Another term suggested by Taylor (1978) is 'tubulate', used to indicate a condition shown in many poneroid ants. When the pretergite and presternite of an abdominal segment are broad and are separated from the posttergite and poststernite by a transverse constriction and an incised groove, the segment is said to be tubulate (Figs 1, 6). The term is useful in a general way but it must be borne in mind that, taking the Formicidae as a whole, there are many degrees of development and secondary obliteration of this feature exhibited.

The pretergite and presternite of abdominal segment 3 are usually extremely reduced in size and very specialized, being thickened and collar-like, and fitting tightly into the posterior foramen of the second abdominal segment (petiole) (Figs 1–6. 7, 11, 13, 15). They form part of a complex and very efficient articulation which allows flexion between the second abdominal segment and segments 3 to the apex. I propose a special term for this articulatory collar, the *helcium*, and define it as follows.

> *The helcium is the much-reduced collar-like pretergite and the accompanying presternite of abdominal segment 3, which anteriorly is socketed in, and articulates with, the posterior end of segment 2 (the petiole).*

In taxa such as the Myrmicinae, where abdominal segment 3 is also very reduced in size (postpetiole) the articulatory pretergite plus presternite of segment 4 may also be very small and specialized, and in this condition may be referred to as the second helcium or helcium of abdominal segment 4.

Finally, the tergites and sternites of abdominal segments 2–4 may or may not be fused in ants (segments 5 to apex are always unfused), as was first pointed out by Gotwald (1969). For the purposes of this study 'fused' is defined as the condition in which the tergite and sternite of any given segment either meet edge to edge, or narrowly overlap (tergite over sternite), and are immovably welded together. This may occur throughout the length of the tergosternal junction or may leave a short distance posteriorly where the tergite narrowly overlaps the sternite but fusion is incomplete.

A small to vestigial band of muscle may arise on the poststernite and insert internally on the tergite, but this appears to be functionless. Overlap of the sclerites is minimal and there is no free movement of the sclerites one against the other.

'Unfused' is defined as the condition in which the tergite of any given segment broadly overlaps the sternite and the two are connected only by thin flexible interscleritic membrane and/or dorsoventral bands of muscle arising from the dorsal margin of the poststernite. The two sclerites are free and capable of considerable movement one against the other.

The cerapachyine taxa

The following descriptions of abdominal segments 2–7 are based on the female and worker castes of the cerapachyine taxa. Where males are known they correspond to the females and workers in the characters mentioned, but in general too few are available for study to make any strong contribution to the investigation. The descriptions complement and add to those presented by Brown (1975).

Acanthostichini (*Acanthostichus, Ctenopyga*)
(Figs 4–6)

Abdominal segment 2 (petiole) (Figs 4, 5). In ventral view proprioceptor zone present on sternite anteriorly, in front of subpetiolar process. Laterotergite developed and also visible in profile (Fig. 4), articulating posteriorly with ventral portion of helcial tergite