

INTRODUCTION TO THE ORDOVICIAN IN JÄMTLAND

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The general distribution of Ordovician deposits along the Caledonian front in Jämtland has been reviewed briefly in the introduction to the Ordovician of Sweden, and illustrated by a rough palinspastic restoration of a cross-section from the autochthonous sequence to the west (Jaanusson, Fig. 3).

As a result of the Caledonian orogeny, the rock sequence is tectonically deformed, the deformation increasing in intensity towards the west. The tectonic style that characterizes the structure of the Caledonian front appears to be cover shortening over a passive basement. In many cases the Middle and Upper Cambrian shales provided a plane of décollement near to the Precambrian crystalline basement, over which the overlying Ordovician and Silurian rock pile was thrust eastwards. The transported sequences became folded, thrust and stacked both on each other and on the Cambrian and Ordovician sedimentary cover which remained autochthonous farthest to the east. See also Gee & Zachrisson (1979); Gee & Wolff (1981).

In central and northern Jämtland the main tectonic unit of the Caledonian front, previously termed parautochthonous but now generally referred to as the Lower Allochthon, has an extensive outcrop area (Karis & Larsson, road log, Fig. 1). This tectonic unit is composed of thrustured rocks of Late Precambrian and Early Palaeozoic age with low grade metamorphism (at the most lower greenschist facies). Along the eastern margin of the Caledonian front the Cambrian and Ordovician sedimentary cover of the Precambrian crystalline basement is exposed in a more or less autochthonous position below the thrustured rocks of the Lower Allochthon and east of the thrust front. This sedimentary sequence is termed the Autochthon. The forces involved in the eastward thrusting of the allochthonous sequence have also affected the autochthonous

rocks to varying degrees. In many places the autochthonous rocks are folded and cut by climbing minor displacements or thrust-planes.

Previous reconstructions of the structure of the Caledonian front in Jämtland emphasised the tectonic and lithofacial discontinuity between the Autochthon and Lower Allochthon (Asklund 1938; Thorslund 1940). Even the basal thrust units of the Lower Allochthon were assumed to have been transported considerable distances eastward, thus bringing different contemporaneous facies into close proximity. The Autochthonous sequence, as then defined, coincided with the distribution in Jämtland of what is now termed the central Baltoscandian confacies belt.

Recent studies during mapping of the bed-rock for a new geological map of Jämtland County have shown that in practice the distinction between the Autochthon and the Lower Allochthon is not always sharp, and in places is even arbitrary. The thrust front of the Lower Allochthon in some areas is situated farther to the east than previously thought. For example, in the Autochthon of the north-western Bay of Brunflo area, which includes the Slandrom section, at least one significant thrust-plane with associated climbing displacements has now been recorded (L. Karis, unpublished). Tectonically this area should thus be classified as Lower Allochthon. Also the discontinuity between the Autochthon and Lower Allochthon is not always as sharp as previously believed. In the basal Lower Allochthon of the area south-east of Storsjön, Asklund (1938) suggested a tectonic structure with successive thrust units, termed the Skute, Bjärme and Sunne Nappes, each having a distinctive stratigraphical composition. This interpretation was important in forming the current usage of the concepts autochthon and allochthon. Recent studies appear to indicate that the differences between these nappes are to a large extent due to rapid spatial change in lithofacies rather than to longer transport for the individual tectonic units.

Figure 1. Correlation table of the Ordovician in some selected areas of Jämtland. Diagonal shading indicates breaks in the sequence. Compiled by V. Jaanusson and K. Larsson (Autochthon), and L. Karis (Lower Allochthon). Unpublished data from Stig M. Bergström are incorporated.

A consequence of these studies is that the tectonic concepts Autochthon and Lower Allochthon no longer coincide with the distribution of the confacies belts. The confacies type characteristic of the central belt continues in some areas into what should be tectonically classified as Lower Allochthon. However, pending comprehensive description of the Caledonian front structure in Jämtland, the accustomed usage of the term Autochthon (Asklund 1938) is followed in this guide. The geographical distribution of the main tectonic units in the region west of Östersund, the Föllinge and Olden Nappes (Asklund 1938), is also disputed. For that reason very few tectonic elements are indicated in Karis & Larsson, Road log, Fig. 1.

The autochthonous Lower Palaeozoic epicontinental deposits crop out in a narrow strip along most of the Caledonian front. Ordovician rocks are preserved from Härjedalen in the south to Lake Malgomaj area in southernmost Lapland. The outcrop area is widest in central Jämtland, south-east of Östersund, on both sides of the Bay of Brunflo.

Along its whole extent from Härjedalen to southernmost Lapland, the Ordovician of the Autochthon belongs to the central Baltoscandian confacies belt. Much of the sequence is lithologically as well as faunally very similar to the Siljan district. However, the clearly nodular upper Dalby Limestone and, locally, Örå Shale resemble contemporaneous beds of the Oslo Region as does the persistent development of the Töyen Shale.