Table 2. Oxygen Uptake by *Musca vicina*

	Oxygen uptake (mm.³/hr./fly)
Intact flies	59
Haltereless flies	28
Decapitated flies	14

Decapitated and intact mosquitoes respond similarly to a reduction of the oxygen tension. The experiments were again carried out in a Warburg apparatus. In all cases the total pressure was maintained at one atmosphere by replacing oxygen by nitrogen.

Both groups maintained a nearly constant uptake of oxygen even in an atmosphere containing only 3–4 per cent of oxygen. The regulation of oxygen uptake at lower oxygen tensions is achieved in mosquitoes by changes in the spiracular activity. The spiracles control oxygen uptake by staying open for longer periods, by general enlargement of the aperture, and by increasing the frequency of opening. All three phenomena were observed in decapitated mosquitoes.

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A Method of controlling the Temperature of Insect Neurosecretory Cells *in situ*

Periplaneta americana, like many other animals, can maintain a 24-hr. rhythm of locomotor activity when in constant conditions of light and temperature. A secretion produced by the neurosecretory cells in the sub-œsophageal ganglion has been shown to act as a controlling factor in the regulation of the phases of this rhythm[1]. Chilling cockroaches at 3° C. for some hours causes the phases of the activity rhythm to be retarded, in relation to solar time, by the number of hours for which the temperature is lowered. A method has now been devised whereby the temperature of the neurosecretory cells of the sub-œsophageal ganglion can be maintained at 3° C., while the rest of the body remains at room temperature. Neurosecretion apparently ceases at 3° C., and the phases of the neurosecretory cycle are retarded by the number of hours for which the cells have been chilled.

Since many functions of insects are known to be affected by the activity of neurosecretory cells, this method of temperature control may be of interest to other workers.

The apparatus is shown in Fig. 1. A copper bar is cooled at one end by a small vessel filled with cold alcohol. At the other end is a hollow conical tip carrying the cooling point, a 0·4-mm. copper wire. This wire is part of a copper constantin measurement thermocouple and is coated with polystyrene. Within the hollow tip is a thermistor. By means of an electronic unit[2] the thermistor controls the current through the heater attached to the bar, and maintains the tip at a constant temperature which is higher than equilibrium value. The alcohol is held at a low temperature by thermal circulation from a sealed chamber immersed in an ice and salt mixture and contained in a lagged tank. The separation of this

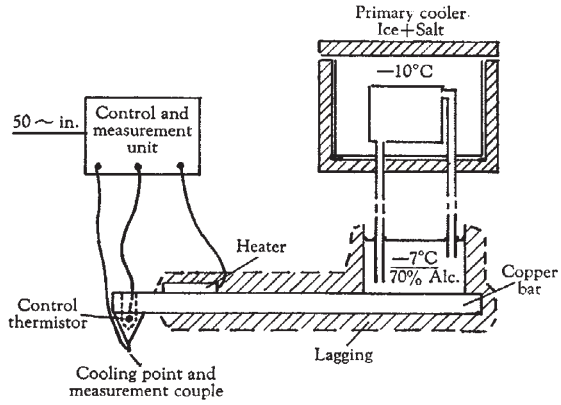

Fig. 1

primary cooler from mechanical contact with the rest of the device allows the bar to be mounted on a manipulator, and the position of the tip to be adjusted with precision.

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Demonstration of Serum Precipitin to Brain Ganglioside

Studies on the structure of brain ganglioside, a macromolecular glycolipid which occurs in high concentration in cerebral grey matter, suggested that this material might be suited to function at membrane surfaces, since it possesses both carbohydrate and lipid moieties structurally so arranged that the molecule could bridge hydrophylic and lipophylic phases[1]. Further investigation of the properties of this substance[2,3] demonstrated that it interacted with certain viruses, both *in vitro* and *in vivo*, in a manner suggesting that it is utilized by infecting viruses as a natural receptor substance in the cell. In a membrane-active system, the clam heart, it was found to have stimulatory effect in very low concentration[4]. The presence of hexosamine and hexose constituents in brain ganglioside relates it structurally to the blood group substances[5]. For these reasons it became of interest to determine whether antisera might be prepared to brain ganglioside.

Since this preparation of brain ganglioside does not contain amino-acid or protein components, adjuvants might have been used in initial immunization attempts. However, it was decided to attempt to obtain an antibody response to the pure substance. Rabbits were injected at weekly and monthly intervals with 0·5 mgm. of bovine brain ganglioside salt in physiological saline, the first injections being made in the toe pads of the animal, and subsequent injections being made intravenously. The presence of antibody in rabbit serum was determined by collecting blood by free drip from the marginal vein of the ear,