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An Australian Fossil Insect Bed Resulting from Cataclysmic Destruction

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Because of the apparent frailty of their bodies, and the ability of many of them to fly, insects are thought of being rarely found as fossils. Any mention of insect fossils though, and most people think of insects spectacularly fossilized in amber.[1] However, insect fossils have also been found preserved in fine-grained sedimentary strata, including those associated with sequences of coal beds.[2]

One world-famous fossil insect bed is that found in the Belmont-Warner's Bay area of Newcastle, approximately 90 miles (145 km) north of central Sydney, Australia.[3] This horizon is about 2 ft. 6 in. (0.75 m) thick, and consists of hard, fine-grained tuffaceous chert. It lies some 70 ft. (20 m) below the bottom of the economically-exploited Fassifern Coal Seam in the upper Newcastle Coal Measures, and thus is conventionally regarded as late Permian at around 250 million years old.[4] Outcrops of the fossil insect bed occur for almost two miles (3.2 km) along a ridge. Its lateral extent has never been traced due to housing estates and industrial developments in the surrounding areas, but it is believed to extend at least six miles (9.6 km) in a one mile (1.6 km) wide belt in a general northwest-southeast direction.

The fine grain size of the tuffaceous chert bed has facilitated the detailed preservation of even the venation in the prolific insect wings entombed therein. Stratification is pronounced and well-defined joints cause the tuffaceous chert to break into rhomb-shaped blocks. In some cases the fresh, grey to black rock is so highly silicified as to be slightly translucent, and all evidence of banding is obliterated. This insect bed is underlain by a 15–18 ft. (4.6–5.5 m) thick sandstone, beneath which is a very prominent bed of coarse, strongly-cemented conglomerate consisting of water-worn pebbles (including pebbles of coal). Fossil wood is abundant in this underlying sandstone, including sections of fossilized tree trunks up to 18 in. (0.46 m) in diameter.

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Fossil insect remains—predominantly wings, but including portions of bodies—were first recognized in this tuffaceous chert in 1898, and subsequently nearly 2000 specimens were collected and registered at The Australian Museum in Sydney.[5] It has been estimated, extrapolating from an average yield of 10–20 fossil insect wings per cubic foot, that there could be some hundreds of millions of fossil insect wings per square mile preserved in this bed.

The diversity of the insect assemblage is equally extraordinary. Some 145 species assigned to 97 genera have been described from this horizon.[6] The Belmont insect fauna is, from an evolutionary perspective, "curiously unbalanced" when compared to that found in rocks of the corresponding geological "age" in the northern hemisphere.[7] No Palaeoptera ("ancient wings"), except an undescribed meganisopteron[8] (large, probably predacious insects resembling dragonflies with 12–75 cm [4.7–29.5 in.] wingspans), no blattoids (cockroaches), and no orthopteroids (straight-winged insects such as grasshoppers, locusts, and crickets) other than a single species of Plecoptera (stoneflies)[9] are known from the Belmont Insect Bed. Only one species of Glosselytrodea (one of the mecopteroids, or insects with wings of equal length, such as the butterflies, moths, and flies) occurs,[10] and one species of Odonata (dragonflies).[11] However, there are about 60 Homoptera (cicadas, leafhoppers, aphids),[12] about fifteen Psocoptera (related to book lice),[13] three families of Neuroptera (lacewings),[14] a few Coleoptera (beetles),[15] and Trichoptera (caddis flies),[16] an abundance (about 30) of Mecoptera (scorpion flies),[17] and a few species (some reassigned) of Diptera (four-winged and two-winged flies).[18] The "earliest" Heteroptera (includes stink bugs, assassin bugs, water bugs, and bed bugs) found anywhere in the world come from this horizon.[19] Furthermore, apart from a single specimen from the late Carboniferous of Tasmania, the insect fauna from the Belmont Insect Bed is the oldest known in Australia.[20]

Of significance is the fact that these insect remains in this tuffaceous chert horizon are associated with plentiful fossil conchostracans (mostly diminutive, branchiopod crustaceans with a bivalved carapace enclosing the whole body, and related to water fleas). Living conchostracans inhabit freshwater environments. A diverse fossil assemblage has been described,[21] a total of 25 species of this group of arthropods being present in this horizon.[22] Fish scales are plentiful in some localities, though no fossil fish have been found.[23] Associated plant remains include *Glossopteris*, *Phyllotheca*, and *Neoggerathiopsis* with occasional *Annularia* and *Sphenopteris*, woody gymnosperm trees, ferns, and horsetails that constitute the flora of the coal seams in the Newcastle Coal Measures, and other southern hemisphere Permian coals. The lower portions of the Belmont Insect Bed possess a coarse texture and are dirty brown to black in color, due to the prevalent comminuted plant remains resembling chopped straw.

Many theories have been advanced to explain how insects might have evolved,[24] beginning with a few wingless groups in Devonian rocks. After a gap in the Lower Carboniferous (Mississippian), there is a sudden explosive "appearance" of winged insects in Upper Carboniferous (Pennsylvanian) and Permian rocks, where representatives of nearly all extant orders are found. There is definitely no evidence of macroevolutionary transitional forms amongst the myriad of fossilized insects found in the Belmont Insect Bed, nor in the insect fossil record as a whole. Insects appear suddenly in the record fully-formed and fully-functional (intelligently designed and created), and after that they just diversify (reproduce after their "kinds"). Yet the relative richness of the insect fossil record is indicated by the 1,087 insect families having a geological history, and the 69% of living families having fossil representatives.

On the other hand, there are only about 790 living insect families, which implies more than 27% of the 1,087 insect families have become extinct. In reality the strata contain a record of death, so graphically evident in this Belmont Insect Bed. Hundreds of millions of insects were suddenly caught in a blanket of volcanic ash catastrophically blasted over them. Wings were ripped from insect bodies, though sometimes bodies without wings and legs, or with parts of only some legs,[25] survived the volcanic blast to be entombed with all the wings. The accumulation of this silicified volcanic ash bed was no slow-and-gradual process in some temporal habitat, for only a catastrophe would have swept together and entombed such an incredible mass of insect parts with the carapaces of countless tiny crustaceans, fish scales, plate remains, and plant "hash." Nor was this volcanic catastrophe some isolated event in the midst of timeless tranquility, but rather a fleeting stage in a far greater watery cataclysm. Directly beneath this volcanic ash bed, deposited over an enormously extensive area, is a coarse, water-worn pebble conglomerate, and sandstone with the fossilized remains of the tree trunks whose violently stripped foliage very soon became the plant remains and "hash" in the volcanic ash. Above, the strata include the great thicknesses of plant debris making up coal seams, buried by further violently transported conglomerate masses.

Thus these swarms of insects, whose original ancestors had been created and then diversified as they had reproduced after their "kinds," were catastrophically destroyed and entombed by a volcanic blast during a watery cataclysm. This Australian fossil insect bed, therefore, bears eloquent testimony to the devastation during the Genesis Flood.

References

1. D. A. Grimaldi, "Captured in Amber," *Scientific American*, 274:4(1996): pp. 70–77. A. Henwood, "Still Life in Amber," *New Scientist*, 137:1859(1993): pp. 31–34.
2. E. A. Jarzembowski, "The Occurrence and Diversity of Coal Measure Insects," *Journal of the Geological Society, London*, 144(1987): pp. 507–511.
3. O. LeM. Knight, "Fossil Insect Beds of Belmont, N.S.W.," *Records of The Australian Museum*, 22(1949): pp. 251–253. I. G. Percival, "Belmont Fossil Insect Bed," in *The Geological Heritage of New South Wales* (1985, Sydney, NSW, National Parks and Wildlife Service), pp. 90–91.
4. S. J. Mayne, E. Nicholas, A. L. Bigg-Wither, J. S. Rasidi and M. J. Raine, *Geology of the Sydney Basin—A Review* (1974, Canberra, ACT, Bureau of Mineral Resources, Geology and Geophysics, *Bulletin* 149), p. 192. F. Gradstein and J. Ogg, "A Phanerozoic Time Scale," *Episodes*, 19:1 and 2 (1996): pp. 3–5 and chart.
5. Knight, Ref. 3. Percival, Ref. 3.
6. E. F. Riek, "Undescribed Fossil Insects from the Upper Permian of Belmont, New South Wales (with an appendix listing the described species)," *Records of The Australian Museum*, 27:15 (1968): pp. 303–310.

7. E. F. Riek, "Fossil History," in *The Insects of Australia* (1970, Melbourne, Vic., Commonwealth Scientific and Industrial Research Organisation and Melbourne University Press), pp. 168–186.
8. Riek, Ref. 6.
9. R. J. Tillyard, "Upper Permian Insects of New South Wales. V. The Order Perlaria or Stone-Flies," *Proceedings of the Linnean Society of New South Wales*, 60(1935): pp. 385–391.
10. E. F. Riek, "Fossil Mecopteroid Insects from the Upper Permian of New South Wales," *Records of The Australian Museum*, 23 (1953): pp. 55–87.
11. R. J. Tillyard, "Upper Permian Insects of New South Wales. IV. The Order Odonata," *Proceedings of the Linnean Society of New South Wales*, 60 (1935): pp. 374–384.
12. R. J. Tillyard, "Upper Permian Insects of New South Wales. I. Introduction and the Order Hemiptera," *Proceedings of the Linnean Society of New South Wales*, 51(1926): pp. 1–30. C. Davis, "Hemiptera and Copeognatha from the Upper Permian of New South Wales," *Proceedings of the Linnean Society of New South Wales*, 67 (1942): pp. 111–122. J. W. Evans, "Upper Permian Homoptera from New South Wales," *Records of The Australian Museum*, 21 (1943): pp. 180–198. J. W. Evans, "New Upper Permian Homoptera from the Belmont Beds," *Records of The Australian Museum*, 24:9 (1958): pp. 109–114.
13. R. J. Tillyard, "Upper Permian Insects of New South Wales. III. The Order Copeognatha," *Proceedings of the Linnean Society of New South Wales*, 60 (1935): pp. 265–279. Davis, Ref. 12.
14. R. J. Tillyard, "Upper Permian Insects of New South Wales. II. The Orders Mecoptera, Paramecoptera and Neuroptera," *Proceedings of the Linnean Society of New South Wales*, 51 (1926): pp. 265–282. Riek, Ref. 10.
15. R. J. Tillyard, "Upper Permian Coleoptera and a New Order from the Belmont Beds, New South Wales," *Proceedings of the Linnean Society of New South Wales*, 49 (1924): pp. 429–435.
16. Tillyard, Ref. 14.
17. Tillyard, Ref. 14. Riek, Ref. 10.
18. R. J. Tillyard, "Permian Diptera from Warner's Bay, N.S.W.," *Nature*, 123 (1929): pp. 778–779. Riek, Ref. 10. E. F. Riek, "Four-Winged Diptera from the Upper Permian of Australia," *Proceedings of the Linnean Society of New South Wales*, 101 (1977): pp. 250–255.
19. J. W. Evans, "Fossil Insects," *Hunter Natural History*, 4:2 (1972): pp. 122–123.
20. Percival, Ref. 3.
21. J. Mitchell, "Descriptions of New Species of Leaia," *Proceedings of the Linnean Society of New South Wales*, 50 (1925): pp. 438–447. J. Mitchell, "The Fossil Estheriae of Australia. Part I," *Proceedings of the Linnean Society of New South Wales*, 52 (1927): pp. 105–112.
22. T. Kobayashi, "Fossil Estherians and Allied Fossils," *Journal of the Faculty of Science, Tokyo University, Section 2*, 9:1(1954): pp. 107–110.
23. Knight, Ref. 3.
24. I. M. Mackerras, "Evolution and Classification of Insects," in *The Insects of Australia* (1970, Melbourne, Vic., Commonwealth Scientific and Industrial Research Organisation and Melbourne University Press), pp. 152–167. E. A. Jarzembowski and A. J. Ross, "Time Flies: the Geological Record of Insects," *Geology Today*, 9:6 (1993): pp. 218–223.
25. E. F. Riek, "The Presumed Heads of Homoptera (Insecta) in the Australian Upper Permian," *Palaeontology*, 14:2 (1971): pp. 211–221.

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