

of June. If, however, any of the last brood of larvae, instead of at once beginning hibernation, incline to feed for two or three weeks, there is plenty of time before severe frosts come to do so and reach the third moult, at which time, in all five-moulting species that I have experimented on, the hibernation occurs, if at all. In such case the larvae would also awake in May, and would reach the butterfly stage two or three weeks earlier than the 25th of June. If any of the summer brood of larvae hibernate after their third moult (a fact which I had no opportunity to establish), then the larvae of both broods would awake at the same time and become butterflies at the same time, making the summer brood. It is to be observed that the several stages of the same brood of larvae do not occur in exactly the same periods of time. From eggs laid on the same day, by the same female, some of the larvae hatched will reach chrysalis several days before others. In the larger *Argynnis* there will be such a difference, amounting to two or three weeks. Therefore some of the larvae which hibernate at the third moult may be retarded so that their butterflies shall emerge contemporaneously with those which proceed from the larvae that hibernate as soon as they leave the egg. The case is parallel with that of *Phyciodes nycteis* and with that of *Apatura celtis*, both double-brooded species, both discovering larvae from the summer brood which hibernate when half grown, while a part of the brood go on to chrysalis and give the fall brood of butterflies, these again producing larvae which also hibernate. (In both these the last hibernation begins after the larva is half grown, the third moult in *nycteis*, the second in *celtis*.) Mr. Scudder has made a hypothetical case which is precisely the actual case that I have set forth above. He says: "Should the season be so long that the *second brood could lay eggs*, the caterpillars would then be forced to hibernate as those of the aestival series and become members of that series the next year. Thus the vernal series would continually feed the aestival," &c. Moreover, in no species do the several preparatory stages of its members run even. On the contrary, in any, whether single or double brooded, there will be found by different females eggs freshly laid, eggs ready to hatch, young larvae and mature larvae, all at the same time. By this means there is kept up for a long period, often for weeks, a succession of newly emerged butterflies of the same brood, and the newer and older are constantly mating. On one day in September of this year I cut a branch of Wild Senna (*cassia*), on which at the moment were newly laid eggs of *Terias nicippe*, larvae in every stage of growth, and a butterfly of the same species just emerged and still resting on the empty shell of its chrysalis.