

Moreover, since the terminology of the mouth-parts in Crustacea is, in the majority of cases, only based upon their relative position, and not upon their development, I do not think it is impossible to regard the true larval kidney of Cirripedes (the pseudo-kidney in the adult) as homologous in a general way with the shell-gland of the other Crustacea.—*Comptes Rendus*, t. exix. no. 26 (December 24, 1894), pp. 1228–1230.

On the Formation of New Colonies by Termites lucifugus.

By J. PÉREZ.

Although the biology of the European and exotic Termites has engaged the attention of numerous zoologists, some of whom are of the highest rank, the origin of the societies of these insects still remains enveloped in complete obscurity. Neither de Quatrefages nor Lespès has observed the swarms of sexual individuals which at certain periods escape from the galleries, and to which has been attributed the mission of founding new colonies. Fritz Müller even goes so far as expressly to deny that they perform such a function. He writes as follows:—"As to the males and females of *Calotermes*, I will not absolutely refuse to admit that they possess the capability of continuing to exist by themselves and of commencing a new settlement. In the case of all species of *Termes*, *Eutermes*, and *Anoplotermes*, however, with whose mode of life I am to some extent acquainted, a winged pair would undertake the foundation of a new colony with precisely the same success as a pair of new-born children deposited upon a desert island" ('*Jenaische Zeitschrift*,' Bd. vii. 1873, p. 458, note 1).

In spite of so absolute a denial on the part of the eminent zoologist just quoted, it is, I think, evident that a social species devoid of the faculty of disseminating itself at a distance would be doomed to fatal and early disappearance. Dissemination must and does exist in the Termites.

When a nest has furnished a swarm of winged males and females there are always to be found in the proximity of the colony, or even about the orifice of exit, a few stray individuals which have lost their wings. They go, as a rule, in pairs, the one following the other very closely. The leader is invariably a female, while her follower is a male. When these couples are captured they speedily perish, unless they are kept under natural conditions, which apparently has never been done.

My own method of proceeding is as follows:—In a large jar containing a certain quantity of earth is placed a block of old dead wood, it matters little whether of oak, fir, or elm. More earth is then added, so as to surround the lower part of the wood to a height of several centimetres. One or more pairs of Termites, which are then placed upon the wood, quickly creep between it and the earth, and take up their abode in some depression, either underneath or upon the sides of the buried portion of the wood. A few drops of water added from time to time, so as to restore the moisture which is lost by evaporation, are sufficient to keep everything in its proper

condition. The jar should remain open, to avoid mould. The insects, moreover, never make the slightest attempt to escape.

Under these conditions the Termites live very well. At the end of from two to three weeks it may be seen that they have selected a domicile between the earth and the wood, and that they have also been feeding. Their abdomens, which were formerly flat, are now slightly convex. They are very lively and extremely active. The narrow space wherein they are living, closed on every side, contains a little fine woody powder, coming from the wood the surface of which has been attacked. Later on they have attacked it more directly at some point or other, and have commenced to excavate in it the commencement of a gallery.

Some pairs obtained on April 29 in the present year were alive and in perfect health on July 4. They had manifestly increased in size, and in their swollen and distended abdomens the intersegmental membranes appeared as fine white borders separating the black disks of the segments. The bulkier abdomens of certain specimens clearly distinguished them as females.

On August 30 the Termites were still thoroughly alive, but somewhat difficult to discover, since they had penetrated deeper into the wood, and were lodged in a globular chamber, to which access was given by a narrow orifice in connexion with the surrounding earth. The white abdominal rings were broader, and the black disks were entirely separated one from another.

On October 15 I found in one of my jars six sexual Termites assembled in the same cavity, which a slight splitting of the wood had revealed. With them were two young workers, which had very recently emerged, since they were of very small size, especially one of them, whose transparent body showed no ingested matter in the alimentary canal. At one point of the wall was attached a large egg. As for the adults, they were still in perfect condition, but were less active than formerly and obstinately shunned the light. The females, however, appeared scarcely more distended than in the month of August, and their abdomens were still far from the monstrous proportions observed in the case of the normal queens of the old nests. This difference is easily explained by the as yet moderate development of the ovaries, which, at the outset of their functional activity, are capable of furnishing only a very limited number of eggs.

Be this as it may, it is already proved by this experiment that the winged Termites issuing from the swarms are perfectly capable of living without the assistance of workers of their own species, and that their pairs develop into king and queen, the founders of a new colony. Thus is to be explained the fact that the winged individuals are always sexually immature, and have never been seen *in coitú*: they do not arrive at sexual maturity until after a somewhat lengthy interval, the duration of which my observations enable me to fix at five or six months.—*Comptes Rendus*, t. cxix. no. 19 (November 5, 1894), pp. 804–806.



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