

provide for itself, the Nauplius has become degraded into a mere skin; in *Ligia* this larva-skin has lost the traces of limbs, and in *Philoscia* it is scarcely demonstrable."

Once more, the Echinodermata in most cases "go through a very well-marked metamorphosis, which often has more than one larval stage. The distinctive character of the metamorphosis appears to be the possession by the larvæ of at least a mouth and pharynx, which, whether absorbed or cast off, is never converted into the corresponding organs of the perfect Echinoderm developed inside of the provisional organism. The mass of more or less differentiated sarcode, of which the larva, or pseud-embryo, as opposed to the Echinoderm within it, is made up, always carries upon its exterior certain bilaterally-arranged ciliated bands, by the action of which the whole organism is moved from place to place, and it may be strengthened by the superaddition to it of a framework of calcareous rods."*

Thus Fig. 39 represents a larva of *Echino-cidaris*, after Muller;† The body is transparent, $\frac{1}{6}$ in length, shaped somewhat like a double easel, but with two long horns in front, which, as well as the posterior processes, are supported by calcareous rods. These larvæ swim by means of minute vibratile hairs, or ciliæ. They have a mouth, stomach, and in fact, a well-defined alimentary canal, but no nerves or other organs have yet been discovered in them. After swimming about in this condition for awhile, they begin to show signs of change. An involution of the integument takes place on one side of the back, so as to form a pit or tube, which continues to deepen till it reaches a mass or store of what is called blastema, or, as we may say, the raw material of the animal body. This blastema then begins to grow, and gradually assumes the form of the perfect Echinoderm. In doing so it surrounds and adopts the stomach of the larva, but forms for itself a new mouth or gullet, throwing off the old mouth, together with the intestine, the calcareous rods, and in fact all the rest of the body of the larva.

Fig. 40 represents a larva probably of *Echinus lividus*, from the Mediterranean, and shows the commencement of the sea egg within the body of the larva. The capital letters denote the different arms, *a* is the mouth, *a'* the œsophagus, *b* the stomach, *b'* the intestine, *f* the ciliated lobes or epaulets, *c* the young sea-egg.

JOHN LUBBOCK

(To be continued.)

EXTIRPATION BY COLLECTORS OF RARE PLANTS AND ANIMALS

THE Legislature, having very properly provided for the preservation of small birds, might extend its protection to other animals and to plants; for although it would be inexpedient to prevent individuals from taking rare insects and botanical specimens, it is surely expedient to deter persons or societies from offering premiums which are leading to the extirpation of such species.

Some years ago a judicious and formal protest against this culpable practice was published by many of the most eminent British botanists, and it has constantly been deplored by all true lovers of natural science. The respected president (the Rev. Dr. Mitchinson) of our East Kent Natural History Society, in his address at the last annual meeting thereof at Canterbury, made such strong observations on the subject as might raise the question whether local societies may not do as much harm by promoting the extirpation of rare plants and animals as good in other respects; and I have always been insisting, at the meetings of the same society and elsewhere, that it is our duty to cherish, and not destroy the precious plants and animals of the

* "Rolleston—"Forms of Animal Life," p. 246.

† Über die Gattungen der Seeigellarven. Siebente Abhandlung. Kon. Akad. d. Wiss. zu Berlin. Von Joh. Müller, 1855, Pl. iii. fig. 3.

district. Whenever a rare plant or animal is exhibited at those meetings, we have always a wail about its having been "not long since often seen, though now fast disappearing." A chief cause of this is the deplorable rapacity of collectors of and traffickers in specimens; since the preposterous notion prevails that botany and entomology consist in a recognition of the mere physiognomy, without the least regard to the physiology, of species, and being able to call them by their scientific names.

And so it will be while local societies continue to encourage such errors, instead of promulgating the essential principles of botanical or entomological science, and obstructing the injurious operations of mere collectors or pretenders. And this desirable end, so far as regards taxonomy, might be easily attained without the least harm to rare species. Prizes for the best display, illustrated by microscopic drawings and preparations of the generic and specific characters of sections or the whole of many natural orders would afford really good tests of the industry and attainments of the candidates. For example, why not try for this purpose the Willows, Grasses, or Sedges? Two of these orders have the further recommendation of being of great economic value. Again, as specific distinctions seem to be the ultimate aim of these societies, certain cells or tissues, such as the pollen, epidermis, hairs, and stomata, would afford good subjects for investigation in this point of view, as would also raphides and other plant-crystals, and very likely disclose valuable characters not yet recognised in the books of systematic botany.

I have been led to these remarks by the increasing frequency of the practice now deplored. As the "West Kent Natural History, Microscopical, and Photographic Society" is much and deservedly respected, and exercises justly considerable influence in its department, an extract from its last "Council's Report," p. 19, will suffice as a sample of the mischief:—"With a view to promote the study of Entomology and Botany among the members of the Society and their families, the Council, in the early part of the year, announced their intention of giving two prizes of 5*l.* 5*s.* each, one for the best Botanical collection, the other for the best collection of Lepidopterous Insects; all specimens to be gathered or taken within the West Kent district." This quotation is by no means intended for blame to any particular society, but merely as an example taken from one of the printed "Reports" that has lately reached me of what is still being sown broadcast generally throughout the country.

And here we have plainly not only a reward of money for the best collection of plants and Lepidoptera in a given district, but a temptation or inducement to unscrupulous collectors, in their anxiety to win the prize and defeat their competitors, to destroy such rare specimens as they may not take away. Such nefarious conduct is not meant to be insinuated of the West Kent Society; but my object is simply to assert that which I know has too often been the effect of such prizes, and to invoke the aid of NATURE in suppressing the evil.

GEORGE GULLIVER

A FRENCH PHYSICAL SOCIETY

THE scientific movement increases in France; it began about the end of the Empire, under the ministry of Duruy, and has since taken greater proportions, especially after the last war. The new French Association for the Advancement of Science,* it is well known, is modelled after the British Association, the success of which has surpassed expectation.

The physicists of Paris have assembled for several years in the laboratories of the Superior Normal School, placed at their disposal by M. Berlin, the director of the scientific studies of this school. They conversed about physics

* See NATURE, vol. v. p. 357.