

NEW FOSSIL INSECT WINGS (PROTOHEMIPTERA, FAMILY MESOTITANIDÆ).

By

KEITH C. McKEOWN,

Assistant Entomologist, The Australian Museum.

(Plates iv-vii, and Figures 1-3.)

THE present paper contains descriptions of a new genus and two species of fossil insects of the family Mesotitanidæ, Order Protohemiptera from the Middle Triassic beds of Beacon Hill, Brookvale, N. S. Wales. They occur in a lenticular mass of shale, about twenty-five feet in thickness, enclosed in the Hawkesbury Sandstone. From the same beds a large series of fishes has been obtained; these have been described by Dr. R. T. Wade.¹ I have also included notes on a fossil wing of *Mesotitan scullyi* Till., which is in a more complete state of preservation than the type specimen.

A few notes regarding *Clatrotitan andersoni*, sp. nov., and its discovery will be of interest. The fossil was collected by Mr. W. Bass, foreman of a brick quarry at Beacon Hill, Brookvale, near Manly, to whose interest this Museum has been indebted for many interesting specimens from time to time. From Mr. Bass the specimen was obtained by Dr. C. Anderson, Director of the Australian Museum.

The specimen is probably one of the most magnificent fossil insect wings in existence, on account of its large size, its beauty and the perfect state of its preservation. From this wing it is possible to estimate that the insect in life attained a wing-span of some twelve inches, but further reconstruction is impossible since we have no indication of the form of its body and appendages. In view of the perfect preservation of the single wing which remains to us, one cannot but regret that some portion, at least, of the body had not been included in the block of stone containing the specimen.

Although the Mesotitanidæ are provisionally included in the order Protohemiptera, doubt has been expressed in some quarters as to their actual affinities, and whether they can validly be considered to have Hemipterous characters. There is no doubt that a study of the venation, and especially of the remarkable "resonating area", should throw considerable light upon this problem.

Had the wing-tip only been preserved, it would have been possible to have prepared a reconstruction of the venation of the remainder on conventional lines, but such a reconstruction would have given not the slightest indication of the remarkable tympanum which occupies the basal two-thirds of the wing—a fact which emphasizes the danger of attempting such reconstructions from a small, and in many cases minute, fossil fragment.

¹ Wade.—The Triassic Fishes of Brookvale, New South Wales. British Museum (Natural History), 1935.

Dr. R. J. Tillyard has suggested that the insect is probably the male of *Mesotitan scullyi*, but in view of the paucity of the fossil material of members of this family that has, as yet, been discovered, and our present knowledge, such a conclusion seems unwarranted, and it has been considered advisable to consider it as a new species, and to erect a new genus for its reception.

I desire to record my sincere thanks to Dr. C. Anderson, Director of the Australian Museum, for permitting me to describe this remarkable specimen, and for his ever willing assistance and advice. I wish, also, to acknowledge indebtedness to Dr. R. J. Tillyard for assistance in solving complexities of venation, Professor L. A. Cotton, University of Sydney, for the loan of material from the Geology Department of the University, Miss N. B. Adams for executing the drawings, the beauty and accuracy of which are a tribute to her patience and skill. To Messrs. H. G. Gooch, University of Sydney, and G. C. Clutton I am indebted for the fine photographs which illustrate this paper.

Family MESOTITANIDÆ Till.

Genus *Clatrotitan*, nov.

Insects of very large size: main venation of wings strong; cross-veins somewhat obliquely arranged in regular single rows. Subcosta and radius nearly parallel and close together. Rs six-branched, pectinate. M two-branched. Cu₁ four-branched, pectinate, Cu₂ nine-branched, pectinate. A large "grid" (probably a resonating area) consisting of three rows of more or less regular oblong cells, traversed by the two branches of M. Cubito-median Y-vein strongly developed. Wings pigmented.

This genus is proposed for the reception of *Clatrotitan andersoni*, sp. nov.

Clatrotitan andersoni, sp. nov.

(Plate iv and Plate v, figs. 1-3; text-figures 1-3.)

The type specimen is a forewing in an extremely fine state of preservation.

Total length of wing 138 mm., indicating a wing expanse of about twelve inches. Greatest breadth 44 mm.

Apex of wing somewhat obtusely pointed slightly nodding. Sc strongly concave, stout, with slender but clearly marked costal veinlets arising throughout its whole length; end of Sc about 15 mm. before apex of wing. R₁ strongly convex, as stout as Sc, running below and subparallel to it and ending just above apex. Rs slender, concave, unbranched until about two-thirds length of wing, when it gives off an obliquely descending pectinate series of fine veins. M with two branches only, viz., M₁₊₂ and M₃₊₄, running subparallel to one another and also to Rs above and Cu₁ below. M₁₊₂ and M₃₊₄ traverse the tympanum, and are unbranched throughout their length and strongly concave. MA is absent. Cubito-median Y-vein strongly developed. Cu₁ markedly convex and terminating in four drooping pectinate branches; it runs subparallel to, and a little above, the well-developed concave Cu₂, which has a strongly descending series of nine pectinate branches. 1A with one branch; 2A unbranched throughout its length; 3A with a pectinate series of descending branches, of which eight are visible (Figs. 1-3).

Archedictyon typical of the known Protohemiptera.

The "grid" or resonating area is a remarkable, somewhat irregularly lenticular area, 62 mm. long by 27 mm. broad, bounded by R₁ and Cu₁. The branches of