

schizophrenic has a blood-pH lower than that of the normal for a given lactic acid content. The author thinks that this is due to diminished excitability of the respiratory centre.

G. W. T. H. FLEMING.

Blood-urea Changes in Abnormal Mental States after the Administration of Amino-acid. (*Biochem. Journ.*, vol. xxvi, No. 3, 1932.) Lockwood, M. R., and Davies, D. R.

The blood-amino-acid changes after the administration of gelatin or glycine to 17 psychotics of varying types showed no material difference from the normal. The characteristic blood-urea curve of agitated and simple retarded melancholia is typified by rapid and uniform changes, the total extent of the changes showing a marked increase over the normal. There is a rapid rise to a high level, followed by a rapid fall within the 5-hour period to the fasting level.

The authors describe a second curve in which, while the early changes are fluctuating, the maximum reading is obtained later than in the normal, the actual changes again being larger than the normal. This is found to occur during recovery from melancholia and in apathetic states generally. The rise in urea level is slow, reaching its peak at the fifth hour of the test period. The authors found marked variations between individuals in the dementia præcox group as a whole, and so were unable to draw any conclusions from this group. They think that the changes noted may be due to some disturbance of factors which control the rate of entry into, and disappearance from, the blood of urea, since Addis, Barnett and Shevkey have shown that adrenaline and pituitrin regulate urea excretion.

G. W. T. H. FLEMING.

Oxidations by the Brain. (*Biochem. Journ.*, vol. xxvi, No. 3, 1932.) Quastel, J. H., and Wheatley, A. H. M.

Human grey matter shows least activity towards the oxidation of succinate. The rate of oxidation of added substrates to the brain varies inversely as the size of the animal. Glucose, sodium lactate and sodium pyruvate at equivalent concentrations are oxidized at approximately the same rate by brain-tissue. Glucose is not appreciably oxidized by brain in Ringer's solution. The addition of phosphate buffer to Ringer's solution restores the rate of oxidation due to glucose. Lactate is probably completely oxidized by brain. The addition of serum increases the oxygen uptake by the brain. Iodo-acetic acid (M/4,000) inhibits the oxidation by brain of glucose, fructose and mannose, but only partially inhibits the oxidation of lactate, pyruvate and glutamate, and has no effect on succinate oxidation. In a mixture of lactate and succinate, the oxidation of the latter is inhibited by an amount exactly equivalent to the oxidation for which the lactate alone is responsible. This action is probably due to the competition of lactate with succinate for the oxidized form of a carrier, possibly cytochrome, which Holmes has shown to be abundant in the grey matter.

G. W. T. H. FLEMING.

Dehydrogenations by Brain Tissue; The Effects of Narcotics. (*Biochem. Journ.*, vol. xxvi, No. 5, 1932.) Davies, D. R., and Quastel, J. H.

Quastel and Wheatley had shown that the exposure of fresh brain-tissue to narcotics at low concentrations results in specific inhibitory effects on the oxidations of the brain. The narcotics exert a profound inhibitory action on the oxidation of substances important in carbohydrate metabolism, *i.e.*, glucose, lactic and pyruvic acids. The narcotics at the same concentrations do not interfere with the oxidation by the brain of sodium succinate or p-phenylenediamine. Narcotics of the same chemical type with the greater hypnotic activity have the greater inhibitory action on the oxidation by the brain of glucose or lactic acid. In the present research the authors found that the dehydrogenating power of grey matter is three to four times as great as that of white matter. Glucose, fructose, galactose and mannitol are activated as hydrogen donors by fresh brain-tissue. The activities of glucose and fructose are less than those of sodium succinate, sodium lactate and sodium

pyruvate. The exposure of brain to narcotics (sommifen, luminal and chloretone) results in an elimination of the activation of the sugar, those of sodium succinate and glycerophosphate being relatively undisturbed. The narcotic and sodium lactate compete for the same activating enzyme. G. W. T. H. FLEMING.

The Effect of Alcohol on the Oxygen Uptake of Brain-tissue. (*Biochem. Journ.*, vol. xxvi, No. 1, 1932.) Robertson, J. D., and Stewart, C. P.

Ethyl alcohol at first increases the rate of oxygen uptake of brain-tissue. This increase, which is greater in grey matter than in white, lasts for about an hour, and is followed by a fall to slightly below the normal rate. The authors suggest that alcohol is adsorbed on the oxidizing surfaces, thereby displacing more usual metabolites, but is more slowly oxidized. The initial increase in the rate of oxygen uptake is explained on the assumption that the alcohol first takes up unoccupied parts of the surfaces. The alcohol content of the brain reaches its maximum under experimental conditions in about half an hour, and has fallen very slightly in four hours. G. W. T. H. FLEMING.

The Relationship between Sugar in Blood and Lactic Acid in Brain. (*Biochem. Journ.*, vol. xxvi, No. 2, 1932.) Holmes, E. G., and Sherif, M. A. F.

The lactic acid content of mouse brains fixed rapidly in liquid air is invariably low. The amount of lactic acid formed on anaerobic incubation depends on the blood-sugar level at death, up to a blood-sugar value of some 200 mgrm. per 100 c.c. At higher levels there is a smaller increase in lactic acid in proportion to the increase in blood-sugar, but this increase is accounted for by a corresponding failure of the brain-tissue to take up carbohydrate. At blood levels at which hypoglycæmic symptoms occur, the resting brain lactic acid level is decreased. G. W. T. H. FLEMING.

The Calcium and Phosphorus Content of the Brain in Experimental Rickets and Tetany. (*Journ. of Biol. Chem.*, vol. xcvi, Nov., 1932.) Hess, A. F., Gross, J., Weinstock, M., and Berliner, F. S.

The authors found that rickets in the rat was associated with a marked decrease in the total calcium and the percentage of inorganic phosphate in the brain, in spite of the fact that the diet was high in calcium.

There was no relationship between the concentration of the calcium in the blood and its concentration in the brain. In rickets the total calcium is normal in the blood and diminished in the brain; in parathyroid tetany it is low in the blood and undiminished in the brain. G. W. T. H. FLEMING.

Further Observations on the Nature of the Highly Unsaturated Fatty Acids of Beef Brains. (*Journ. of Biol. Chem.*, vol. xcvi, July, 1932.) Brown, J. B.

The author prepared the methyl esters of the highly unsaturated fatty acids of beef brains. The acids belonged chiefly to the C₂₂ series. Docosapentenoic was the predominant acid present, together with small amounts of docosatetrenoic acid. There was no evidence of the presence of ordinary arachidonic acid, such as occurs in the glandular lipids. There was little or no evidence of the presence of acids below the C₂₂ series. Possibly small amounts of tetracosapentenoic acid were present. G. W. T. H. FLEMING.

The Destruction of Cholesterol by the Animal Organism. (*Journ. of Biol. Chem.*, vol. xcvi, Aug., 1932.) Page, T. H., and Minschick, W.

An endeavour was made to alter the cholesterol content of the brain and vascular system by the feeding of cholesterol to rabbits. The authors found that administered cholesterol was deposited throughout the body except in the brain. From 0.8-1.8 gm. per week was destroyed. G. W. T. H. FLEMING.