threshold under the *NR* condition was, in every determination, higher than that under the *R* condition. Figure 1 is a record showing the variations in threshold for seen motion through one session. At each introduction of the *NR* condition the threshold rose abruptly. At lower and higher speeds the same effect occurred, though less markedly. Figure 2 (*a–c*) shows the percentage of threshold elevation, 100 $[(\overline{NR}-\bar{R})/\bar{R}]$, as a function of velocity for the three subjects. Since conditions *R* and *NR* are indistinguishable at angular velocity of 0° per second, we can assume the absence of threshold elevation at that point. The relationship between velocity and percentage of rise in threshold is curvilinear, with a maximum in the 4- to 9-degree region. In addition, we found, as did other investigators (*8*), the luminance threshold to be an increasing function of the velocity of the stripes.

To assess the relationship between threshold elevation and motion aftereffect, a measure of motion-aftereffect strength was obtained. The subject viewed the stripes in motion, retinally stabilized, for 1 minute. He then shifted his focus to a stationary textured field (at luminance of 39 mlam) and reported when he no longer saw motion. The field was at the same distance for the inspection and test phases. There was a period of 2 minutes between trials. A number of tests for motion aftereffect were made with the three subjects of the earlier tests, and at a number of velocities.

Figure 2 (*d–f*) depicts the mean duration of motion aftereffect at the velocities studied. Figure 2*g* shows comparable data from the work of Kinoshita (*9*). Motion aftereffect occurs over a broad range of velocities; the relationship is approximately curvilinear, not unlike the threshold-elevation function shown in Fig. 2 (*a–c*). Inter- and intrasubject variability in motion aftereffect makes it necessary to view this last conclusion with caution.

Our results definitely support an explanation of motion aftereffect on the basis of direction-specific cortical adaption, such as Sutherland has proposed. In accordance with this explanation, it has been shown that the threshold for motion perception changes as a function of the direction of motion. The change in threshold shows peaking and curvilinearity with velocity, much like the motion aftereffect itself.

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## Hymenoptera: Pure Venom from Bees, Wasps, and Hornets

Abstract. *Pure venom can be obtained from bees, wasps, and hornets by electrical stimulation with inexpensive apparatus.*

The methods which have been described for obtaining bee venom by electrical excitation (*1*) are not applicable to certain wasps and hornets because of insufficient excitation voltage or because of the danger of fighting among these insects.

The method described here (*2*) has been found adequate for obtaining pure venom from one to several hundred individual bees, wasps, or hornets. The insects suffer no apparent damage and many may often be used for repeated venom extractions. Samples obtained are readily prepared for microanalyses or immunologic studies.

The apparatus (Fig. 1) consists of a small (about ¼-inch diameter) half-cylinder of fine brass mesh about ½-inch long soldered to the end of a 2-inch length of rigid iron wire which is bent for insertion into a rubber stopper. The insect is anesthetized with carbon dioxide, placed in the half-cylinder, and

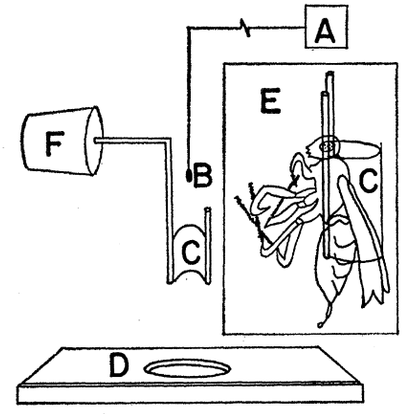


Fig. 1. Procuring venom from a wasp. *A*, Spark coil with 6-volt d-c power supply; *B*, nichrome wire; *C*, brass mesh half-cylinder; *D*, microscope well-slide; *E*, insert showing insect mounted in half-cylinder before being wrapped with aluminum ribbon; *F*, rubber stopper.

bound in place with a ¼-inch ribbon of aluminum foil which is twisted behind the half-cylinder. The mounted insect is supported by a clamp directly beneath a nichrome wire lead from a spark coil (about 10,000 volts) (*3*). A microscope well-slide is placed under the insect in such a manner that only the sting lancet reaches into the well. The well-slide can be filled with agar or agarose gel for microdiffusion studies of venom antigens or the empty well can be used for collecting the venom. As the insect begins to revive, it is excited by a brief high voltage shock, controlled by a key switch, until venom is secreted. The venom on the slides may be dried in a vacuum over phosphorus pentoxide. The dried venom may be stored at 0°C for several months without loss of activity. With this apparatus, two or three insects can be "milked" each minute with no apparent effect on the insect except pronounced hunger and thirst.

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