1. Biochemistry, Physiology, etc.

Accumulation of Acetylcholine in Brain and Blood of Animals Poisoned with Cholinesterase Inhibitors. Stewart, W. C. [*Brit. J. Pharmacol.*, **7**, 270–6 (1952).]

Lethal doses of tetraethyl pyrophosphate increased the total acetylcholine (I) content of brains of rats over that of rats killed by asphyxia, $CHCl_3$, or strychnine. Diisopropyl fluorophosphonate, paraoxone, and eserine also increased the total (I) content of rat brain. During severe anticholinesterase poisoning (I) appeared in the blood. RICHARD F. RILEY (Chem. Abstr.).

Penetration of Acetylcholine into Nerve Fibers Demonstrated by a New Method. Mitchell, Ruth, et al. [*Proc. Soc. Exptl. Biol. Med.*, **81**, 5–6 (1952).]

A chemical method for demonstration of quaternary ammonium compounds has been adapted to the demonstration of acetylcholine (I). Bromophenol blue is added to the sample in alkaline phosphate solution. The coloured dye complex which forms is extruded with ethylene dichloride containing 4 per cent. of isoamyl alcohol and the amount of colour is measured in a spectrophotometer at 600 mμ. The lower limit of sensitivity is 1γ per sample. The penetration of (I) into the interior of the resting squid axon, which had been soaked in diluted (I) solution, was demonstrated by its detection in the axoplasm extruded by pressure. The outflow of (I) from resting axons previously immersed in (I) solution was also demonstrated. L. E. GILSON (Chem. Abstr.).

Acetylcholine's Natural Functions. Ervenius, Olav. [*Farm. Revy*, **51**, 593–602 (1952).] *A lecture.* G. E. P. (Chem. Abstr.).

Cerebral Physiology of the Aged. Fazekas, Joseph, et al. [*Am. J. Med. Sci.*, **223**, 245–57 (1952).]

The mean levels of cerebral O consumption of persons 50 years old or older were less than those of younger subjects and were not noticeably related to clinical manifestations of vascular disorder. Inhalation of 100 per cent. O did not change cerebral O consumption. Inhalation of 5 per cent CO_2 increased the cerebral blood flow and, in most instances in which cerebral O delivery was less than 4·9 cc./min./-100 g. of brain, also increased the rate of cerebral O consumption. The data suggest that decreased cerebral enzyme activity and (or) impaired O availability may contribute to the changes in central nervous system function frequently encountered in the aged. M. H. PESKIN.

Experimental Electroencephalography. Andre, J. E. [*Année biol.*, **52**, 87 (1948).]

Experiments on rabbits indicate that dial exerts its main effects upon the cortex and to some extent upon the thalamus, not upon the cerebral trunk.
W. C. TOBIE (Chem. Abstr.).

Glutamic Acid and Cerebral Metabolism. Boulanger, P. [*Exposés ann. biochem. méd.*, **13**, 119–43 (1951).]

A critical review. Although glutamic acid affects the metabolism, there is little evidence of pharmacological activity when administered therapeutically.
W. C. TOBIE (Chem. Abstr.).

Effect of Diphenhydramine on Human and Rabbit Electroencephalograms. Tanaka, Kiyoshi. [*Japan J. Pharmacol.*, **1**, 87–90 (1952).]

Changes in the electroencephalogram (E.E.G.) in man, produced by the intravenous administration of diphenhydramine (I), differed individually, depending on the normal pattern of the subject. In general the E.E.G. became similar to patterns characteristic of those at the onset of sleep. In the rabbit (I) produced central excitement and corresponding changes in the E.E.G. (I) given intraventricularly in the rabbit acted as a central depressant and produced marked changes in the E.E.G. characterized by high-voltage slow activity.
RICHARD F. RILEY (Chem. Abstr.).

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Metabolic Disturbances and Blood Changes in Chronic Alcoholics. Lecoq, Raoul. [*Ann. biol. clin.*, **10**, 68–76 (1952).]

In fasting subjects an increase in the $MeCO\text{-}CO_2H$ (I) and AcH (II) concentration in blood is an index of variation in EtOH metabolism, as these catabolic intermediates are usually promptly restored to normal levels. The increase in (II) appears to precede the increase in (I). There is usually a decrease in the amount of blood urea, an increase in cholesterol, and a decrease in alkaline reserve, indicating an acidosis due to an increased urinary excretion of base. These changes are the reverse of those observed usually in renal, endocrine, or hepatic disease. Neither cellular nor plasma Cl is changed even in chronic alcoholics of long standing. An increase in total protein is a very constant finding. Under treatment the abnormal blood findings in cases of chronic alcoholism return to normal rapidly.

B. K. (Chem. Abstr.).

The Cause of the Alcohol Habit. (I) *Alcohol Habit and the Blood Alcohol Concentration. Eda, Susumu.* [*Folia Pharmacol. Japon.*, **45**, 20–4 (1949).]

Alcohol habit was produced in rabbits by daily intravenous injection of EtOH 1 gm./kgm. After 2 weeks the time required to return to the physiological concentration of EtOH in the blood was shortened by 30–60 minutes and the β-value according to Widmark and oxidation coefficiency increased, and after 6 weeks these changes were reversed. The time for paralysis was shortened subsequently, being 60 per cent. after 2 and 34 per cent. after 6 weeks. The content of EtOH in the blood serum 90 minutes after injection (when its dispersion had reached an equilibrium) was 90 per cent. whether the habit was gained or not. Before the equilibrium the EtOH content in the blood was not changed by the habit though less appeared to be contained in the serum. This difference is discussed from the physicochemical point of view. S. KITAOKA (Chem. Abstr.).

The Location of Cholinesterase in the Central Nervous System. Burgen, A. S. V., et al. [*Quart. J. Exptl. Physiol.*, **37**, 61–74 (1952).]

The oil/water distribution coefficiencies of the following cholinesterase (I) inhibitors were determined: diisopropyl fluorophosphonate, 9·50; tetraethyl pyrophosphate (II), 0·14; *p*-nitrophenyl diethyl phosphate, 3·35; neostigmine, 0·0011; phosphopyristigmine (3-diisopropylphosphato-N-methylpyridinium methyl sulfate) (III), 0·0006; and eserine pH 6·5, 0·10, pH 7·2, 0·25, pH 8·1, 0·48, free base, 0·842, cation, 0·072. The inhibition of (I) in brain of dogs was measured by methods described by B. and C. after injection of (II) and (III) both systemically and intracranially. (II) inhibits brain (I) in a nonselective manner. (III) being almost insoluble in lipide, produces no physiological effects on the central nervous system. Less than lethal doses of (III) produces only 16 per cent. inhibition of (I) in gray and white matter. (I) in a sympathetic ganglion is freely inhibited by (III). There are probably at least 3 arrangements of synaptic (I): (1) at the neuromuscular junction, postsynaptic, and outwardly directed; (2) at sympathetic ganglia, presynaptic, and outwardly directed; and (3) at central synapses, presynaptic and inwardly directed.

Metabolism of Animal Brain in Reflex Epilepsy. Golubtsova, A. V., et al. [*Vestnik Moskov. Univ.* 6, *No.* 11, *Ser. Fiz-Mat. i Estestven. Nauk No.* 7, 57–66 (1951).]

Brain homogenates of rats with reflex epilepsy (before or after the convulsive attack caused by bell-ringing stimulus) show an enhanced loss of glucose in anaerobic conditions, but no difference from the normal in the aerobic state. The amounts of lactic acid formed in the brain tissue in anaerobic conditions from glucose was the same in experimental and control animals, as was respiration of brain tissue without added glucose. With added glucose the O consumption almost doubles in all cases. The brain tissue of epileptic animals after the attack has supernormal concentration of lactic acid and NH_3. G. M. KOSOLAPOFF (Chem. Abstr.).

The Chemical Transmission of the Nerve Impulse. Chauchard, Paul. [*Année biol.*, **52**, 381–92 (1948).]

A review, with stress on the activity of adrenaline and acetylcholine, with 35 references. W. C. TOBIE (Chem. Abstr.).

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The Relation to Neurohormones of a Substance Liberated by Frog (Isolated) Spinal Cord. Sozer, Furuzan. [*Bull. faculte med., Istanbul*, **14**, 423–38 (1951).]

A study was made on the effect of a substance (I) which is liberated by the isolated spinal cord of the frog, during its rest or activity, upon frog heart, upon the smooth muscles of the blood vessels of the stomach, of the cat ilium, and of the frog lung, as well as on dorsal muscles of the leech. (I) has a positive inotropic effect upon frog heart when the latter is put in a hypodynamic state by use of strychnine, acetylcholine, urethan or Ringer solution with a low concentration of Ca. The positive inotropic effect of (I) upon heart cannot be removed by gynergen. (I) has no effect on blood vessels. (I) does not give the fluorescence reaction which is yielded by adrenaline. These results show that (I) is not identical with adrenaline. (I) does not cause any contraction of the dorsal muscles of the leech, regardless of being treated with eserine or not, or on the lungs of the frog. Therefore, it is not identical with acetylcholine. (I) increases the tonus of the isolated stomach of the frog or the ilium of the cat, but this effect can be removed by antistine. The results show that the effect of (I) resembles that of histamine.

S. Somay (Chem. Abstr.).

On 273 Cases of Attempted Suicide by Poisoning. Andereggen, P. [*Rev. méd. suisse romande*, **68**, 257–79 (1948); *Abstracts World Med.*, **6**, 26 (1949).]

Chemical and other agents are discussed, with data on their pathological effects, and the pharmacological aspects of antidotes. W. C. Tobie (Chem. Abstr.).

Arterial Hypertension and Chronic Alcoholism. Lecoq, Raoul. [*Rev. pathol. comparee et hyg. gen.*, **52**, 323–5 (1952).]

Ethylism induces arterial hypertension, which can be alleviated, as well as the other symptoms, by intravenous injections of alcohol extract of liver, containing glucose, or by intramuscular injections of vitamins B_3 and B_4.

J. Dufrenoy (Chem. Abstr.).

Studies of the Course of Alcohol Intoxication, with Special Regard to Pharmacological-psychological Relationships in the Resorption Phase in Alcoholics. Bschor, Friedrich. [*Deut. Z. ges. gerichtl. Med.*, **40**, 399–420 (1951).]

Psychomotor effects were determined by timing the subjects' efforts to string curtain rings. During the resorption period following dosage of 5 alcoholics with 1·5 gm. EtOH/kgm. body weight, the psychomotor effect of a given blood concentration of EtOH was distinctly greater than the effect of the same concentration during the eliminative phase. While the blood concentration of EtOH was rising, the threshold for an effect on psychomotor ability was 0·1–0·6 mgm. EtOH/gm. blood; while it was falling, the threshold was about 1·0 mgm./gm. The maximal psychomotor effect seems to precede the time of maximum blood EtOH.

Marshall E. Deutsch (Chem. Abstr.).

Hippuric Acid Excretion and Glycine Availability in Schizophrenics. Mall, G., et al. [*Arch. Psychiat. Nervenkrankh.*, **188**, 289–300 (1952).]

The Sherlock (intravenous injection of Na benzoate solution) and the II modification of the Quick test gave nearly the same results in healthy persons. In more than half of 168 untreated schizophrenics the hippuric acid (HA) excretion was below normal in the Sherlock test, whereas in 125 patients from the same group test (II) was usually normal. This result is interpreted to show a decreased availability of glycine for HA synthesis. In 42 schizophrenics there was fairly good correlation between clinical improvement and an increase toward normal in HA excretion (Sherlock test). All of 5 patients improved after liver therapy (litrison), and 23 of 38 improved after treatment with litrison combined with electroshock, insulin hormone, and fever therapies in various combinations.

Warren M. Sperry (Chem. Abstr.).

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Clinical Experience with Modified Hippuric Acid Tests and a New Liver Therapy of Schizophrenia. Levi, Rolf., et al. [*Arch. Psychiat. Nervenkrankh.*, **188**, 26–50 (1952).]

The excretion of hippuric acid (HA) in the urine was determined during the 4 hours following the administration of 6 gm. Na benzoate alone (Quick test I), or (2 days later) together with 6·2 gm. glycine (Quick test II) in 30 schizophrenics, in most of whom the 2 tests were repeated several times. A close correlation between test I and the clinical status was found, the HA excretion being abnormally low during acute attacks of schizophrenia and returning to normal during remissions following insulin or electric shock or liver therapy. Test II gave normal values in most of these patients. This result (low test I along with normal test II) is ascribed to a deficiency of available glycine. The findings are considered to show liver disturbances in schizophrenia. Liver therapy was of value in producing and maintaining remissions. WARREN M. SPERRY (Chem. Abstr.).

The Normal Hemolysin Content of the Cerebrospinal Fluid in Multiple Sclerosis and in Other Diseases of the Nervous System. Konyves-Kolonics, L., et al. [*Orvosi Hetilap*, **89**, 471–4 (1948).]

Human serum contains small amounts of hemolysin (I) which passes into the cerebrospinal fluid (CSF) only if the permeability of the blood-CSF barrier is pathologically increased. A test for (I) in CSF is described, based on the lysis of sheep erythrocytes. The test was positive in 16 of 21 cases of disseminated sclerosis. The only other diseases which may give positive tests are meningitis, general paresis of the insane, and polyneuroradiculitis. W. C. TOBIE (Chem. Abstr.).

The Concentration of Bilirubin in Blood. A Laboratory Test for Differential Diagnosis of Cerebral Thrombosis and Hemorrhage. Furtado, Diogo, et al. [*Arch. intern. pharmacodynamie*, **78**, 229–35 (1949): *Abstracts World Med.*, **6**, 39 (1949) (*in French*).] W. C. TOBIE (Chem. Abstr.).

The Etiology of Psychoses of the Acute, Exogenous Reaction Type. The Toxic Activity of Traces of Lysergic Acid Diethyl Amide. Blickenstorfer, E. [*Arch. Psychiat. Nervenkrankh.*, **188**, 226–36 (1952).]

Discussion of the remarkable ability of 10 to 30 γ of lysergic acid di-Et amide (I) to produce psychotic symptoms in human subjects. The hypothesis is developed that (I), or similar substances, formed from protein split products under pathological conditions are etiologic factors in psychoses.
WARREN M. SPERRY (Chem. Abstr.).

Metabolic Studies During Treatment of Schizophrenic Psychoses with Mixed Insulin Preparations. Knick, Bernhard, et al. [*Arch. Psychiat. Nervenkrankh.*, **188**, 237–60 (1952).]

Mixtures of unmodified and " delayed " (Zn-protamine, etc.) insulin were used to produce coma in 15 patients. Detailed data, including blood glucose curves, are given for several patients. Several advantages are claimed.
WARREN M. SPERRY (Chem. Abstr.).

Enzymes of Leucocytes in Schizophrenics with Particular Reference to Trypsin. Mall, G., et al. [*Arch. Psychiat. Nervenkrankh.*, **188**, 317–27 (1952).]

Washed total blood cells are incubated 24 hours, at 37° with casein solution as substrate. The split products are determined by titration with alkali after addition of 9 parts hot EtOH, and centrifuging. Because of the reported absence of proteolytic activity in red cells the results are ascribed to tryptic activity of leucocytes. Findings so far with this method in schizophrenics are inconclusive and are not reported in detail. WARREN M. SPERRY (Chem. Abstr.).

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The Pathogenesis of Brain Edema. The Catalyzing Action of Brain Tissue on the Process of Polymerization. Wilke, G., et al. [*Arch. Psychiat. Nervenkrankh.*, **187**, 424–34 (1952).]

Fresh, minced, mouse brain tissue catalyzes the polymerization of acrylamide in aqueous solution at 37°. The hypothesis is advanced that a cause of brain edema is the similarly catalyzed polymerization of unsaturated compounds from lipide or protein metabolism and the absorption of H_2O by the polymers.

WARREN M. SPERRY (Chem. Abstr.).

Comparison Between Results of Different Methods of Determination of Protein in the Cerebrospinal Fluid and its Significance for Diagnosis based on Cerebrospinal Fluid. Gleiss, Jorn., et al. [*Arch. Kinderheilk.*, **139**, 65–80 (1950).]

Protein determined by the chemical method (Kjeldahl as modified by Abelin) and by the photometric method using a Pulfrich-Zeiss step photometer (Weichselbaum method, modified by Dittebrandt) gave the following results. The upper limit by the photometric method was 45 mgm. per cent. The Kafka-Samson volumetric method (Samson, *Ergeb. inn. Med. u. Kinderheilk*, **41**, 553 (1931)) gave results similar to the Kjeldahl method as modified by Abelin, namely 31·0 mgm. per cent. Measurements from 62 patients involving 184 separate measurements showed that in 15 patients protein increased in the cerebrospinal fluid as tested by the Kjeldahl method and the photometric method but showed decreased protein values by the Samson-Kafka technique. Cerebrospinal fluid in 38 per cent. of patients with tumors of the central nervous system gave normal protein values as determined by the Samson-Kafka method but showed increased protein by the other two methods. Statistically there was good agreement between the Kjeldahl method as modified by Abelin and the photometric method, but not between either of these methods and the Samson-Kafka method which generally gave values about 40 per cent. lower. NELLIE M. PAYNE (Chem. Abstr.).

β-Glucuronidase of Peripheral Nerve During Wallerian Degeneration. Rossiter, R. J., et al. [*Rev. can. biol.*, **11**, 79 (1952).]

The β-glucuronidase activity of cat sciatic nerve increased after either nerve section (neurotmesis) or nerve crush (axonotmesis). After each type of operation the β-glucuronidase activity, like the concentraton of desoxypentose nucleic acid (DNA), reached a maximum in 16 days and then fell gradually. Even 600 days after nerve crush the activity was greater than that in the control nerves. Although the time course of the rise is similar to that of DNA, the extent is quite different. Whereas the concentration of DNA increased by a factor of 4 after 16 days, the activity of the β-glucuronidase increased by a factor of more than 30. If, as is now widely accepted, the concentration of DNA per diploid cell is constant for any one species, it is apparent that the total amount of DNA in a nerve gives an accurate index of the number of cell nuclei present. This means that during the cellular proliferation of Wallerian degeneration the β-glucuronidase activity per cell is greater than in control nerves. A. PAPINEAU-COUTURE (Chem. Abstr.).

The Biochemical Lesion in the Epileptogenic Focus. Tower, Donald B., et al. [*Rev. can. biol.*, **11**, 87–8 (1952).]

Slices of cerebral cortex from human epiletogenic foci, when incubated in saline medium containing normal (2·7 mM) or high (31 mM) K, produce free acetylcholine (ACh) at the same rates as do slices from normal cortex. But, in distinct contrast to non-epileptogenic tissue, the focal tissue fails to increase its content of bound ACh. This failure of, or interference with, bound ACh production can be reproduced experimentally in 2 ways: (1) with slices of cerebral cortex from animals in which seizures have been induced by methionine sulfoximine (the toxic agent of agenized flour), or (2) in normal animals with slices of cortex incubated under partial anoxia. Administration of anesthetics or anticonvulsants to animals before excision of the tissue causes an increase in bound ACh production and counteracts the effects of methionine sulfoximine and of partial anoxia. *In vitro* incubation with DL-glutamine (20 mM), L-asparagine (10 mM), DL-methionine (20 mM),

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or L(+)-glutamic acid (10 mM) of slices of normal cortex has no effect on ACh production. The *in vitro* addition of glutamine, asparagine, or methionine, but not glutamic acid, reverses the effect of methionine sulfoximine on bound ACh production. The *in vitro* addition of glutamine or asparagine, but not methionine or glutamic acid, reverses the effect on bound ACh production of *in vitro* partial anoxia. The production of free ACh is not affected by these additions.

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

The Pathological Physiology of Phenylpyruvic Acid Oligophrenia. Schrappe, O. [*Nervenarzt*, **23**, 175 (1952).]

In 4 patients with phenylpyruvic acid oligophrenia there were large differences in the daily excretion of phenylpyruvic acid (I) per kgm. body weight, and there was no relation between the degree of mental deficiency and the amount of (I) excreted. The excretion of (I) was decreased by a protein-low diet and sharply increased by the taking of an air encephalogram. In 2 patients the total serum proteins contained 8·5 per cent. phenylalanine. The biochemical mechanism of the disease is discussed. WARREN M. SPERRY (Chem. Abstr.).

The Source of the Proteins of the Cerebrospinal Fluid. Kafka, V. [*Deut. Z. Nervenheilk*, **168**, 77 (1952).]

The proteins of the cerebrospinal fluid come not only from the blood but also from the central nervous system. WARREN M. SPERRY (Chem. Abstr.).

The Influence of Corticotropic Hormone on Phosphorus^{32} Uptake of the Adrenals and Brain of normal and hypophysectomized animals. Reiss, M. [*Intern. Congr. Biochem., Abstrs. of Communs. 1st Congr., Cambridge, Engl.*, 1949, 430–1.]

P^{32} uptake of the adrenals was increased in rats kept in the cold. This reaction also occurred in 3- and 8-day-old rats when removed from their mothers, but did not occur in hypophysectomized rats. It was, therefore, assumed to be caused by the endogenous mobilization of corticotrophic hormone (I). The P^{32} uptake of adrenals was reduced 60–80 per cent. 24 hours after hypophysectomy. The relation between the ascorbic acid test for (I) and the P uptake was studied. Hypophysectomized rats were injected intraperitoneally with P^{32} one hour before injection of (I). The first adrenal was removed, then (I) was injected intravenously. The second adrenal was removed one hour later and had an increase of P^{32} up to 80 per cent., but there was no direct correlation between this increase and the decrease in ascorbic acid. The P^{32} content of the acid-soluble brain fraction was increased 7 days after hypophysectomy and was reduced again by treatment with (I). The P^{32} uptake of brains of animals kept in the cold was increased.

THERESA MCKEE (Chem. Abstr.).

The Role of Endocrines in Regulation of brain metabolism. Gordon, J. J., et al. [*Intern. Congr. Biochem., Abstrs. of Communs. 1st Congr., Cambridge, Engl.*, 1949, 431.]

The pyrophosphatase activity of the brain was increased after hypophysectomy, whereas removal of the testis or adrenals had no effect. At the same time as this increase the acid and alkaline phosphatase activity with glycero-phosphates was not, or only very slightly, altered. It is suggested that these changes are connected with phosphorylation processes and increased carbohydrate metabolism since radioactive P uptake in the acid-soluble fraction of the brain was increased.

THERESA MCKEE (Chem. Abstr.).

Biochemistry of Nervous Tissue of Man and Monkey : Nature of the Fatty Acids of the Phosphoaminolipides of the Gray Matter and White Matter. Blancher, G., et al. [*Compt. rend. soc. biol.*, **146**, 219 (1952).]

The spectral absorption curves indicate the presence of acids with 2, 3, 4, and 5 double bonds in the phosphoaminolipides of both the cells of the brain (gray matter)

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and the myelin sheaths of the nerve fibers, and acid(s) with 6 double bonds in those of the cells only. L. E. GILSON (Chem. Abstr.).

The Distribution of Acetal Phosphatides in the Human Central Nervous System with Particular Reference to the Hypophyseal-hypothalamic System. Stammler, A. [*Deut. Z. Nervenheilk*, **168**, 305 (1952).]

The approximate amount of acetal phosphatide was determined by histochemical methods in several structures of 8 adult and 3 fetal brains. WARREN M. SPERRY (Chem. Abstr.).

Chemical Stimulation due to Sodium Glutamate and Aspartate on the Motor Cortex and Subcortical Nuclei. Ito, S., et al. [*J. Physiol. Soc. Japan*, **14**, 392–4 (1952).]

A minute dose of Na glutamate induced clonic convulsion by application to the motor cortex and to the thalamus of dogs. Na aspartate induced clonic convulsion by application to the same areas and also to the gyrus suprasylvius, gyrus ectosylvius, and nucleus niger. Na asparatate sometimes induced sustained movement of one limb from cortex and locomotive convulsion from mid-brain. ITIRO TYUMA (Chem. Abstr.).

A New Case of Parkinsonism Probably Casued by Carbon Disulfide. André, M. J., et al. [*Presse méd.*, **58**, 437 (1950); *Excerpta Med., Sect. VIII*, **4**, 27 (1951).]

Pathological features after 3-month exposure to CS_2 fumes are described. W. C. TOBIE (Chem. Abstr.).

Physiological Action of Thiamine. (1) *Sonic Stimulation and Thiamine Content in Brain. Koyanagi, T., et al.* [*Igaku to Seibutsugaku* (*Med. and Biol.*), **10**, 9 (1947).]

Sonic stimulation (10-second bell-ringing every 6·5 minutes for 3 hours) caused significant decreases in thiamine contents in brain and in liver, while no decrease was observed in muscle of rats. Ascorbic acid contents were little influenced by this treatment. MICHINORI NAKAMURA (Chem. Abstr.).

Succinylcholine. Evans, F. T., et al. [*Lancet*, **263**, 682–3 (1952).]

Following intravenous injection of 10 mgm. succinylcholine chloride (I), a marked depolarizing reaction occurred; there were spasms of muscle groups, arching of the spine, inability to lift the head, spasm of the pharyngeal constrictors, and an apnea lasting for 40 seconds. The serum pseudocholinesterase level (II) was 82 units. When the (II) was raised to 122 units by intravenous injection and 10 mgm. of (I) again injected, virtually no depolarization occurred and the only subjective experience was a transitory sense of heaviness. The response to (I) may depend on the plasma-(II) level. BARBARA R. MURRAY (Chem. Abstr.).

Action of Parathion on the Central Nervous System. Enders, Alfred, et al. [*Arch. intern. pharmacodynamie*, **90**, 175–84 (1952).]

Electrical impulses from all parts of the brain are much increased in acute parathion poisoning in cats. Ether, evipan, or Eunarcon narcosis decreases the toxicity and reduces the convulsions in rats. Fish and tadpoles show paralysis without convulsions. M. L. C. BERNHEIM (Chem. Abstr.).

Localization of Nucleic Acids in the Nerve Cell. Preto Parvis, V. [*Boll. soc. ital. biol. sper.*, **25**, 646–8 (1949).]

In the cat, in the cells of the spinal anterior horn, the nucleolus and the tigroid substance appear to be high in nucleic acid. After HCl hydrolysis the residual protein of the nucleolus is acidophilic owing to removal of ribonucleotides with basophilic properties. W. C. TOBIE (Chem. Abstr.).

Origin and Properties of Cerebral Pressor Substance (*CPS*). *Taylor, Robert D., et al.* [*Am. J. Physiol.*, **170**, 321–9 (1952).]

Cerebral pressor substance, cerebrotonin, is distinguished from other pressor agents in that it is not inhibited by peripheral sympathetic blockade (benzodioxan,

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priscoline) or by renin tachyphylaxis. It is augmented by ganglionic blockade (tetraethylammonium chloride) and is strongly inhibited by apresoline, veratramine, and verloid. E. D. WALTER (Chem. Abstr.).

Brain Metabolism During Inhibition and Excitation of Higher Nervous Activity. Palladin, A. V. [*Biokhimiya*, **17**, 456–61 (1952).]

The inhibitory effect was achieved by giving the rats medinal. During the narcotic sleep, the activity of the enzyme deoxyribonuclease in the brain increased considerably, but no decided change was observed in the nucleic acid content. From this it is deduced that an intense nucleic acid metabolism occurred in the brain, with the synthetic process predominating. Confirmatory proof was obtained by the use of ribonucleic acid and deoxyribonucleic acid tagged with P^{32}. A study of the carbohydrate-P metabolism in the brain of rabbits during brief sleep (4 hours) showed that the preformed lactic acid decreased, compared to normal, that the glycolytic activity remained unchanged, and that the polysaccharide content increased. All this points to a low expenditure of carbohydrates during narcotic sleep. The hexokinase activity of the brain was low, but the amylase and phosphorylase activities remained normal. The adenosine triphosphate (ATP) content of the brain increased during sleep ; the accumulation was possible because of the slow rate of expenditure. From the biochemical point of view sleep must be regarded as a protective inhibition. The data prove that during sleep the metabolism does not slow down, but, on the contrary, proceeds actively. The activity of some enzymes actually increases, the nucleic acid content does not decrease, the consumption of carbohydrates is lessened, and the ATP content increases. During sleep the synthetic processes predominate over the hydrolytic ones, thus enabling the brain to regain its working capacity. Excitation of the higher nervous activity, to the point of convulsion, caused a decrease in the polysaccharide and ATP content of the dog brain, and an increase in the enzymes decomposing these substances. During the excitation of the rabbit brain with pervitin, the nucleic acid content of the brain did not change, but the amount of deoxyribonucleic acid increased slightly. The ATP content increased during pervitin excitation, but was normal in metrazole (I) excitation. The preformed lactic acid content was low in pervitin excitation, compared to (I) excitation. The intensity of anaerobic glycolysis in the brain during pervitin excitation was higher than that of normal, and higher than that of (I) excitation. Pervitin and (I) thus exert different effects on the brain metabolic processes. Pervitin possesses a stimulating effect on the brain because of the accumulation of ATP.

H. PRIESTLEY (Chem. Abstr.).

Phosphates of Brain During In Vitro *Metabolism : Effects of Oxygen, Glucose, Glutamate, Glutamine, and Calcium and Potassium Salts. McIlwain, H.* [*Biochem. J.*, **52**, 289–95 (1952).]

Cerebral-cortex slices metabolizing in a balanced saline (Na^+, K^+, Ca^{++}, Mg^{++}, Cl^-, SO_4^{--}, PO_4^{3-}, and sometimes HCO_3^- and glycylglycine) contain creatine phosphate and adenine polyphosphates and 3·5 micromoles inorganic P per gm. fresh tissue if O and glucose are present. In the absence of either, the creatine phosphate decreases and the inorganic P increases. Addition of glutamic acid or of glutamine causes the creatine phosphate to fall, with or without glucose. When glucose replaces the salts of glutamic acid the inorganic P in the slices increases and creatine phosphate decreases, and an undetermined labile P compound appears. Lowering Ca^{++} or raising K^+ causes a fall in creatine phosphate, sometimes with a rise in inorganic P. S. MORGULIS (Chem. Abstr.).

Estimation and Significance of Paraldehyde Levels in Blood and Brain. Figot, Paul P., et al. [*Acta Pharmacol. Toxicol.*, **8**, 290–304 (1952).]

A new method of determining paraldehyde in blood and brain is described. The paraldehyde is depolymerized by heating with diluted H_2SO_4 and the AcH formed is distilled into a semicarbazide solution buffered to pH7 with phosphate. The amount of semicarbazide fixed is determined by spectrophotometric measurement at 224 mμ. The oral LD_{50} of paraldehyde for rats is 1·65 gm./kgm. The

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median lethal brain concentration is 47 mgm. per cent. There seems to be a correlation between the toxicity and the brain level attained. Twenty minutes after administration of paraldehyde to rats a ratio of about 1·63 is established between blood and brain levels and remains relatively constant for at least 12 hours. Brain paraldehyde levels appear to be reasonably reliable indexes of death in cases of paraldehyde poisoning. L. E. GILSON (Chem. Abstr.).

The Toxic Effect of Oxygen on Brain Respiration and Tissue Enzymes. Dickens, M. F. [*Actualites biochim.*, **10**, 140–3 (1947).]

The pyruvate oxidase system is among the most sensitive of the brain enzymes to O. However, it is probably necessary to postulate poisoning of other enzymes also; perhaps triosephosphate dehydrogenase, phosphoglucomutase, succinic dehydrogenase, and fructose-6-phosphate phosphorylase.

JOHN T. MYERS (Chem. Abstr.).

Creatine Phosphokinase in Mammalian Brain. Narayanaswami, A. [*Biochem. J.*, **52**, 295–301 (1952).]

Different levels of activity in the central nervous system are associated with different contents of energy-rich phosphates and of inorganic phosphate. In the brain, the energy-rich bond of phosphocreatine is transferred to a phosphate acceptor (adenylic acid or adenosine diphosphate) so that the stored energy remains largely available. Homogenates of mammalian brain have been found to split phosphocreatine in the presence of adenylic acid. The phosphokinase activity of the brain homogenates can be recovered in the supernatant. The enzyme activity requires Mg ions, and 1–2 mM Mg^{++} must be added to the dialyzed preparations. Mn or Ca ions are less effective than Mg ions and K ions are entirely inactive. Under optimum pH (5·9–7·0) conditions and Mg-ion concentration 2 mgm. brain substance will split 2·5 micromoles phosphocreatine in 20 min. The same preparations will also catalyze the synthesis of phosphocreatine from creatine + adenosine triphosphate at pH above 8·3 Drugs with central nervous action had no effect on the enzyme activity, which was completely inhibited by iodoacetate and to a much lesser degree by 0·5 mMF. The creatine phosphokinase system is not acted on by 2, 4-dinitrophenol. S. MORGULIS (Chem. Abstr.).

Glutamic Carboxylase and its Physiological Significance in the Brain. Okunuki, K., et al. [*Proc. Japan Acad.*, **27**, 658–61 (1951).]

Stable glutamic carboxylase (I) is prepared by extracting the seeds of Cucurbita pepo with phosphate buffer, precipitating the (I) with 50 per cent. saturated $(NH_4)_2SO_4$, and drying the precipitant on a clay plate and in a desiccator. The (I) concentration of the seeds increases during germination. (I) is found in the cotyledon of the germinating seeds, and in the leaves and roots as the plant matures. γ-Aminobutyric acid (II), like benzedrine, has an inhibiting action on tyramine oxidase. It is suggested that the (II) resulting from the action of (I) on glutamic acid has a physiological action in the brain related to the pharmacological action of benzedrine. A. DIETZ (Chem. Abstr.).

Transmission Processes at Nerve-muscle Junctions. Kuffler, S. W. [*Modern Trends Physiol. and Biochem.*, 277–90 (1952).]

Some problems regarding the mechanisms of transmission between nerve and muscle are presented. The excitatory action of current spread in peripheral nerve during impulse conduction is compared with its effect at the neuromuscular junction. Action currents seem unable to account for the mechanism by which nerve terminals transmit excitation to the endplate. The thesis of acetylcholine liberation from motor-nerve terminals is briefly examined. The evidence obtained with electric recording techniques, particularly in conjunction with pharmacological studies, is strongly in favour of a role of acetylcholine in transmission. Although many aspects of "transmitter" mechanisms are not known, there appears as yet no strong evidence which makes it necessary to revise the main concepts of the original acetylcholine hypothesis. M. HETRICK (Chem. Abstr.).

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Ultrastructure and Function in Nerve. Non-electrical, Physical Aspects of Excitation and Conduction, as Deduced Primarily from Polarization Experiments. Tobias, Julian. [*Modern Trends Physiol. and Biochem.*, 291–322 (1952).]

A discussion of the chemical and structural-mechanical changes accompanying passage of an excited state along a nerve fiber, on the basis of experiments utilizing electric polarization of the cell. In this method, a pair of external electrodes apply a voltage to the nerve axon, producing changes in electric properties similar to those produced by the normal impulse, and presumably also similar chemical and structural changes. Experiments of this type show movement of water inside the cell with swelling at the cathode or " excited " end and shrinkage at the anode or " restoring " end, a rise in Ca ion concentration at the anode greater than at the cathode with a rise of K ion concentration greater at the cathode. It is deduced from this evidence that the probable results of impulse propagation are (1) circulation of changed particles including water along the long axis of the nerve, the cations separating to some extent on the basis of mobility, with both cations and water moving in the direction of the about-to-become-active region from the now-active region, while various amphoteric particles (proteins, lipoproteins) move toward the now-active region, water and ions also moving transversely across the surface layer, (2) changes in viscosity, cellular transparency and light scattering due to solation or dispersal of the cell structure accompanying movement of water and the ions, (3) changes in the osomotic pressures, and (4) mechanical distortion of the axonal tube, resulting in a kind of neural peristalsis. A large number of experiments bearing on this problem are described and discussed and the limitations of the method are outlined. M. HETRICK (Chem. Abstr.).

The Comparative Physiology of Nervous Systems. Prosser, C. Ladd. [*Modern Trends Physiol. and Biochem.*, 323–36 (1952).]

The problem of nerve activity is presented from the comparative evolutionary point of view, with emphasis on 7 general problems: (1) participation of intracellular fibrils and bridges in conduction, like those which apparently co-ordinate the movement of cilia in protozoa and in ciliated epithelium of multicellular organisms; (2) origin of nervous function and trends in the evolution of the nervous system; (3) variations in transmission mechanisms at the interneuron junctions and motor endplates; (4) the mechanism of action of acetylcholine, adrenaline, and tyramine, found in most phyla; (5) mechanisms of inhibition of muscle action; (6) spontaneous activity such as is found in the central nerve cords of crustaceans, insects, and annelids or the forebrain and midbrain of vertebrates; and (7) persistent changes in excitability or conditioned responses, such as have been produced in flatworms, annelids, snails, cephalopods, insects, and all main classes of vertebrates. M. HETRICK (Chem. Abstr.).

Blood Ammonia in Epilepsy. Weinland, W. L., et al. [*Z. klin. Med.*, **146**, 155 (1950).]

A study was made of 84 cases of idiopathic and 44 cases of symptomatic epilepsy. High blood-NH_3 values up to 5-fold of the normal were frequent during the epileptic attack. No difference was observed between idiopathic and symptomatic epilepsy. In many cases the increase in NH_3 concentration preceded the attack, while in some cases the values remained normal during the attack. Normal values for blood NH_3 varied from 20–60 γ per 100 ml. B. A. (Chem. Abstr.).

The Nature of Brain Amylase and its Link with Proteins. Palladin, A. V., et al. [*Ukrain. Biokhim. Zhur.*, **20**, 151–64 (*in Russian*), 165–7 (1948).]

By repeating the autolysis of carefully washed brain pulp, additional quantities of amylase entered into solution. When this tissue was extracted with water, NaCl 10, $NaCHO_3$ 1, or NaOH 5 per cent., the greatest amylase activity was present in the aqueous extract; NaOH solution and residual neurokeratin were less active; still less was the NaCl solution. This water-soluble protein fraction (neuralbumin) did not precipitate at its isoelectric point (at pH 5·2–5·9 there was maximum precipitation in acetone), and was not adsorbed on activated C at neutral pH. The neuralbumin appeared uniform on attempted fractionations by the amylase activity and by ultraviolet absorption (2,400–2,500 A. maximum). These properties

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characterize it as a protein, but the difficulty of precipitation with CCl_3COOH, EtOH, and incomplete precipitation with saturated $(NH_4)_2SO_4$ leads to the conclusion that it might be a large fragment of a protein molecule. It was present as 400–600 mgm. per cent., and the losses were 50 per cent. at each purification. The method yielded an amylase free of other enzymes and of much higher amylase content in each mgm. of protein than the original extract.

BORIS GUTOFF (Chem. Abstr.).

Distribution of Cholinesterases in Nerve Tissue as Revealed by Histochemical Methods. Peterson, A. C. [*Proc. S. Dakota Acad. Sci.*, **28**, 131–2 (1949).]

The distribution of cholinesterase activity has been studied in the nerve tissues of the cat and dog. The method of Gomori has been applied, by using lauroyl-, myristoyl-, stearoyl-, and palmitoyl-choline chlorides in the presence of Co salt. Nerve tissue of the cat fails to hydrolyze any of the esters. Dog tissue hydrolyzes the myristoyl and palmitoyl esters only. The dog cholinesterase has been detected primarily in the supporting tissue elements of nerve tissue. Nerve-cell cytoplasm shows limited and variable activity, while the enzyme is absent from nerve fibers of both central and peripheral origin. B. A. (Chem. Abstr.).

Relative Distribution Patterns of Three Brain Enzymes, Carbonic Anhydrase, Choline Esterase, and Acetyl phosphatase. Ashby, Winifred, et al. [*Am. J. Physiol.*, **170**, 116–20 (1952).]

The occurrence of specific quantitative patterns of distribution of the enzymes acetylphosphatase, cholinesterase, and carbonic anhydrase, in the central nervous system of 3 species of animals is demonstrated. These patterns should give indications as to the specific contribution of these enzymes to the functioning of the central nervous system. E. D. WALTER (Chem. Abstr.).

Lipides of the Myelin Sheath of Nerve. Rossiter, R. J. [*Intern. Congr. Biochem., Abstrs. of Communs. 1st Congr., Cambridge, Engl.*, 593–4 (1949).]

The important lipides of the myelin sheath are 2 sphingolipides, cerebroside and sphingomyelin, as well as free cholesterol. Lecithin and cephalin are less prominent. W. C. TOBIE (Chem. Abstr.).

The Electrochemical Activity of Substances Occurring in Nerve. Barnes, T. Cuncliffe, et al. [*Intern. Congr. Biochem., Abstrs. of Communs. 1st Congr., Cambridge, Engl.*, 200–2 (1949).]

Previous work is interpreted, and some new data are given. K does not produce phase-boundary potential. Low-voltage after-potentials can be produced in nerve by adenosine triphosphate, but only an alkaloid can produce a spike. Thiamine (0·05 per cent.) gave 12 mv. negative on saline-guaiacol solution. Curare had the electric properties of acetylcholine (I). Ephedrine was too unstable to be tested, but all other sympathomimetics in oil did not generate potential. The (I) wave will travel along an oil-saline solution interface in a glass tube. A 3-mv. wave lasting 0·15 seconds was recorded 1 m. from the point of applying 0·1 mgm. (I). The synapse was imitated by a low-resistance U-tube containing oil. Synthetic phenolic resin on the axon duplicated its insensitivity to (I). The model used does not apply to sensory nerves, shown by Feldberg (C.A. 39, 2555[1]) not to contain (I). W. C. TOBIE (Chem. Abstr.).

Estimation of Nucleic Acids in Tissue from the Nervous System. Logan, J. E., et al. [*Biochem. J.*, **51**, 470–9 (1952).]

The brain of the dog (gray and white matter) and sciatic nerve of the cat were analyzed for acid-soluble P, lipide P, and protein-bound P, in addition to total nucleic acid, desoxypentosenucleic acid (DNA), pentose-nucleic acid (PNA), and phosphoprotein (PP). Certain discrepancies were revealed in analyses made by different procedures which were traced to the presence in nervous-system tissue of a P compound, probably a lipide-protein containing inositol. The concentration of DNA is the same in all 3 types of tissue studied; the concentration of PNA is

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much greater in gray matter. Similarly the concentration of PP is the same in all, but the concentration of inositide P is much greater in white matter than in the others. S. MORGULIS (Chem. Abstr.).

Carbohydrate Metabolism in Nervous Tissue. Coxon, R. V. [*Biochem. Soc. Symposia, No.* 8, 3 (1951).]

The processes by which carbohydrate is burned to supply energy in the brain do not differ fundamentally from those which operate in other tissues.
THERESA MCKEE (Chem. Abstr.).

Glutamic Acid and its Relation to the Nervous System. Weil-Malherbe, H. [*Biochem. Soc. Symposia, No.* 8, 16 (1951).]

A continuation of the review which concluded with literature published in 1950 (cf. C.A., 45, 5273*a*). THERESA MCKEE (Chem. Abstr.).

Phosphates and Nucleotides of the Central Nervous System. McIlwain, H. [*Biochem. Soc. Symposia, No.* 8, 27–43 (1951).]
THERESA MCKEE (Chem. Abstr.).

Lipides of the Central Nervous System. Sloane-Stanley, G. H. [*Biochem. Soc. Symposia, No.* 8, 44 (1951).]
THERESA MCKEE (Chem. Abstr.).

Brain Metabolism and Cerebral Function. Richter, D. [*Biochem. Soc. Symposia, No.* 8, 62 (1951).]
THERESA MCKEE (Chem. Abstr.).

Biochemical Aspects of the Transport of Ions by Nervous Tissue. Davies, R. E., et al. [*Biochem. Soc. Symposia, No.* 8, 77 (1951).]
THERESA MCKEE (Chem. Abstr.).

The Use of Radioactive Isotopes in the Study of the Metabolism of the Nervous System. Dawson, R. M. C. [*Biochem. Soc. Symposia, No.* 8, 93–101 (1951).]
THERESA MCKEE (Chem. Abstr.).

The General Significance of the Neurosecretory Cell. Scharrer, E. [*Scientia (Italy),* **87**, 176 (1952) (*in English*).]

The significance of nerve cells which possess the structural characteristics of gland cells and produce hormones (neurosecretory cells) is discussed in view of the apparent inability of the nervous system to transmit impulses directly to cells of endocrine organs. Neurosecretory cells appear to provide the mechanism for linking the nervous and endocrine systems. L. E. GILSON (Chem. Abstr.).

Infrared Spectroscopy of Brain Tissue. A Lipide Fraction in Normal and Irradiated Adult and Fetal Rats. Schwarz, H. P., et al. [*Proc. Soc. Exptl. Biol. Med.,* **80**, 467–72 (1952).]

Frozen and dried sections of rat-brain tissue, brain extracts, and pure compounds related to lipide metabolism were studied by infrared spectroscopy, and some characteristic absorption bands were assigned to certain lipide structures. An amide-free lipide fraction was studied in adult and developing (fetal) brain. Differences in the absorption spectra of adult and developing brain tissues are in part due to differences in content of amide-free lipides. Whole body x-ray irradiation decreases the amide-free lipide fraction in the adult and increases it in fetal brain.
L. E. GILSON (Chem. Abstr.).

Hormones of the Sympathetic Nervous System and the Adrenal Medulla. v. Euler, U. S. [*Brit. Med. J.* (**1**), 105–8 (1951).]
MARSHALL E. DEUTSCH (Chem. Abstr.).

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Application of Countercurrent Distribution to the Separation of Phospholipides. Lavern, J. A. [*Biochem. J.*, **51**, 464–70 (1952).]

The crude glycerophosphatides of ox brain have been partitioned between aqueous EtOH and light petroleum. A satisfactory degree of separation was obtained of phosphatidyl choline from similar lipides containing ethanolamine and serine, of plasmalogen from lipides other than phosphatidyl serine. The plasmalogens represent complex substances. The crude phospholipides of ox brain include choline-containing lipides which are different from lecithin or sphingomyelin, also appreciable amounts of substances, presumably wax esters, and gummy lipides of unknown composition. S. MORGULIS (Chem. Abstr.).

Chemical Studies of Peripheral Nerve During Wallerian Degeneration. III. Nucleic Acids and Other Protein-bound Phosphorus Compounds. Logan, J. E., et al. [*Biochem. J.*, **51**, 482–7 (1952); *cf. C.A.*, 45, 3064*a*.]

Wallerian degeneration of the distal portion of a sectioned or crushed peripheral nerve involved disintegration and ultimate destruction of axon and myelin sheath. The changes in the P were investigated from 2 to 96 days after nerve sectioning and from 8 to 600 days after crushing. At 8–16 days the acid-soluble P increased to a maximum in either case, and returned to practically a preoperative level after 32 days. In the case of the sectioned nerve, the acid-soluble P continued to decrease. Lipide P changed little the first 8 days, but decreased rapidly during the 8–32-day period. In sectioned nerves the lipide P continued to decrease but in crushed nerves it started to rise and continued to increase throughout the period of regeneration. The concentration of total nucleic acid increased to a maximum in 16 days, decreasing thereafter. The PNA (pentose nucleic acid) increased more rapidly than the DNA (desoxypentose nucleic acid) so that the ratio PNA/DNA was increasing. The protein-bound P fell during the entire course of degeneration, but in the case of crushed nerves it began to rise by 96 days and reached the level found in the control nerves in 250 days. The " inositide " P followed a course similar to that of the lipide P. The increase in concentration of nucleic acid and decrease in lipide and " inositide " P persisted even 600 days after nerve crushing. S. MORGULIS (Chem. Abstr.).

Glycolysis and Content of Adenosine Triphosphate (ATP) During Excitation of the Central Nervous System. Palladin, A. V., et al. [*Doklady Akad. Nauk S.S.S.R.*, **84**, 777–9 (1952).]

Rabbits subjected to stimulation of the central nervous system by either pervitin (5–10 mgm./kgm.) or metrazole (I) (50–75 mgm./kgm.) were examined for ATP, lactic acid, and degree of anaerobic glycolysis in the brain, after decapitation following a 4-hour duration of the excited state. The determinations were run after quick-freezing of the tissues. Pervitin causes increased ATP content by nearly 100 per cent., while (I) causes a moderate change (average about 10 per cent.). Pervitin lowers the concentration of preformed lactic acid, while (I) causes a moderate rise. Pervitin leads to higher anaerobic glycolysis than (I), both being above the controls by some 15–20 per cent. G. M. KOSOLAPOFF (Chem. Abstr.).

Adrenal Function in Women with Chronic Epilepsy. Urinary Steroid Excretion and Eosinophil Levels Before and After Convulsive Seizures. Costa, P. J., et al. [*J. Am. Med. Assoc.*, **149**, 1093 (1952).]

Women with chronic epilepsy exhibited a greater day to day variation in urinary steroid excretion than do normal female subjects of comparable age. There was no significant difference in the mean values of 17-ketosteroid and reducing corticoid values during the post-seizure periods in comparison with control or seizure-free periods. There was a tendency toward eosinopenia after *grand mal* seizures. Patients with chronic epilepsy do not respond to convulsive stress in the same manner as non-epileptics. There is some indication that the adrenal cortex of patients with chronic epilepsy may become conditioned to convulsive stress. EDWARD J. VAN LOON (Chem. Abstr.).

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Biochemical Studies on the Action of the Nerve. IV. Serum Cholinesterase. Okinaka, S., et al. [*Igaku to Seibutsugaku* (*Med. and Biol.*), **20**, 215 (1951); *cf. C.A.*, 46, 177*f*.]

Results of some fifty determinations on serum cholinesterase activities in patients with various diseases are given. M. NAKAMURA (Chem. Abstr.).

Pathogenesis of Hepato-cerebral Diseases. (1) *Relation Between Cholinesterase Activities of Serum and of Basal Ganglia. Okinaka, S., et al.* [*Igaku to Seibutsugaku* (*Med. and Biol.*), **21**, 4–8 (1951).]

Serum cholinesterase (I) activity has a close relationship to liver function, and the enzymic activity shows a significant decrease in degenerative hardening of the liver. To test a possibility that serum (I) may play a role in hepato-cerebral diseases, (I) activities were determined in 6 cases in which serum (I) activities were normal and in 8 cases in which decreased (I) activities in serum were observed. In the normal group, the following values were given in average: serum (in c.mm. CO_2/c.c./min.), 78·8; basal ganglia (in c.mm. CO_2/5 mgm. fresh weight tissue/hr.): putamen, 316·4; nucleus caudatus, 301·1; globus pallidus, 87·2. Respective values for the group with decreased serum (I) were 19·1, 231·8, 267·4, 52·1. The decrease in serum (I) activity does not seem to bring about a significant effect on the (I) activity of basal ganglia. M. NAKAMURA (Chem. Abstr.).

The Muscle-relaxing Action of Succinylcholine Iodide in Man. Thesleff, S. [*Acta Physiol. Scand.*, **25**, 348 (1952).]

Succinylcholine iodide is a synthetic quaternary ammonium base exerting a brief muscle-relaxing action by neuromuscular block similar essentially to that produced by decamethylenebis (trimethylammonium bromide). Studies were made on patients during anesthesia and under clinical conditions. Within 60 seconds after an intravenous injection a rapid and powerful muscle relaxation attains maximum strength and brief muscular twitches of fasciculatory type appear immediately preceding paralysis. Muscle strength is quickly restored with doses ranging from 0·1 to 0·6 mgm. per kgm. Although there is extensive variation in the response to this drug, in the same individual and to the same dose the variation in duration and degree of muscle paralysis is not great. The dose which paralyses respiratory musculature is about twice the dose necessary to paralyse peripheral muscles, because of the greater resistance to succinylcholine iodide of the diaphragm muscles. The muscle-relaxing action of the drug is not affected by barbiturates, cyclopropane, or spinal anesthesia, but ether seems to weaken the paralysing effect on the respiratory muscles. Succinylcholine iodide is a distinct antagonist of *d*-tubocurarine or flaxedil, bringing about a transient abolishment of the muscle paralysis caused by these drugs. Prostigmine prolongs somewhat the muscle relaxation. Clinically it is important that by slow intravenous infusion of succinylcholine iodide it is possible to produce muscle relaxation which is easily controlled and can be quickly interrupted. S. MORGULIS (Chem. Abstr.).

Determination of Nucleic Acids in Tissue from the Nervous System. Mannell, W. A. [*Rev. can. biol.*, **11**, 72–3 (1952).]

The concentration of total nucleic acid, desoxypentose nucleic acid (DNA) and pentose nucleic acid (PNA) was determined in white matter and gray matter of the brain of the dog and in the sciatic nerve of the cat by the methods of Schneider, Schmidt and Thannhauser and by an ultraviolet absorption method. The values obtained for total nucleic acid, DNA, and PNA by the Schneider method and those for total nucleic acid and PNA by the S.-T. method were greater than those obtained by ultraviolet absorption method. With other tissues the agreement between the 3 methods was good. The difference in tissue from the nervous system is due to the presence of (*a*) a P compound, probably the inositol-containing lipoprotein complex of Folch and Le Baron, which is established as PNA by the S.-T. method and is measured, in part, as nucleic acid P in the Schneider method, and (*b*) chromogenic material that interferes with the colour reactions of the Schneider method. The concentration of nucleic acid in tissue from the nervous system is considerably less than indicated by previously published figures. The concentration of DNA is

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of the same order in white matter, gray matter, and peripheral nerve, but the concentration of PNA is much greater in gray matter. The concentration of the inositide P is much greater in white matter. These results are discussed in relation to the cellular constituents of these 3 tissues and the suggestion that the inositide P is derived from neurokeratin, a constituent of the myelin sheath.

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

Isolated Nuclei of Cells of the Cerebral Cortex. Richter, D., et al. [*Abstracts Communs., 1st Intern. Congr. Biochem.*, 279 (1949).]

The enzymes of animal brains and of normal and pathological human brains are discussed. W. C. TOBIE (Chem. Abstr.).

Inhibition of Brain-slice Respiration In Vitro *by Alkyl Phosphates. Locker, A., et al.* [*Experientia*, **8**, 302–3 (1952).]

Tissue respiration of brain slices *in vitro* was inhibited by Parathion, Pestox III (bisbis [dimethylamino] phosphoric acid anhydride), Pestox XIV (bis [dimethylamino] fluophosphine oxide), and Pestox XV (bis [isopropylamino] fluophosphine oxide) in concentrations of 10^{-5}–10^{-4} M. The order of activity is Pestox XIV > Parathion > Pestox III > Pestox XV. With the exception of Pestox III the inhibitory action of these compounds on brain cholinesterase is greater than the effect on brain-slice respiration. D. S. FARNER (Chem. Abstr.).

2. Pharmacology and Treatment.

Action of Hydergin on the Circulation of the Brain. Taeschler, M., et al. [*Helv. Physiol. et Pharmacol. Acta*, **10**, 120–37 (1952).]

Hydergin decreased the cerebral vascular tone in cats but had little such effect in dogs. Whether the effect is central or directly on the musculature of the vessels is uncertain. L. E. GILSON (Chem. Abstr.).

Visual Disturbances due to Tridione. Dekking, H. M. [*Acta XVI° Concilium Ophthalmol. Britannia*, **1**, 465–7 (1950).]

The vivid sensations of glare and almost total disappearance of colour in brightly lighted objects which sometimes follows use of the drug is caused by a specific action on the retinal cones. It interferes with their light adaptation. Dark adaptation is not interfered with by this drug.

KARL F. URBACH (Chem. Abstr.).

The Anticonvulsant Activity of Ureides. Lubieńska, Jolanta. (*Polska Akad.*) [*Umiejetnosci Rozprawy Wydzialu Lekarskiego*, **12**, *No.* 6, 20 pp. (1951).]

The anticonvulsant activities were studied of the ureide derivatives of phenylacetate (I), α-phenylpropionate (II), β-phenylpropionate, α-phenylbutyrate (II), γ-phenylbutyrate, phenylcyanate, α-chlorophenylacetate, and α-bromophenylacetate. These compounds, practically insoluble in H_2O, were given as 10 per cent. suspensions in gum acacia. The most potent anticonvulsant was (I). For comparison purposes phenylethylbarbituric acid (IV) and the Na salt of diphenylhydantoin (V) were used. By the electric method on rabbits, (IV) and (V) were 4 times as potent as (I) in rats. (I) was 1·2 times stronger than (II) and (III) had minimum activity; the rest of the derivatives were without activity. In shocks produced by cardiac glycosides and coramine, (I) was 1·3 times as potent as (V); in coramine-induced shocks (I) was 1·9 times as potent as (V). (I) was effective in abolishing convulsions produced by malononitrile in white mice and protected frogs against picrotoxin-induced convulsions.

L. J. PIOTROWSKI (Chem. Abstr.).

Changes in the Sugar and Potassium of Blood During Electrometrazole-, and Insulin-shock in Man. Riechert, W., et al. [*Nervenarzt*, **23**, 212 (1952).]

The concentrations of glucose (I) and K were determined in blood taken before and at intervals after 6 electroshock treatments in 2 patients and 14 metrazole (II) shocks in 5 patients. K and (I) concentrations increased considerably immediately

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