in a very elegant manner in the form of a double comb, possess very strong outlines in a great part of the retina. The retina of the Plagiostoma also, both Sharks and Rays, contains fibres of a breadth of as much as 0·01 mill., which exhibit all the characters of the varicose fibres with double outlines which occur in the nervous centres. Lastly, I have observed that in the eyes of many Dogs, the optic nerve is still white at its entrance into the eye, and that it is only in the retina that the nervous fibres become pale and transparent. But the change takes place very soon after the entrance of the optic nerve, whilst in the fishes just mentioned, the fibres with double outlines extend over a great part of the retina, and only pass by degrees to the aspect of the pale fibres. In a physiological point of view it is remarkable that in the Fishes of which I am speaking, notwithstanding the double outlines of the nervous fibres, the retina appears to be tolerably transparent during life, whilst in the Rabbits and Dogs it is opaque and white, in the whole extent of the fibres with double outlines. In the former case the influence upon the sight does not appear to be important, but in the latter the perception of light must be hindered or disturbed as far as this peculiarity of the fibres extends; and the ophthalmoscopic effect of the bottom of the eye, and especially of the entrance of the optic nerve, must present remarkable modifications in all the animals in which a state similar to that which has long been known in the Rabbit exists.—*Comptes Rendus*, Oct. 20, 1856, p. 743.

Remarks on Nika edulis, *Risso*. By William Thompson.

The possession of a healthy specimen of *Nika edulis* has enabled me to offer the following remarks, which, I trust, may add something new to what is already known of this species.

The first specimen I obtained by dredging on the 2nd July, 1853. I find by my notes, which were made at the time, that it was a female, and in spawn; the ova were darkish green, the animal itself was of a cream colour, and spotted with red dots; the spots were of different sizes, perfectly round, and rather thickly and regularly placed. This specimen was dead before I examined it, and this will account for the difference of colour as contrasted with the specimen, the more immediate subject of the present paper. I had previously obtained one specimen, and a third specimen, also in spawn, was brought to me on the 20th July, 1855; the ova were bright green, and the animal of a cream colour. This specimen was dead when examined.

The subject of the present paper was brought to me alive by my dredger on the 21st February in this year, and lived three weeks. It was dredged in Weymouth Bay, near the mouth of the harbour. The colour in this living specimen was very different from that of the dead specimens I had previously obtained. When first brought to me, the whole animal was a light greenish-drab, irregularly and thinly sprinkled with pure white stars; the carapace and covering of the abdomen were alike transparent, and the intestines could be easily

seen beneath. I could also detect the breathing apparatus placed on each side at the back of the mouth; the movement was similar to that of a long rope when gently waved at one end. After a few days' confinement it changed colour: five or six broadish bands of a lovely rose colour appeared, the bands of colour being restricted to the back portion of each segment of the body; the tail also changed to the same rosy hue, but in the course of two or three days the animal again assumed its original colour. I have noticed this change of colour in many of the *Palæmonidæ* and *Crangonidæ*, and I believe it to arise from the transparency of the cuticle enabling any change in the body itself to be seen through it, and that the change of colouring of the body is occasioned by fear or some instinct. In all the specimens of *Nika* I have obtained the shell is soft as in a new-moulted Prawn, and in piercing them with a fine pin for preserving, the shell bends before it. Is this of any value as a generic character? M. Milne-Edwards says they resemble *Athanas* "in possessing but a small rostrum;" they also resemble them in their mode of locomotion, as they then carry the external pedipalps and first pair of feet extended before them in a line with their body; their movements are also slow and deliberate, and they appear to progress by walking and not by swimming; when alarmed they shoot backwards by striking forward with their tail, as is the habit of all the long-tailed Crustaceans.

I now proceed to lay before you the information I have obtained as to its habits.

I may assert that *Nika* is essentially a burrowing genus. I was not prepared to find it so, as I considered its slender limbs and its prominent eyes but ill-adapted for the purpose; however, we live and learn, and I have learned that practice is far better than theory; had I relied on the latter I should have insisted that *Nika edulis* was not a burrower.

In accordance with a plan which I have formed of attempting to study the habits of any of our rarer marine animals I may have the good fortune to meet with, I placed my prisoner in a vase with a few weeds and some pebbles, that being the nature of the ground on which it was dredged; I left it in this vessel for two days, and found out it was not at home, and, in fact, that a pebbly bottom was not its choice. I therefore removed it to a large earthenware pan in which I had previously placed a few weeds, having filled it also to the depth of three inches with coarse gravel; I then left it for an hour, and on examining the vessel I could not find my friend; I searched on the table, thinking it might have thrown itself out, but it was without success; I turned over the stones and weeds, and with the like result. I then commenced turning over the gravel, and at last found that *Nika edulis* was a burrowing Crustacean. I accordingly transferred it for facility of observation to a vase, and placing in it the same material, namely, the coarse gravel and weeds, in this gravel it buried itself three several times. Burrowing in this loose material was evidently a difficult matter; it required great patience and perseverance to overcome the difficulty occasioned by the loose gravel constantly falling in on the excavator: it took the animal ten

minutes to burrow to about the depth of three parts of its length. I afterwards transferred it to a vase with sand to the depth of three or four inches at the bottom; in this it quickly disappeared, three minutes sufficing to completely cover itself. In this vase it was that I made the following observations on it.

Its mode of mining is extraordinary: lying at the bottom of the vase, it commenced proceedings by probing the sand around with its third pair of feet, and inserting them to some depth in it; when it found a spot suited for the purpose, that is, free from any large stones, it at once commenced excavating. These operations were carried out by the external pedipalps, which are very long and strong, and also by the first, third and fourth pairs of legs; the second pair of legs, as may be supposed, are for this purpose perfectly useless: they are as much as possible placed out of the way, being bent up snugly with the hand turned backwards: the only motion I could detect was a nervous action in the moveable finger, constantly attempting to clutch objects, but not seizing anything. The fifth pair of feet have a simple though useful office assigned them: it is to support the body in the proper position until the burrowing has progressed sufficiently to enable the burrower to do without their support; they are then immediately called into more active employment, and assist in the work of excavation. The spot for burrowing having been selected, the little animal steadies its body by means of its fifth pair of legs, and this allows the greatest freedom of action to the body. The pedipalps perform a prominent part in the burrowing; the nail on the last joint is curved slightly forward, and the advantage of this is clearly seen, as in digging, the pedipalps are forced into the sand or shingle, and are thus forced forward and outwards, and they prevent the side of the burrow from falling in; the third and fourth pairs of feet are in constant motion, probing the sand and loosening it, thus lightening the labour for the pedipalps; all these movements take place very regularly and at the same time. A small hollow having been made, the animal raises its body by means of its fifth pair of legs to nearly a right angle with the bottom; its eyes, which are very large and carried at right angles with the body, are thus suddenly thrown forward with a spring in a line with the rostrum, and the hollow is surveyed; should it not be of a sufficient depth the body is again lowered and the burrowing continues, the eyes resuming their original position; when the hole is sufficiently deepened, the eyes are again brought forward, the antennæ are thrown back in a line with the body, and the animal forces its head in the hole it has made; this is facilitated by the body being gradually raised by means of the fifth pair of legs; the head being inserted, the burrowing continues with increased energy, and the animal assumes the position as in photograph No. 2; this view shows the sand which has been thrown up accumulated in a heap under the body.

I have occasionally found it continue in this position, but generally it burrows perpendicularly, until only the tips of the antennæ are visible.

I placed my captive in a glass vase, and his having selected the side of the glass for burrowing (probably from the glass forming one firm side to the work), enabled me to watch every movement; the sand appeared to be passed to the mouth of the hole by the legs and false legs, when it filled round the body and filled in as the animal passed downwards. The antennæ are delicately sensitive. I believe this sensitiveness depends on the sense of touch: the slightest contact with them sets the animal in motion (and this when it is buried some depth), using every exertion to burrow deeper. It is evidently a night-feeding genus, as it remained buried and inactive during the day, but the state of the sand in the tank in the morning proved that it had not been idle during the night.

From these facts I am justified in stating that *Nika edulis* is a burrowing species (if not of a burrowing genus), and that its burrowing is only by day to hide itself from its enemies, and not to procure food.

The description I have given of the colouring of this species will be found to be different from that given by Risso, as stated by Mr. Milne-Edwards. I should have great diffidence in differing from these eminent naturalists had I not imagined that their descriptions might have been taken from cabinet specimens. Had I waited to describe my specimen until after its death, I must have described it as it now is, namely, *flesh-red*; I find all the thinner-shelled Crustacea change more or less of a flesh-red, with the exception of the *Crangonidæ*.—*Proc. Zool. Soc.*, April 22, 1856.

NAUCRATES DUCTOR.

To the Editors of the Annals of Natural History.

Falmouth, November 1, 1856.

Gentlemen,—A shoal of the *Naucrates ductor*, Cuv., made its appearance in shallow water, Custom House Pier, on Friday afternoon, Oct. 31, 1856, and more than three dozen of them were caught in nets, baskets, &c., by persons on the beach. I have procured species of this interesting fish every year during my residence in this neighbourhood.

I am, Gentlemen, yours truly,

W. P. Cocks.

On Peculiar and Quasi-spontaneous Movements of the Plasmatic Cells of certain Animals. By Prof. Kölliker.

I have just observed at Nice, upon a fine animal of the family of the compound Ascidians, which according to M. Milne-Edwards has not yet been described, a very peculiar fact, namely, movements of the cells which occur in great number in the gelatinous substance common to the whole bunch and formed of cellulose. These cells, which are round or stellate and of very various forms, have, in the living animal, a slow, but easily perceptible movement, consisting in a constant change of form, so that the same cell, which was at one time round, becomes stellate or fusiform in different degrees, by the