An Interesting Case of Maternal Care in an Aquatic Cockroach, *Phlebonotus pallens* Serv. (Epilamprinæ).

INSTANCES of maternal care are rarely met with outside the order Hymenoptera. It is, therefore, of great interest to record an example from among the cockroaches.

Shelford in his book entitled "A Naturalist in Borneo" mentioned that in the two viviparous species of cockroaches, namely, *Pseudophoraspis nebulosa* and *Phlebonotus pallens*, the newly hatched nymphs swarm on to the body of the mother and cling there.

On the 12th June 1929, I collected a female specimen of *Phlebonotus pallens* near the edge of the water channel of a small stream about six miles from Yercaud (4,500 ft.), Shevroy hills, South India. At the time of collection the specimen showed no extraordinary features and was preserved in spirit along with other aquatic fauna collected from the locality. Recently when the collected material was being sorted by my assistant, Mr. S. Rebiero, it was noticed that this cockroach had about one dozen young ones under its wings, while some were lying loose in the tube. The young ones were very securely packed under and could easily be seen through the wing covers which were now almost clear. A photograph of the specimen with some nymphs *in situ* is given in the figure.

The wing covers of the specimen were carefully displaced to ascertain if and how the nymphs were clinging to the body of the mother. All the nymphs were noticed to be quite free from the body of the mother. This also indicates that they most probably do not at this stage take any food from the mother, as is the case in some other insects. The nymphs are yellow or pale brown in colour and have patches of minute stiff dark hairs on several regions of the body.

The female cockroach does not look at all bulky nor was it awkward in its movements when it was carrying the young ones. The wing covers are large and arched and together with the upper side of the abdomen which is depressed from a chamber inside which the nymphs can be carried about comfortably.

In view of the fact that cockroaches have numerous enemies, the habit of carrying the young ones in the fashion described above appears to be a very efficient safeguard for the protection of the progeny. In life, the wing covers are opaque and the young ones lying under them are so nicely packed that the human eye cannot easily detect on superficial examination that the individual is carrying so many young ones on its body. Moreover, as will be readily understood, this habit, in addition to securing the safety of the nymphs against the attacks of enemies, is very useful for dispersing the species.

I am very thankful to Dr. R. Hanitsch of Oxford, who kindly named the cockroach for me.

HEM SINGH PRUTHI.

Zoological Survey of India,
Indian Museum, Calcutta.
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An Unusual Growth Phenomenon in *Coleus barbatus* Benth.

THE Labiate member *Coleus barbatus* Benth. is quite common at high elevations up to 8,000 feet, chiefly in the sub-tropical Himalayas and is rather a hardly herbaceous plant. It grows in rocky situations and its root is tuberous which, according to Cooke,[1] is pickled and eaten by the natives.

In October 1931 (at Naini Tal) while changing pressed plants after a fortnight to fresh drying sheets, certain tiny buds were found jutting out from the region a little above (about 25 mm.) the broken end of the stem of *Coleus barbatus*. The production of buds on dry specimen, specially under such an abnormal condition as that of the plant press, aroused some interest and a close observation was, therefore, made on the very same specimen under similar conditions for a period of about four months.

[1] *The Flora of the Presidency of Bombay*, 2, Part II, 1906.

As a result it was found that the buds continued to grow under the herbarium-sheet and by the end of sixteen weeks each of them had attained a length of about 10 mm. They were, however, vegetative in character. On dissecting one of them out, small leaves were found arranged in the manner as in the ordinary vegetative buds. Owing to their being shaded from light under the herbarium-sheet, the buds had not developed the characteristic green coloration (see photograph). Nevertheless, when exposed to light, they turned green.

Coleus barbatus: The herbarium specimen showing lax central inflorescence and the white vegetative buds (in the black square). × 1/10.

At the same time, it might be mentioned here that the central inflorescence, at the outset, was compact with open flowers. But during the four months that the observations were continued, it was found that the inflorescence-axis also kept on elongating, thus making the whole inflorescence lax (see photograph). The increase in length measured 26 mm. There was, however, no such change observed in the lateral younger inflorescences in which the flower buds had not opened at all.

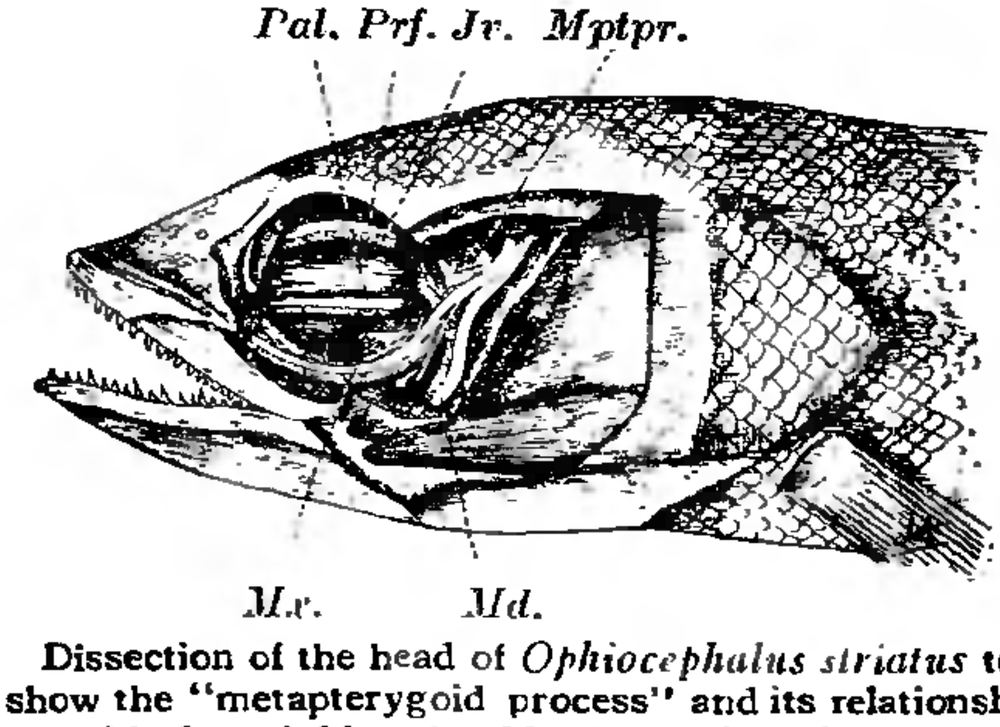
This peculiar behaviour of *Coleus barbatus* is really interesting as it demonstrates the enormous power of endurance of the plant even under the most unfavourable conditions of the plant press with great pressure and lack of water and light.

T. C. N. SINGH.

Department of Botany,
Ravenshaw College,
Cuttack.

The "Metapterygoid Process" in the Skull of *Ophiocephalus striatus*.

ONE of the few interesting cranial features of *Ophiocephalus striatus* is the presence of a flat, prominent metapterygoid process. The palatoquadrate bar articulates with the cranium not only by the palatine in front and through the hyomandibular behind, but also by the metapterygoid process, immediately behind the orbit and in front of the Trigeminofacialis chamber. The upper edge of the process is incompletely ossified. A careful study of this structure in other animals clearly shows that the metapterygoid process is homologous with the "Processus ascendens" of Dipnoi and Tetrapoda. The topographical relations of this process



Dissection of the head of *Ophiocephalus striatus* to show the "metapterygoid process" and its relationship with the neighbouring blood vessels and nerves.

Jv.—Jugular vein. *Mx.*—Maxillary branch of the V nerve. *Md.*—Mandibular branch of the V nerve. *Mptpr.*—Metapterygoid process. *Pal.*—Palatine branch of the VII nerve. *Prf.*—Profundus branch of the V nerve.

and the processus ascendens with the nerves and blood vessels are identical. The profundus branch of the V nerve and the jugular vein (*vena capitis lateralis*) pass on the inner side of the metapterygoid process, while the maxillary and the mandibular branches of the Trigeminal pass on its outer side. This feature of the pterygoquadrate bar has not been so far described among any of the Teleostomi.[1] A complete comparative account of the skulls of various members of the family *Ophiocephalidæ* and *Cyprinidæ* (chiefly *Labeo, Catla, Cirrhina,* etc.) will be shortly published elsewhere.

B. S. BHIMACHAR.

Department of Zoology,
Bangalore,
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[1] E. S. Goodrich, *Studies on the Structure and Development of Vertebrates*, p. 413, London, 1930.