**Leó Kristjánsson, Institute of Earth Sciences,**
**Science Institute, University of Iceland**

# Current research projects - January 2013

## *Paleomagnetism*

1. An ongoing project since 2009 on the oldest lava formations in NW-Iceland, south of the Ísafjarðardjúp fjord. Stratigraphic mapping and sampling of 66 lava flows in Skálavík, Hnífsdalur, Súgandafjörður and Skutulsfjörður, 2010-12, magnetic measurements and processing of results were completed in late 2012. Collaboration with M.S. Riishuus of the Institute of Earth Sciences and R.A. Duncan of Oregon State University regarding geochemical and geochronological studies, especially the question of a possible long hiatus and unconformity at the level of lignite-bearing sediments in the area.
Support: 3-year grant from the research council Rannis 2009-11, with M.S.R. as principal investigator.
Output so far by M.S.R., R.A.D. and L.K.:
- Poster at the AGU Fall Meeting, San Francisco, Dec. 2010
- Talk at the 2011 Spring Meeting of the Geoscience Society of Iceland
- Poster at the 30th Winter Meeting of Nordic geologists, Reykjavik, Jan. 2012
A manuscript on the results will be written up in 2013.

2. A study published in 1996 (partially already in 1989) showed that a prolonged period of instability of the geomagnetic field was recorded in three stratigraphically overlapping mountainside profiles through the lava pile in the tributary fjords Mjóifjörður and Ísafjörður of Ísafjarðardjúp, NW-Iceland. In a new project initiated in 2012, 32 lavas were mapped and sampled in three short profiles near the original profiles. Remanence measurements are ongoing, with interesting results. Further sampling in the area is envisaged in the spring of 2013.

3. Statistical analyses of various aspects of primary remanence directions and intensities in over 5200 magnetically stable lava flows in Iceland, of ages 1- 16 Ma. Similar analyses have been carried out by L.K. earlier on some of these aspects, with smaller data sets from Iceland.
Output so far:
- Poster at the AGU Fall meeting, San Francisco, Dec. 2012
A manuscript on the results was submitted to a journal in Dec. 2012.

## *Magnetic surveys*

4. A new ground survey of the principal peak of a major magnetic anomaly at Stardalur farm, SW-Iceland, was undertaken in 2011. Previously, rock-magnetic measurements had been carried out in 2008-10 by L.K. and by S. McEnroe at the Norwegian Geological Survey on material from a 200-m deep drilling at this site in 1969-70.
Output so far:
- Talk at the Fall meeting of the Geoscience Society of Iceland, Nov. 2010.
A manuscript describing the results and their interpretation was submitted to a journal in late 2012. Additionally, this manuscript reviews research carried out by

L.K. and many others since 1968 on this anomaly and on material from the above-mentioned drilling. The ms. also contains the main results of a 2012 ground survey at a similar but less intense anomaly at Hvanneyri, W-Iceland.

***History of scientific research***

5. In this field, the main project since 1995 has concerned the scientific applications of Iceland spar crystals recovered from the Helgustaðir quarry in Reyðarfjörður, c. 1780-1930. Steady progress is being made towards a revised edition of L.K.'s 400-page Science Institute Report in English (2010) on these applications and on the history of operations at the quarry. Five days were spent in libraries at the University of Wisconsin, Madison in Nov. 2012. The new edition will probably appear in mid- to late 2013.
Output in 2012:
- A general paper in the journal "History of Geo- and Space Sciences"
- A paper in the Icelandic periodical "Raust" describing the various uses of Iceland spar crystals in research on X-rays, to about 1960.
- A short account on L.K.'s website describing the use of Iceland spar prisms in clinical chemistry instrumentation in the period c. 1840-1940, especially in connection with the diagnosis, treatment, and research of diabetic disease.

6. Bibliographic compilations. L.K. has previously been placing bibliographies of several Icelandic geoscientists on his website, with additions and corrections from previous published versions. In 2012, scientific bibliographies of Tómas Tryggvason, Helgi Pjeturss (papers in foreign journals) and Guðmundur Pálmason were included in this collection. Also, a list of papers by the French 19th century chemist A. Damour containing chemical analyses of Icelandic minerals and rocks, and a compilation of numerous papers and books on the natural history of Iceland published in Edinburgh (mostly in the 19th century). L.K. contributed information to a biographical book on the Danish auroral researcher Sophus Tromholt, regarding his residence in Iceland in 1883-84.