Icelandic National Committee
for the Geodynamics Project

Icelandic National Report for the Geodynamics Project 1971-1975

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Reykjavik 1975

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In the "Iceland National Report on the Upper Mantle Project 1968-1970" a summary was given of the Icelandic effort in the field of geodynamics until the end of 1970. The present report deals with scientific research carried out by or in cooperation with Icelandic research institutes since that time to the present day.

The main research topics related to the Geodynamics Project in Iceland were listed in the programme of the Icelandic National Committee in 1971 (Inter-Union Commission on Geodynamics, Report No. 3, p. 199-202). The topics were broadly divided into three categories: I. The active volcanic zones, II. Plateaubasalt areas adjacent to the active volcanic zones, and III. General studies of Iceland and the shelf regions. Much research has been done in all these fields during the first half of the period of the Geodynamics Project. A comprehensive summary of research activities in Iceland until 1973 was given in a review paper by G. Pálmason and K. Saemundsson: "Iceland in Relation to the Mid-Atlantic Ridge", Annual Review of Earth and Planetary Sciences, 1974, Vol. 2, p. 25-50.

Geological maps in the scale 1:50 000 have been made of large areas of particular geological interest both in the active volcanic zones and in the plateau-basalt areas, and are in preparation for publication. A major effort is presently being made in age dating rocks in the plateaubasalt regions with a combination of K/Ar , palaeomagnetic, and conventional stratigraphic methods. Petrological studies have been carried out on a large number of samples from most parts of the country and from the Mid-Atlantic Ridge both to the north and south of Iceland. Particular emphasis has been laid on trace element and isotope studies of the volcanic rocks.

An aeromagnetic survey of Iceland is nearly completed. More detailed aeromagnetic surveys have been carried out in several hydrothermal areas and in the vicinity of active volcanoes. Marine magnetic surveys of most of the shelf area surrounding Iceland have also been completed.

A systematic gravity survey of Iceland has been completed, covering both the land area and the shelf surrounding Iceland. This ties in with marine surveys made by expeditions from other countries.

The network of seismograph stations has been greatly expanded. Mobile station networks have been set up in some areas of the volcanic zone to study microearthquakes and general seismicity.

Regional heat flow data have been collected from available drillholes, and model studies made to interpret the data in terms of geological processes. Magnetotelluric surveys have been made to estimate crustal and upper mantle temperature.

Scientists from several nations have been doing research in Iceland and in the shelf regions around the island. Most of this research has been done in cooperation with Icelandic scientists. The largest one-nation expedition to Iceland was made by a group of Soviet scientists who worked for three successive field seasons in Iceland under the leadership of Prof. V. Beloussov. The largest multinational research project was the North Atlantic Seismic Project which was coordinated by Prof. M.H.P. Bott.

The Geoscience Society of Iceland organized an international meeting on geodynamics in Reykjavík on 1-7 July, 1974. The conference was supported financially by the NATO Scientific Affairs Division, the Inter-Union Commission on Geodynamics, and other sources. The proceedings of the conference have been published (Geodynamics of Iceland and the North Atlantic Area, ed. L. Kristjansson, 1974, 323 p. D. Reidel Publishing Co., Dordrecht-Holland). This book includes summaries on much of the more recent research in the Iceland region.

A Nordic Volcanological Institute was formally established in Reykjavík in 1974. The institute is organized and financed by the five Nordic nations (Denmark, Finland, Iceland, Norway, and Sweden). Presently the institute is mainly concerned with research in petrology, geochemistry, and volcanic geology, but geophysical research will be taken up in the near future. Most of the research projects are on Icelandic rocks, but members of the institute are also doing research in Jan Mayen and Norway. The chairman of the board of directors is Prof. Arne Noe-Nygaard, and the executive director is Dr. Gudmundur E. Sigvaldason. Further information about the institute can be obtained by writing to: Nordic Volcanological Institute, Geoscience Building, Reykjavík, Iceland.

Preliminary plans are presently being made for deep crustal drilling in Iceland. The primary aim of the project is to investigate the composition and various physical and chemical properties of the crust, and it is hoped that core samples from layer 3 (V_p=6.5 km/s) can be obtained. Inquiries regarding participation of scientists from other countries are invited. Further information on the project can be obtained by writing to G. Pálmason, Orkustofnun, Laugavegur 116, Reykjavík, Iceland.

Members of the Icelandic National Committee for the Geodynamics Project:

Ágúst Bödvarsson, Icelandic Survey Department, Laugavegur 178, Reykjavík.
Gudmundur Pálmason, chairman, National Energy Authority, Laugavegur 116, Reykjavík.
Gudmundur E. Sigvaldason, Nordic Volcanological Institute, Geoscience Building, Reykjavík.
Kristján Saemundsson, National Energy Authority, Laugavegur 116, Reykjavík.
Leó Kristjánsson, Science Institute, University of Iceland, Reykjavík.
Ragnar Stefánsson, Icelandic Meteorological Service, Reykjavík.
Sigurdur Steinthorsson, Science Institute, University of Iceland, Reykjavík.
Sigurdur Thorarinsson, - " -
Sveinbjörn Björnsson, - " -
Sveinn Jakobsson, Museum of Natural History, Reykjavík.
Trausti Einarsson, Faculty of Engineering, University of Iceland, Reykjavík.

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