

the season when they were abundant. The chief interest of the subject, however, centres in the fact that some species are *always* rare. Sometimes this may be partly accounted for by the scarcity of the food plant, or by their being subject to attacks of parasites to an unusual degree, but still there may be other reasons. Are such species dying out? And will they in a comparatively short time become extinct from purely natural causes? It is generally admitted that all animals receive at birth a vital impetus, sufficient to ensure their living for a certain period of time, which varies in length according to the species. That is, when not tainted by hereditary disease. This impetus carries each individual through a certain progress of growth, maturity and old age, provided accident or fatal illness does not intervene. In the case of man, this period is about seventy years. Yet we know that many a man, blessed with a vigorous constitution, is as strong and healthy at eighty as others are at sixty, a result due in a great measure to a difference in inherent vitality. This is the case with animals, including insects. The latter live out their allotted time and die of old age, just as men do. Sir John Lubbock describes the death of his pet wasp as being evidently from this cause. And here, I may say that the Hymenoptera have among them insects which live longer than any other in the perfect state. Sir John Lubbock has had ants seven years old in his formicaries. Now, as there is an individual vitality in animals, giving to each a certain life period, which varies according to the species, may there not also be a specific vitality? May not species, as well as individuals, have an allotted time, and grow old and die? If such is the case, insects would give the best opportunities of studying the subject. The rapidity of the changes they pass through, and the quick succession of generations, would lead us to expect that, in a comparatively short time, many species might run their course, and become extinct from mere loss of specific vitality. The speculation is an interesting one, but its value will not be proved for a long time to come. I lately met, however, with an item in an old number of the "Zoologist," (page 7095) which seems to have some bearing on the subject. It is a communication from Dr. Wallace to the Entomological Society of London, and reads as follows:

*Remarks on the occurrence of Rarer British Sphingidae.*

"The fact that in many female Sphingidae

captured in Great Britain and Ireland, in the autumn months, no *ora* have been found, induces the question as to whether some species may or may not be continuously indigenous. Many think that the absence of *ora* in the female is merely a question of time, as in the case of *A. atropos*, the females of which, notoriously devoid of eggs in the forced autumn specimens, are found in June depositing *ora*, whence the brood is perpetuated. Others maintain that it is a question not of time only, but also of place; for taking *S. concoloranti*, females of which are constantly taken in the autumn months, almost invariably without eggs (in 1846 and 1859 the species occurred most freely; one individual took nearly fifty specimens in 1859, all the females of which were destitute of *ora*). In this case either a female is hatched in the autumn with eggs, hibernates and deposits *ora* in the spring, or emerges in the spring from the *pupa*, or else specimens fly over from abroad and deposit *ora* in this country. I would ask has *S. concoloranti* ever been taken or observed in the spring or early summer in this country, and if so in what condition or of what sex? Are we to look for a development of females of *D. lineata* without eggs, in the autumn months, if a hot summer intervenes? A series of observations carefully made as to time, place, condition, sex, and also as to the complete development of sexual organs of any or all of the rare Sphingidae, would help to resolve the question. I commend it to the attention of entomologists." The interesting fact here stated is, that numbers of females among the rarer Sphingidae in England, taken in autumn, are destitute of *ora*, and consequently incapable of continuing the species. Dr. Wallace seems to imply that hot weather is a cause of the phenomenon, the absence of *ora* being a result of the forcing process. May there not be other and more important causes working with this to bring about such a remarkable result? From what we know of the development of insects, the effect of an abnormal degree of heat, (within certain limits) on the *pupa*, is merely to hasten the appearance of the *imago*, and not to interfere with the perfection of its organs. It seems probable, therefore, that this failure in the due development of these most important organs is owing to a weakness in the specific vitality of these moths, tending to their complete extinction. A strong instance is that of *S. concoloranti*. Dr. Wallace asks if it has ever been taken in the