

The true Phacopid characters appear in the Silurian. There takes place, as Reed (1905, p. 176) has shown, a partial loss of pentamerism, a shortening and broadening anteriorly of the glabella, so that it is no longer high with subparallel sides, but wide with markedly diverging lateral borders. The third pair of side glabella lobes become greatly reduced and are often nodular at the extremity. There is a general absence of spines, the genal angles being rounded off and the pygidium nonmucronate with few segments. In addition to the smaller eyed *Trimeroccephalus* forms, these modifications take place in two distinct, though closely related, Silurian groups, the one characteristic of the Tethys (Bohemia) realm, and the other widely spread, but typical of the northern Atlantic realm. For the present, the former may be referred to as the group of *P. glocheri* Barrande and the latter as the group of *P. stokesii* (Milne-Edwards). In the *P. glocheri* group the anterior glabella furrows are broadened and deepened in a characteristic manner, so that the frontal lobe is almost detached as in *Dalmanites*. The segregation of this group was recognized by Wedekind (1911) who incorporated it under the name of his genus *Glocheria*. It will be shown, however, that this name cannot stand. In the other group, apparently not represented in the Tethys (Bohemia) realm the first and second pairs of glabella lobes are almost completely fused with the frontal lobe leaving only faint furrows, while the third pair is profoundly reduced and at its extremities becomes characteristically nodular. In the earlier Silurian this group includes *Phacops orestes* Billings, *Trilobites elegans* Sars and Bocck and *Phacops (Portlockia) marklandensis*, n. sp. In the later Silurian it embraces *Calymene stokesii* Milne-Edwards. While the group of *P. glocheri* becomes extinct at the end of the Silurian, the second group gives rise to numerous forms in the Devonian. But as already noted by Wedekind (1911) the Silurian forms are considerably unlike their descendants. They differ in their smaller size, poorer development of tuberculate surface, especially of the glabella, and much more depressed, never overhanging anterior surface of the glabella. The last character is very diagnostic and of stratigraphic value.

SYSTEMATIC RELATIONS.

Phylum ARTHROPODA.

Class CRUSTACEA.

Subclass TRILOBITA WALSH.

Order PROPARIA BEECHER.

Family PHACOPIDAE CORDA.

Subfamily DALMANITINAE REED.

Genus DALMANITINA REED.

1843. *Acaste* Goldfuss (non Leach) (partim), Neues Jahr. Min., etc., 1843, p. 563.
1845. *Dalmania* Emmrich (non Desvoidy) (partim), Neues Jahr. Min., etc., 1845, p. 40.
1852. *Dalmania* Barrande (partim), Syst. Sil. du Centre Boheme, 1, p. 528.
1852. *Dalmanites* Barrande (partim), Syst. Sil. du Centre Boheme, 1, p. 934.
1864. *Acaste* Salter, Mon. Brit. Tril., Pal. Soc., 1864, p. 14.
1905. *Dalmanitina* Reed, Geol. Mag., (5), 2, p. 224.
1905. *Phacopidella* Reed (partim), Geol. Mag., (5), 2, p. 173.
1906. *Phacopidella* Reed, Lower Pal. Tril. Girvan, III, Pal. Soc., p. 156.
1913. *Dalmanitina* Raymond, Zittel - Eastman Textb. Pal., 2nd ed., p. 726.
1913. *Phacopidella* Raymond (partim), Zittel - Eastman Textb. Pal., 2nd ed., fig. 1409.

The genus *Dalmanitina*, proposed by its author (as a subgenus of *Dalmanites* Barrande) for the primitive generalized Ordovician types, is now extended to include what are here interpreted as similar generalized forms in the Silurian. The generic characters are: well-marked pentamerism of the glabella without semi detachment of the frontal lobe, genal angles rounded off or only produced into short spines, pygidium with few segments and rounded posteriorly or rarely produced in a short mucronation. It includes *Dalmania socialis* Barrande, *Calymene downingiae* Murchison, *Phacops (Acaste) constricta* Salter, and *Dalmanitina logani* var. *conservatrix*, n. var. The Ordovician *P. apiculata* (Salter) apparently also belongs here.

As here interpreted *Dalmanitina* is considered to replace *Acaste* Goldfuss and in particular Salter's use of it. *Acaste* was erected by Goldfuss in 1843 for forms with the pentamerism of the glabella retained. It thus included forms now referred to *Dalmanitina*, but of course was given a broader interpretation than is now proposed for the latter genus. Salter's use of *Acaste* was more restricted and practically coincides with that of *Dalmanitina* as here emended. Under it he places all the Silurian forms listed above with the exception of the then unknown Arisaig variety. Salter gave *Acaste* only subgeneric rank, under the genus *Phacops*.

Reed includes the Silurian forms now referred to *Dalmanitina* in his broad subgenus *Phacopidella*, for he did not extend the scope of *Dalmanitina* beyond the Ordovician. He designated the *Acaste* forms as falling within it and in 1906 referred *Calymene downingiae* Murchison to the subgenus (of *Phacops*) *Phacopidella*.