It is now some three or four years since I discovered fibrils, hovering upon the limits of vision aided by the best oil-immersion lenses, which ran from nucleus to nucleus in the retina of vertebrates. The first hints were slowly followed up, and I have now established the fact that all the nuclei of the retina are connected together, by fibrils coming from the intra-nuclear networks, into a nuclear system; that is, into a reticulum of which the individual nuclei are the nodes.

As a student of the retina, my first interest in this nuclear system pervading the cytoplasmic framework turned upon the fact that it might supply us with the hitherto undiscovered link between the retinal nerve strands and the rods. This I have found to be the fact; the full details are described in a paper which I hope shortly to publish.

The importance of this discovery cannot, however, be confined to the retina. Not only have I succeeded in discovering similar inter-nuclear connecting fibrils in other tissues, *e.g.* in the brain, but the simple fact that in the retina they supply the paths for the nerve stimuli shows that they must lie somewhere nearer the basis of the morphology and physiology of protoplasm than we have hitherto succeeded in reaching.

In discussing the nature of this nuclear network and its bearing upon the "cell" doctrine, I have described a number of observations tending to show its relations, on the one hand, to the chromatin stored up in the nuclei, and, on the other, to the cytoplasm which forms the supporting framework of the retina. I have, further, endeavoured to show that it brings fresh light upon more than one difficult problem, for example, on the morphology of nerves and the nature of their peripheral terminations.

Several lines of argument made it almost certain to my mind that a similar nuclear network must also exist in plants, and I have little doubt but that Prof. Macfarlane's suggested continuity of the "hereditary substance" from "cell" to "cell" will ere long be demonstrable under the microscope.

I have suggested the term protomitomic as applicable to this nuclear system, that being as nearly as possible simply descriptive. The nuclear filaments, it is true, seem to supply some of the requirements of Strasburger's hypothetical kinoplastic fibrillar system. But the term kinoplasm, which I should have preferred using, has already passed into current use for structures which may have little or nothing to do with this nuclear connecting system, a preliminary announcement of which I have felt justified in making since my attention was called to Prof. Macfarlane's address.

HENRY M. BERNARD.

Clapham, S.W., March 25.

Beechen Hedges on Elevated Ground.

VISITORS to Buxton, who are observant of trees, have been exercised during the winter by noticing how the smaller beech trees, where isolated, and especially the beechen hedges, where unsheltered, have maintained their foliage through the winter, contrary to the habit of deciduous trees.

The spray enclosed was plucked, this morning, from a tree about 12 ft. high, one of a number similarly clothed, bounding the western side of the pavilion grounds where exposed to the force of the storm winds, and standing at the elevation of the town, about a thousand feet above the sea; and, in the park close at hand, are long lengths of beech hedges exhibiting this appearance. In Ashwood Dale, half a mile away and well sheltered, the larger beeches are as leafless as the lime and the ash.

I see nothing in Kerner's "Natural History of Plants" to account for this departure—this tree being spoken of as constant in dropping its leaves—except the remark that the beech is most resourceful and to be regarded as a "weed" amongst trees, and calculated to oust others, where unhindered by human agency. Is this holding of the leaves, until pushed off by the growing points, to be regarded as a protective device in exceptional circumstances, and is this occurrence observable in young plants in similar elevated and exposed positions?

WM. GEE.

Barlboro' Cottage, Spring Gardens, Buxton, March 31.

Meristic Variation in Trochus *Zizyphinus*.

ON recently examining a number of specimens of *Trochus zizyphinus* collected at Plymouth in September 1900, it was noticed that one specimen exhibited a peculiar abnormality, viz. the presence of two supernumerary eyes on the right side (Fig. 1). On the left side of the animal both cephalic tentacle and ocular peduncle were perfectly normal. The right cephalic tentacle was also normal, and the ocular peduncle of this side, though bearing three eyes, presented only a slight furrow indicating a partial division between the original eye and the two which are secondary and supernumerary (Fig. 2). Several cases of supernumerary eyes in Gasteropods have already been recorded, and in some cases (for example, *Patella*, *Littorina*) duplication of the eye is accompanied by duplication of the cephalic tentacle.

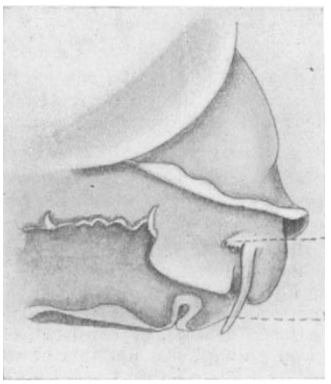

FIG. 1.—Head of abnormal specimen of *Trochus zizyphinus*, seen from the right side.

Double eyes have also been recorded in *Helix*, *Clausilia*, *Phidiana*, *Murex*, and *Sub-emarginula*[1]; in the latter, supernumerary eyes were found on both right and left sides, though in the majority of other cases they were present on one side only. It would thus appear that only double eyes have been so far recorded, and that the presence of three eyes on the right side of this abnormal specimen of Trochus is, apparently, unique. All three eyes are perfectly formed, each being provided with crystalline lens, retina, and optic nerve, thus all of them were, in all probability, functional during life.

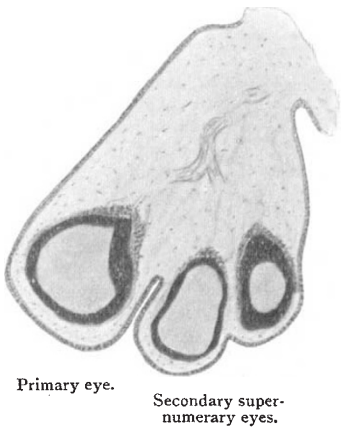

FIG. 2.—Longitudinal section of right ocular peduncle, showing the three eyes in section.

So far as can be made out from the examination of an unfortunately incomplete series of longitudinal sections through the right ocular peduncle, the innervation of the eyes is derived from a single optic nerve arising from the right cerebral ganglion. This nerve bifurcates, one branch going to the primary eye, the other branch again dividing into two, to supply the two secondary supernumerary eyes.

W. B. RANDLES.

Royal College of Science, London, March 25.

[1] For particulars and references, see Bateson's "Materials for the Study of Variation," pp. 279, 280.