mostly by dark and black argillites. The total content of organic matter in the studied sediments is very low and varies from 0.1 up to 2 %. The average value in lower part of Lower Cambrian successions in Estonia is 0,79 %, in upper part of Lower Cambrian it increases up to 2,56 %. The spatial distribution of organic matter was studied in sediments of Lontova Stage of Lower Cambrian in Estonia and its content is characterised by small differences in values. The total content of organic matter in Lower and Middle Cambrian deposits in northern part of Western region (Latvia) is characterised by similar average values (0,66 % and 0,74 %). In Lower Cambrian dark argillites from southern part of Western region (Lithuania) it is 0,48 % and in Middle Cambrian sediments it reaches 0,59 %.

The isotope composition of organic carbon in Cambrian rocks in the studied area was studied for the first time. The obtained data showed that isotope composition of organic carbon is typical for dispersed organic matter of sapropelitic type from Cambrian sediments (SIDORENKO & SIDORENKO 1975).

In Northern region the isotope composition of organic carbon characterises by values $\delta^{13}C$ from -31,8 ‰ in Lower Cambrian sediments and up to -29,8 ‰ versus PDV in Middle Cambrian deposits. In the limits of every stratigraphical unit the fluctuations of $\delta^{13}C$ are very low. Organic carbon of Lower Cambrian sediments in the northern part of Western region has the $\delta^{13}C$ values from – 30,9 ‰ up to -26,3 ‰ in Middle Cambrian. In the southern part of Western region the $\delta^{13}C$ values from -30,0 ‰ up to -27,9 ‰ were established. Study showed that isotope composition of organic carbon from lower parts of studied successions has the negative shift up to 2 ‰ in $\delta^{13}C$ relatively with isotope composition of organic carbon from deposits of Middle Cambrian. Isotope composition depends on the isotope distribution in the initial biomaterial as well as on the isotope fractionation during diagenesis.

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The Devonian sediments of Spitsbergen – an environmental study

BLOMEIER, D. & DALLMANN, W.

Norsk Polarinstitutt, N-9296 Tromsø, Norway

Devonian sediments mainly crop out within a N-S trending fault trough in the north-western part of Spitsbergen (Fig). The half-graben, bounded by the Raudfjorden Fault Zone (RFZ) in the W and by the Billefjorden Fault Zone (BFZ) in the E, represents a part of an extended molasse basin, mainly siliciclastic Old Red sediments were deposited.

Recent investigations within this area concentrate on the Wood Bay and Grey Hoek formations that built up an approx. 3500 m thick succession, ranging from the Early (Siegenian) to the Middle Devonian (Eifelian). According to their lithology, sedimentary structures and faunal assemblages, the formations are divided into several members that represent different depositional environments.

The **Wood Bay Formation** (ca. 2400 m) that generally can be described as a fining-upward succession, is subdivided into the Austfjorden (ca. 900 m), Dicksonfjorden (ca. 1400 m) and Verdalen members (ca. 100 m). The AUSTFJORDEN MEMBER mainly consists of yellow to light-grey weathering, calcareous conglomerates and sandstones, displaying a fluviatile high-energy environment, characterised by extended channels. The DICKSONFJORDEN MEMBER is formed by red-brownish coloured conglomerates to claystones that are arranged in a repeated alternation of rhythmic successions. The depositional environment is characterised by braided rivers, overbank areas, floodplains and paleosols. The VERDALEN MEMBER consists of an interbedding of reddish sand- to siltstones and carbonates that may represent changing fluviatile (siliciclastics) to marginal marine (carbonates) environments. The top of the entire formation is marked by a distinct colour-change from red to grey, displaying also the Middle/Lower Devonian boundary.

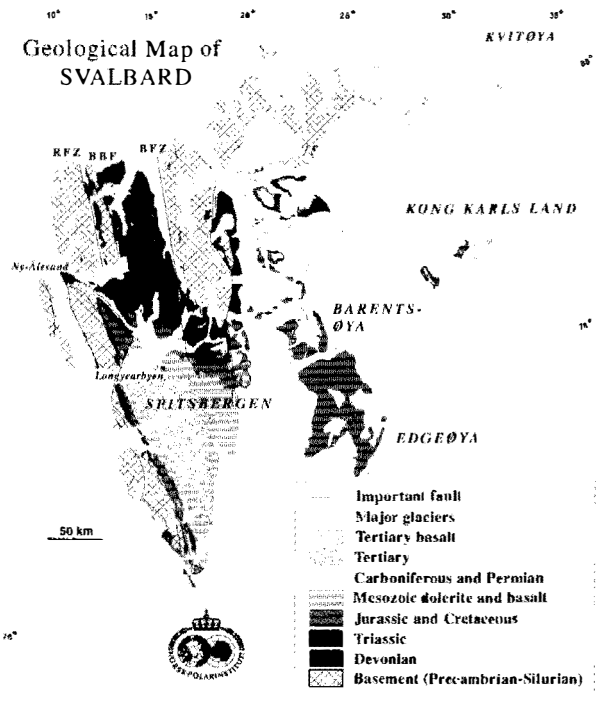

Fig. 1

The **Grey Hoek Formation** (1000 m) that is conformably overlying the Wood Bay Formation, comprises the Skamdalen (ca. 80 m), Tavlefjellet (ca. 300 m) and Forkdalen members (ca. 600 m). The SKAMDALEN MEMBER is characterised by an interstratification of carbonates and grey silt- to claystones that may also represent changing lacustrine or lagoonal (siliciclastics) to marginal marine environments (carbonates). The TAVLEFJELLET MEMBER shows a monotonous succession of dark-grey to black calcareous claystones, occasionally intercalated with dark siltstones, reflecting broad coastal swamps within a marginal marine environment. The FORKDALEN MEMBER is characterised by claystone/quartzitic sandstone intercalations, also representing shallow lagoons, probably cut off from more typical marine conditions by sandy barriers.

The entire Devonian succession shows an increasing geomorphic maturity of the depositional area and a change from a typical Old Red fresh-water (Wood Bay Formation) to a marginal marine environment (Grey Hock Formation). Further investigations will focus on the carbonates of the Verdalen and Skamdalen members that may possibly reflect first marine ingressions within a continental depositional area.