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ARTHRICOCEPHALUS CHAUVEAUI BERGERON - A KEY SPECIES FOR THE CORRELATION OF A GLOBAL CAMBRIAN STAGE BOUNDARY

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Arthricocephalus chauveaui makes its first appearance in the *Megapalaeolenus* Zone at the top of the Tsanglangpuian Stage of China and its association *with Ovatoryctocara granulata* Tchernysheva,1962 in North Greenland (Blaker and Peel, 1997) provides evidence for a linking of the world's major Cambrian successions. Hitherto, it has not been regarded as a major guide to the correlation of Cambrian sequences and its occurrence, below the extinction of the redlichioids, has always placed it within the Lower Cambrian. However, the concept of a global Lower-Middle Cambrian boundary has varied greatly (Robison *et al.*, 1977) and, if only three subdivisions of the Cambrian System are to be recognized, then correlation of a basal Middle Cambrian boundary needs to be reviewed.

Traditionally, beds with olenelloids or redlichioids have been referred to the Lower Cambrian and beds with paradoxidoids Middle Cambrian. Unfortunately, these trilobite superfamilies characterize separate continental sequences and no lineage of the superfamilies indicating a gradual passage of time between them has been demonstrated. For correlating different continental successions, it is evident that open-ocean taxa, occurring at the continental edges, are important indicators of time, as graptolites and ammonites are in later systems. Among such Cambrian taxa, the agnostids, eodiscids and oryctocephalids provide the best guides for correlating across the main oceans. Of necessity, global correlation can only be achieved via a convolute route by the recognition of succinct assemblages that include some common well-established species.

Here, for the purpose of recognizing a basal Middle Cambrian boundary, I also identity the following species: *Peronopsis (Eoagnostus) roddyi (*Resser and Howell, 1938), *Acidiscus theristes* Rushton, 1966, *Bathydiscus dolichometopus* Rasetti, 1966, *Cephalopyge notabilts* Geyer, 1988, *Kiskinella cristata* Romanenko et Romanenko,1962, *Pagetides elegans* Rasetti, 1945, *Redlichia (Pteroredlichia) guizhouensis* Zhou in Lu Yanhao *et al.*,1974, *Eccaparadoxides nobilis* (Geyer, 1998), *Xystridura templetonensis* (Chatman, 1929) and the following major edge-of-shelf sequences, Anti-atlas Mountains, Morocco, (Geyer, 1988), Southwest Avalon Peninsula, Newfoundland (Fletcher, 1972), Taconic New York (Rasetti, 1966), North Greenland (Blaker

and Peel, 1997), mountain chain north of Toung-yen-Fou in Tongren County, Guizhou, southwest China (Lu Yanhao *et al.*, 1974); Kounamskiy Shelf, Siberia (Savitsky *et al.*, 1972) and Australia (Jell, 1990; Lin Tianrui and Jago, 1993).

Based upon the distribution of the above species, it is clear that the earliest paradoxidoid *E. nobilis* makes its first appearance in beds **older** than those with *C. notabilis and B. dolichometopus* and that the youngest olenelloids and redlichioids disappeared **later** than *O. granulata* that is

Table 1. Correlation chart of the overlapping ranges of *Olenellus*, the youngest redlichiids and the earliest paradoxidids.

Australia	South China	Greenland	Taconics	Siberia	SE New'fld	Morocco
		atavus	**atavus**	**fissus**	**atavus-fissus**	
gibbus		**gibbus**	**gibbus**	**gibbus**	**tenera**	**tenera**
		Glossopleura			**affinis**	
				Kounamkites		
		Albertella			**bennetti**	**arenosa**
					harlani	
templetonensis		**Plag-Poliella**				
	? cristata	*Olenellus*	*Olenellus*	*cristata*	**cristata**	**frequens**
		elegans	**elegans**	**Oryctocara**		
guizhouensis	*guizhouensis*	*roddyi*	*roddyi*		*roddyi*	
	chauveaui			**AMGIAN**		
		granulata		*granulata*		
			dolichometopus	*Schistocephalus*	*dolichometopus*	*Schistocephalus*
	Megapalaeolenus					
janeae		**Bonnia**	**Acimetopus**		**Cephalopyge**	**Cephalopyge**
			Acidiscus		*Acidiscus*	*Eccaparadoxides*
bungerooensis						
		Salterella	*Salterella*		*Salterella*	
				TOYONIAN	**Hupeolenus**	**Hupeolenus**
tatei			**asaphoides**		*sabulosa*	
				---------- ---*Triangulaspis*----------		
		Nevadella			**Callavia**	**Sectigena**
				BOTOMIAN		

associated with the last appearance of *C. notabilis* and the first appearances of *A. chauveaui*, *K. cristata* and *P. roddyi*.

It is evident that the time ranges of the olenelloids and redlichioids overlap with the range of the paradoxidoids and, therefore, the base of the Middle Cambrian is currently drawn at different stratigraphical levels around the world.

The correlation proposed here indicates that the first appearance of *0. granulata* and its associates, e.g., *A. chauveaui* in China and Greenland and *P. roddyi* in Greenland, Newfoundland and Taconic New York, is a suitable level to be considered as a global marker for the basal stage of the Middle Cambrian. The recognition of *A. chauveaui* just below *R. (Ptero.) guizhouensis* in China indicates that the base of the Middle Cambrian can also be drawn within the redlichioid sequence of Australia, where *R.(Ptero.) guizhouensis* occurs below *X. templetonensis,* which marks undisputed Middle Cambrian strata.

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