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HIGH ALTITUDE OBSERVATION CHAMBER FOR INSECT PHYSIOLOGY STUDIES¹

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A high altitude observation chamber for the observance of gross insect behavior patterns and physiologic changes that may occur at varying altitudes was described by Perry and Webster (1950). The chamber of this equipment was evacuated by means of a Luer syringe. Hiestand and Stemler (1951) studied the acquired tolerance of various insects to repeated decompressions by using test tubes cut to appropriate lengths and explosively decompressed by means of a vacuum pump.

The apparatus developed by Perry and Webster has since been enlarged and modified to provide five observation chambers for the study of a number of insects at two different simulated altitudes simultaneously. It is equipped with a cooling system to maintain lower temperatures (see Figure 1).

The equipment currently in use con-

sists of a plastic box housing five removable, stoppered chambers of pyrex glass. The bases of these chambers fit into cent drilled, inverted Number 6 rubber corks. The openings at the bases of three of the corks are slipped over the ends of one fourth inch copper tubing leading to a common copper duct which passes through a calibrated vacuum gauge to the vacuum source. The remaining two chambers are similarly connected through another gauge. All joints were made vacuum tight with Glyptal.* The vacuum is furnished either by two 100 cc. Luer syringe supported by clamps to the frame, or by an electric vacuum pump. When the syringe is utilized, the registered vacuum is maintained by closing the cut-off valve located below the gauge. When the vacuum pump is used, the leads are removed from the two syringes, brought together through the use of rubber tubing and a glass "Y" to a common rubber duct leading to the pump. The vacuum in each system is maintained by adjusting the air-bleeder valve located below the cut-off valve. Fine adjustment may be made by adjustable metal clamps on the rubber hoses leading from the pump through the valves to the two gauges. By this system vacuum levels can be maintained from one to thirty inches of mercury.

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* General Electric Company.

The cooling system is a one-eighth horsepower refrigeration unit with evaporator coils within the upper periphery of the plastic box encircling the group of test chambers. It was found that even with heavy insulation, controlled temperatures could not be maintained below -5° Centigrade.

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