Note –*Notis*

A discussion on the Torfinnsbu Window, Jotunheimen

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Trevor Emmett kindly furnished us with a preliminary copy of his recent paper on a window through the Jotun Nappe. The importance of such a window prompted our own investigation and regretfully we have to report that the geology of the Torfinnsbu area does not represent a window through the Jotun thrust sheet.

Emmett (1980) describes a small region on the north side of Lake Bygdin where homogeneous Svartdalen Gneiss of the Jotun Nappe is underlain by finer-grained schistose rocks with a hornblende-biotite-epidote-plagioclase (An_{25})-quartz mineralogy. The contact between the two sequences is a major shear zone with an easterly component of overthrust displacement. Emmett proposes a metasedimentary origin for the lower rocks and correlates them with the Valdres Group sediments which underlie the Jotun Nappe. Hence he implies that the major shear zone could represent the basal thrust to the Jotun Nappe and that doming and erosion is responsible for exposing the underlying rocks within his window.

However, we do not believe that the Torfinnsbu rocks can be correlated with Valdres Group sediments. We have recently remapped the whole of the Valdres Group and were not able to recognize any of the Valdres formations within the Torfinnsbu area. The Olefjell Formation of the Valdres Group is present under the Jotun Nappe in the surrounding areas of Bessheim, Bygdin, and Tyin, and would be expected to occur if Torfinnsbu represented a window. In contrast to Emmett, we believe that the Torfinnsbu rocks had a crystalline gneiss parentage and that the present sediment-like appearance of the rocks is due to later shearing. During our investigations we found several localitites with enclaves of coarse, granular hornblende-biotite gneisses (particularly on the lake shore at 757027) which could be traced into shear zones which retrograde and reduce the grain size to form flaggy greenschists which are superficially similar to metasediments. In our opinion only the 'quartzite' which Emmett described could be sedimentary; even this we suspect is of quartzofeldspathic igneous origin.

Secondly, the major structure of the area is clearly not that of a window. We believe that Jotun rocks crop out on the south shore of Lake Bygdin, opposite to Torfinnsbu, and that these rocks clearly have a northerly dip beneath the Torfinnsbu rocks. Hence the latter are clearly over- and under-lain by Jotun gneisses. From a geological section we calculate that the basal thrust plane to the Jotun Nappe is structurally at least 1.5 km beneath the Torfinnsbu area.

To sum up, we believe the Torfinnsbu rocks are part of the Jotun Nappe and that they represent an original series of crystalline gneisses at amphibolite facies which have been retrograded by shearing to schistose tectonites. A Caledonian age cannot be proved for the retrogression nor for the emplacement of the Svartdalen Gneisses above the Torfinnsbu rocks. In fact the continuation of the major shear zone, to the southwest across Lake Bygdin, seems to connect with the major shear zone through Eidsbugarden (McRitchie 1965) which Heim et al. (1977) suggest has a Precambrian age.

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References

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