ing in the hatchery a high atmospheric temperature safeguards the worms from intestinal infections.

This abundance of always fresh, naturally moist food and the sanitary, even temperature in the hatchery result in raising healthier and more vigorous worms with much stronger silk glands. This method of feeding further results in the larvæ arriving at the cocoon stage in approximately 18 days, instead of the period of approximately 36 days now required. The quality of the silk produced by the larvæ raised by this method is equal to or better than that of the silk produced by the larvæ raised by the methods now employed. The output of the silk wadding substantially increases.

HORTICULTURE. The uses of the turgorator in the various fields of horticulture are so numerous that at the moment it is possible to indicate only a very few: rooting of plants difficult to root; grafting of species difficult to graft; preserving of cut plants; nourishing of cut stems; inducting of salt and other solutions into stems; measuring the quantity of water consumed by a plant, etc.

I have applied for a U. S. patent for the method of establishing artificial turgor in cut plants with the help of my turgorator. Any questions of commercial nature regarding this invention must be directed to my commercial agents, Paul Semion & Co. Inc. 1655 Polk Street, San Francisco 9, California.

516 Cole St., San Francisco, Calif., U.S.A.

SEX DIFFERENCES OBSERVED IN LARVÆ OF *DANAUS BERENICE*

by ALICE L. HOPF

In the first week of July, 1953, while vacationing at Daytona Beach, Florida, I was surprised to note several *Danaus berenice* Cramer flying in the neighborhood. I had supposed that this butterfly was confined to the southern part of Florida, around the Everglades. Since for the previous two years I had been breeding *Danaus plexippus* Linné for migration study, I thought it would be interesting to see how *D. berenice* compares to its northern cousin. Accordingly, I looked around for milkweed plants. We were staying near the river and the beach, and where there was vegetation, the ground was thickly covered with a kind of low palmetto which gave scant room for flowering shrubs. It was not until shortly before our departure that I discovered a few milkweed plants at a distance along the road from our cabins. These were a different species from our northern milkweed, and it was only

by breaking off a leaf from every plant in the vicinity, looking for the milky juice, that I finally found them. I was able to search the plants twice before leaving Daytona, and each time collected a half dozen eggs. The eggs looked exactly like those of *D. plexippus,* even under a magnifying glass, but it seemed likely to me that they were *D. berenice,* since *D. plexippus* must have long since gone north.

On reaching home, I found seven little caterpillars, and they made no objection to eating our common northern species of milkweed (*Asclepias syriaca*). Five of these were reared to the butterfly stage, but none could be induced to mate, although one female laid a number of infertile eggs.

Of particular interest was the comparison with *D. plexippus.* As noted, the eggs appeared the same. The *D. berenice* caterpillar is smaller and much darker than the larva of *D. plexippus.* The background color is black, and there is a yellow stripe along each side and an oblong yellow spot on the top of each segment. This caterpillar has three sets of fleshy protuberances instead of the two sets on *D. plexippus*, the extra ones being on the fifth segment behind the head.

When the caterpillars neared their maximum growth, I noted that their markings were not all alike. Two of them had uniform black and yellow markings as described above. But in three, the yellow markings on the tops of the 3rd, 4th, and 5th segments were greatly dulled and obscured. Moreover, one caterpillar had red coloring on the base of all six protuberances. Each caterpillar was put in a separate jar, marked with a description of the individual, and when the butterflies emerged, two from caterpillars with the uniform bright yellow markings were males, whereas the three from larvæ with the yellow spots obscured were females. The caterpillar with the red on the protuberances was one of the males. This was the last one to come out and suffered an accident, falling down to the bottom of the jar and being unable to climb back up the stick that had been placed there. It is unlikely that this accident had any connection with the red markings.

The *D. berenice* were in pupation for ten days, as opposed to the usual fourteen for *D. plexippus* (though *D. plexippus* has taken shorter and even longer periods here, depending on the temperature). When about to open, the *D. berenice* pupæ first turned black and then a chocolate brown. This last color would indicate a diseased and dying pupa in *D. plexippus,* but is the ground color of the wings of *D. berenice* and is natural for them. No appreciable difference was seen in the color and markings of the green pupæ of the two species, but *D. berenice* is somewhat smaller.

Thanks to the cooperation of a fellow Society member in Florida, Mr. W. M. DAVIDSON, I have been able to rear a dozen more *D. berenice* this past summer. This time the difference in coloration in the mature larvæ was again noted, and as before, the brightly colored ones all produced males, the duller ones all females. It would be of very great interest to know whether any other species of Lepidoptera show the sex difference this clearly in the larval form.

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