(*e*) By the endings *ensis* and *iensis* to a geographical name, as *timorensis, timoriensis.*

Art. 36: Omit from the examples—*Macrodon, Microdon; cœruleus, cœruleus, ceruleus; silvestris, sylvestris, silvaticus, sylvaticus; littoralis, litoralis; autumnalis, auctumnalis; dama, damma.*

Appendix F: In the English and German texts, substitute the words *transliteration* and *transliterated* for *transcription* and *transcribed.*

Appendix G: In all three texts, substitute *paragraph* for *rules,* and omit from the heading in French text the words *Regles de la.*

Italian Translation.—The commission has voted to issue an official Italian edition of the international rules.

CH. WARDELL STILES,
Secretary of Commission

SPECIAL ARTICLES

PRELIMINARY NOTE ON THE PERMEABILITY TO SALTS OF THE GILL MEMBRANES OF A FISH

IT is known that when marine fishes are placed in fresh water there is a gain in weight supposed to be due to the absorption of water. Sumner (1905) has obtained evidence tending to show that the water enters the body chiefly through the gill membranes. Experiments by one of the authors of this note tend to confirm this. Sumner (1905) has also compared the chlorine content of such fishes (analyzing the ash obtained by fusing the entire fish) with the chlorine content of the normal fish and has reported a loss in chlorine, indicating that while there was a movement of the fresh water into the body of the fish through the gills there was at the same time a passage of salts outward—in other words the gill membranes seemed to be permeable to salts.

In a series of experiments carried out at the Biological Laboratory of the U. S. Bureau of Fisheries at Woods Hole, Mass., the authors have obtained further evidence along this line, experiments of the following nature being most significant. A quantity of blood was taken from the caudal artery of a large specimen of *Mustelis canis.* The specimen was then placed in a sea-water tank (the caudal part of the body not being immersed and loss of blood being prevented) and a stream of fresh water was then turned into the tank, the salt water being turned off so that it was replaced by the fresh water in about fifteen minutes. The specimen was kept in this fresh water for thirty minutes, when a second sample of blood was obtained from the caudal artery. The specimen was then returned to the fresh water for forty-five more minutes and a third sample was then taken. Analysis of the blood was begun in each case immediately after the sample was obtained. Following are the results:

Sample 1. Normal blood (*i.e.,* from fish just taken from sea-water).

Sample 2. Blood from same specimen after immersion in salt-fresh to fresh water for 45 minutes.

Sample 3. Blood from same specimen after immersion in fresh water for 45 minutes more.

GRAMS PER 1,000 GRAMS OF BLOOD

	Water	Organic Matter	Chlorides
Sample 1 =	868	118	6.041
Sample 2 =	881	110	4.132
Sample 3 =	885	104	3.590

The greater amount of water in the second sample shows a dilution of the blood. The blood is further diluted in the third sample. There is no question then about the absorption of water. Since the blood is diluted we should expect to find less organic matter. This decrease is shown in the second column and was obtained by subtracting the weight of the ashed sample from the weight of the dried sample and reducing to grams per 1,000. The actual amount of chlorides was obtained by the Volhard method and then reduced to grams per 1,000. The results are shown in the third column. Since we should expect a diminution of the salts, provided water is added to the blood, the diminution shown above may be partially explained in this way. But it can be seen at a glance that the chlorine reduction is out of proportion to the decrease in organic matter. If the organic matter is reduced from 118 to 110 by simple dilution, to get the same degree of dilution the chlorides would be reduced from 6.041 to 5.631 grams per 1,000. As a matter of fact, the actual amount of chlorides found was 4.132 grams per 1,000 or 27 per cent. less than if it were a case of simple dilution. Again applying the same method to the third sample, if it were a case of dilution alone we should expect 5.324 grams per 1,000 grams blood, whereas analysis shows but 3.590 grams, or about 33 per cent. less chlorides than if it were a case of simple dilution. The salts would not disappear in the tissues, for if anything the tissues would be surrendering their salts to the blood stream in an endeavor to keep up the osmotic pressure of the blood. We are therefore forced to conclude that the chlorides passed out through the gills—in other words, the gills are permeable to salts.

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PÆDOGENESIS IN TANYTARSUS

As the phenomenon of pædogenesis in the Chironomidæ is rarely observed, it may be of interest to zoologists to know that we have a species of rather wide distribution in which this mode of reproduction seems to be of common occurrence. In the summer of 1903 at Ithaca, New York, while studying the Chironomidæ, I several times came upon the larva of *Tanytarsus dissimilis,* which, when placed in a tumbler of tap water gave rise to a number of individuals. The same year the late Dr. Fletcher, dominion entomologist, sent me some adults of the same species for identification which he said had developed pædogenetically.

This summer at Orono, Maine, I found a number of them in a jar in which some *Dixa* larvæ were kept. They appear to have been the progeny of a larva introduced by chance. One individual of this generation after careful examination was transferred to another jar containing distilled water, a bit of sterilized vegetable débris serving as food. These precautions were taken in order to prevent eggs or small larvæ being carried over. After about two weeks a number of minute trails were observed, each containing a young *Tanytarsus* larva, a new generation appearing simultaneously also in the first jar. Though I have reared many species of *Chironomidæ,* I have never observed this method of reproduction in any other species. In this connection it is interesting to note that Professor Zavrel quite recently ('07) published an account of pædogenesis in *Tanytarsus* occurring in Bohemia. It is quite possible that the species with which Grimm worked also belonged to the same genus.

The larvæ are usually to be found in the mud and sediment in pools where *Anopheles* might live. Jars containing cultures of Protozoa are sometimes seen with a number of the characteristic trails or tubes of *Tanytarsus* larvæ on the sides of the glass. The tube is composed of fragments of decaying plant tissue and is usually several times longer than the larva which inhabits it. If the tube be disturbed the insect wriggles out and swims away by violent contortions of its body. When full grown it is about 3.5 mm. long, of a pale amber color and is readily distinguished from other related forms by its relatively long, non-retractile antennæ and the form of its mouth parts. The pupa is characterized by the arrangement of the setæ on the dorsum of the abdominal segments, most readily seen in a cast skin. The adult is about 1.5 mm. in length, yellowish-green in color with three brown thoracic stripes, and though common enough, owing to its small size is but rarely seen. More extended descriptions of the three stages may be found in Bulletin 86, New York State Museum (1905).

I have long delayed publishing my notes on this insect thinking that I might sooner or later chance upon larvæ in which the young were developing, but as lack of time prevents my making a systematic search I now write this in the hope that it may put someone else upon the track of this interesting species.

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