

constantly in the butterflies changed by cold, as related, it is common in this region, predominating over the other varieties. It is also found more or less as far north as New York, though there it is not common. And moreover its distinctive peculiarity of color is seen in the allied species *phaon*, inhabiting the Gulf States, and in *vesta*, Texas, which in some degree replace *tharos* in those regions. Both these are seasonally dimorphic, and both are restricted in the winter form, so far as I can learn, to the single phase denoted by B in *tharos*. And in their summer generations, both have a close resemblance to the summer *tharos*, though owing to the increased number of summer generations in the extreme south, permitted by the length of the season, there are phases of the summer form in these species not observable in higher latitudes. It is noteworthy that these two species, the only ones, excepting *Batesii*, on the Atlantic slope especially near to *tharos* (and what *Batesii* is, whether it is not another variety of the winter form of *tharos*, is not yet settled), should be seasonally dimorphic, while of the many other species of the genus belonging to our fauna, not one, so far as is known, shows any marked difference between its winter and summer generation.

The significance of these phenomena I take to be this: when *phaon* and *vesta* and *tharos* were as yet only varieties of one species, the sole coloration was similar to that now common to the three. As they gradually became permanent, or in other words, as these varieties became species, *tharos* was giving rise to several sub-varieties, some of them in time to become distinct and well marked, while the other two, *phaon* and *vesta*, remained constant. As the climate moderated and the summer became longer, each species came to have a summer generation; and in these the resemblance of blood-relationship is still manifest. As the winter generations of each species had been much alike, so the summer generations sprung from them were much alike.

And if we consider the metropolis of the species *tharos*, or perhaps the parent species back of that, at the time when it had but one annual generation, to have been somewhere between 37° and 40° on the Atlantic slope, and within which limits all the varieties and sub-varieties of both winter and summer forms of *tharos* are now found in amazing luxuriance, we can see how it is possible, as the glacial cold receded, that only part of the varieties of the winter form might spread to the northward, and but one of them at last reach the sub boreal regions, and hold possession to this day as the sole representative of the species. And at a very early