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A NATURAL HYBRID BUTTERFLY OF THE GENUS
VANESSA IN NEW ZEALAND

by

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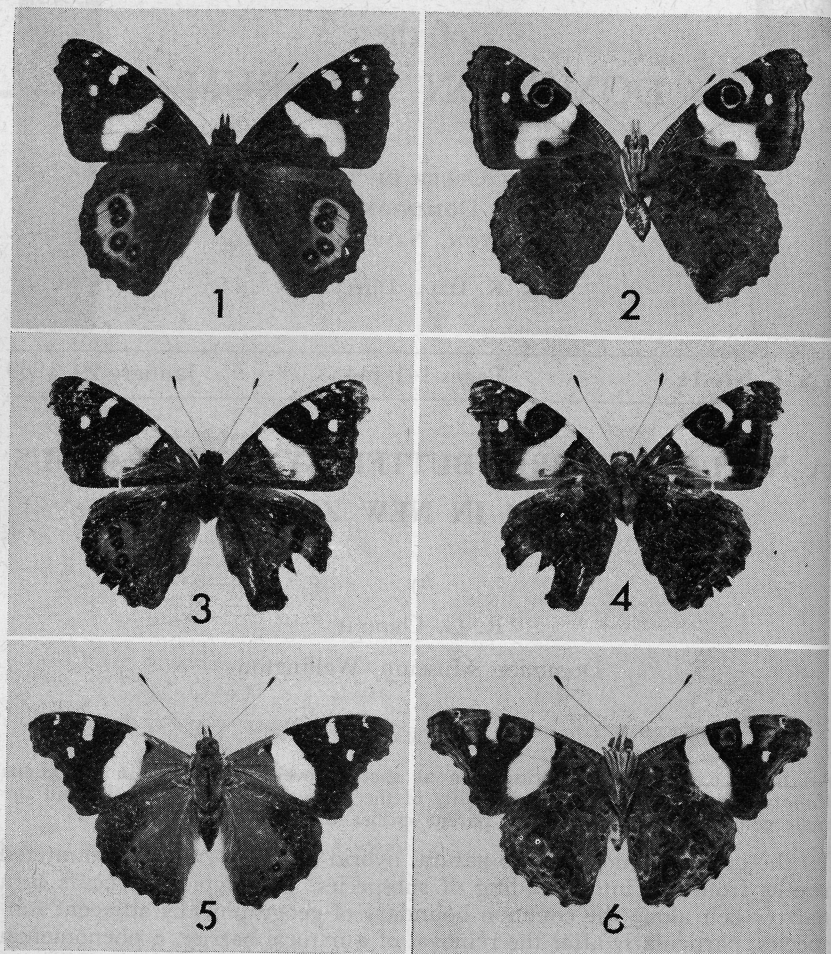
Dominion Museum, Wellington

SUMMARY

AN instance of natural hybridization at species level is recorded in the genus *Vanessa* (Nymphalidae), the variability of the parent species is discussed and the male genitalia of the hybrid and parent species are figured.

IN the order Lepidoptera the natural hybrid that is normally encountered results from the inter-breeding of subspecies. This typically occurs in a narrow belt along the common boundary of geographically adjacent subspecies, particularly after the removal of a natural barrier, a phenomenon described by E. B. Ford (1945) and E. Mayr (1963). The possibility of hybridization at species level is clearly demonstrated, by the experimental work of Clark and Sheppard (1964), for example, and hybrids at generic level have also been produced in the laboratory. Speaking of the Sphingid genus *Celerio*, Wigglesworth (1939), has drawn attention to the tendency for only male hybrids to complete development. While induced hybrids are well documented, existing collections indicate that natural hybrids at species level are seldom collected and in view of the current interest it seems worthwhile to record a New Zealand example.

Occurring in New Zealand is the Red Admiral *Vanessa gonerilla* (Fabre) an endemic species, and the Yellow Admiral *Vanessa itea* (Fabre), which also occurs in Australia. There are many parts of New Zealand where one or other species is dominant but the association of the two species is common and G. V. Hudson (1928) has discussed their habit of engaging in "aerial battle". In December 1965 Mr. P. J. Waddington collected several specimens of each species at Petone, Wellington, and among them was a male hybrid specimen which is now in the



Dorsal surface

Ventral surface

1 & 2 *Vanessa gonerilla*; 3 & 4 *V. gonerilla* x *itea* hybrid; 5 & 6 *V. itea*

Photographs — John B. Turner

collection of the Dominion Museum, Wellington. In most respects its colouring is intermediate between those of the parent species and dorsally, the blue marginal spots of the hind wings and the discal patch of the forewings are good examples. The marginal spots are intermediate in size, while the discal patch is narrow anteriorly as in *V. gonerilla*, but broadened posteriorly as in *V. itea*. The hybrid also bears yellow scales anteriorly as in *V. itea* but orange scales posteriorly. The colouring of the hybrid wing tip is also mixed. Although reduced, the outer blue spots, which occur on *V. gonerilla* but not on *itea*, are present. The proximal white spot of *V. gonerilla* is present instead of the yellow spot of *itea* but the lower white spot is plain as in *V. itea* and not ringed in blue as in *gonerilla*. The wing outline of the hybrid is exactly intermediate. On the

hind wing the blue spots are positioned on an orange patch which has neither the sharp outline of *V. gonerilla* nor the completely merged condition of *V. itea*. On the ventral surface there is a greater similarity between the parent species but nonetheless the blending of their colour patterns in the hybrid is quite apparent.

This intermediate condition is also reflected in the sclerotized parts of the genitalia of the hybrid which are fully developed. The apex of the cucullus is intermediate between the large blunt form of *V. gonerilla* and the smaller acute form of *V. itea*. Similarly the costal lobe of the cucullus is neither as large and blunt as in *V. gonerilla* nor as acute as in *V. itea*. The aedeagus and the lobes of the sacculus are also intermediate. Induced hybrids typically exhibit blending of colouring and wing shape, and the hybrid nature of this specimen seems quite straightforward, but



7 Male genitalia, (caudal) *Vanessa gonerilla* (Fabre); 8 Male genitalia, (caudal) *V. itea* (Fabre); 9 Male genitalia, (caudal) *V. gonerilla* x *itea* hybrid.

variation within the parent species should be considered. Museum collections of these species show that while *V. itea* is very consistent in its colouring, *V. gonerilla* is a little more variable. Many specimens from the Chatham Islands have a yellow to brown overtone, and Mr T. H. Davies (pers. comm.) has drawn the author's attention to a form with pale hind wings which he collected, together with the usual dark form, at Puketitiri, Hawke's Bay. Having collected regularly in the area for the past seven years, Mr Davies first captured this pale form in October 1965 and caught it again in October of the following year. He reports that his series shows a gradual spread of the silver white area across the wing surface from its base. The variety is not, however, confined to this locality, and none of the variants approach the hybrid condition.

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