

# ICE AND FIRE – ICELAND

Jan Williams

Icelandair flight 1300 lands at Keflavik Airport 30km from Reykjavik, the capital city of Iceland. Just before we land we get a weather report from the flight crew. The wind is 30 knots (equals 7-8 on the Beaufort scale) and the temperature is 2°C. They don't mention the snow "falling" horizontally; there is none on the ground as it's all been blown into the Atlantic, like the soil!

We get on a mini-bus and meet "Siggy" our Icelandic guide and set off to our first stop near the port of Þorlákshöfn. "Think of a land in tension" said Siggy. The landscape is black and grey, a lava field, small domes of rock each with small cracks in the top. The crust is being pulled apart, not one big split but millions of small splits.

After spending the night near Þorlákshöfn, we go down some lava tubes, on the way to the Vestmannaeyjr ferry - two hours fifty minutes of sea-sickness for some, but not for me! After checking into our hotel we see the land created by the 1973 eruption of Eldfell volcano and the fissure eruption. Nearly half the town was engulfed in lava, the other half buried in ash. Some buildings are 14 metres deep in lava, and have signs to say what is under them. There are some part-buried buildings still to see with the new house built in front! Next day we climb into the crater Eldfell, see steam coming out of the ground and carefully pick up hot rocks. The ground has stayed hot for 30 years! Next we go to the volcano show and see an amazing film of the fissure eruption and active lava flow, the night sky lit up in fire. We also learned the social history of the disaster; five thousand three hundred souls were saved that night. All the damage was repaired and the town was back in business in a very short time. Fire hoses were used to save the harbour. You just have to be impressed by the guts and drive of these hardy people.

Day four sees us back in Þorlákshöfn to see a basalt lava field, three types of lava, vesicular, non-vesicular and ropy basalt. Jet-black rock and thirty to forty centimetres of snow make a magic black and white world, massive waves pound the shore and have thrown a block the size of our bus up on to the land. Sea gastropods still crawl, searching for the sea, which is 15 metres below them. Siggy tells us that it was washed up yesterday. Geology in action!

Day five and we head north to Borgorðfjörður and Hvalfjörður and stopped on a beach to find jasper and basalt. Then we travelled on to a rhyolite quarry to find obsidian. Later we went to a large fault where tectonics have reversed the drainage of the river; we see patterned ground and dykes and sills everywhere. Then on we went to Akranes to see the mineral museum - just brilliant! Next we go down a 170 metre deep tunnel on the way to Reykjavik, where we watch the second volcano show. This has footage of most of the volcanic activity in Iceland,

filmed by a local vulcanologist. It showed very spectacular and detailed geology; a great show.

Day six is hot-springs day. We visit Eden, a garden centre where food crops are grown, as well as flowers, cacti and bananas! Eden is at the base of a rift and is a hot-spot. The ground is too hot to touch and steam is flowing out of the ground everywhere, hence the large green-houses. Then we hit the tourist trail and go to Gullfoss and Geysir. Gullfoss (*photograph 1*) is a large waterfall caused by faulting. Geysir is an extensive hot-spring. There are colloidal silicates in solution and the water temperature is greater than 100°C.



*Photograph 1: Gullfoss Waterfall*

Strokkur (*photograph 2*) erupts at five minute intervals. Blessi is two pools of boiling, still water, one blue and one green. Really pretty. Little Geysir is about the size of a dustbin, full of bubbling boiling water. Really sweet. Red and green silica flowstone "paves" the ground. The hot-springs throughout Iceland flow out of the ground and at around 100°C; there are low fences and danger signs in four languages; it's up to you to keep safe, (*photograph 3*).



*Photograph 2: Strokkur Geyser, about to erupt*



Photograph 3: Typical Icelandic warning sign

The last day we travel along the south coast. On the way we see two waterfalls and a fault. A raised beach which forms the coastal plain is now the main farming area. We cross a large Sandur, a glacial drainage plain which tells us we are near Eyjafjallayakull glacier. We climb right into the ice at the snout and see basaltic till, moraines, braided streams and deep-blue ice.

I have not been able to do more than touch on a lot of the geology of this fantastic trip as I would take up the whole journal for my report. If you would like to know more just ask me if you have one to two hours to spare!

If you plan to visit Iceland for the first time in winter (October to May), see me for advice on what to wear, boots, coats etc. This can make or break your trip, it is very important to get this right.

#### Further reading:

Thordarson, Thor & Hoskuldsson, Armann, *Classic Geology in Europe, 3 Iceland* (ISBN 1-903544-06-8).

Barðarson, Hjalmar R., *Ice and Fire*, 4th English Edition (ISBN –9979-818-13-1)

For general advice *Insight Guides, Iceland* published by the Discovery Channel.

## DID YOU KNOW?

### New Sea Crater link to Mass Extinction:

New analysis of rock cores from the Bedout High crater off the north west coast of Australia has shown that it was probably caused by an asteroid or comet that hit the Earth about 250 million years ago. This date coincides with the great Permian extinction when 90% of all marine species and 80% on land, died out. At the time of impact, Australia was joined to all the continents as part of Pangea. The crater would still have been offshore, in a super-ocean called Panthalassa. An impact at the Bedout High would explain the pattern of debris, breccia and shocked quartz, found at other sites around the world.

Most scientists already accept that the asteroid that formed the Chicxulub crater off the coast of Mexico was partly responsible for the mass extinction that killed the dinosaurs 65 million years ago.

Extreme volcanic activity is known to have taken place around the times of both the Bedout and Chicxulub impacts and it is possible that the impacts actually triggered the volcanism. The cumulative impact of an asteroid strike, volcanic destruction and the climate change produced by both events could underlie the mass extinctions that took place 250 and 65 million years ago.

The facts are still highly contested by geologists.

*More information about the Chicxulub crater can be found on page 45 in this Journal.*

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### Coping with Climate Change:

According to the NERC magazine, Planet Earth (Spring 2004) a flight from London to Australia puts as much greenhouse gas into the atmosphere *per passenger* as does the use of one car for a typical year's motoring. The same issue of the magazine mentions a sea level rise of 60m should the Antarctic ice sheet melt completely. The Greenland ice would add to this. 'Coping with Climate Change' was the title of a recent meeting at Burlington House. 'Science claims that the planet is entering a state of potentially dangerous instability' was one of the messages and 'the catastrophe of unchecked climate change' one of the outcomes.