91 (S.E. of mean ±23) and 92 (S.E. of mean ±23) (cal kg)/°C/min respectively. At the end of the three days of chlorpromazine treatment, however, mean S_t was reduced to 43 (S.E. of mean ±8) (cal kg)/°C/min which was significantly different from both the pre-treatment ($t=1{\cdot}95$, $P<0{\cdot}05$) and 1 week post-treatment ($t=2{\cdot}01$, $P<0{\cdot}05$) values. The resting oral temperature was not significantly different between any of the three periods studied.

In 3 subjects cardiovascular reflex activity was assessed before and after 3 days chlorpromazine treatment by measuring forearm blood flow during lower body suction and hand blood flow during the application of ice to the neck (Foley, 1970). Mean forearm blood flow during lower body suction was (2·2 ml/100 ml)/min both before and during chlorpromazine treatment. Mean hand blood flow during the application of ice to the neck was 7·3 ml/100 ml before and (7·1 ml/100 ml)/min during chlorpromazine treatment.

The results indicate that chlorpromazine impairs thermoregulatory mechanisms at doses which do not result in a fall of body temperature or alteration in cardiovascular reflexes. This impaired sensitivity does not appear, therefore, to be mediated by a peripheral effect on the vasomotor control of thermoregulation.

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The distribution of solutes in cerebral cortex slices and the effects of drugs on the permeability of intracellular compartments to glucose

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Investigations of monosaccharide transport systems involving incubated cerebral cortex slices have required that the total slice water to be quantitatively partitioned between intracellular and extracellular compartments (Bachelard, 1971; Gilbert, 1966). It has been customary, therefore, to include in the incubation medium a solute whose distribution is restricted to the extracellular compartment. The difference between the volume of distribution of the solute (solute space) and the total slice water is then taken to represent the magnitude of the intracellular compartment. At 37° C raffinose becomes distributed in a space which behaves as an extracellular compartment (Gilbert, 1966). However, studies conducted at 1° C have shown that phenobarbitone can increase the rate of transport of glucose through the raffinose space (Gilbert, 1972). This suggested that at 1° C the raffinose space

contains a cellular component. This possibility has been further examined in the present work which includes studies of the effects of drugs on the transport of glucose into the raffinose space.

Cerebral cortex slices were prepared from guinea-pigs and incubated for 30 min at 37° C in an oxygenated, Krebs-Ringer phosphate medium containing sodium pyruvate (4 mM) as nutrient. The temperature of the medium was then reduced to 1° C and glucose (10 mM, final concentration) or glucose and inulin (5 mg/ml) or glucose and raffinose (10 mM) was added to the medium and the incubation continued. When drugs were used they were present throughout the incubation procedure.

The volume of distribution of inulin (effective hydrodynamic radius 1·5 nm) was only 75–80% of that of raffinose (0·6 nm) at equilibrium and the difference between the volumes of distribution of the two solutes is likely to represent an intracellular compartment which is accessible to raffinose under these conditions. Phenobarbitone (2 mM) but not barbitone (2 mM) or thiopentone (0·8 mM) increased the uptake of glucose by this intracellular compartment of the slices. Diphenylhydantoin (0·5 mM) also increased the glucose uptake but ethosuximide (0·5 mM) and acetazolamide (0·2 mM) were without detectable effect.

These findings, considered with those of previous studies (Gilbert, Ortiz & Millichap, 1966; Gray & Gilbert, 1970) suggest that monosaccharide uptake by cerebral cortex slices involves movement of the monosaccharide into at least two intracellular compartments, one best studied at 37° C (A) and the other at 1° C (B). The anticonvulsants tested can influence the permeability of either compartment A or B or both. The permeability of compartment A to monosaccharides is sensitive to phenobarbitone, ethosuximide, dimethadione and acetazolamide at 37° C. The permeability of compartment B to monosaccharides is sensitive to phenobarbitone and diphenylhydantoin at 1° C. It is speculated, on the basis of this and other work (Tower, 1968) that compartment A contains neurones and compartment B contains glial cells.

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Some characteristics of cortical inhibition induced by local stimulation and by an acute seizure focus in the cat

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In the present study the inhibition of cortical neuronal firing produced by epicortical stimulation (Krnjević, Randić & Straughan, 1966) has been compared