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URANIUM IN THE ISLE OF MAN

A review of the history and geology of uranium prospects at Snaefell and Laxey mines.

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SYNOPSIS

A material, originally believed to be anthracite, was first found in Great Laxey lead mine in about 1890. Subsequent investigations by the United Kingdom Atomic Energy Authority, and others, showed it to contain uranium. An account of these investigations is given, along with a description of the occurrence and geology of the uranium bearing mineral.

Although the Isle of Man is known for its lead, zinc, and copper ores, few people are aware that an unusual uranium ore exists there. This has attracted the interest of both geologists and atomic energy authorities on a number of occasions. This article gives a brief description of the history of these investigations, and considers possible modes of formation of the deposit.

Essentially, the island consists of a central range of hills running north-east to south-west, flanked on the north-west and the south-east by lowland areas. The hills are of Ordovician or Silurian slates, uplifted during the caledonide orogeny by granites which are exposed at Dhoon, Oatland, and Foxdale. The south-east of the Island is a lower Dinantian carboniferous limestone region, lying unconformably on the slates. The northern and north-western areas have the carboniferous limestone at depth, but subsidence has permitted the survival of the overlying permo-trias, and allowed the later accumulation of the quaternary glacial till that forms the present land surface in that region.[4] The mineralisations occurred in late carboniferous to triassic times.[7,8] Laxey and Snaefell mines both have north-south striking, steeply dipping veins, which contained zinc, lead, and copper and were in a country rock of slate throughout the entire mine depth.[4] The mineral of interest here – a hydrocarbon associated with the copper ores – was known definitely to exist in Great Laxey mine, at about the 100 fathom level, in copper ground, between "Engine" and "Corner" shafts,[4] [p.250]. It was in the form of veins, whose interbedding with the strata, or else conformation with the orebody was not obvious. Heresay also has it that similar occurrences were found in Snaefell mine.[6] However, no documentary evidence exists about that case.

The pursuit of this mineral by at least three groups of investigators made an interesting study.

It started after World War Two, when the U.K. wanted its own supply of uranium, and began searching its mineral deposits in a serious manner.

The Mona's Herald of 29 August 1950 carried an article headed *Manx uranium deposits around disused lead mine*,[1] and a year later, Davidson and Bowie[1] published the results of a study of a mineral called Thucholite, taken from Great Laxey Mine.

This is a mixture of pitchblende and hydrocarbon – a strange bedfellow with copper ore! Spencer[3] included Thucholite in his third supplement to the list of British minerals. Also, Bannock[14] produced a report of investigations of Laxey and Snaefell mines.

The interests of the U.K. Atomic Energy Authority are enlightening: again, the *Mona's Herald*, 29 August 1950: On being questioned about Manx uranium, a Manx mines board official denied knowledge, even though the United Kingdom Atomic Energy Authority was known to be building a new plant at Capenhurst, Cheshire, for separating out the radioactive isotope of uranium from the rest of the isotopes. Discoveries of uranium in potash beds in England were mentioned along with that of a lead mine in Dolgellau in Wales.

(A Sunday journal – of unknown identity – also mentioned the Isle of Man at around that time.[6])

J.N. Panes, at that time the Government Secretary of the Manx Government had no knowledge of tests being done, nor had any prospecting licenses been issued since World War Two. However, he did recall that a group of people, including mining engineers, were considering floating a company to survey a disused lead mine, but did not know which one, or where it was.

At that time, Bannock and Marsland were trying to develop Snaefell and Great Laxey mines.[6] According to Maurice Dudley[6] the miners had also seen "anthracite" in Snaefell Mine, and according to Lamplugh,[4] [p.520] it existed in Great Laxey mine. Laxey, Snaefell, Bradda, and Foxdale had all been checked by the U.K.A.E.A., in 1951-1952. The results were never publicly released. Rumour has it[6] that some of these locations produced ores, which, when separated from the surrounding "gangue" had up to 16% uranium by weight.

Then an article appeared in the *Isle of Man Examiner*, 29 January 1954.[5] Mr Brannock, who had investigated Snaefell mine earlier, was forming the Island Exploration Company, to investigate possible mineral "anomalies" – mainly detected by electrical and magnetic techniques, but also studied by analysis of metals leached out into small streams and rivers. Although interest centred on a misleading iron-copper sulphide lode near Slieu Whallion, and also on another lode at Shughlaquiggin (near Baagarrow, North of Glen Helen), their interest was excluded from Snaefell and Great Laxey because of prior license to English and Canadian companies. A lease was signed by the U.K.A.E.A. for Snaefell mine in 1951,[6] and was held by Canadian interests in 1953-57.[10]

Thus maybe the U.K.A.E.A. had anticipated Mr Bannock's attempt to reinvestigate Laxey and Snaefell by a few years, and, presumably, had secretly obtained prior rights to all uranium in the Isle of Man in about 1951. Although the Island Exploration Company worked until about 1956, and had a Canadian company and later, a British company, drill Slieu Whallion and Shughlaquiggin for lead, the Island Exploration Company came to an end in about 1957 without making any significant discoveries.[10,13] Nor were Bannock or Marsland involved from about 1953 onwards.

The story has an interesting sequel:

Mr Ladds, the then head librarian of Douglas Public Library told the story of the request by the Russians (Leningrad University) in about 1969 for a copy of W.G. Lamplugh,[4] and its subsequent trip to Leningrad and back. Lamplugh does not mention uranium, but does mention a substance, mistakenly identified as anthracite, on page 520, as occurring in the Great Laxey Mine. What further investigations the Russians made are unknown.

The geological nature of these "anthracite" deposits is worth considering in further detail, even though they are not economically viable.

[44]

The emplacement of the Manx mineral ores seems to have happened a long while after the emplacement of the granites. This is discussed in detail by Lamplugh[4] and by Gaciri and Ineson,[7] and Ineson *et al.*[8] Essentially, the granites caused fissures in the slates, during the Devonian period, at which time the range of mountains from the Scottish Highlands, through the Isle of Man, to the Irish county of Leinster were raised up. Later on, in carboniferous to Permian times, hydrothermal activity brought metal saturated solutions up from deep strata, possibly out of the granites or the earth's mantle, and on cooling and depressurising, released the metals as oxide and sulphide precipitates. It is not known how the hydrocarbons got there. Presumably they are organic remains from life in the shales before uplift by the granites. It is worth noting that the hydrocarbons survive only in regions far from the granites and that the lead-bearing fluids were not much above 150°C – too low to decompose the hydrocarbons. Further, by their very nature, the hydrocarbons would reduce, and therefore precipitate, metals, the heaviest metals (such as uranium) going first. Such a reaction would tend to concentrate uranium into the hydrocarbons, and deplete the remaining fluids and metal salts of uranium. Bath, Brasell, Parnell, and others[9] have recently produced a report on these deposits. The metal enrichment by reduction is clear in several samples including that from Great Laxey. Strangely, no mention is made of Snaefell Mine, but, significantly, these uranium ores were found at Laxey in association with copper and Bismuth. When Snaefell mine tips were reworked (about 1965?) – as detailed by McKay and Schnellman[10] – they were uneconomic, because the copper ore from there suffered a high Bismuth penalty.

Finally, the occurrence of these hydrocarbons in association with lead-zinc ores is not as uncommon or improbable as might at first be thought. They have been observed in Czechoslovakian hydrothermal kaolinite deposits. Two European examples are given by Ross[11] who discusses a Swedish deposit, and Deans[12] who gives an example from Nottinghamshire. However, even with all these examples, much remains to be understood about the formation of hydrocarbons in ancient rocks, and the later association with them of uranium and other metals.

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