

Some remarks on the Steinkjer Mega-boudin

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The evidence for the presence of a major tectonic lens, the Steinkjer Mega-boudin, in the Caledonian allochthon of northern Trøndelag is summarized. The lens itself is composed of three distinct tectonic units: an upper complex of schists, gneisses and amphibolites, a middle unit of dolerite-intruded feldspathic sandstones, and a lower unit of feldspathic sandstones lacking dolerites. Lamprophyres occur locally in the lower unit. These three units are directly comparable with the Seve, Särsv, and Offerdal Nappes of the Swedish Caledonides.

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Reconnaissance of the Tømmerås Antiform, northern Trøndelag (Springer Peacey 1964) defined the general regional distribution of the main rock units, identifying a lowermost largely rhyolitic basement unit, the Tømmerås Group, overlain by sandstones of the Lower and Upper Leksdalsvann Group and then volcanic and sedimentary rocks of the Lower and Upper Snåsa Group, the entire sequence being metamorphosed in greenschist to amphibolite facies. Gee (1974) drew attention to the evidence for the allochthonous character of all but the lowermost tectonic unit in the antiform. He compared the sandstones of the Leksdalsvann Group with the Offerdal Nappe sandstones, and included overlying schists, gneisses, and amphibolites in the Seve of the Seve-Köli Nappe Complex (cf. Törnebohm 1896). The lenticularity of these two units, along the southwestern margin of the Tømmerås basement, had been demonstrated by the previous mapping.

Fieldwork in 1975 (Gee 1976, 1977) identified the presence of a third tectonic unit, in this large lens, separating the two mentioned above, composed essentially of meta-sandstones intruded by a suite of dolerites; this unit was correlated with the Särsv Nappe. The maximum thickness of this mega-lens, subsequently referred to as the Steinkjer Mega-boudin (Gee 1978), is in the order of two kilometres.

Gee's data were obtained largely from the northern part of the lens in the area of Steinkjer and directly to the southeast. In that area, dolerite dykes occur in Springer Peacey's (1964) Upper Leksdalsvann Group, the Lower Leksdals-

vann Group apparently lacking basic sheets. In the absence of detailed remapping of the southwestern part of the Tømmerås Antiform, Gee inferred that the Upper Leksdalsvann Group in general could be correlated with the Särsv Nappe, and the Lower Leksdalsvann Group with the Offerdal Nappe, and that the contact between Springer Peacey's Upper i Leksdalsvann Group and Lower Snåsa Group was the tectonic boundary between the Särsv and Seve units. Wolff (1976) likewise accepted these contacts to be of tectonic origin.

Subsequent investigations, concentrated to six profiles through the Leksdalsvann Group, persuaded Andreasson (1978) that the Upper Leksdalsvann Group is only locally intruded by basic dykes and that concordant basic sheets also occur in the Lower Leksdalsvann Group, near the base. Only at one locality, near Støa, did Andreasson locate a conspicuous zone of high strain separating the Lower and Upper Leksdalsvann Groups, and he concluded that Springer Peacey's boundary between the groups was neither a significant stratigraphic nor tectonic contact. He emphasized the evidence for increasing strain and recrystallization downwards in the Leksdalsvann Group and the presence of mylonites separating the meta-sandstones from the underlying basement.

Our subsequent investigations in the Tømmerås area have confirmed the presence, below the greenschist facies Upper Snåsa Group, of an amphibolite facies, trondhjemitic-intruded complex of schists, gneisses, and amphibolites comprising the upper part of

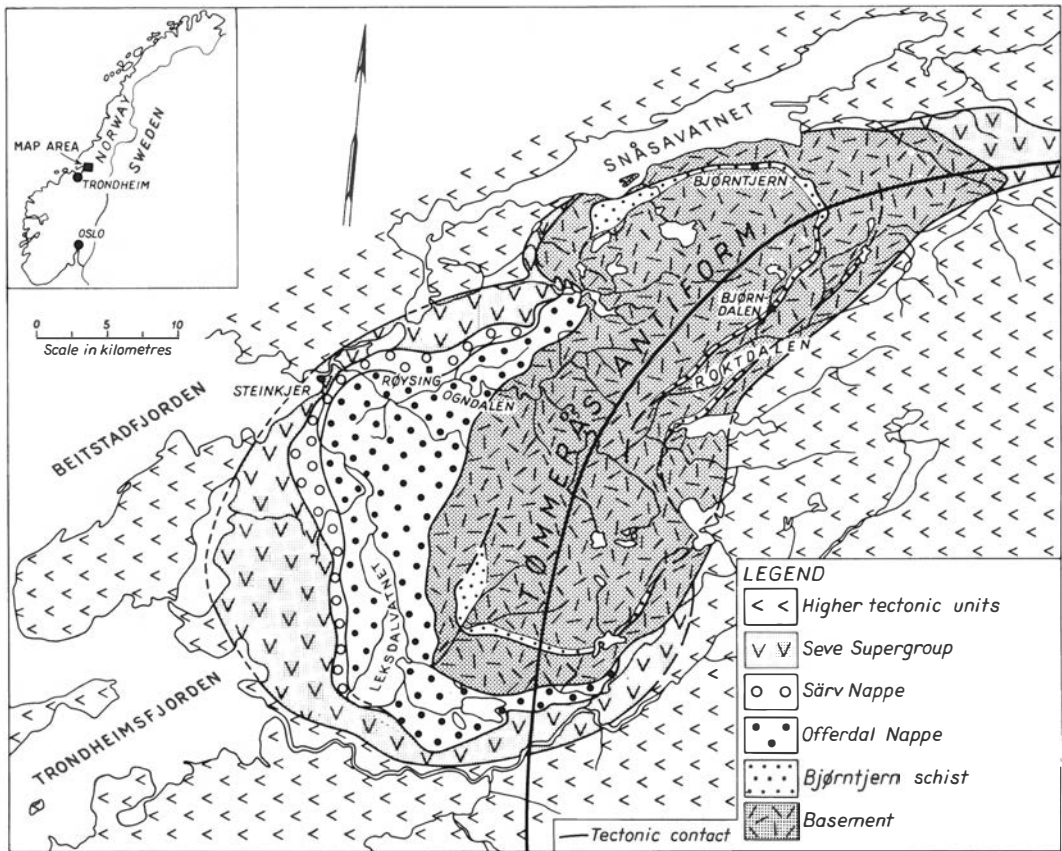


Fig. 1. Distribution of the main tectonic units in the Tømmerås Antiform.

Springer Peacey's Lower Snåsa Group. These units are well exposed in the E6 road-cutting south of Steinkjer and in the vicinity of the E6 road-tunnel, c. 5 km north of Verdal. They are underlain by a sandstone unit in which there occur numerous porphyritic dolerites and then by a lower unit of sandstones lacking dolerite sheets. These relationships are excellently exposed at and above the Ramstadkammen quarry (map-sheet Snåsavatnet, Coord. 6351/71053) east of Steinkjer. The upper part of the dolerite-intruded sandstone unit passes up through concordant sandstones and porphyritic greenstones (the basal units of Springer Peacey's Lower Snåsa Group) into the higher grade complex referred to above.

Whereas discordant dolerite sheets are typical in the upper unit, they have not been observed in the lower unit. Concordant greenstones, referred

to by Andreasson (1978:111) as occurring near the base of the lower unit, appear to be of local development only; the composition of these strongly foliated amphibolites is known to differ markedly from that of the dolerite dykes in the upper unit. The latter compare closely with the Ottfjäll dolerites of the Särvi Nappe type area (Solyom et al. 1979, Z. Solyom, pers. comm. 1977). A few lamprophyric dykes have been recorded locally in the upper part of the Offerdal unit near Steinkjer.

We are thus persuaded firstly that the three-component character of the Steinkjer Megaboudin is essentially correct, and secondly that the internal geometry of the lens is more complex than that outlined by Gee on the basis of previous mapping. The lenticular geometry has also been modified by late-Caledonian high-angle faulting. Fig. 1 is a better approximation of

the extent of the different units within the lens; the boundaries between the units only locally coincide with those separating Springer Peacey's Lower Snåsa Group and Upper and Lower Leksdalsvann Group.

We want to emphasize that detailed remapping will certainly revise these boundaries as they are marked on Fig. 1. However, the external geometry of the Steinkjer Mega-boudin appears well established, the lower margin being defined by the mylonitic (Andreasson 1978) contact to the Tømmerås basement rocks and the upper margin by the phyllonites separating the amphibolite facies Seve rocks from the overlying greenschist facies Upper Snåsa Group (Springer Peacey 1964).

Stratigraphic and tectonic nomenclature in the Tømmerås area are clearly in a state of flux. We have chosen not to introduce a new local terminology for the tectono-stratigraphy and advise against such innovations until the necessary detailed mapping of the rock units has been completed.

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