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Gateway to the Arctic: Late Cretaceous history of the Turgai Strait

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The Late Cretaceous history of the Turgai Strait, which connects Western Siberia and the Arctic with Middle Asia, has been reviewed based on evidence from ammonites, belemnites and foraminifera. The opening of the Turgai Strait in the earliest Late Cenomanian was marked by a quick two-way migration of ammonites. At this time, the North American ammonite family Binneyitidae first appeared in Middle Asia, while Asian placenticeratids appeared in Western Siberia and reached the Western Interior Seaway, while belemnites of the family Belemnitellidae, common in Europe and Middle Asia, penetrated northwards through the Turgai Strait. However, unlike ammonites, they did not cross the Arctic, and their northernmost Cenomanian finds are restricted to the Western Taimyr. The Cenomanian inoceramid assemblage from Western Siberia consists of species with broad geographic ranges, and the migration pathways of inoceramid bivalves remain unclear. The presence of Pacific taxa suggests a direct connection between the North Pacific and the Arctic at this time. In the Turonian, ammonites continued to migrate from North America to the West Siberian Sea and further southwards to the Middle Asia sea basins. Among these, the most important are the appearances of collignoniceratids and American scaphitid species in Siberia. The presence of scaphitid ammonites closely related to common European species in Western Siberia may indicate northward cephalopod immigration via the Turgai Strait. Foraminiferal evidence also supports the existence of the Turgai Strait during the Turonian. The fossil assemblages from the Coniacian to Santonian age in Siberia do not include faunal elements that support the existence of the Turgai Strait, as well as there is no evidence of the connection between the West Siberian basin and the Western Interior Sea. However, dinocysts confirm the existence of Turgai Strait at this time. Based on the analysis of foraminifera, it can be concluded that the strait re-appeared not later than in the Late Campanian and was open during the Maastrichtian. However, due to the limited amount of available data, it is difficult to understand how long this connection existed. The earliest Campanian ammonite faunas of the West Siberian Sea are closely similar to the coeval faunas of the Western Interior Sea. Both Scaphites and Baculites lineages that inhabited these seas are similar, although due to the a few number of specimens the Siberian succession is not complete. The existence of the Turgai Strait during the Maastrichtian is also well-supported by the presence of belemnites both in the northernmost Kazakhstan and in Western Siberia.

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