

As already noted, the Silurian group of *Phacops stokesii* (Milne-Edwards) is ancestral to the group of *P. latifrons* Bronn and differs from the latter by having the glabella more depressed anteriorly, so as not to overhang the anterior margin, the size is smaller, and the surface less tuberculose. They are here placed under the subgenus *Portlockia* McCoy emend., with *P. stokesii* as the genotype. Among the species referred to it are:

Calymene stokesii Milne-Edwards.

Trilobites elegans Sars and Boeck.

Phacops orestes Billings.

Phacops (Portlockia) marklandensis, n. sp.

As described and applied by McCoy in 1846, *Portlockia* McCoy had a rather wide interpretation and included both Silurian and Devonian forms with the typical Phacopid structure. It fell within *Phacops* Goldfuss and was practically equivalent to subgenus *Phacops* Salter, embracing both the *P. stokesii* and *P. latifrons* groups. McCoy (1846: 50) states that "this genus includes *Calymene tuberculata* and *C. macrothalma* of the Silurian system [= *Phacops latifrons* Bronn and *P. stokesii* Milne-Edwards according to synonymy of Salter (1864: 18, 21)]; *Phacops tuberculata* of Captain Portlock's Report; *Calymene nupera* Hall; *Calymene bufo* Green, etc." In 1846 he (1846, p. 51) described and placed in this genus *Portlockia sublaevis* McCoy. Salter considers this a synonym of *P. stokesii* (1864, pp. 21, 22). Later he (1855: 162) says: "The *Calymene bufo* of Green, *C. macrothalma* of Murchison [= *P. stokesii*], etc., being the types of the genus". Since *P. latifrons* is the type of *Phacops* Emswiler and *Calymene bufo* Green is a similar Devonian form, *Phacops* should be restricted to that group, while the group of *P. stokesii* is now separated under the subgenus *Portlockia*.

Genotype: *Calymene stokesii* Milne-Edwards.

Phacops (Portlockia) marklandensis, n. sp.
(Markland, Nova Scotia in Scandinavian mychology).

Compared with *Phacops (Portlockia) elegans* (Sars and Boeck) this species has a still more reduced basal (third side pair) lobe and smaller tubercles at its extremities. It differs in a similar manner from *P. (Portlockia) stokesii* Milne-Edwards and in addition in the presence of well developed, although not highly elevated, tubercles at the extremities of the thoracic axial segments. Compared with *P. (Portlockia) orestes* Billings, the basal lobe and tubercle are much more reduced, the thoracic-axial tubercles are more strongly developed and the axial segments relatively more slender. The glabella is somewhat depressed, with first pair of side

furrows short, weakly impressed, and come anteriorly. The second pair are short, weakly impressed, and almost straight. The pygidium has four pairs of ribs on the pleural lobes, divided distally by a median sulcus. The fourth pair are faint. The axis of pygidium is divided into about eight rings.

Dorsal shield width 14 m.m., length 20 m.m.

Cephalon " 14 m.m., " 6 m.m.

Pygidium " 9 m.m., " 5 m.m.

Horizon and Locality. Rare in the Ross Brook formation, Arisaig, N.S.

Collections. Victoria Memorial Museum, Yale University collections.

CONCLUSIONS.

The results of the foregoing discussion may now be summarized.

(1). A generalized primitive line ranging from the Ordovician into and through the Silurian is recognized. The genus *Dalmanitina* Reed is extended to include all of these unmodified forms. Thus interpreted it is considered to be practically synonymous with Salter's use of *Acaste* Goldfuss (non Leach) and in a broad way with *Acaste* as used by Goldfuss.

(2). A constant tendency to partial fusion of the two anterior lobes and the frontal lobe, but without the profound modification of the subfamily Phacopinæ Reed, is observed. Such Devonian forms are recognized in the species for which J. M. Clarke has proposed the generic name of *Phacopina*. But these forms are not Phacopid and exhibit none of the profound specialization of the cephalon as seen in that subfamily. Slightly modified species of a similar nature are recognized in both the Ordovician and Silurian but are thought to be evolutions independent of *Phacopina* Clarke. They are provisionally left under *Dalmanitina*. Another slight modification is shown by some forms in which the glabella is broadly expanded anteriorly, but which retain the primitive pentamerism of *Dalmanitina*.

(3). The subfamily Phacopinæ Reed became differentiated at the very beginning of Silurian time and thereafter remained entirely distinct from the primitive generalized line. The profound modifications of this subfamily have been described by Reed and have been reviewed above. Probably the most diagnostic is to be found in the great reduction of the third pair of glabella lobes and the tuberculation of their extremities. Two stocks of this subfamily are of present interest.

(4). One of these Phacopid stocks is of wide distribution in the Silurian and continues into the Devonian, giving rise there to *Phacops s. str.* The more primitive and ancestral Silurian forms of this