Tethyan-Boreal Correlations and the Jurassic-Cretaceous Boundary

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with 7 figures

Abstract. The author (1987) was able to determine three inter-realmally correlatable horizons, which are relevant with respect to the stratigraphic position of the Jurassic-Cretaceous boundary (see Fig. 2):

1. The rock interval in the upper part of the Buchia 'elderensis' Subzone in California which yielded the ammonite genus Kossmatia. This interval correlates with (a) a part of the Tethyan 'Durangites' Zone and with (b) a part of the boreal Epivirgatites variabilis Zone.

2. The concurrent range of the ammonite subgenera Spiticeras (Proniceras) and Spiticeras (Spiticeras) in the upper part of the Buchia fischeriana Zone and the lower part of the Buchia aff. okensis Zone in California provides a correlation of this interval with (a) the upper part of the Tethyan Berriasella jacobi Subzone and with (b) the upper part of the boreal Craspedites okensis Zone and the Taimyroceras taimyrense Zone.

3. The ammonites found in the upper part of the Buchia okensis Zone in British Columbia ('Argentinicearas' ex gr. noduliferum/bituberculatum) and in the lower part of the Buchia uncticoides Zone in California and British Columbia (Neocosmoceras) allow of a correlation of that stratigraphic interval with (a) at least a part of the Tethyan Berriasella paramimouna Subzone and with (b) the lower part of the upper division of the boreal Hectoroceras kochi Zone.

The Jurassic-Cretaceous boundary voted for in the Lyon colloquium (1973), viz. at the base of the Berriasella jacobi Subzone (boundary A), is situated between horizons 1 and 2, and correlates approximately with the base of the Siberian Craspedites okensis Zone. The Jurassic-Cretaceous boundary advocated by the author (1981, 1982, 1987), viz. at the top of the Pseudosubplanites grandis Subzone (boundary B), is situated between horizons 2 and 3, and interpreted to correlate with the top of the Chetaites chetae Zone. All four boundaries are characterized by rapid and important change-overs in the composition of the ammonite faunas in the Tethyan as well as in the Boreal Realm. The change-overs were ascribed to eustatic sea level lows. The Tethyan faunal turn-overs can therefore be considered contemporaneous with the boreal ones.

Boundary A is chronostratigraphically closest to the top of the Jurassic as it was erroneously conceived by D'Orbigny (1850). Boundary B is however closest to the base of the Cretaceous as it became accepted after the introduction of the Neocomian as the lowest 'stage' of the Cretaceous (Thurmann, 1836) and therefore also closest to the top of the Tithonian as originally defined by Oppel (1865) (often erroneously quoted as if he had included the Berriasian in the Tithonian). It corresponds with the base of the Berriasian as it was originally conceived by Coquand (1869 to 1875). Since boundary B is also chronostratigraphically closest to the top of the Volgian in Siberia and to the top of the Portlandian as recently conceived in England, this boundary had best be considered the most appropriate Jurassic-Cretaceous boundary.

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