

The theory now proposed is a considerable modification of this one, in it supposes that the contents of the central body did not take place until it was partially consolidated, and had attained nearly its present dimensions.

I do not pretend, in these remarks, to have thoroughly discussed the cases of the other planets, and have only drawn attention to a few salient features; in the paper itself the subject is considered at greater length. It will, however, I think, be admitted that the theory agrees with some considerable facts in the solar system.

G. H. DARWIN

THE SEXUAL COLOURS OF CERTAIN BUTTERFLIES

DR. SCHULTZ, of Pirmasensville, has called my attention to the beautiful colours which appear on all the wings of a butterfly, the *Dionides bellina*, when looked at from one point of view. The two sexes of this butterfly differ widely in colour. The wings of the male, when viewed from behind, are black with six marks of pure white, and they present an elegant appearance; but when viewed in front, in which position, as Dr. Schultz remarks, the male would be seen by the female when approaching her, the white marks are surrounded by a halo of beautiful blue. Mr. Decker, also, showed me in the British Museum an analogous and more striking case in the genus *Agapanis*, in which the sexes likewise differ in colour, and in the male the same magnificent ground blue tint is visible only to a person standing in front. Again with *Dionides* the hind wings of the male in its normal species of a fine golden yellow, but only when viewed in front; this holds good with *C. auripennis* but here we have a partial deception, as was pointed out to me by Mr. Decker, for the hind wings when viewed from behind change from a golden tint into a pale bluish blue. Whether this latter colour has any special meaning could be discovered only by some one observing the behaviour of the male in its native home. Insects when at rest close their wings, and their lower surface, which are often obscurely checked, can then alone be seen; and this it is generally admitted, serves as a protection. But the male, when courting the female, obviously departs, and raises their wings, thus displaying the brilliantly coloured upper surface; and it seems the safest inference that they act in this manner in order to show to them or to the female. In the cases above described this inference is rendered much more probable, as the tail beauty of the male can be seen by the female only when he advances towards her. We are thus reminded of the elaborate and diversified manner in which the male of many birds, for instance the peacock, eyes pheasant, &c., display their wonderful plumage to the poorer advantage before their unadorned female.

The construction of these cases leads me to add a few remarks on how far conclusions necessarily drawn therefrom in the first appointment of certain instincts, including sexual display; for as all the males of the same species behave in the same manner whilst courting for their sex, we may infer that the display is at least now instinctive. How unnecessary appear to believe that every detail was at first minutely performed; but this seems to me a common conclusion in many cases, though true in others. Beads, when minutely examined, assume strange shapes and ruffs their handles; and if the structure of the beads in some particular manner were advantageously made whilst courting the female, those do not seem only very improbably in the offspring which inherited this action being favoured; and we know that odd tricks and new postures performed unconsciously are often inherited by man. We may take a different class (which I believe has been already advanced by some one), that of young ground birds which open and hide themselves when in danger immediately after emerging from the egg;

and here it seems hardly possible that the habit could have been consciously acquired just after birth without any experience. But if those young birds which remained motionless when frightened, were chosen preserved from means of prey than those which tried to escape, the habit of squatting might have been acquired without any consciousness on the part of the young birds. This squatting applies with special force to those young wading and water birds, the old of which do not conceal themselves when in danger. Again a lone partridge when there is danger flies a short distance from her young ones and leaves them closely grouped; she then flutters along the ground as if crippled, in the weakest manner which is familiar to almost every one; but differently from a really wounded bird, she makes herself conspicuous. Now I venture then to doubt whether any bird ever existed with sufficient intellect to think that if she induced the actions of an injured bird she would draw away a dog or other enemy from her young ones; for this proposition, that she had observed such actions in an injured animal and knew that they would tempt an enemy to pursue. Many naturalists now admit that, for instance, the bludge of a shell has been formed by the preservation and inheritance of successive useful variations, the individuals with a somewhat better constructed shell being preserved in greater numbers than those with a less well constructed one; and why should not beneficial variations in the inherited actions of a partridge be preserved by the same means, without any thought or conscious intention on her part any more than on the part of the mollusc, the bludge of whose shell has been modified and improved independently of consciousness. CHASLES DARWIN
Down, December 26, 1879

NOTES

We are much pleased to be able to announce that the Committee of the British Association for the Exploration of Greece have secured the services of Dr. L. E. Haldim, Professor of History at Glasgow, as naturalist. Besides many other qualifications for the post Dr. Haldim has recently taken part in the execution of a similar piece of work as one of the naturalists attached to the station for the observation of the Transit of Venus at Rodriguez. Dr. Haldim will leave for Achaia on the 25th inst., and proceed thence to Patras.

It. FERRAZ, the head of the French Survey, has been appointed a Member of the Academy of Sciences. It may be remembered that M. Ferraz is a commander on the staff, and has just accomplished one of the greatest problems that at present, the connection of the South of Spain with the Alpine provinces of Cors. M. Ferraz is a supporter of M. Houssier's scheme, and his appointment is considered likely to accelerate the work of the survey for the great Sahara Survey.

We are pleased to see that a movement is on foot to erect an additional natural history museum in Paris, as a memorial to the late Sir Thomas Monroville, president of the Peruvian National History Society. From a statement sent us by Dr. Buchanan White, we notice that the capitalists have a rational idea of what such an institution should be, and their scheme is a comprehensible one, having in view the education of the citizens of the richest town, as well as the collection of objects of natural history connected with the country. A generous citizen of Paris, M. Robert Deller, offers part of the ground which it is estimated the building will cost.

M. K. LAROUSSE, a well-known French geographer, has invented an instrument or descriptive geographical game, to which he gives the name of "Tour du Monde." It is played on a large terrestrial globe divided into 232 spherical rectangles, each of which has a number, corresponding to a number on a die,