eleven doses of 0·0625 mgm., given twice daily, shortened the response of normal female rats to evipal, but 10-day hormone treatment with twice this dose given daily, or 0·5 mgm. daily for ten days, failed to influence the male rat response to this barbiturate. Likewise, 0·125 mgm. of the hormone given daily per adult female mouse for one week failed to alter the response to evipal. Treatment of about one week's duration with daily doses of 0·125 mgm. testosterone acetate per rat significantly and to about the same extent shortened the response to evipal in both normal and spayed female rats. Treatment for two weeks with 0·25 mgm. per rat daily of the more powerful testosterone propionate shortened the response to evipal in adult and young female rats to that of the male level, and even reduced the depression time in the male; treatment of the male rats with double this daily hormone dose for two additional weeks was about as effective as the dose of 0·25 mgm. per rat. Ten-day treatment of male and female rats with

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1 mgm. per kgm. of testosterone (as the propionate) failed to influence the acute depression time and the incidence of delayed deaths following administration of the barbiturate nostal, to which the untreated rats showed a measurable sex difference for the first time in the authors' experience. Three or ten-day administration of 1 mgm. per kgm. of testosterone (as the propionate) daily or double this dose for ten days did not influence the percentage of male rats which developed tolerance to gradually increasing doses of Na pentobarbital. However, the lowered percentage of castrated male rats which developed tolerance was brought up to the normal level by either three- or ten-day hormone administration in the dosage just given. The hormone administration did not increase the average maximum dose of pentobarbital that tolerant normal or castrated males detoxified within 90 minutes. Whereas three-day administration of 1 mgm. per kgm. of testosterone (as the propionate) failed to increase definitely the percentage of normal female rats which developed tolerance to pentobarbital, ten-day treatment was signally effective in this respect; doubling the dose of the hormone did not cause further improvement. The somewhat increased percentage of tolerance consequent upon spaying of female rats was further increased by three-day administration of the hormone and brought up to the male level by ten-day treatment. This latter also increased the average maximum dose of pentobarbital detoxified within 90 minutes by tolerant spayed females. When estradiol (as the dipropionate) was administered in a dosage of 1 mgm. per kgm. daily for ten days to normal male and female rats, it caused severe loss of body weight in the males and, later on, marked reduction in the size of the testes in most cases. Whereas this hormone did not influence the female reaction time to evipal, it markedly lengthened this in case of the males; this effect persisted at least six weeks after cessation of hormone medication when these male rats were again gaining weight. Five, 30 and 300γ, respectively, of estradiol per kgm. (as the dipropionate) were administered ten, five and one day before, and on the day of beginning medication with gradually increasing doses of pentobarbital and once daily thereafter, to rats which developed tolerance. Vaginal smear tests were positive when the barbiturate was first given; also, definite effects were noted upon the average weights of the uterus and uterine tubes and of the seminal vesicles. The only change in effects that could be detected was always a lessened ability to develop tolerance to pentobarbital, and, with the highest dose of hormone, a lowered average maximum dose of pentobarbital detoxified in 90 minutes by tolerant young rats of either sex. When a heavy dosage of testosterone propionate was given simultaneously with a moderate dosage (0·030 mgm. per kgm.) of estradiol, which latter failed to influence the castrated male rat response, the beneficial action of the male hormone upon tolerance was observed in its usual degree.

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

Pharmacological Interactions of Cobra Venom and Thiamine. Macht, David I., and Spencer, Elizabeth C. [*J. Am. Pharm. Assoc.*, **31**, 146–50 (1942).]

Administration of suitable amounts of vitamin B_1 to mice makes them more resistant to cobra neurotoxin, while excessive doses of thiamine are toxic in this respect. Mice maintained on diets deficient in vitamin B_1 are less resistant to cobra venom. Deficiency of thiamine in rats does not affect the analgesic potency of cobra neurotoxin.

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

Influence of Temperature on the Stimulation of Oxygen Consumption of Isolated Brain and Kidney by 2, 4-Dinitrophenol. Fuhrman, Frederick A., and Field, John, 2nd. [*J. Pharmacol.*, **75**, 58–63 (1942).]

The maximum acceleration of O_2 consumption was at 32° for rat cerebral cortex and at 22° for rat kidney cortex when 2, 4-dinitrophenol was added in 0·0000335 M concentration.

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

Studies on Pain. Measurement of the Effect of Ethyl Alcohol on the Pain Threshold and on the "Alarm" Reaction (in Man). Wolff, H. G., Hardy, J. D., and Goodell, H. [*J. Pharmacol.*, **75**, 38–49 (1942).]

In three subjects weighing 65–66 kgm. the maximum pain-threshold-raising effect of ingested EtOH was approximately 45 per cent. elevation above the control level. The minimum amount of 95 per cent. EtOH producing this maximum effect was 30 c.c. With 90 c.c. the effect was more prolonged, lasting about four hours. A combination of 30 c.c. of 95 per cent. EtOH and 0·3 gm. acetylsalicylic acid had the advantages due to the alcohol, namely, swift elevation of the pain threshold and the desirable feelings of contentment, relaxation and freedom from anxiety, coupled with the longer duration of the pain-threshold-raising effect of the acetylsalicylic acid. Like the opiates, EtOH accentuated the ability to dissociate pain perception from the fight-flight-anxiety reaction pattern of pain. In contrast to the uniformity of the threshold for the perception of pain, the threshold for the alarm reaction, as determined by decrease in electric resistance of the skin, varied widely in different individuals and in the same individual from day to day. The threshold for the alarm reaction was elevated to a remarkable degree by 30–40 c.c. of EtOH.

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

The Psychological Effects of Sodium Bromide. Trowbridge, Lowell S., Moore, Merrill, and Gray, M. G. [*J. Tenn. State Med. Assoc.*, **35**, 142–5 (1942); *cf. C.A.*, **36**, 1970[9].]

A daily dose of 2·6 g. NaBr for six weeks does not appear to have any effect on the behaviour of the individual, as measured by the strength of grip, speed of voluntary muscular response,

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reaction time and attention. There were individual differences in the amount of Br accumulated in the blood, a finding consistent with individual tolerance and uncontrolled salt intake. Although the same dose was given in each instance, the highest levels of accumulation in each case varied from 59 to 150 mgm. Br per 100 c.c. blood. RUTH BERGGREN (Chem. Abstr.).

Cerebral Findings in Acute Experimental Phosphorus Poisoning. Takeya-Sikô. [*Arch. Psychiat. Nervenkrankh.*, **109**, 113–27 (1939).]

In dogs which had been given 0·06–0·5 gm. of P, intracerebral or subarachnoidal hemorrhage was a regular finding; fatty degeneration of the brain was never seen. Small necrotic foci, especially in the cortex of the end-brain, were found in most, and advanced degeneration of the large and medium-sized nerve-cells of the end-brain in some cases.

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

The Influence of Benzedrine on Work-decrement and Patellar Reflex. Alles, Gordon A., and Feigen, Geo. A. [*Am. J. Physiol.*, **136**, 392–400 (1942).]

Doses of 10, 20 or 40 mgm. of benzedrine sulfate (I) inhibit the production of voluntary muscular fatigue. Like doses of (I) may abolish essentially complete voluntary muscular fatigue maintained by repeated but static work trials. The effect is related fairly well in degree and time with the patellar-reflex activity effects of (I). The effect is more marked than that with ten times as great a dosage of caffeine under the same conditions.

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

Does Bismuth Pass into Brain after [*Intramuscular*] *Administration of Spirobismol Solubile? Strobel, T.* [*Allgem. Z. Psychiat.*, **113**, 328–38 (1939).]

Bi was not detected in the cerebral tissue of rabbits which had received up to a total of 12 c.c. of spirobismol solubile (=360 mgm. of Bi) with or without simultaneous administration of pyrifer (producing artificial fever). B. C. P. A. (Chem. Abstr.).

Treatment of Equine Encephalomyelitis (Western) with Certain Sulfonamide Compounds: An Experimental Study. Schlotthauer, C. F. [*Proc. Staff Meetings Mayo Clinic*, **17**, 187–9 (1942).]

The efficacy of sulfanilamide, sulfathiazole, sulfadiazine, promin (Na p, p′-diaminodiphenylsulfone-N, N′-didextrosesulfonate) and 8 unnamed sulfonamide drugs was tested in guinea-pigs which had received intracranial inoculations of 0·2 c.c. of a 30 per cent. emulsion of infected guinea-pig brain in physiological saline solution or inoculations of 0·2 c.c. of a similar brain emulsion into the pad of the left hind foot. Since intracranial inoculation often causes transient anorexia, the animals received the drugs for four days or more before inoculation to insure a satisfactory hemoconcentration of the drug in the early stages of the disease. None of the drugs used appeared to have any specific inhibiting effect on this virus. All the treated and untreated guinea-pigs which had received the virus intracranially succumbed and 91 per cent. of the treated and 75 per cent. of the untreated guinea-pigs which had received the virus in the pad of the left hind foot died. Similar intracranial and foot pad inoculation made in vaccinated guinea-pigs did not cause any apparent ill effects. Since these drugs could not prevent the development of equine encephalomyelitis in experimentally infected animals, it is doubtful if they would have any therapeutic value in treating this disease.

RUTH BERGGREN (Chem. Abstr.).

The Action of Pyridine, some of its Derivatives, and Phenylcinchoninic Acid in Preventing Convulsions Produced by Metrazole. Pollock, Lewis J., Finkelman, Isidore, and Tigay, Eli L. [*Trans. Am. Neurol. Assoc.*, **67**, 6–10 (1941); *cf. C.A.*, **36**, 2923[2], 3554[1].]

Marked antagonism to the convulsant action of intravenous metrazole in rabbits was exhibited by pyridine, given intravenously and orally before the metrazole, by nicotinamide given intravenously and by 2, 6-dimethylpyridine-3, 5-dicarboxylic acid and cinchophen (route not specified). Pyridine-HCl, given intravenously, likewise was an effective anticonvulsant, but caused too much pain to be tried in many animals. Less marked anticonvulsant action was exhibited by oral nicotinamide, and by nicotinic acid (route not specified). Sodium nicotinate showed little or no anticonvulsant activity, while pyridine thiocyanate, conium and sparteine caused fatal poisoning in doses insufficient to prevent convulsions (routes of these compounds not specified). Intravenous injections of pyridoxine-HCl, 2′-butoxy-2, 6-diamino-5, 5′-azopyridine (Niazo) and diiodopyridoneacetic acid diethanolamine (Diodrast) were not anticonvulsant. The mode of action of pyridine and some of its derivatives in inhibiting metrazole convulsions remains to be discovered. A direct chemical antagonism is excluded by the lack of anticonvulsant effect when pyridine and its derivatives were first mixed with the metrazole and then injected. Effect via peripheral vasodilatation is excluded by the fact that nicotinic acid, which produces vasodilatation, is less effective than nicotinamide, which does not. Since pyridine and its derivatives and cinchophen do not prevent convulsions due to picrotoxin or to the passage of alternating current through the head, their antagonism to metrazole convulsions does not seem to be related to changes in intracellular oxidations through an action on a coenzyme, nor to a specific depressant effect upon the reticular formation of the brain stem (on which picrotoxin acts) nor to a general narcotic action. A detoxicant mechanism is suggested but not proved. Glycine likewise afforded very notable protection against metrazole convulsions.

MARION HORN (Chem. Abstr.).

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