

## ONE OF THE MANY PROBLEMS: TAXONOMY OF THE COMMON SILURIAN NAUTILOID CEPHALOPOD "*ORTHO CERAS BULLATUM*" J de C. SOWERBY

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British Silurian nautiloid cephalopods, now under revision, are numerous, of interest in terms of palaeoecology and palaeobiogeography, and potentially biostratigraphically significant. Unfortunately they are frequently poorly preserved. In the graptolitic facies they are seen as flattened moulds; in the siltstones or sandstones of the shelf facies they tend to be broken, and infilled so as to be without preservation of internal structures. Good preservation is seen in some limestones but is uncommon. "*Orthoceras bullatum*" J de C. Sowerby though usually seen as distinctive fragmentary compressed moulds, ornamented and of characteristic proportions, is probably the commonest of all British species, particularly in the upper (Ludfordian) stage of the Ludlow Series. Consideration of it provides a good example for discussion of taxonomic problems and their possible solution.

In the form *Orthoceras bullatum* var *pictonense* McLearn, from Arisaig Nova Scotia, it was assigned by Rousseau Flower (1943) to Foerste's (1928) genus *Polygrammoceras*, of which several species from Anticosti were described. This genus was defined as having longitudinal ornament finer and without the fluting of *Kionoceras*. *Polygrammoceras* has been included, for example in the *Treatise of Invertebrate Paleontology*, in the Subfamily Kionoceratinae.

My experience has now shown that by examining all available material it is sometimes possible to find a rare vital clue to internal structure, which is crucial if phylogenetically reasonable taxonomy is to be suggested, without that suspicion of homeomorphy which perhaps excessively surrounds the use of readily available ornamentation. The type specimen of *O. bullatum* illustrated in Murchison's *Silurian System* of 1839 (plate 5, figure 29) reveals the siphuncle in part of the phragmocone.

Curiously, Blake's illustration (1882, plate 12, figure 4) omits the relevant part of the specimen. The segments of the siphuncle are somewhat expanded, as indeed they are in some of the Anticosti examples. Of the 369 specimens of "*Orthoceras*" *bullatum* that I have examined, a single example from the Much Wenlock Limestone of Ledbury, Herefordshire, which has been cut longitudinally and polished, reveals not only the external surface but internally annulosiphonate deposits developed towards the apical end.

Fortunately, this was the second example figured by Blake (1882, plate 12, figure 5) and is reasonably to be regarded as a paratype. Flower (1962) discussed the difficulty that many orthocones appear to have empty siphuncles until suitable preservation of a more apical region of the shell reveals their development there.

Thus the common problem of generic assignment is reasonably solved in this case by the name *Polygrammoceras* but the diagnosis of this genus in the *Treatise* must be modified to allow for the presence of siphuncular deposits. *Kionoceras* itself appears in some specimens to be similarly endowed. This was noted by Flower (1962), is mentioned with caution in the *Treatise*, and is seen in some of Barrande's illustrations. Thus the notion of the Subfamily Kionoceratinae, with genera separated particularly in terms of ornament, begins to appear somewhat more robust.