Table 1. ACTIVITY OF L-GLUTAMIC DEHYDROGENASE (ΔE_{340}/MIN MG PROTEIN) IN MITOCHONDRIA OF MATERNAL AND FOETAL RAT LIVERS

Day of pregnancy	Mothers: Activity and standard deviation	Mothers: No. of experiments	Foetuses: Activity and standard deviation	Foetuses: No. of experiments
17	355 ± 50·7	7	105 ± 37·6	5
18	431 ± 63·2	5	157 ± 36·1	4
19	366 ± 55·0	17	172 ± 55·1	9
20	430 ± 36·7	12	211 ± 87·5	9
21	392 ± 28·6	12	224 ± 49·5	8
22	394 ± 44·8	9	321 ± 76·8	9

The results are given in Table 1. On the twenty-first day the activity of GDH in the foetal livers was still considerably lower than in the maternal ones; approximately similar values were obtained only for the twenty-second day. The oxidation of L-glutamate is thus inhibited, both with GDH and by way of transamination, since a level of transaminase activity comparable to that of the adult is reached only at birth. However, this means that more glutamate is available for protein synthesis—an important reason for the relative resistance of the foetus to a maternal lack of protein, which has been shown experimentally[6]. The low activity of GDH in foetal liver mitochondria accords with the high respiratory quotient of foetal livers[7], which indicates an almost exclusive oxidation of carbon hydrates.

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Adrenergic Beta-receptor Blockade and Anaerobic Metabolism

IT is known that adrenaline accelerates glycogenolysis in liver and in muscles, which leads to an elevation of the concentration of blood sugar and blood lactate[1]. During work (and especially with high work loads) there is a substantial increase in the concentration of blood lactate, which is mainly produced in the working muscles[2]. This can in part arise from increased adrenergic activity during work. The purpose of the present investigation was to test this assumption by means of an adrenergic beta-blocking agent.

In four cases, the arterial lactate concentration was studied at rest, during work and 3 min after work. They were determined again after oral administration of 15–20 mg propranolol, an adrenergic beta-receptor blocking agent. At rest, the mean lactate concentration was 0·69 mmole/l. and this remained unchanged after propranolol. During heavy work, the mean lactate concentration was 3·00 mmole/l. and 3 min afterwards was 2·71 mmole/l. Both these figures were lower after propranolol (mean = 2·16 mmole/l. and 1·77 mmole/l., respectively). The decrease was significant ($P < 0·01$) during the blockade for eleven out of the twelve samples. It seems that the effect of adrenergic activity on the metabolism, especially during and shortly after muscular work, is at least to some extent an effect of beta-receptors.

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Patterns of Spontaneous Rhythmic Activity within Various Thalamic Nuclei

THE generation of spontaneous rhythmic activity has been studied by simultaneous recording with four microelectrodes (4 M sodium chloride, 1–3 M Ω), either arranged in a square with sides of 1·2–4·4 mm, or in a straight line with spacings of 1·2–3 mm.

With adult cats, which had been lightly anaesthetized with 40 mg sodium pentobarbitone/kg body-weight, spontaneous periods of rhythmic activity (spindles) were recorded from various thalamic nuclei, as described earlier[1]. The activity consisted of groups of cell discharges

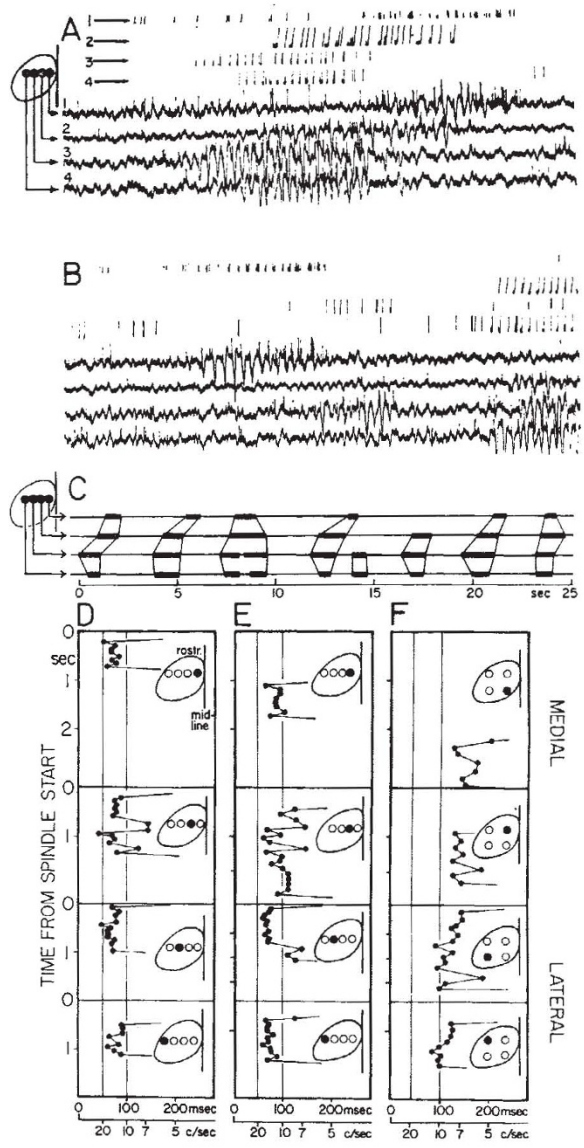

Fig. 1. *A*, Generalized thalamic spindle. Rhythmic activity obtained by four microelectrodes (1–4), 1·5 mm apart, placed along a frontal line, and 7·25 mm under the dorsal surface of the thalamus. The vertical lines of the upper four traces indicate the spikes in the corresponding microelectrode records. *B*, Localized thalamic spindle. Recording as in *A*, with a period of rhythmic activity in trace 1 only, followed by local activity in trace 3 only. The start of a generalized spindle can be seen on the right-hand side. *C*, Duration of spindle activity recorded from the same four electrodes as in *A* and *B*, plotted as thick horizontal bars. Thin lines facilitate a comparison of the onset and stop of spindle activity at the different electrode locations. *D*, *E* and *F*, Three examples of generalized spindles. Time from an arbitrary 0-point along the ordinate, the time between successive bursts of spike discharges along the abscissa. Electrode location given by filled circle in insets. In *D*, the spindle frequency is similar in all locations, although the onset varies. In *E* and *F* the spindle frequency is different at various electrode locations, and sometimes alters during the spindle