

Skye, Perthshire, Folkestone and Hythe, Dartmoor, Cambridge, Oxford, and of course Wilts.

When it is found that a number of well-known species such as those given above can be found with such large ranges of pH , it seems impossible to accept Prof. Labbé's statement that a small increase of pH is responsible for the transition of one species into another.

In this connexion further observations may be cited. I have found *Cyclops fimbriatus* living in three inches of foul muddy water and dredged it up on the same day in 100 feet of clear water from a Scottish loch. Prof. Sars records the dredging of exactly the same species from 300 feet of water. This is by no means an isolated case. In addition, many of the species of *Cyclops* are absolutely cosmopolitan, the same species being recorded from the Arctic Circle to the equator wherever there is fresh water.

As a third kind of direct observation I should add that in a series of experiments on the spine formulæ of *Cyclops lacunæ*, I bred several generations of the well-known species *C. signatus* and *C. albidus*. The description of these experiments is now in the press and full details are given; suffice it to say here that the animals were bred in jars in an incubator, as controls, and that during the experiments the pH gradually went up from 7.2 to 8.6. The spine formulæ were observed as carefully as possible and both species bred absolutely true to type, and I do not know of any more exacting test.

My experiments and observations therefore do not agree with those of Prof. Labbé, and it is surely now almost an established fact that the alterations of pH within reasonable limits have little or no direct effect on freshwater entomostraca or insect larvæ, but a profound effect on most of the protozoa. It is well known of course that certain animals bred in captivity and under abnormal conditions may give rise gradually to a series of monstrosities, e.g. the Chinese gold-fish described by Tornier, but there is nothing in these experiments comparable to the transition of one species into another in Nature.

Finally, there is abundant literature, including that given by Prof. Labbé himself, dealing with the continual change of pH that takes place normally in any exposed piece of water, and since the entomostracan fauna often remains practically unchanged for weeks and in some cases for months, it is surely obvious that most of the species are not affected by small changes of pH , and in some cases they are not affected even by considerable changes.

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'Pwdrre Ser' (The Rot of the Stars).

PERHAPS I may be allowed to reopen a subject which gave rise to a very interesting correspondence in NATURE in 1910. I refer to the mysterious jelly-like substance found lying about in open spaces, and popularly connected with 'shooting-stars,' about which Prof. T. McKenny Hughes contributed an interesting article to these columns on June 23, 1910. Many suggestions as to the origin of this substance were made both by Prof. Hughes and by later correspondents, but no definite conclusion seems to have been reached. Of course it cannot be taken for granted that the 'jelly' is always of the same nature. It may well be that the 'jellies' recorded by some observers were the plasmodia of Myxomycetes, or masses of Nostoc or some other organism. But it seems to have been suggested so early as 1667 by Merrett that the jelly consisted of the viscera of frogs.

He says (I quote from Prof. Hughes) ". . . Regiæ Societati palam ostendi solummodo oriri ex intestinis ranarum a corvis in unum locum congestis, quod aliis etiam ejusdem societatis viri praestantissimi postea confirmarunt."

The German observer Melsheimer, again, as was pointed out in these columns by Dr. G. H. Pethybridge, considered the jelly to be the remains of the oviducts of frogs. Melsheimer (*Jahresber. Westfälischen Provinzial-Vereins für Wiss. u. Kunst*, Münster, Sitzung February 28, 1908, p. 53) believed that these were left on the ground, or thrown up undigested, by some animal which devoured frogs, such as the heron, polecat, or water-vole. He also carried out experiments which showed that the oviducts of frogs, if dissected out and exposed to moisture, formed just such masses of jelly, and in some cases eventually became covered with colonies of algæ of the type of Nostoc.

I am in a position to state that the explanation offered by these writers is, at least in some instances, the correct one. My father, the Rev. F. Baylis, who has for some years visited Dartmoor during the summer and autumn, has both last year and this found such jelly-like masses lying on the moor. This year he has forwarded his 'finds' to me for examination, and I have been able to satisfy myself that they consist of parts of the viscera of either frogs or toads. In one specimen the 'jelly' was accompanied by portions of both oviducts in a fair state of preservation, with part of the ovaries, containing the characteristic black eggs, resembling shot, and with the greater part of the animal's alimentary canal, to which the urinary bladder was attached.

What appears to happen is that the gelatinous secretion of the glands lining the oviducts, when exposed to moisture, swells up to such an extent that the oviducts split open longitudinally, and their contents soon assume the appearance of an amorphous jelly. With advancing decomposition, the jelly persists for some time, but the tissue from which it originated may become unrecognisable. I have carefully examined stained microscopic preparations of the tissue, which was on this occasion comparatively fresh, and compared them with similar preparations of the wall of the oviduct of a known frog, supplied by my colleague, Mr. H. W. Parker. By this means both Mr. Parker and myself were able to satisfy ourselves completely that the tissues were of the same kind. From the fact that the stomach, which evidently belonged to the same animal, contained recognisable remains of a fairly large earthworm, I am inclined to believe that the animal was a toad rather than a frog.

The question now arises: How do the viscera of toads or frogs come to be lying on the ground in such situations? One specimen came from near the top of a 'tor.' If the animal had been swallowed by a heron or other bird, and its remains disgorged, it seems probable that these soft parts would have been digested more rapidly than the muscular and bony portions, of which there is no trace. I am inclined, therefore, to believe that some carnivorous creature (such as the weasel, stoat, badger, crow, or buzzard) is in the habit of disembowelling toads or frogs, and leaving some of the viscera on the site of the 'kill.' It would be interesting to know whether any direct observations have been made which bear upon this question.

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