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MID 20TH CENTURY MINES IN THE DOOLIN AREA, CO. CLARE, IRELAND

by

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ABSTRACT

During the Second World War, phosphate and flourspar deposits close to Doolin, Co. Clare, were investigated by the Irish Government's mining company, Mianrai Teoranta and underground workings developed to exploit them. The flourspar deposit proved unproductive, but the phosphate deposit, which had previously been privately worked by an opencast quarry, was highly productive and was worked until 1947. The earlier opencast workings had stripped the shale covering from the bed of the Aille River, allowing it to sink into the subjacent Doolin Cave System. The existence of this open cave beneath a surface river flowing on limestone has previously been explained by reference to the heterogeneous nature of karst aquifers but can now be attributed to human activity.

INTRODUCTION

Although the Irish Republic was neutral during the Second World War, it was by no means unaffected by that conflict. Many of its vital imports were disrupted by U-boat activity, mounted as part of the attempted German blockade of the United Kingdom. Bulk mineral supplies were amongst the commodities to be badly affected and this caused the Irish Government to look for alternative sources nearer to home. Such sources would not, under normal peacetime conditions, have been economically viable, but the emergency required that all possible supplies be exploited. In the Doolin area of Co. Clare, two known sources of material were further investigated, the phosphatic shales and a vein of Flourspar in the Carboniferous Limestone. The former proved highly productive for a time, but the latter unfortunately did not.

This paper gives details of the extent of the mine workings and also describes their few visible remains.

THE DOOLIN PHOSPHATE MINES

No 1 adit: NGR R 0820 9712
No 5 adit: NGR R 0838 9699
Altitude: 25 m.
Service Shaft: NGR R 0810 9691
Altitude: 48 m.
Depth of service shaft 33 m.
Depth below adit. 10 m.

These mines are situated 500 m south east of the bridge that spans the Aille River at Roadford. There were three inclines; two were above the river on an old narrow gauge railway embankment which can be traced among the dense undergrowth on the southern side of the river. The third, No 1 incline, was some 60 m to the west of the main adit mouth, now covered over. No 5 incline is some 150 m south east of the main adit, just above the riverbank adjacent to a 3 m tall concrete pillar. The main adit entrance is almost opposite the ruins of the

15th century church. The confusing nomenclature is due to the various excavations being named in the order of their development; Figure 2 shows the relationship between the various parts; Figure 1 shows the location of all the mines in the Doolin area. No underground access is possible today as the entrances are blocked by collapse. Virtually the entire working is flooded; the timbers that remain were seen in the 1980s, only forty years after they were installed, to be in an extremely poor condition. During the development of the mine, the degree of settlement of the roof was under constant observation. By the time the mine was abandoned it had not moved by more than 10 cm. As the roof was an almost smooth flat surface, the engineers considered it generally to be structurally sound.

The history of the extraction of phosphatic shale in this area dates back to 1924, when Judge Michael Comyns of Lisdoonvarna, a lawyer and amateur geologist, discovered a band of this material at Noughaval, on the eastern edge of the shale outcrop, some 12 km east of Doolin. He first had 50 tons removed for economic assessment and in 1925 a further 100 tons. At about the same time, he received planning permission to develop a quarry in this area. There were three opencast workings at NGR R 205 964, adjacent to the stream which sinks at swallet G8 (Tratman, 1969, Figure 1). This quarry was worked for a few years but was closed prior to 1933 (McCluskey, 1933), due to the increasing costs of removing the overburden above the seam of phosphatic rock and the superior quality of the phosphate being excavated from the Doolin mines. On closure the area was landscaped and given back to agriculture. No evidence of the quarry can be seen today.

Following on from his work at Noughaval, Judge Comyns surveyed more of the shale deposit and discovered a richer outcrop of phosphatic material in Toomullin Townland, just east of Doolin. This he also developed as an opencast working, removing the shale mainly from the bed of the Aille river and from the land adjoining. The opencast quarrying took place from outside O'Conners Bar, upstream to approximately Poll an Fhia. Workers on this undertaking (Taddy Tierney and Jack Geraghy, taped interviews with the author, 1999) have stated that as the impervious phosphate bed was removed so the river water disappeared into cracks in the newly exposed limestone to flow into the Doolin cave system. Since then the river has only reached the sea at times of higher flow. This matter is discussed more fully below.

As Judge Comyns developed the opencast quarry his men were forced to continually alter the route of the river to facilitate their removal of the underlying phosphatic bed. To allow work to progress, earthen dams were constructed to divert the river. This work was carried out mainly in the level ground, now meadows, found particularly on the east side of the river. These earth dams suffered during winter storms and were in need of constant maintenance.

Judge Comyns' men worked this outcrop until about 1939 when the undertaking was compulsorily taken over by the government mining company, Mianrai Teoranta. It would seem that the Judge was promised a dividend for any mineral removed, a common mining practice, but for some reason the two sides fell out and a lawsuit followed. It is said that the Judge was granted a sum of £50,000 by the court but the same rumours also state that the money was never paid. The truth of this is not knownat present, but research continues.

The development of the underground quarry was commenced in earnest during the emergency in 1941 by Mianrai Teoranta, to replace the country's supplies of fertiliser from North Africa and South America (McCluskey, 1951; Tommy O'Brien and Jack Geraghy, taped interviews with the author, 1999). It was one of the largest mining undertakings in Ireland, employing almost 700 men at its height. The bed of phosphatic rock occurred almost horizontally and had an average thickness of approximately one metre. The hardness of the phosphate

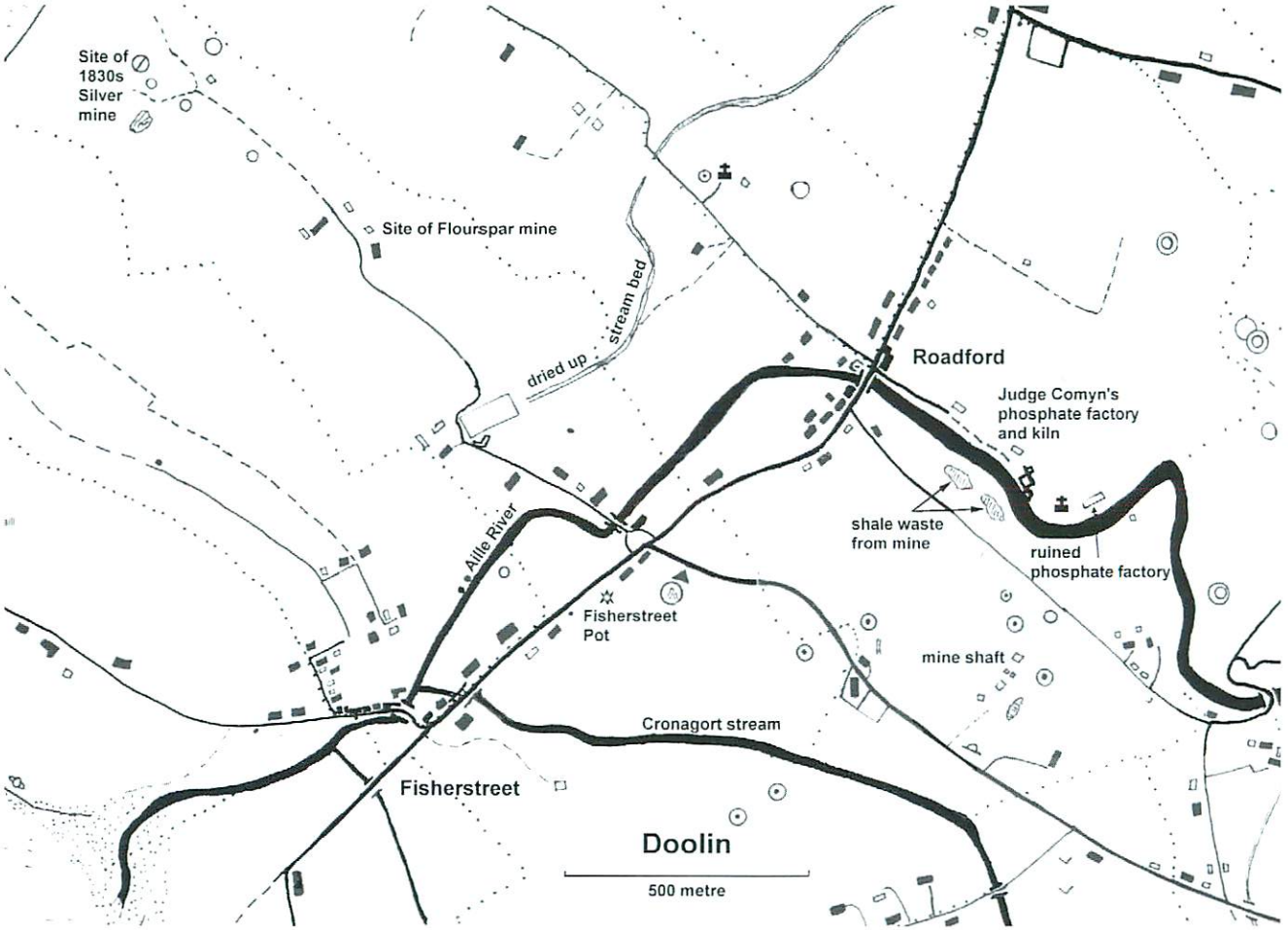

Figure 1. *Sketch map of the Doolin area showing the location of the mines.*

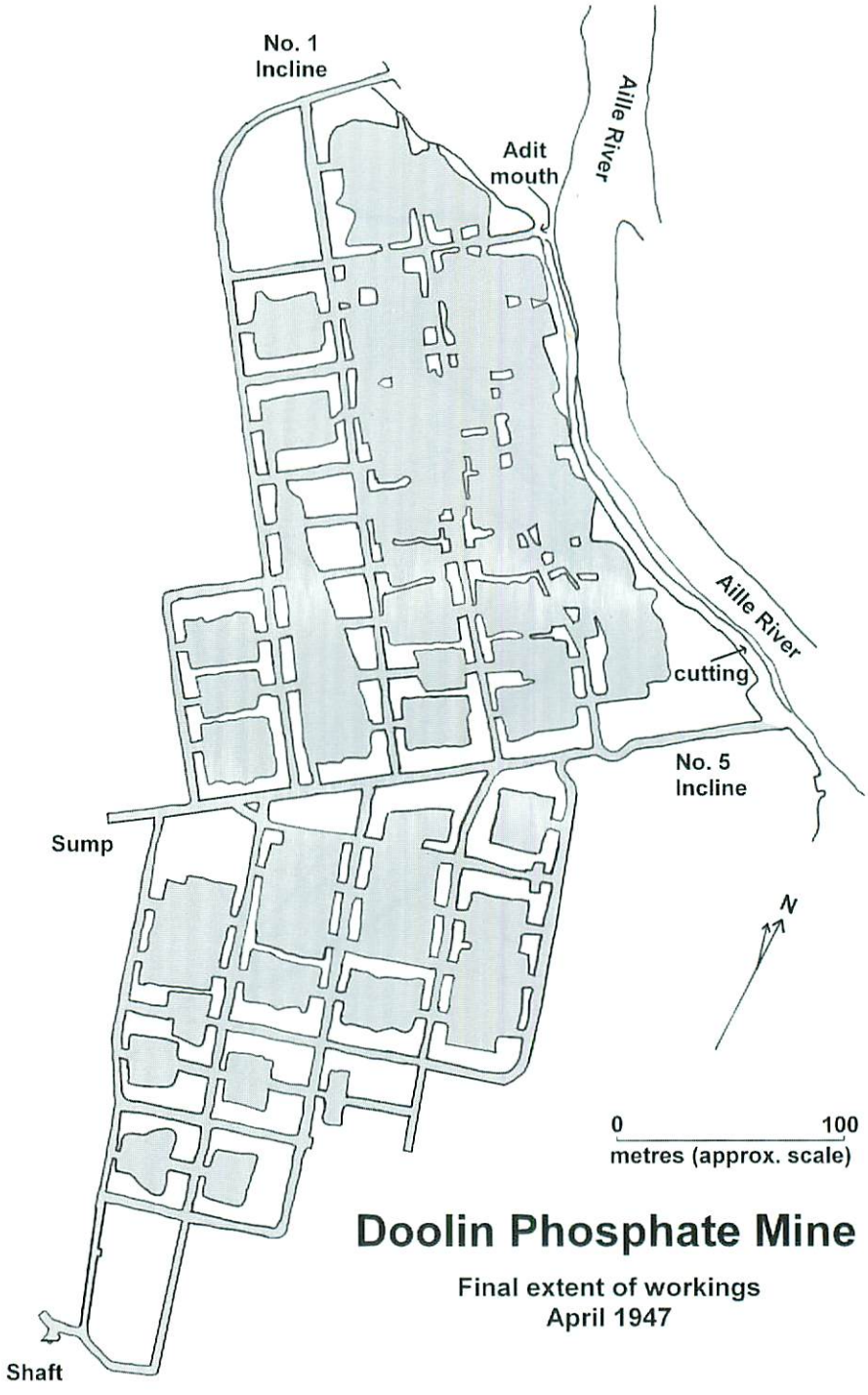

Figure 2. *Plan showing the extent of the Doolin phosphate mine*
Adapted from the mine closure plan held by the Geological Survey of Ireland.

was the ultimate reason for the closure of the mine in 1947 as the processing of the mineral was reported to be almost £3 a ton more expensive than for the cheaper imports which, following the end of the emergency, had once more become available (McCluskey, 1951).

The mine was worked on a pillar and stall system and extended for about 400 m from the mouth of No 1 Adit to the now inaccessible 33 m vertical service shaft. The mine was developed so as to follow the low southerly dip of the beds, draining water toward the service shaft sump for collection. The workings cover an area of approximately one-quarter of a square

Remains today

On the surface, alongside the river, can be found a piece of geared machinery that appears to be the remains of a small crane and the ruins of several buildings including the compressor house, the crushing plant, a lorry maintenance garage, the winch house, the drying shed, and the explosives store. All of these date from the era of government control, except the crushing house, which was built by Judge Comyn. Most of the motive power for this plant was supplied by steam traction engines.

The head of the service shaft is at R 0810 9691, Until the mid 1990s it was possible to peer down the 2.5 m^2 unlined shaft, but in about 1995 it was partially backfilled with rubbish and since that time the area has been landscaped and, although the location can be identified, no recognisable remains can now be seen.

DOOLIN FLUORSPAR MINE

NGR R 0693 9765
Depth: 14.5 m.
Length: 58 m.
Altitude: 30 m.

This mine is situated next to the roadside on the hillside above Doolin village. The mine is totally flooded and has been used as a water source by residents of the adjacent house. No access is possible as the shaft is sealed.

The mine was one of two local prospecting ventures carried out in 1943 by Minerals Exploration & Development Co. Ltd., acting on behalf of Mianrai Teoranta, the official representatives of the government. Two preliminary exploration trenches were dug to uncover a known mineral vein to enable a more accurate assay to be done. Of the two excavations "trench one" was chosen for development. This was adjacent to an earlier shallow fluorspar quarry. "Trench two", 400 m to the north west was abandoned for the time being. Unfortunately the richness of fluorspar

A single, timber divided shaft for hauling and access, was sunk vertically to a depth of 14.5 m. A crosscut was then constructed on a westerly heading for 15 m to where it entered the mineral vein. The main passage is aligned roughly North/South. Opposite the point of entry onto the vein is a short blind 5 m continuation of the crosscut. To the south the single passage extends 10 m to its forefield (working, or end, face). To the north the passage runs for 25 m, again to a mineral forefield. The shaft and crosscut were completed by early 1947 and the major development of the vein took place between August and October of that year. The mine was officially abandoned on 31 October 1947. The poor quality of the mineralisation made the

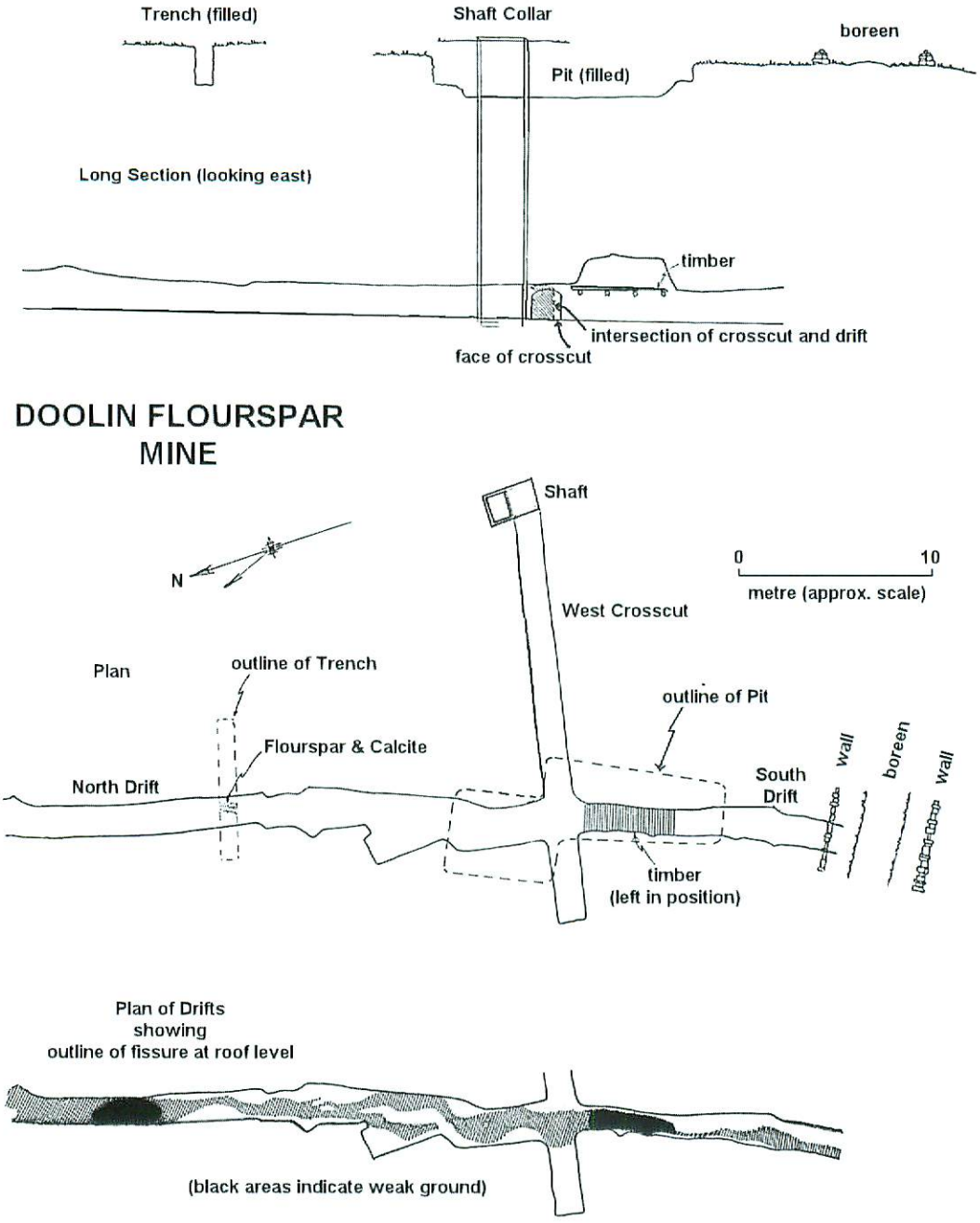

Figure 3. *Plan and section of the Doolin Flourspar mine.*
Adapted from the mine closure plan held by the Geological Survey of Ireland.

area within the vein somewhat unstable. The miners likened the roof to a sugar loaf, shattered and crystalline and with little inherent strength.

The mine produced little ore; minerals assayed from the vein were: blende (Zinc) 2.5% to 48.5%, galena: a trace to 5.65%, fluorspar: a trace at depth. There were also some beautiful examples of dog-tooth calcite (details from mine closure plan, 1947, held by Geological Survey of Ireland).

Close to "trench two" a trial was made for silver in the 1830's. This venture was also unsuccessful.

THE EFFECTS OF THE PHOSPHATE MINING ON THE DOOLIN CAVE SYSTEM

The Doolin Cave System was discovered in 1953, when both the passages upstream of Fisherstreet Pot and downstream of St. Catherine's 1 swallet were explored and found to come very close to each other, though a physical connection was not made until 1955. Prior to this time, opinion had been such that "any upstream passage [from Fisherstreet Pot] would also be barred after a short distance because it would have to cross under the Aille River, where this was running on limestone, and the chances of any passage being passable by an ordinary caver seemed to be unlikely in the extreme." (Shaw and Tratman, 1969, p. 20). Nevertheless, the pot was descended and a survey undertaken which "revealed the then well nigh incredible fact that the open cave passage passed under the Aille River." (*ibid*, p. 21.) This situation has been used on numerous occasions since to illustrate the heterogeneous nature of karst aquifers and the importance of geological controls on the flow patterns of underground karst streams. Indeed it has even been quoted in influential text books on karst geomorphology and hydrology (Jennings, 1985, p. 58; White, 1988, p. 182).

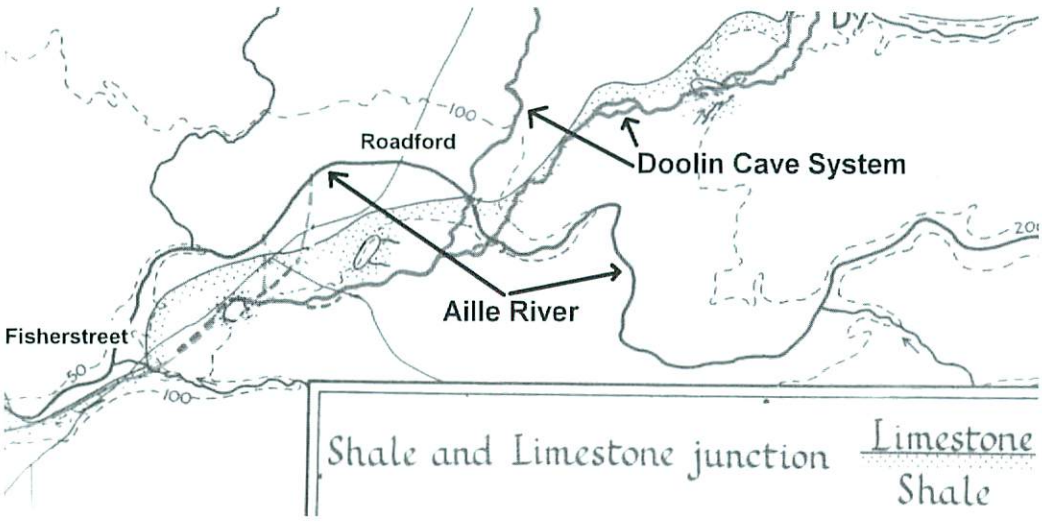

Figure 4. *Outline geology of the Doolin area as mapped after 1950.*
Adapted from Ollier and Tratman, 1956.

However, the realisation that much of the bed of the Aille river has only been bare limestone since the mining work of the 1930s and 1940s puts a very different slant on this matter. Figure 4 shows the outline geology of the Doolin area as mapped by UBSS members in the early 1950s (adapted from Ollier and Tratman, 1956) and indicates that from a point just to the east of Roadford the river bed does appear to be on limestone. A walk along the river confirms this fact. Figure 5, on the other hand, seems to indicate that only a short loop of the river crosses onto the limestone and even then it is running on "drift" rather than on bare rock. This second map is the 1880 edition of the 1:63360 scale map published by the Geological Survey and would thus seem to show the position prior to the mining and quarrying work being undertaken. This conclusion has been confirmed by the study of the original geological survey 1:10560 field sheets of the area, though these seem to differ in some minor details from the published version.

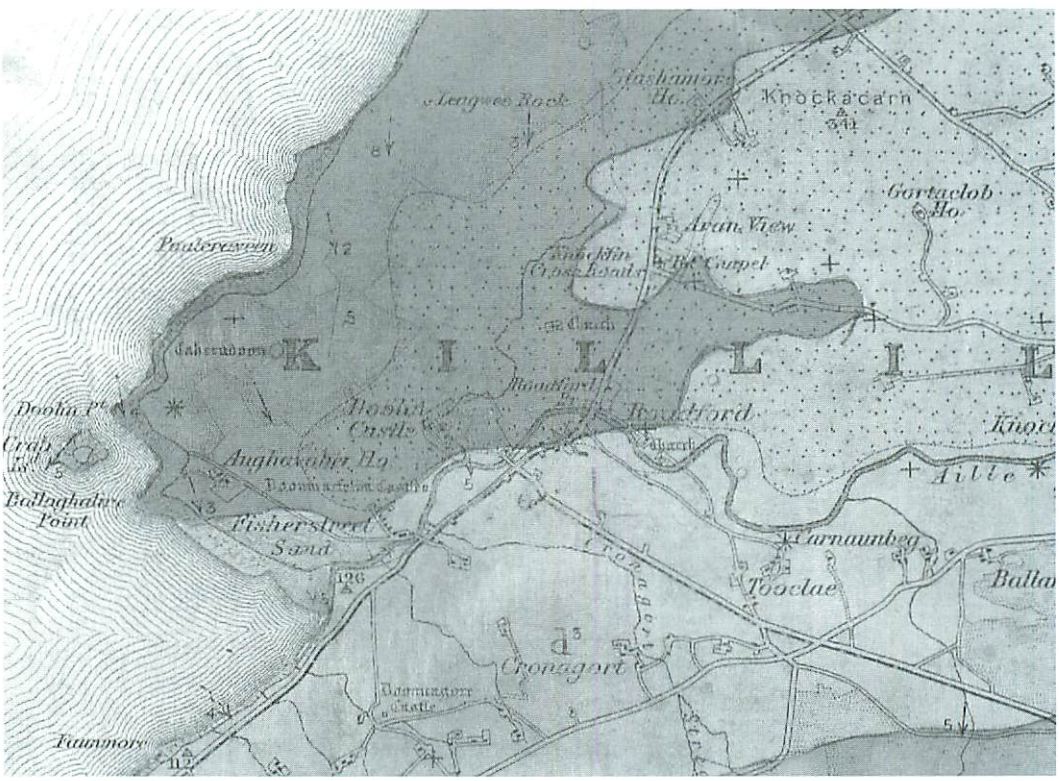

Figure 5. *1880 edition of the Geological Survey map of the Doolin area. The darker colour represents the limestone sequence and the lighter colour represents shale. Stipple indicates the presence of glacial drift.*

Thus it would seem that the current remarkable situation, of a surface river flowing directly over a vadose cave is a very recent development and is unlikely to prove stable in the long term. Indeed, even by the date of the original explorations, only about ten years after the

mining ceased, water had begun to find its way into the cave from the river and contemporary reports indicate that this began to happen very soon after the work had exposed the limestone (Tommy O'Brien and Jack Geraghy, taped interviews with the author, 1999). Although there are, as yet, no reports that these inlets are growing in size or any observations that the river is becoming progressively dryer it can only be a matter of time before the entire flow of the river, even in flood conditions, sinks underground. It will be interesting to observe quite how long this takes.

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Copies of most of the relevant maps and plans are available for inspection in the library of the UBSS.

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