

Graptolite Zonation in the late Wenlock (Early Silurian), with a New Graptolite-Brachiopod Fauna from New South Wales

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ABSTRACT. The Panuara Formation at Cobblers Creek near Orange, New South Wales, Australia has yielded a graptolite-brachiopod fauna assigned to the *sherrardae* sub-Biozone (late Wenlock: Early Silurian). The *sherrardae* sub-Biozone as defined here is equivalent to the *praedeubeli* sub-Biozone, and is the lowest part of the *ludensis* Biozone. The *ludensis* Biozone is reappraised following restudy of the type specimens of *Monograptus ludensis*, which are shown to exhibit growth stages from the *deubeli* to the *gerhardi* condition.

The graptolite fauna consists of *Gothograptus chainos* Lenz, *G. marsupium* Lenz, *Pristiograptus jaegeri* Holland, Rickards & Warren, *Pristiograptus dubius* (Suess), *Monograptus ludensis* (Murchison), *Monograptus moorsi* n.sp., *Monograptus* sp. and *Lobograptus sherrardae* (Sherwin). The limited shelly fauna includes the brachiopods *Plectodonta brownae* n.sp., *Bracteoleptaena pannucea* n.sp. and *?Lissatrypa*.

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Silurian strata in the vicinity of the New South Wales central western city of Orange have yielded important and abundant graptolite faunas (e.g., Sherrard, 1954; Packham & Stevens, 1955; Sherwin, 1971a, 1982; Jenkins, 1978, 1986; Rickards, Packham, Wright & Williamson, 1995) as well as abundant shelly fossils (see Pickett, 1982). The small but significant fauna of graptolites and shelly fossils, from Silurian exposures in Cobblers Creek, a tributary of Panuara Rivulet (Fig. 1) described here, was discovered by Ray Smith (1966)

during mapping of the Mandurama-Panuara district, south of Mount Canobolus; the locality is about 30 km roughly SSW of Orange (Fig. 1). Our initial collections were made by Henry Moors, Norman Savage and Tony Wright in about 1963; further collections were made by Barrie Rickards, Penny Williamson and Wright in 1989, and again by Wright in 1996. The graptolites are described by Rickards, and the brachiopods by Wright; trilobite identifications are by Andrew Sandford of the Museum of Victoria, Melbourne, Australia.