tory feet, with enormous respiratory vesicles, and with scarcely any setæ. 6. The male and female reproductive apparatus. I have discovered the male of *L. trigonellus* and rediscovered that of *L. lamellatus*; they differ from the females by their smaller size, their more elongated body, and by the considerable size of the antennæ of the first pair. The essential part of the reproductive organs consists of a membranous sac on the inner surface of the penultimate joint of the tail, containing two sacciform glands, slightly constricted in the middle, and each furnished with a wide and short excretory duct; these two ducts open at the base of the caudal lamina. Spermatozoids are frequently met with in the fecundated females; these are, like those of the *Daphniæ*, fusiform bodies with a membranous border. The female apparatus of the *Lyncei* greatly resembles that of the *Daphniæ*; the winter eggs, which the incubatory cavity contains at certain periods of the year, are not enclosed in a common *ephippium*, but there is a membranous capsule or distinct *ephippium* for each egg.

Straus Dürckheim, in a memoir which has justly become celebrated, has given in much detail the anatomy of *Cypris fusca*; but he had never seen anything but ovaries in the individuals which he examined, which led him, like Ramdohr, Treviranus, and many others, to regard the *Cyprides* as hermaphrodites. In 1850, M. Zenker indicated the existence of distinct males. In 1854 he described in detail their sexual organs—consisting of two testes represented by masses of cæcal tubes, of two cylindrical glands of very complicated structure (*glandulæ mucosæ*), the secretion from which serves to form the spermatophores, and, lastly, of two corneous sacs, enclosing a corneous penis and hooks, or excitative organs, which are also corneous.

Having myself rediscovered the males of *Cypris monacha*, and studied great numbers of the females and young of other species, I have been able to verify most of M. Zenker's observations, and to add some new facts to those made known by him.

These new facts are as follows :—The mucus-glands of the male *C. monacha*, contrary to what is stated by M. Zenker, present a temporary sacciform prolongation, which is sometimes found filled with spermatophores. The place of formation of the spermatophores is not the deferent canal of each testis, but the central canal of the corresponding mucus-gland. The free spermatozoids (that is to say, destitute of the envelopes of the spermatophore) may be classed in two groups : those of the first group are filiform, without dilatation of any kind; and those of the second, which are met with in *C. ovum*, and perhaps in *C. punctata*, are furnished at one of their extremities with an inflation, which is constricted in the middle and set on at a right angle upon the principal stem, like the handle of a walking-stick. The copulation of the *Cyprides* appears to take place in the mud. M. Zenker has described, in the females, two pyriform sacs (*receptacula seminis*) in which the spermatozoids are stored up; these, according to him, communicate by two excretory canals with the oviducts. According to my observations, the canals in question simply open at the base of the tail.

Although the young *Cyprides* undergo no metamorphosis like those of a great number of other Crustacea, I have found that the form of the valves in the young of many species is the opposite of that observed in the adults.

Bosc and Straus succeeded in keeping *Cyprides* in wet mud for a period of time which they do not particularize. I have repeated the same experiment, and found that this time did not exceed eight days, and that many other small aquatic animals, such as *Cyclops*, *Hydrachna*, *Naïs*, and the larvæ of Diptera, possessed the same power of resisting for a long time a nearly complete privation of water.

V.—*Description of a Siliceous Sand-Sponge found on the South-east Coast of Arabia.* By H. J. Carter, F.R.S. &c.

Tethya dactyloidea (mihi).

Mammilliform, elongated, date-shaped, fixed, erect, fleshy, tough; surface smooth above, becoming hispid with recurved spines below; colour reddish brown, purplish. Upper extremity obtuse, round, perforated at the point by a circular aperture or vent separated into five divisions by as many septa extending from the circumference to a central union. Lower extremity terminating in a bundle of loose, soft, spiculiferous, keratose filaments, which, tending to a spiral arrangement, finally spread out root-like into the sand beneath. Hollow internally for the purpose of receiving the contents of the excretory system of canals, which, ramifying through the cortical fleshy body, thus empty themselves into the cloacal cavity, somewhat constricted at the vent, already described. Spicules fusiform, pointed at each end, or with one extremity terminating in a trifid extension. Body of sponge $1\frac{4}{8}$ inch long and $\frac{6}{8}$ inch broad; pedicel 1 inch long.

Hab. Sea, south-east coast of Arabia, in shallow sandy bottom near shore.

Obs. This is a siliceous sponge growing erect on the sand,

to which it is attached by a loose flocculent bundle of filaments partially twisted into a spiral arrangement, either from the effect of currents or the instinct of the organism, or both. More detail I cannot offer, as I have given away the specimen.

There is a bright yellow sponge of the same kind, but growing in groups on the sandy bottom of the Mahim estuary, off the Island of Bombay. Of this I possess no record whatever; and the specimens were given away with that of *Tethya dactyloidea*.

I found many specimens of *Tethya* on the south-east coast of Arabia, opposite to Ras Abu Ashrin, close to the north-east end of the Island of Masira, where the land presents an expanse, unbounded to the view, of white, dome-shaped, calcareous sand-hills, upwards of 100 feet high, forming the southern part of the great Desert of Akhaf, with a very shallow shore and soft sandy bottom extending for many miles out to sea. Some of the specimens were alive, others dead, some floating and free, others fixed to the few black basaltic rocks which here and there skirt this otherwise all-white and desolate coast, but most among the exuviæ in the little bay at this point, where, upon the stoneless and barren strand, lay heaped together a mass of drift, looking more like an accumulation of great bushes than zoophytes, which on my arrival they proved to be.

Here I saw more *Tethyadæ* than on any other part of the coast. Those which were growing on the rocks adhered with such pertinacity, and were so rigid and unyielding in structure, that I could only get them off piece by piece with a hammer and chisel. Like Actiniæ, molestation appeared to increase their rigidity.

It might be assumed that the soft sandy nature of the shore and sea-bottom on this part of the coast of Arabia is peculiarly well adapted for the habitat of sponges generally and zoophytes, of which the enormous amount of drift on the strand bore ample testimony.

The specimens of *Tethya*, as already stated, are found globular and floating, or hemispherical and fixed to the rocks, or shaped like the one above described, throwing out a number of radical fibres coral-like into the sand beneath, thus differing from those Spongiadæ which seek a purer situation on the sloping or undersides of rocks, where foreign particles fall off rather than upon them.

Calcareous Sponges.

The spicules of *Grantia ciliata* among the Calcareous Sponges, as well as those of *Gorgonia* and those of *Operculina arabica* among the Foraminifera that I have examined, have no central canal, in which they thus decidedly differ from the spicules of the Siliceous Sponges.

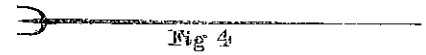

Fig 4

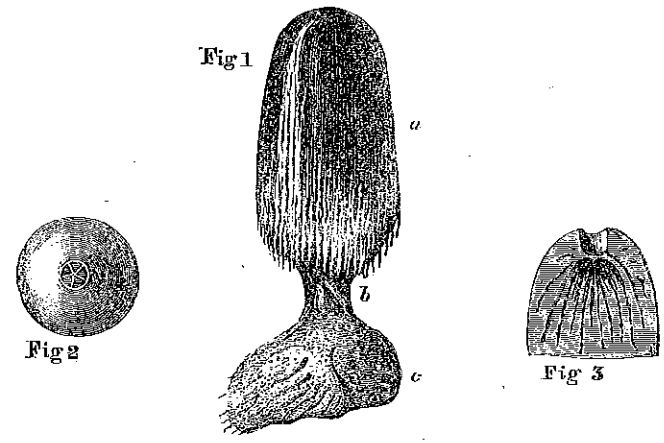

Fig. 1. *Tethya dactyloidea*, natural size: *a*, body; *b*, pedicel; *c*, root, or filamentous extension into the sand.
Fig. 2. Upper extremity, showing vent septated.
Fig. 3. Vertical section of same, showing vent, cloacal cavity, and termination of excretory canals.
Fig. 4. Trifid spicule.

VI.—*Descriptions of several new Species of Nymphalidian Rhopalocera.* By Arthur G. Butler, F.L.S., F.Z.S., &c.

[Plate IX.]

The following species would, according to the arrangement of Lepidoptera given in Westwood & Hewitson's 'Genera of Diurnal Lepidoptera,' belong to three distinct families; but these divisions, according to Bates, must be regarded as subfamilies of one large group.

Family **Nymphalidæ** (Westwood, *part.*), Bates.

Subfamily *Heliconinæ*, Bates.

Genus Heliconius, Fabricius.

1. *Heliconius Zelinde*, sp. nov. Pl. IX. fig. 1.

♂. Alæ supra fuscæ, area basali nigrescente certo situ cærulescente: