ADDITIONAL NOTES ON THE LIFE-HISTORY OF *ARCTIA*
PHALERATA, HARR.

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In the December number, 1900, of this journal, page 369, the writer published the life-history of the above Arctian. During the past summer, through the kindness of Mr. A. Kwiat, of Chicago, in forwarding eggs of *A. phalerata* (laid 18th June), I have had the opportunity of still further studying this species, and, as these larvæ varied considerably from those described in 1900, the following notes were made:

In the larval stages i, ii and iii those bred in 1901 answered well to my former descriptions. In stage iv the larvæ were not so black as the specimens reared the previous year, but many of them showed the dorsal stripe. This stripe was also present in stage v, besides which 40 of the larvæ possessed a series of pale orange spots on sides between tubercles ii and iii, and iii and iv, and the skin of the body in a line with the upper spots (between tubercles ii and iii) was slightly grayish, not black like the rest of the skin; this and the spots gave the appearance of a faint lateral band, distinguishable on all segments but 2 and 13. In stage v in 1900 none of the larvæ showed the dorsal stripe. In stage vi last season all of the 123 specimens, with the exception of 2, showed a distinct orange dorsal stripe, but in a few specimens this was faint. In 1900 the specimens did not show a dorsal stripe in this stage. In stage vii the larvæ were much larger the past season than those bred the previous year. The mature larvæ in July, 1900, measured 30 mm. at rest; those in July, 1901, averaged 42 mm. in length, and all the specimens but 9 showed the distinct dorsal stripe, expanded in the middle of each segment, or the series of elongated spots noted in my previous description of this stage. In many of the larvæ the stripe was present on all the segments, but was particularly wide and distinct on segments 5 to 13, inclusive.

In stage vi in 1900 the width of the head averaged from 2.0 to 2.4 mm. The past year some of the heads were 2.6 mm. wide. In stage vii also in 1900 the width of the head, as given in my description, was 2.5 to 2.8 mm. In July, 1901, the widest head measured 3.4 mm. The chief variation in the mature larvæ bred the past season was in the colour of the bristles. In many specimens the bristles from all the tubercles, with the exception of a few short bristles from the tubercles above the spiracles, were of a decidedly pale grayish colour, tipped with black; in

others the bristles were more of a yellowish tinge, those from tubercles on segments 2, 3 and 4 being slightly rusty. In these specimens the skin of the body was not so black, and did not have the velvety appearance which the larvæ with the black bristles from dorsal tubercles had. In some larvæ all the bristles, with the exception of a few black ones from tubercles above spiracles, were a pale rust-red, those from tubercles on segments 2, 3 and 4 being brighter. In most cases the bristles from tubercles above spiracles of larvæ bred in 1900 were black, the only exception being that in some specimens all the dorsal tubercles bore a very few bristles of a dark rusty colour; none, however, possessed any pale grayish or yellowish bristles as above mentioned.

On the 14th July, 1901, some of the specimens had changed to pupæ, and on the 23rd July the first moths emerged. Early in August 2 males and 2 females, which had just emerged, were placed in a cage out of doors, and another batch of eggs were secured. These hatched in due course, and about 32 of the larvæ passed through all their stages by the 1st September, and by the 14th and 15th the first moths of this brood appeared, the date of the last emergence being 14th October. The larvæ which did not pupate, having showed signs of hibernation, were placed in a cool cellar on the 21st October, to be afterwards put outside for the winter.

In 1900 there was a remarkable lack of variation in the moths bred, but this cannot be said of those reared the past year. While the majority, however, did not show any material variation, yet in some specimens the W mark on the primaries was indistinct, and in a few moths (females), nearly obsolete. In fact, there was much variation as to the width of all the bands on the primaries. In some specimens these were quite wide, in others the bands were narrow. Then, again, the colour of the secondaries in four of the females reared was quite yellow, almost as yellow as the secondaries of the males. In the moths of the two broods bred the past season, the black edging of the primaries in both sexes was more in evidence than those reared in 1900.

South Kensington Museum loses a distinguished lepidopterist in Dr. A. G. Butler, the head of the entomological section, who retires under the age limit after nearly forty years' connection with the zoological department. Dr. Butler is a great authority on African butterflies, and he has also won world-wide reputation as an enthusiastic ornithologist. It is stated that his successor will be Sir George Hampson.—*London, Eng., Daily Telegraph.*