

A “Mystery Fossil” is Evidence for Massive Devonian Trees in Australia

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ABSTRACT. In 1991 a Late Devonian sandstone block was found in a gravel quarry in Griffith, New South Wales with a fragment of a deep, repetitive impression within it. It was determined to be a genuine fossil but the impressing organism could not be identified. Within the Australian Museum it became known as the “mystery fossil”. New digital techniques have now been used to create a three dimensional image of the impressed surface which could be rotated through 360°. This revealed the shape of the impressing object. Digital matching of sections of the impressing surface created an expanded image with a structure similar to arborescent lycopsid leaf cushions. If this fossil was produced by an impression of lycopsid leaf cushions, the cushions would be some of the largest so far described. In order to place this fossil in context, the history and structure of Australian lycopsid fossils is reviewed together with that of arborescent lycopsids worldwide. A possible taphonomic process is postulated for the “mystery fossil”, and the effect of tectonic movements in the Late Devonian/Early Carboniferous on Australian forest structure is discussed. If further corroborating evidence of large arborescent lycopsids is found in Australia it will indicate that Australian Late Devonian/Early Carboniferous forests were of much higher profile than previously supposed.

KEYWORDS. Lycopsid; lycopod; leaf cushion; lycopsid forest ecosystems.

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In 1991 the Australian Museum received a specimen from the NSW National Parks and Wildlife Service in Griffith. The hand specimen was a sandstone rock from a gravel quarry near Griffith with a deep repetitive impression within it. The quarry was sited on loose gravel and processed scree material from a bedrock of pebbly sandstone with thin conglomerate bands, sandstone and lithic sandstone of Late Devonian age.

This specimen was shown to a number of palaeontologists who were all puzzled as to its origins. A fossil animal print was ruled out, as was the impression of a modern digging tool. All agreed it was a genuine fossil, and a natural mould of something organic. But what that “something organic” was, no-one could suggest. This specimen became the “Mystery Fossil”.