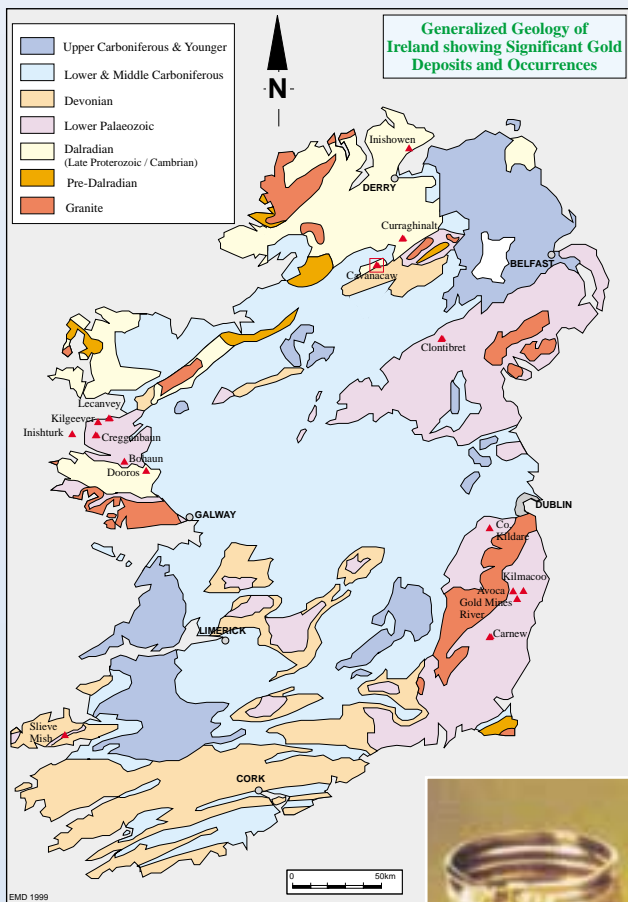


# EXPLORATION AND MINING DIVISION IRELAND

ZINC • LEAD • COPPER • GOLD • SILVER • BARYTES • GYPSUM • COAL • DOLOMITE • TALC •

## GOLD IN IRELAND



Department of Communications, Marine and Natural Resources

# POTENTIAL IN DIFFERENT GEOLOGICAL ENVIRONMENTS

## Historical Record

Although gold has played an important part in the cultural history of Ireland, notably in the wealth of recovered gold ornaments, records of gold extraction or its occurrence are relatively sparse and poorly documented prior to the 17th century.

### BRONZE AGE AND LATER

Considerable quantities of prehistoric gold ornaments have been found throughout the island of Ireland. Most belong to the Bronze Age (2,000 - 400 BC) although others date from the late Iron Age and Early Christian periods. Archaeological opinion has long been divided as to whether the gold used in the ornaments had been imported or whether it had been mined in Ireland. The fact that there was only one known locality which had the potential for significant (alluvial) gold mining (the Gold Mines River, Co. Wicklow) lent support to the view that the gold was imported. However, recent exploration has demonstrated that gold in significant quantities is to be found at a number of localities throughout Ireland. While there is no evidence of historic mining at any of these locations, there is now a greater likelihood that the prehistoric ornaments were made from Irish gold. Some confirmation for this view is provided by the Annals of the Four Masters (1632) which refer to the discovery of gold in Ireland in 1600 BC approx. and further state that the gold was smelted in the forests south of the present-day capital of Ireland, Dublin.

### 17TH - 20TH CENTURY

Although the only record of significant gold production in Ireland is from the Gold Mines River, there are a number of historical references to the working of gold or to its occurrence. Alluvial gold is recorded from the Moyola River in Northern Ireland (1652) and from Avoca, where it was associated with copper ore (1753). In 1889 a number of minor gold occurrences were recorded by G.A. Kinahan, including localities in Co. Antrim in northeast Ireland, and Co. Cork in southwest Ireland, where gold is found in the gossans of copper lodes.

During the early part of this century minor gold occurrences were recorded at several more localities in northwestern and southeastern Ireland. Subsequently, in 1957 at Clontibret, during a re-evaluation of an old antimony mine, high gold values were obtained from a stibnite-arsenopyrite vein. Despite the fact that these many minor occurrences were known, there was no systematic gold exploration undertaken in the country, almost certainly because of the perceived lack of potential for significant gold deposits. However, the discovery in Northern Ireland of the Curraghinalt gold deposit in 1982 resulted in a wave of gold exploration in the 1980s, with attention largely focused on vein-hosted targets in Dalradian and Lower Palaeozoic terrain. While this work has resulted in a number of significant discoveries, major deposits have so far proved elusive.

### ALLUVIAL GOLD MINING

In 1795 the existence of alluvial gold in a minor river in Co. Wicklow became generally known. A local gold rush ensued and lasted for six weeks during which some 80kg of gold is estimated to have been recovered from what subsequently became known as the Gold Mines River. The Government then stepped in and dispersed the gold diggers. Subsequently mining was carried out by the Government (1796 - 1803), again by the local populace (1804 - 39), and by a private company (1860). Significant amounts of gold were extracted during these periods, but since then only very small amounts are known to have



Gold washings near the Gold Mines River. From an 1804 print.

been recovered. The total amount of gold recovered is calculated at some 300kg, although the true figure may be higher. While most of the gold occurs as free particles, grains and nuggets (up to 0.75kg) have been found. Attempts were made to trace the bedrock source of the gold, with no success. The most recently-proposed theory is that most of the gold is derived from iron-copper mineralization hosted in Ordovician acid volcanics.

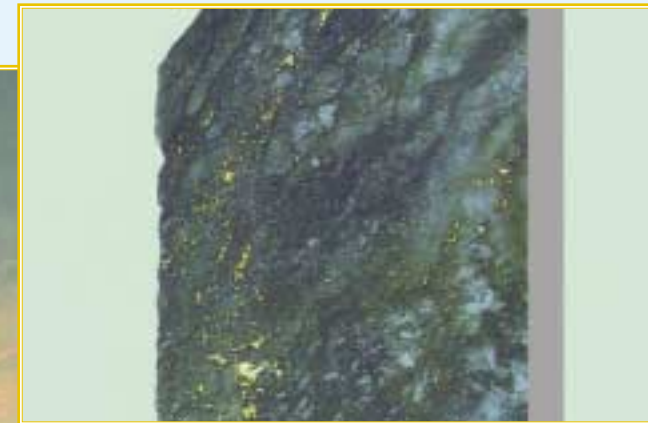
## Recent Exploration

Recent exploration has indicated the presence of bedrock gold in a number of different geological terrains. In the Lower Palaeozoic rocks of southeast Ireland gold is known to be associated both with volcanogenic massive sulphide mineralization (Kilmacoo) and with metasedimentary and/or metavolcanic sequences (Kildare, Carnew). In the Lower Palaeozoic of the west of Ireland, gold is found both in quartz veins (Lecanvey) and in a major shear zone (Cregganbaun). Gold is also found associated with arsenopyrite-stibnite veining in Lower Palaeozoic greywackes of the northeast (Clontibret). In the Dalradian (Pre-Cambrian) metasediments of the north of Ireland, gold occurs in quartz veins and shear zones (Cavanacaw and Curraghinalt, Northern Ireland).

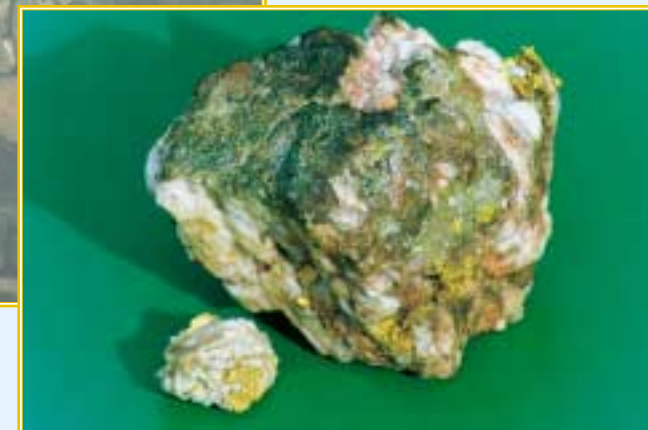
### SIGNIFICANT DISCOVERIES

#### • Avoca (Co. Wicklow)

This massive sulphide deposit (historic production 16Mt of ore grading 0.6% Cu), adjacent to the Kilmacoo prospect, occurs within a complexly deformed Lower Palaeozoic volcanic-sedimentary sequence. Mine concentrates contained payable gold and the ore typically contained



Drill core from Cregganbaun showing visible gold. (Courtesy: Glencar Explorations Plc.)



Gold in vein quartz, float material, Co. Kildare.

0.3g/t Au, with some pyritic rocks containing up to 0.75g/t Au. Much of the gold appears to be contained in pyrite, but gold also occurs in chalcopyrite, in galena and as free gold. In recent years attempts have been made to recover gold

from the Avoca mine tailings by a non-toxic thiourea leaching process. It has been estimated that the tailings contain between 2 and 3Mt grading 0.03 to 1 oz/ton Au.



Quartz vein containing visible gold at Cregganbaun.

#### • Carnew (Cos Wicklow and Wexford)

Drilling in 1997 on a gold-bearing structure in altered Ordovician metasediments and metavolcanics near Carnew intersected significant gold values. Best intersection was 18.40g/t Au (with visible gold) over 0.5m at a depth of 71m; a previous hole nearby had intersected 11.6g/t Au over 0.38m at a depth of 108m. Both intersections are believed to be from the same mineralised zone, which is open at both ends and also down dip.

#### • Cavanacaw (Co. Tyrone, Northern Ireland)

Discovered in 1987, gold occurs in quartz veins and shear zones in Dalradian metasediments. The gold infills microfractures or occurs as discrete grains with galena, chalcopyrite and iron pyrite. A resource of 300,000 ounces at an average grade of 17g/t Au has been estimated. The upper

portion of this resource is considered to be amenable to open pitting, and capable of producing an initial 50,000 ounces at a head grade of 16g/t Au.

- **Clontibret (Co. Monaghan)**

Gold at Clontibret is found in late-stage arsenopyrite-stibnite veins in Ordovician greywackes. The gold occurs in solid solution in arsenopyrite and pyrite as well as local inclusions of native gold within these sulphides. Drilling by Conroy Diamonds and Gold PLC has yielded best values of 16.24g/t Au over 2.42m (from 37m depth) and, in the same hole, 10.48g/t Au over 2.78m (from 56m). A second hole gave 2.91g/t Au over 4.79m (from 21m) and 5.2g/t Au over 1.30m (from 77m). More recent drilling intersected 6.23g/t Au over 1.50m (from 22.70m), including 0.3m of 21.75g/t Au, and 6.75m of 3.15g/t Au (from 78.50m).

- **Cregganbaun (Co. Mayo)**

In south Co. Mayo the E-W Cregganbaun Shear Zone traverses tuffs and metasediments of Ordovician age. Following the discovery of gold in bedrock in 1988, gold has been found at many localities along the 33km length of the structure. Drilling at the western end of the Shear Zone has indicated the existence of 530,000t grading 6g/t Au to a depth of 80 metres.

- **Curraghinalt (Co. Tyrone, Northern Ireland)**

The existence of minor alluvial gold in this region has long been known. However, it was only in 1982, following a programme of panning and prospecting, that bedrock gold was discovered. The gold is associated with pyrite in steeply-dipping quartz veins in Dalradian metasediments. Drilling and underground development has outlined a measured and indicated resource of 460,000t grading 16.94g/t Au.

- **Co. Kildare**

The 1993 discovery of visible gold in quartz float in Co.Kildare, southwest of Dublin, has stimulated interest in this new target area of Lower Palaeozoic greywackes.

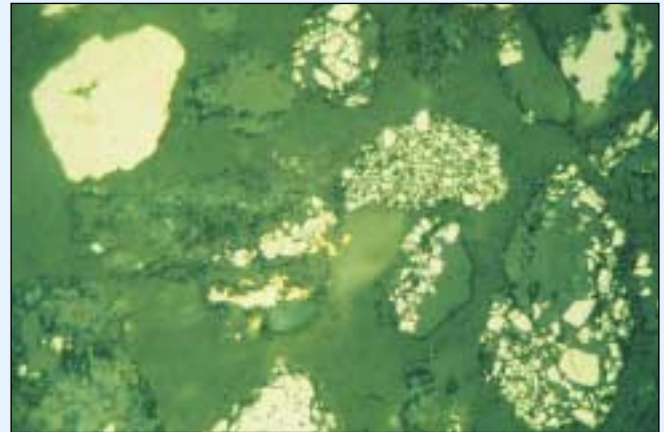
- **Kilmacoo (Co. Wicklow)**

Drilling in Ordovician metasediments at Kilmacoo, adjacent to Avoca, has confirmed the existence of significant bedrock

gold. The presence of some 400,000t grading 1.5 to 2g/t Au over a strike length of 125m is indicated.

- **Lecanvey (Co. Mayo)**

A systematic programme of panning and prospecting in south Co. Mayo led, in 1984, to the discovery of visible gold in quartz veins in Silurian quartzites at Lecanvey. Drilling outlined a “geological reserve” of 498,000t grading 9.94g/t Au. The immediate area of the deposit has since been excluded from Prospecting Licences due to its location near the summit of a mountain of pilgrimage, Croagh Patrick.



*Native gold associated with pyrite at Clontibret (Courtesy: Dr. J.H. Morris).*

- **Other Localities**

At **Bohaun**, northwest of Galway, visible gold with consistent values of 40 to 190g/t Au over widths of up to one metre have been found in a silicified breccia in Silurian metasediments. In the same area, an intersection of 0.17oz/st Au over 15 feet was drilled in massive pyrrhotite-amphibolite pods in a Dalradian volcanic-sedimentary sequence at **Dooros**. Gold occurs in quartz veins in Silurian quartzites at **Kilgeever**, west of Lecanvey, where a bulk sample of 0.5t assayed 6.7g/t Au. On **Inishturk** island, west of Cregganbaun, visible gold occurs in quartz veins in Ordovician metasediments where channel samples have assayed from 4.3 to 31.6g/t Au over widths of 0.6 to 2.0m.

## Targets for Gold Mineralization

Based on recent successful exploration, a wide range of targets for gold mineralization are known to exist in Ireland. These include:

- Shear zones in Dalradian and Lower Palaeozoic rocks.
- Quartz vein systems in Lower Palaeozoic quartzites and greywackes.
- Association with volcanogenic massive sulphides.
- Banded iron formation in Lower Palaeozoic rocks.

Other potential targets in Ireland's varied geology include:

- Association with copper porphyry deposits.
- Carbonate-hosted 'Carlin type' deposits in the Lower Carboniferous.
- Palaeoplacers, particularly in the Devonian of Southern Ireland.
- Recent placers.

For further information see McArdle, P., Morris, J.H., and Gardiner, P.R.R. (1987). Gold in Ireland: the potential for mineralization. *Geol. Survey Ireland Rep. Series RS 87/1*, 91pp.