Tjörnes, North Iceland: A Bibliographical Review of the Geological Research History

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ABSTRACT

The Tjörnes sequence spans Late Tertiary and Quaternary lava flows and fossiliferous sedimentary rocks. The great thickness of the sediments is unusual in Iceland which consists mainly of volcanic rocks. The sequence is unique in the North Atlantic area in its lithological character and long Quaternary record. The Tjörnes sequence combines lithological and palaeontological evidence about past temperature conditions and climate. The present paper is a review of the geological research history of the Tjörnes area. The earliest contributions deal mainly with the fossil material. While the palaeontological research has continued up to the present, studies combining stratigraphical, palaeontological, and sedimentological aspects of the sequence became more frequent in the 20th century. During the last two decades the main emphasis has been on palaeomagnetic stratigraphy, K/Ar dating, and lithostratigraphy of the upper part of the Tjörnes sequence, where lithological evidence and changes in mollusc assemblages indicate the onset of recurrent glaciations.

INTRODUCTION

Tjörnes has been frequented by geologists for over a century. This is reflected by the wealth of literature concerning the area. Two features set the Tjörnes sequence apart from other exposed sequences in Iceland. Firstly, it contains thick marine sediments of Pliocene and Pleistocene age. Secondly, Tjörnes (Fig. 1) represents a horst structure bounded in the east by a subsiding volcanic zone (Thoroddsen 1902, Th. Einarsson et al. 1967, Sæmundsson 1974). The presence of up to 500 m thick, predominantly marine sediments in this uplifted segment has obvious implications about the nature of the nearby shelf area. Clearly, the study of the Tjörnes sequence is of local importance in evaluating offshore data in the Tjörnes area. Ever since Pjetursson (1905b) found glacial signs in the Tjörnes sequence in the Bay of Breiðavík, the controversy about the Pliocene/Pleistocene boundary in Iceland has involved the Tjörnes sequence. On the basis of the fossil evidence, the sequence has been used to define that boundary in Iceland (Th. Einarsson 1968). Th. Einarsson et al. (1967) reported ten glacial horizons in the upper Tjörnes sequence and attempted a correlation with the palaeomagnetic time scale. The investigation of the sequence is thus of importance for the local stratigraphy of Iceland, and for the evaluation of the climatic evolution before and during the Late Cainozoic ice age in the North Atlantic area.