

THE CONVULVULUS HAWK-MOTH, 1944.

In the early hours of Monday September 18th. two females of this species were attracted to the searchlight in Cricketfield Lane. Shortly after dark on Friday Sept. 22nd. one male and one female were found at the light, and before dawn a further male appeared.

On Saturday Sept. 23rd. the last female was placed in a cage with growing flowers and leaves of the Greater Bindweed, *Convolvulus sepia*, and during that night deposited 44 ova. No particular method of oviposition could be noted. 13 ova were found singly and in pairs amongst the sand on the base of the cage, 1 on the muslin, 2 on the woodwork, a batch of 9 on a water bottle, 1 on the upper surface of a leaf, and a batch of 18 were piled up irregularly on the upper surface of another leaf. The moth lived in captivity for 6 days, but did not deposit any further ova. As this species is a native of a warmer climate the ova were removed to an unheated room.

The egg only lightly adheres to the leaf, and is very small for the size of the moth, being oval in shape and only about 1.3 mm long by 1.0 mm wide. It is smooth and shining, with a faintly embossed pattern, and of a very brilliant blue-green colour when first laid. After about 4 days a faint hazy yellowish patch at one end indicates the head of the developing larva, and when 6 days old the general colour becomes a yellowish green, and a depression develops in the upper surface. When about 12 days old it is green with a large hazy orange patch at one end, and the caving in of the upper surface is very pronounced. A few hours before the emergence of the larva, on the 17th. day, the colour gradually fades, becoming a dull white. Of the 44 ova only 9 produced larvae, though about a dozen others developed to the green and orange stage, and of the 9 larvae 7 refused to eat, and 1 died in the second moult, but the remaining one is, at the present moment (November 26th.), in its fifth and final instar, and is still feeding voraciously.

In emerging the larva eats a large hole in the side of the eggshell, but does not eat any of the eggshell after emerging.

When just emerged the larva is 3.5 mm long, and of a pale yellow colour, with the head very slightly darker. It is of a more slender build than the common Hawks. The anal horn is 1.5 mm high, quite straight and held erect, and of the same pale colour as the rest of the larva, but after a few hours it becomes black and curved slightly forward apically. When a few hours old the larva started feeding on the underside of a leaf of the Lesser Bindweed, *Convolvulus arvensis*, biting a small roughly circular hole through the leaf. The mandibles were then noticed to be black. In the first instar the larva feeds only by biting small holes in the leaf, each hole representing a meal and taking about half an hour, with rests of about 2 hours duration between each meal. It rests on the midrib under the leaf, either lying parallel with it, or holding the midrib by means of the 4th. and anal pairs of claspers, and stretched out at an angle of 45° with the midrib, after the manner of the Geometer larvae. When 9 days old, on October 19th., the larva ceased feeding. It was then 9 mm long, of a greenish yellow colour, with a dark green mid-dorsal line, and the head a very pale brown. On October 20th. it cast its skin, and its next meal was the major portion of the cast skin, leaving only the tail end.

Immediately after moulting it is 8 mm long, with the horn 2 mm high. The general colour is a very pale green with a broad darker green mid-dorsal line, bordered on either side by a broad whitish green line. The horn is a very pale grey-green at first, but soon becomes black except at the extreme base where it is yellowish. The thoracic legs are reddish, and the last two pairs of spiracles are prominent, being marked with black. During the second and subsequent instars the larva eats the leaf from the edge inwards.

It will eat *Convolvulus arvensis* or *C. sepia* with equal relish. The larva attained a length of 16 mm on October 29th., and ceased feeding. It moulted for the second time early on October 30th., and ate most of the cast skin.

Immediately after the second moult the general colour is pale green; all the spiracles are now easily seen, all except the last two pairs appearing as black spots; the last two pairs are larger, and red, circled with black.

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The horn is 3.5 mm high, erect and tapering, and of a pale grey-green colour. The mid-dorsal dark line is present at the beginning of this instar, but soon fades. The horn becomes a greenish yellow colour, with a large black mark in the middle, and black at the tip. The whitish sub-dorsal lines remain throughout this instar, and towards the end of it the oblique lateral stripes appear on the first seven abdominal segments. These stripes are dark green above and whitish below. The head is a slightly darker green than the body, with a paler stripe on either side. The larva attained a length of 25 mm at rest, (27 mm when crawling) on the evening of November 6th., and then ceased feeding. It moulted for the third time at midday on Nov. 9th.

Immediately after the third moult the length is 24 mm, with the horn 5.5 mm high. The ground colour is whitish green with white oblique lateral stripes; head slightly darker green and unmarked; horn very wide at the base and tapering to a point, rough on the basal three quarters, smoother at the apex, and dull grey-green in colour; thoracic legs dark red, and there is a double thin black line on the sides, just above the insertion of the claspers.

The spiracles are now all very prominent, all being a deep pink circled with black. A few hours later there is a considerable increase in the black markings. The head has a broad vertical black line on each side, a very thin inverted Y in the centre of the front, and a black line on either side between this Y and the broad black side lines. On the body, above each oblique lateral stripe are several small black marks, placed more or less in three rows longitudinally (on each side), and forming rather irregular upper borders to the oblique stripes. The first segment is unmarked; the second third and fourth have black dots in a row on each side of the mid-dorsal area, these dots continuing as the dots forming the upper end of the black bars above the oblique stripes. The first thoracic spiracle has a small black mark in front and a larger one behind it. The horn is nearly straight, curved very slightly backwards; the middle portion is black at the front, the base brown, the sides greenish at the base, the apex yellow, with the extreme tip black. By the evening of November 18th. the larva had attained

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a length of 48 mm at rest, and it then ceased feeding and moulted for the fourth time at midday on Nov. 21st.

Immediately after this moult the ground colour was a mottled grey-green; spiracles black; a continuous but irregular pale line below the spiracles; oblique stripes pale green; head pale yellow striped with pale green; anal flap pale yellow-green; anal claspers pale grey-green; horn pale pink-green, curved backwards, 7 mm long; dorsal plate on first segment pale grey-green; thoracic legs pinkish, and mandibles black. Five hours later the general ground colour had darkened considerably to black, mottled with grey and faintly tinged with green. The green stripes on the head became black, so that the head was yellow and black striped. The dorsal plate was black in the middle and on each side, and the oblique lateral stripes were very indistinct, except at their extreme upper (rear) end where there was a white spot. The horn was completely black except at the extreme base behind, where it was grey-green. The anal flap was grey-green, but the anal claspers were strongly marked with black. The lateral line below the spiracles was pure white. When annoyed or disturbed the larva jerks the head and fore part of the body sideways, and sometimes ejects a greenish fluid from the mouth.

By November 28th. the larva had grown to a length of 85 to 90 mm, and the general colour had become deep sepia, faintly mottled with brown. The head had become black and brown; the white spots on the oblique stripes had become light brown and the white line below the spiracles had become tinged with brown. The oblique stripes were still very indistinct, being only noticeable in that the brown mottling was paler below than above. Dorsal plate dark brown. A light brown stripe commences on the dorsal plate on either side of the mid-dorsal area, and continues to segment three, where it becomes broken up into a series of light brown spots, and is continued to the horn as the light brown spots at the upper (rear) end of each oblique stripe. Around the insertion of the horn the colour is deep sepia in front, mottled brown at the sides and behind. The anal flap is light brown, with

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the middle of the basal area mottled brown. All the legs and claspers are dark sepia, but the palpi are dull white. As the larva becomes full-grown the dark sepia ground colour becomes slightly paler, and the brown spots also pale and become more noticeable. Each segment is made up of eight sub-segments, the first of which is the widest and is plain sepia and contains the large pale brown spots forming the upper (rear) end of each oblique lateral stripe, and also a smaller less distinct spot on each side of the mid-dorsal area. The other sub-segments are fairly evenly mottled. When full-grown the sub-spiracular stripe is a very pale brown.

On December 3rd. the larva attained a length of 105 mm at rest, 110 mm when crawling, and was still feeding voraciously. On December 4th. it made only a few small meals, and by 6 p.m. it had ceased feeding and commenced its wanderings. Observation continued until 11 p.m. during the whole of which time it was crawling round and round the cage at an average speed of 1 foot per minute. Observation ceased at 11 p.m. at which time it was still crawling, so that it covered a distance of at least 100 yards.

By next morning it had ceased wandering, and had evidently made one or two experimental borings, as the head and thoracic segments were covered with peat dust. It started its final burrowing some time during the afternoon of December 5th., and disappeared under the surface at about 6.45 p.m.



Nov. 29th.
 $\frac{3}{4}$ Natural
Size.

D.A.A.