THE GENUS *CONOCARDIUM* FROM AUSTRALIAN PALAEOZOIC ROCKS.

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(Plates xiii–xiv.)

Introduction.

This paper deals with the known species of *Conocardium* from Palaeozoic rocks in Australia. Reference is made to the rather limited records of the genus in literature, and new species are described from the Lower Middle Devonian (Murrumbidgee Series) of New South Wales, from the Upper Middle Devonian (Atrypa limestone) of Western Australia, and from the Permian of New South Wales and Queensland.

The material examined is in the collection of the Australian Museum, with the exception of three specimens, described as *Conocardium gogoense*, sp. nov., from the collection of the University of Western Australia. I am indebted to Dr. Curt Teichert for the opportunity of describing this interesting species.

The known geological range of the genus in Australia extends from the Silurian to the Upper Permian.

The genus *Conocardium* embraces one of the early highly specialized types of shell and was first recorded from Permian rocks in Australia by McCoy (1847, p. 300). Opinion is divided regarding the position of the animal within the shell and the correct orientation is still a subject of discussion. Some workers in this group consider the short truncated end of the shell to be anterior, while others are certain it should be considered the posterior end.

Tryon (1884, p. 195), comparing the shell with *Adacna*, concluded that the conical and gaping end was anterior, the aperture being for the passage of the foot and the function of the long tube or rostrum being siphonal. This view, held by a number of authors, was elaborated by Hind (1900, pp. 452–453) who, after a close examination of the internal characters of a perfect specimen of *Conocardium herculeum*, brought forward several reasons in support of it. He considered the external ligament of *Conocardium* to be restricted, occupying a depression between the umbones and the long rostrum. He remarks: "This surely cannot be placed anterior to the umbones." Other authors, however, are of the opinion that the ligament is amphidetic or paravincular—types one would rather expect in a shell of this type. Hind also states that in bivalves the anterior adductor scar is usually the deeper and better marked, and in many genera, as in *Conocardium*, is bounded behind by a ridge of shell. In *Cucullaea* and other genera, however, we find the exact opposite, the posterior adductor scar being well defined and with a strongly developed ridge.

The pallial line in *Conocardium* is simple and the assumption that it is a siphonate form appears to be attributed to the gape, the presence of the elongated rostrum or analogies with other siphonate genera which have no pallial sinus. These are exceptional, and as a general rule siphonate forms are always recognized by the presence of a pallial sinus. This fact raises the question: what definite evidence have we that *Conocardium* is a siphonate genus?

Hind is of the opinion that the gaping aperture was used for the extrusion of the foot and with this I agree. He states, however, that the foot would be unlikely to protrude over the prominent or sharp interlocking teeth of the valve. In many genera this is exactly what occurs, a case in point being *Cardium*, in which the foot protrudes over much heavier teeth than are present in *Conocardium*.

After a study of the evidence in favour of the truncated end of the shell being posterior, and after several interesting discussions with Mr. Tom Iredale, Conchologist