

companions, which latter journeyed northward, following the course of the retirement of the main ice-sheet. They had found in elevation their congenial climate; and they have followed this gradually to the top of the mountain, which they have now attained and from which they cannot now retreat. Far off in Labrador the descendants of their ancestral companions fly over wide stretches of country, while they appear to be in prison on the top of a mountain. I conceive that in this way the mountains may generally have secured their alpine animals. The Glacial period cannot strictly be said to have expired; it exists even now for high levels above the sea, while the Esquimaux finds it yet enduring in the far north. Had other conditions been favourable, we might now find Arctic man living on snow-capped mountains within the temperate zone.

At a height of from 5600 to 6200 feet above the level of the sea, and a mean temperature of about 48 degrees during a short summer, the White-Mountain butterflies (*Eneis semidea*) yet enjoy a climate like that of Labrador within the limits of New Hampshire. And in the case of moths an analogous state of things exists. The species *Anarta melanopa* is found on Mount Washington, the Rocky Mountains, and Labrador. *Agrotis islandica* is found in Iceland, Labrador, the White Mountains, and perhaps in Colorado. As on islands in the air these insects have been left by the retiring ice-flood during the opening of the Quaternary.

On inferior elevations (as on Mount Katahdin, in Maine), where we now find no *Eneis* butterflies, these may formerly have existed, succumbing to a climate gradually increasing in warmth from which they had no escape; while the original colonization, in the several instances, must have always greatly depended upon local topography.

I have briefly endeavoured to show that the present distribution of certain insects may have been brought about by the phenomena attendant on the Glacial period. The discussion of matters connected with this theoretical period of the earth's history thus brings out more and more clearly, as it now appears, the fact of its actuality. I hope that my present statements may draw the attention of our zoologists more to the matter, seeing that we have in our own country fields for its full exploration.—*Silliman's American Journal*, Nov. 1875.

On the Reproduction of the Eels. By M. C. DARESTE.

Last year M. Syrski considerably advanced the question of the reproduction of the eels, by showing that in certain eels there exist in the place of the female reproductive organs, some organs of quite different form and structure. M. Syrski regards these as male reproductive organs. The description which he gives of their form and structure renders his opinion very probable. It must, however, be added that M. Syrski could not ascertain the existence of spermatozoids in these organs, the proof of which alone could serve to demonstrate certainly their true nature.

The eels in which M. Syrski discovered what he regards as the male organs, differ from the others by several characters, and especially by their small size and the great volume of their eyes.

Having been engaged during last year in a revision of the Anguilliform fishes, I have been able to ascertain the correctness of the facts announced by M. Syrski; and I have convinced myself that in many individuals of the species *Anguilla vulgaris* there exist, in place of the ovaries, organs of very different form and structure, which are very probably the male organs. I have also ascertained that these individuals differed from the others by their small size and their large eyes. They all belong to the variety known in France as the *Anguille pimperneau*, which does not ascend rivers, but remains always at their mouths, and at the expense of which Kaup has formed three distinct species under the names of *Anguilla Cuvieri*, *A. Bibroni*, and *A. Savignyi*. As I have hitherto been unable to investigate these animals elsewhere than in the collection of the museum and in individuals preserved in alcohol, I could not, any more than M. Syrski, detect the presence of spermatozoids; but for many reasons, which I cannot here develop, I share his opinion as to the testicular nature of the organs discovered by him.

There is, however, one point upon which I cannot agree with M. Syrski; and it is that these small eels, of the variety called *pimperneau*, do not exclusively belong to the male sex. I have ascertained the existence of perfectly well-characterized ovaries in several individuals belonging to this variety.

From this observation it follows that the *Anguille pimperneau*, an essentially marine variety which does not ascend rivers, possesses both sexes; while those which ascend rivers and which belong to the varieties called *Latirostres* and *Acutirostres* present only female individuals, in which, however, the ova never arrive at maturity, and consequently they always remain barren.

The eels of North America do not differ specifically from those of Europe; and we find there the same varieties of form. That which represents our *pimperneau*, and which Kaup has described under the name of *Anguilla novæ aurelianensis*, has furnished me with the form of reproductive organs which I regard as belonging to the male sex.

The species *Anguilla vulgaris* would therefore present a sexual form (the *pimperneau*) and several sterile forms. This very remarkable fact, however, is not isolated in fishes, since we meet with analogous facts in the carp.

I have found these male organs in some individuals of another species of eel, *Anguilla marmorata*, which belongs to the Indian Ocean. Here the deficiency of materials has prevented my ascertaining the existence of a completely sexual form and of sterile forms.—*Comptes Rendus*, July 19, 1875, p. 159.



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