of lowered metabolic rate. Our histochemical observations lead us to suppose that glycogen accumulation, at least in brain wounds, may be correlated with the decreased oxidative metabolism and possibly with prevailing anaerobic glycolysis in the same localities. Apart from somewhat stable glycogen, either in the paraventricular structures or in brain wounds, adult mammalian brains contain variable amounts of labile glycogen, which are demonstrable only after intra-vital perfusion fixation. This labile glycogen co-exists with some respiratory enzymes[4,9]. The probable presence of at least two kinds of glycogen in the brain seems to be comparable with the results on the heart muscle and conducting system reported by Schiebler[13].

Nobuo Shimizu
Yoriaki Hamuro

Department of Anatomy,
Osaka University Medical School,
Osaka-shi, Japan.

[1] Friede, R., *Virchows Arch.*, **324**, 15 (1953).
[2] Hess, A., *Arch. Neur. and Psychiat.*, **74**, 149 (1955).
[3] Hamuro, Y., *Arch. Hist. Jap.*, **13**, 69 (1.57).
[4] Shimizu, N., and Kumamoto, T., *Anat. Rec.*, **114**, 479 (1952).
[5] Shimizu, N., *J. Comp. Neur.*, **102**, 323 (1955).
[6] Cammermeyer, J., *J. Comp. Neur.*, **90**, 121 (1949).
[7] Wislocki, G. B., and Dempsey, E. W., *J. Comp. Neur.*, **88**, 319 (1948).
[8] Leduc, E. H., and Wislocki, G. B., *J. Comp. Neur.*, **97**, 241 (1952).
[9] Shimizu, N., and Morikawa, N., *J. Histochem. and Cytochem.*, **5**, 334 (1957).
[10] Dempsey, E. W., and Wislocki, G. B., *Endocrinol.*, **35**, 409 (1944).
[11] Bradfield, J. R. G., *Nature*, **167**, 40 (1951).
[12] Friede, R., *Arch. Psychiat. u. Z. Neur.*, **194**, 213 (1956).
[13] Schiebler, T. H., *Z. Zellforsch.*, **43**, 243 (1955).

Clearing Action of Lysolecithin

Recent communications[1,2] indicate the growing interest in the properties of lysolecithin. Its clearing action on lecithin sols is remarkable, and mixed sols of lecithin and lysolecithin show an interesting viscosity maximum[3]. The lyso-compound has a considerable effect on the stability of lecithin sols in the presence of salts[3]. Neumann and Habermann point out[2] that the formation of lysolecithin *in vivo* could provide a mechanism for changes in cell membrane permeability.

In these laboratories, we are at present studying the physical properties of lysolecithin sols. Diffusion measurements indicate that the aqueous sols contain large micelles consisting of about 273 molecules of the monomer[4]. These large micelles can incorporate lecithin, and our diffusion measurements with mixed sols of the two phosphatides indicate that the mixed micelles are very much larger than those of pure lysolecithin.

The surface activity of lysolecithin is very high; 10^{-4} per cent wt./vol. in water gives a surface tension (Saunders, L., and Robinson, N., unpublished) of 66 dyne cm.$^{-1}$ at 20° C. It is this combination of high surface activity and large micelle size which makes lysolecithin so effective as a clearing agent for lipid sols.

By Hanahan's method[5], we have made batches of up to 15 gm. of lysolecithin, using Russell viper venom, for the gift of which we are indebted to Dr. A. C. White of the Wellcome Research Laboratories, Beckenham. However, we have found that the product does not give a clear solution in warm ethanol. Prolonged spinning of this warm solution in a high-speed centrifuge gave a residue of weight similar to the weight of venom used in the preparation. We therefore recommend that lysolecithin should be recrystallized several times from warm ethanol, clarifying the warm solution each time[3]. If this is not done, the product will contain traces of venom which will confuse the results of experiments in which the lysolecithin is brought into contact with lecithin sols.

The final product is a white solid, of crystalline appearance, which shows a parallel extinction under the polarizing microscope.

L. Saunders
I. L. Thomas
N. Robinson

School of Pharmacy,
University of London,
17 Bloomsbury Square,
London, W.C.1.

[1] Webster, G. R., *Nature*, **180**, 660 (1957).
[2] Neumann, W., and Haberman, E., *Nature*, **180**, 1284 (1957).
[3] Saunders, L., *J. Pharm. Pharmacol.*, **9**, 834 (1957).
[4] Saunders, L., and Thomas, I. L., *J. Chem. Soc.*, 483 (1958).
[5] Hanahan, P. J., Rodbell, M., and Turner, L. D., *J. Biol. Chem.*, **206**, 431 (1954).

Relative Distribution of the Mitochondria in the Two Types of Fibres in the Pectoralis Major Muscle of the Pigeon

It has been noted that the pectoralis major muscle of the pigeon consists of two types of fibres, one of them a white, broad and glycogen-loaded variety, and the other red, narrow and fat-loaded[1], and that the lipase activity is much greater in the latter than in the former[2]. Recent studies conducted in our laboratories[3,4] suggest the presence of a well-organized fatty acid oxidation system in the breast muscle of flying birds. Since the mitochondria are known to be the seat of oxidative processes, it was thought desirable to study the relative distribution of the mitochondria in the two types of fibres in the pectoralis major muscle of the pigeon.

For the demonstration of mitochondria, Altmann's method, as described by Gray[5], was adopted. On observing the sections under oil immersion, mitochondria were found to be mainly located in the narrow fibres and extremely sparse in the broad ones. Chappell and Perry[6] reported that mitochondria in the breast muscle of pigeon constitute about 20 per cent of the total nitrogen of the muscle. Our work shows that the broad fibres, which make up not less than one-fifth the volume of the muscle, are poor in mitochondria. Evidently the main bulk of mitochondria obtained by Chappell and Perry must have come from the narrow fibres.

Studies on the cyclophorase preparation of skeletal muscle by Paul and Sterling[7] show that there exists a correlation between granule count and oxidative activity. Chappell and Perry[6] correlated the low oxidative activity of the rabbit muscle suspension with the low granule content, and suggested that this tissue (rabbit muscle) must be largely anaerobic in function.

From all these observations it is evident that the pigeon breast muscle is made up of two distinct components the morphological characteristics of which seem to be correlated with function. With the poor mitochondrial content associated with the high glycogen-load, lack of myoglobin and smaller surface