

Letters to the Editor

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NOTES ON POINTS IN SOME OF THIS WEEK'S LETTERS APPEAR ON P. 664.

CORRESPONDENTS ARE INVITED TO ATTACH SIMILAR SUMMARIES TO THEIR COMMUNICATIONS.

Are Termites Descended from True Cockroaches?

MANY authors have given their opinion that the termites or white ants are nothing more than socialised cockroaches; but, so far, definite proof to this effect has been entirely lacking. The nearest approach to any scientific theory of descent is that of Crampton¹, in which the author concludes that the termites come nearest to cockroaches in their morphology and are probably descended from some very remote ancestor, but not from true cockroaches.

but merely includes that portion served by vein 2A and its branches, and folds about a groove (af) lying between 1A and 2A.

The cockroaches, on the other hand, have a complete anal fan which folds in the usual Orthopteroid manner; in addition, that portion served by vein 2A folds up concertina-wise, and lies like a folded fan against vein 1A, under the rest of the wing. As it is clear that the cockroach condition is far more specialised than that of *Mastotermes*, it would seem impossible to derive the termites from cockroaches.

A fortunate discovery in the rather small cockroach fauna of the Kansas Lower Permian has enabled me to solve this problem. Among the material studied, I have found a hindwing of the genus *Pycnoblattina* (a true cockroach of the family Spiloblattinidæ) in which the anal area is completely preserved (Fig. 1). It will be seen at once from Figs. 1 and 2 that, not only is the anal lobe developed and folded exactly as in *Mastotermes*, but also a close correspondence extends to many other details of the venation. In fact, I would go so far as to claim, from this comparison alone, that *Mastotermes*, and therefore the whole order Isoptera, must have been evolved from a form differing very little from the genus *Pycnoblattina* itself. The chief lines of specialisation by which the Isoptera have been evolved are: reduction of the pronotum, lengthening of the wings, reduction of the basal parts of the wing, and development of the humeral suture (Fig. 2, *su*), along which the wings are cast off when shed.

We now see that it is the cockroaches which have gone ahead, since Permian times, in the development of the mode of folding of the hindwing, while the termites at first 'stayed put', like *Mastotermes*, and later eliminated the anal lobe entirely.

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Canberra,
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Feb. 3.

¹ *Bull. Brooklyn Ent. Soc.*, 18, 85-93 (1923).

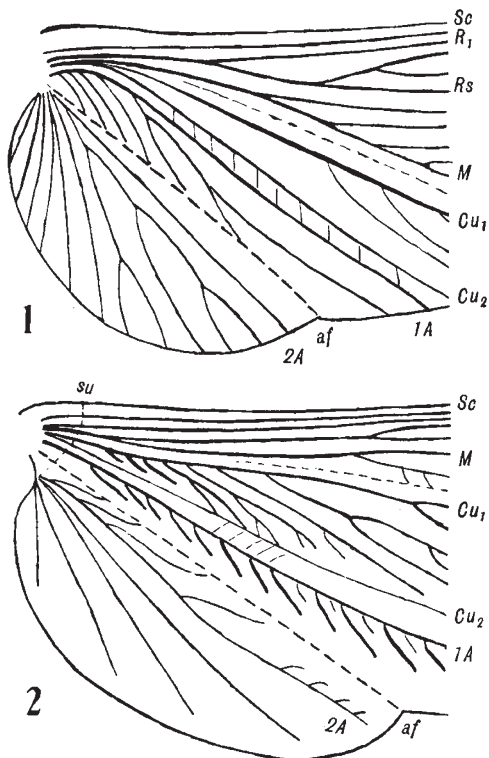


FIG. 1. *Pycnoblattina* sp., hindwing (basal half); Lower Permian of Kansas. FIG. 2. *Mastotermes darwiniensis*, Frog. Recent. North Australia. Usual notation for veins; af, anal fold; su, humeral suture.

It is universally admitted that *Mastotermes*, the giant termite of northern Australia, is the most archaic type by far within the order. Hence a grave difficulty in deriving termites from any other type of insects has been the peculiar method of folding of the hindwing in *Mastotermes* (Fig. 2). Alone among termites, this genus possesses a definite anal lobe, which is not homologous with the anal fan of other Orthopteroids, since it is not the complete anal area, folded about a convex groove between *Cu*₂ and 1A,

The Oil-Drop Method and the Electronic Charge

FOR several years it has seemed to us to be of interest to repeat the oil-drop method in order that this method may have an opportunity of contributing to the building up of the new value of the electronic charge, which is now going on. The only existing prototype, the famous oil-drop experiments of Millikan in 1913 and 1916, seems to predict an internal consistency somewhat less than that of the new spectroscopic X-ray and electron-wave¹ methods.