though there is some overlapping and the difference should be analyzed statistically (perhaps with the aid of a spectrometer). It would also be interesting to compare this type, presumably from the northeastern extremity of the butterfly's range, with specimens from the Prescott area, presumably the northwestern extremity (and rather different from the White Mountains in climate).

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## A NEW TECHNIQUE FOR SPREADING MINUTE MOTHS

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For many years glass tubes containing cyanide have been used for killing small moths. These were experimentally replaced with plastic ones in order to reduce the danger of breakage. It was noted, however, that in the plastic tubes minute moths were forcibly drawn to the sides by static electricity, and held there until death. After death there was no static electric attraction, but many of the scales were left adhering to the tube, and spoiling the specimens. Because of this disadvantage I no longer use plastic tubes for killing.

With this static electric attraction in mind, a special spreading board was designed. The board (Fig. 1) consists of a solid piece of one-inch lumber, 2¼ inches wide and 12 inches long. The top is rabbeted along each side to a width of one-half inch and a depth of one-eighth inch. A strip of cork is glued in the rabbet on each side. Another strip of cork is glued to the bottom, flush with all edges of the board. A strip of "Plexiglass," one-inch wide and one-sixteenth inch thick is glued to the top of the nonrabbeted center portion of the board. Before it is glued onto the board, the plastic strip is sawed for three-quarters of its width at intervals

of one inch. The saw kerf should be about one mm wide. After the plastic is glued to the board, holes are drilled in the center of each saw kerf through the wood, but not through the cork lining the bottom. This hole is almost as wide as the saw kerf and allows the insect pin to be inserted in the cork at the bottom of the board.

To use this spreading board, the little moth is slightly anesthetized in a tube containing acetic ether. It is immediately pinned through the center of the thorax (usually a No. 000 pin). It is important that the pin be inserted absolutely perpendicular to the longitudinal axis of the moth's body. Because the moth is not dead the muscles are relaxed, and the wings can be gently blown from behind with a puff of breath, until they are semispread. The pin is then inserted through the hole and into the cork at the bottom of the board. Because the moth is alive, static electricity causes the wings and antennae to adhere to the plastic. The wings and antennae are now manipulated into the correct position using a No. 000 insect pin. The point of the pin is not inserted in the wings but is used to push the wings into place by inserting it under the trailing edge of each wing near the body. When the wings are in the right position, a strip of thin cellophane is placed over them on each side of the body, and the ends of each strip are pinned to the cork at the sides of the board. The moth is now killed by placing the open end of an uncorked killing tube, containing acetic ether in cotton, over the moth and leaving it there a minute or two until the moth is dead. The static electric attraction is now gone, but the cellophane strips hold the wings in place until the moth is removed from the board.

This technique is particularly suitable for narrow-winged moths with long fringes, such as Gracillariidae, Lyonetiidae, Coleophoridae, Nepticulidae, and Tischeriidae.

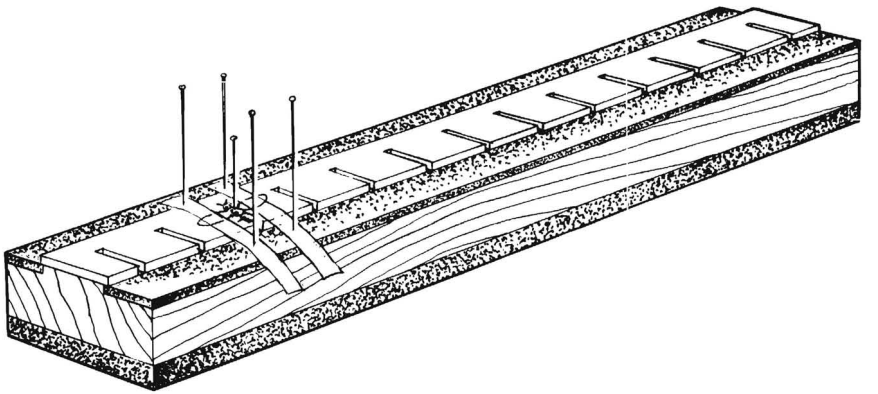

Fig. 1. A new type of spreading board for minute moths.