coronary arteries. The dog appeared to be in good health. The heart after injection through the extracardiac anastomoses contained as much dye as did the somatic muscles. In this animal a collateral blood supply had been built up sufficient to maintain cardiac function.

The experiments show that a collateral blood supply to the heart of dogs can be made available by operation. The circulatory bed thus supplied does not interfere with the filling and emptying of the heart. This vascular bed distributes blood supply to the myocardium and experimentally becomes a mechanism which permits compensation that protects a faltering heart from stopping. It makes possible the maintenance of function despite the occlusion of large coronary trunks.

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Influence of Diet on Lipid Content of the Rat's Brain.

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Previous studies on the blood lipids in epilepsy[1] and in acute infectious diseases[2] indicated to us the need for further information regarding the factors which control the lipid content of the tissues. The present report deals with the influence of various diets on the total fatty acid, cholesterol and phospholipid content of the rat's brain. The interest of earlier workers appears to have centered chiefly in cholesterol. Page and Menschick,[3] Chanutin and Ludewig[4] and others have shown that the cholesterol content of the rabbit's liver is greatly increased by prolonged ingestion of this substance, whereas that of the brain is not changed. Best and Ridout[5] found that the livers of cholesterol-fed rats could be prevented from becoming excessively fatty by addition of choline to the diet. A high fat diet is said to inhibit and a high carbohydrate diet to accelerate deposition of cholesterol in the liver.[4] The effect of diet on

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[2] McQuarrie, Irvine, and Stoesser, A. V., PROC. SOC. EXP. BIOL. AND MED., 1932, **29**, 1281.

[3] Page, I. H., and Menschick, W., *J. Biol. Chem.*, 1932, **97**, 359.

[4] Chanutin, A., and Ludewig, S., *J. Biol. Chem.*, 1933, **102**, 57.

[5] Best, C. H., and Ridout, J. H., *Am. J. Physiol.*, 1933, **105**, 6.

the phospholipid content of the brain appears not to have been investigated.

A series of experiments covering a wide range of diets and extending over periods of from 1½ to 13½ months proved fairly definitely that the lipid content of the growing rat's brain tends to remain strikingly uniform. Between 3 and 6 normal rats from our own stock colonies were placed at the age of 3 weeks on one of the following special diets: 1. High-carbohydrate (80%), 2. high-fat (85%), 3. high-protein (80%), 4. low-fat (20%), 5. fat-free (Burr and Burr), 6. standard stock diet (Jackson), 7. standard control diet (Chanutin and Ludewig), 8. the latter plus 2.5% added cholesterol, 9. the same plus 5% added cholesterol, and finally, 10. the standard control diet plus 1.25% cholesterol and 1.30% choline. For each group of animals on special diet a control group was kept on a standard mixed diet for the same period of time. At the end of the experimental period the animals were killed by sudden decapitation, after which the brain was immediately dissected out *in toto*. One-half of the organ was then carefully weighed before and after complete desiccation in a drying oven for determination of the water content. After preparation by the method of Osato and Hehi[6] with minor modifications, the remaining half was used for determination of the total fatty acids, cholesterol and phospholipids by the methods of Bloor.[7, 8]

In spite of the extreme variations in diet there was no significant difference between the composition of the brains of the experimental animals and that of the controls, with the exception of the 44-day experiment on the effect of added cholesterol. In the latter instance the brains of rats receiving the standard diet plus 2.5 or 5.0% added cholesterol showed average cholesterol values which were higher and phospholipid values which were lower than those for the control group, although the water content did not differ. The average cholesterol percentage (wet weight) for the control group was 1.32 and the phospholipid 6.98 as against cholesterol 1.65 and phospholipid 5.58 in the experimental animals. This difference entirely disappeared, however, when the experiments were continued beyond 3 months. The total lipids were found to be unaffected by diet. Age was found to be a definite factor in the cholesterol content of the brain. In keeping with the results of previous workers, the percentage of cholesterol was found to increase significantly with age.

[6] Osato, S., and Hehi, M., *J. Biol. Chem.*, 1930, **87**, 543.

[7] Bloor, W. R., *J. Biol. Chem.*, 1928, **77**, 53.

[8] Bloor, W. R., *J. Biol. Chem.*, 1929, **82**, 273.