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**Sequence Stratigraphy of the Finnmark Carbonate Platform (Upper Carboniferous-Permian), Barents Sea**

EHRENBERG, S. N., Statoil, N-4035 Stavanger, Norway; T. A. SVANA, Statoil, postboks 40, N-9481 Harstad, Norway; and N. A. H. PICKARD, Cambridge Carbonated Ltd., Clematis Cottage, 41 Linthurst Newtown, Blackwell, Bromsgrove, Worcestershire, B60 1BP, U.K.

The entirely subsurface Finnmark carbonate platform, offshore north Norway, has been studied in cores from 2 exploration wells and 5 shallow stratigraphic test wells (Fig. 1). The platform succession (500 m thick in the exploration wells) is divided into nine lithostratigraphic units, each comprising a distinct facies association. Broadly correlative and lithologically comparable strata are exposed on the Svalbard archipelago 450-800 km to the northwest (Fig. 2). Trends in facies, cycle thickness, and gamma ray profile are used to differentiate a hierarchy of stratigraphic sequences, recording probably 5$^{th}$- through 2$^{nd}$-order fluctuations in relative sea level. Seven main (?3$^{rd}$-order) sequences are recognized comprising the 50-60 m.y. history of platform evolution.

The lower 2 sequences (Moscovian-Gzhelian) consist of mixed siliciclastics and shallow-shelf carbonates, reflecting waning tectonism following mid-Carboniferous rifting. Sequences 3 and 4 (Gzhelian-Sakmarian) contain cyclic photozoan carbonates with frequent exposure surfaces, algal buildups, early dolomitization, and good reservoir quality. Only a minor fraction of the carbonate strata in sequences 1-4 are peritidal facies, indicating that the platform surface oscillated abruptly between subtidal depositional “catch-up” and exposure throughout its initial 30 million years. The beginning of sequence 5 (Sakmarian-Artinskian), consisting of tightly cemented bryozoan-crinoid grainstone to wackestone, corresponds with a regional mid-Sakmarian change from photozoan to heterozoan deposition and the growth of major bryozoan-stromatactis mud mounds over much of the Barents Sea. Sequences 6 and 7 (Kungurian-Late Permian) are composed of shale, bryozoan-brachiopod packstone, and porous silica spiculite, representing continued climatic cooling and transgression. The platform is overlain by over 1 km of lowermost Triassic shale and siltstone.

The Upper Paleozoic strata form a monocline that dips approximately 2•northward at top Permian level, due to increasing Tertiary uplift toward the mainland. Correlation from the exploration wells to the 5 shallow stratigraphic test cores near the erosionally truncated southern edge of the platform, a distance of roughly 30 km as projected onto the N-S dip direction (Fig. 1), reveals pronounced landward thinning of all platform sequences, but only subtle facies changes. This pattern indicates landward-increasing erosion and hiatuses between and possibly also within each stage of platform deposition.

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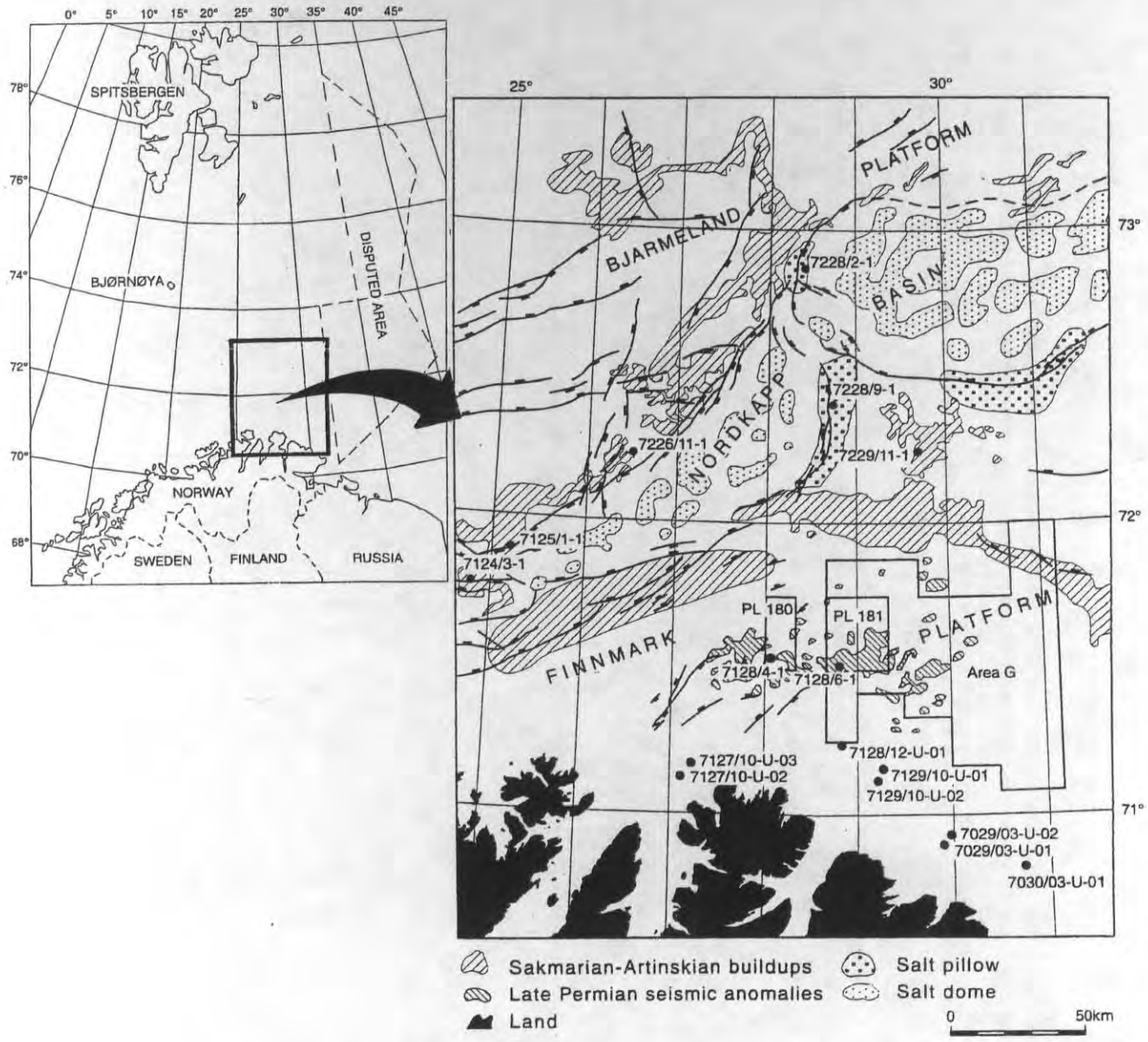


Fig. 1 - Locations of wells, seismic-scale buildups, and structural features on the Finnmark Platform and adjacent areas. Salt intrusions in the Nordkapp Basin are inferred to be derived from Upper Carboniferous-Lower Permian strata deposited during sea-level lowstands that exposed surrounding carbonate platforms.

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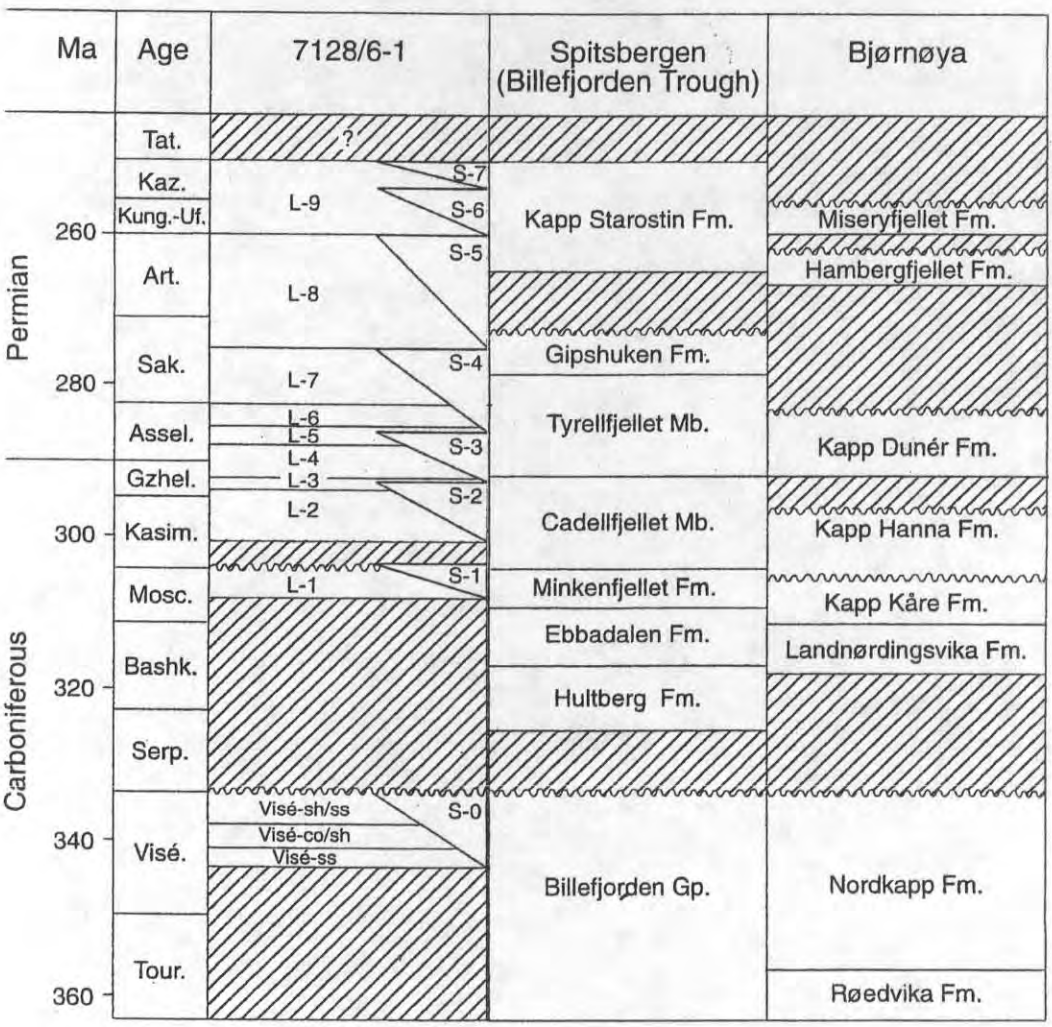


Fig. 2 - Ages and suggested regional correlation of Upper Paleozoic lithostratigraphic units from the Finnmark carbonate platform (well 7128/6-1) to outcrop sections of Spitsbergen and Bjørnøya (Fig. 1). Vertical axis is absolute time scale of Harland et al. (1990). Triangles under 7128/6-1 depict major depositional sequences. Diagonal ruling indicates non-deposition.