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D.M. Romer



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A note on the Aherlow Cu-Ag deposit, County Limerick.

D. Romer

Tara Prospecting Ltd.
162 Clontarf Road,
Dublin 3.
Ireland.

Abstract

Routine exploration in the Glen of Aherlow area, County Limerick, in 1965 yielded promising geochemical and geophysical (IP) anomalies. Diamond drilling outlined a copper deposit with a geological tonnage of more than 6Mt grading 0.89% Cu and 33.8g/t Ag. Mineralization is hosted within the lower part of the Carboniferous limestone/shale succession and in the underlying Devonian sandstones and shales. Significant mineralization is confined to a steep shear zone on the northern limb of the Aherlow Syncline. The main mineral phases are chalcopyrite, which characterizes the upper part of the shear zone, and bornite and chalcocite, which occur in the lower part.

Introduction

The Aherlow copper-silver deposit lies within the Glen of Aherlow in County Limerick, approximately 13km SW of Tipperary town.

Exploration in the Glen of Aherlow resulted from the publication of the Gortdrum discovery some 15km to the north. Soil geochemistry was undertaken on an old mineral showing, and the resulting anomaly was followed up by induced polarization and resistivity surveying. Diamond drilling initiated in October 1965 proved a deposit (Fig. 1) in excess of 600m in strike, 250m down dip (65°-75°) and 30m wide giving a geological tonnage well in excess of 6Mt grading 0.89% Cu and 33.8g/t Ag (Denison Annual Reports, 1968 and 1969).

Geology

Stratigraphically, Lower Carboniferous bioclastic limestones and shales, having a true thickness of about 240m, overlie Devonian sandstones and shales of unknown thickness (Fig. 2). The Devonian clastic rocks are typically red and green shales with interbedded conglomerates, overlain by sandstones and calcareous sandstones. Immediately above the Devonian rocks the Carboniferous dark limestones are unfossiliferous and have a high silt and mud content, but gradationally they become more fossiliferous (crinoids, corals and brachiopods) and less silty toward the top of the section. The uppermost rock unit is the Waulsortian mudbank limestone (Reef). The sub-Waulsortian limestones host the Aherlow mineralization.

Structurally, the Glen of Aherlow lies within a syncline, the southern limb of which is hidden under Silurian rocks in the upper plate of the Galtee Thrust which parallels the southern margin of the Glen. The mineralized zone is

confined to a very steep, southerly-dipping shear on the northern limb of the Aherlow Syncline (Fig. 2). The shear penetrates the lower portion of the Carboniferous section and extends into the Devonian succession, but drilling has not investigated in detail the shear in the Devonian rocks. Within the shear zone the rocks are highly folded, fractured and faulted; the lower part of the succession (essentially shales) is folded and sheared in response to pressure, whereas the upper part (mainly pure limestones) is brecciated, fractured and recrystallized. In essence, this main shear zone is the axial plane of an isoclinal fold.

The economic mineral assemblage is mainly chalcopyrite, bornite and chalcocite with some sphalerite and galena located peripherally at the southwestern end of the deposit. Chalcopyrite characterizes the upper zone (breccias, veins, fractures, disseminations) and bornite/chalcocite is typically found in the lower zone (shears and folds). Gangue minerals are calcite, dolomite, quartz and barite. In places deep weathering has produced supergene copper minerals. The deposit is enveloped by a low grade chalcopyrite halo, and similarly the limestones are partially silicified within a few tens of metres of the shear zone.

Conclusions

The Aherlow copper-silver prospect is very similar to the Gortdrum deposit (Thompson, 1967) having a virtually identical succession of Carboniferous sediments but lacking the major igneous associations of Gortdrum, although there are small, altered, chlorite zones at Aherlow. Gortdrum's gross mineralogy of chalcopyrite, bornite and chalcocite is similar to that at Aherlow, but the latter lacks the tennantite — tetrahedrite associations as well as the mercury and arsenic which are found in these grey coppers. The intense deformation of Gortdrum is also a feature at Aherlow.

Thompson (1967) clearly invoked an epigenetic genesis for Gortdrum, and the same genetic interpretation applies to Aherlow.

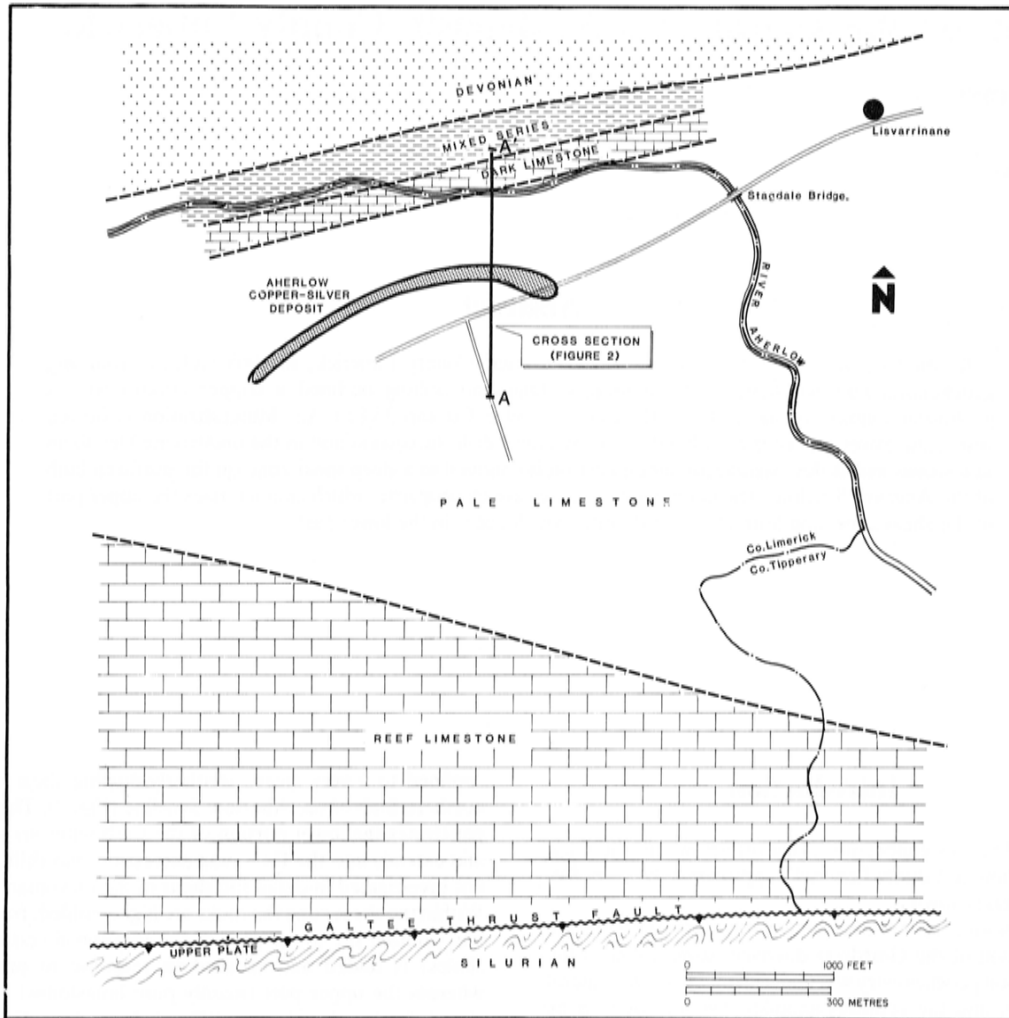


Figure 1. Geological map of the area around the Aherlow deposit.

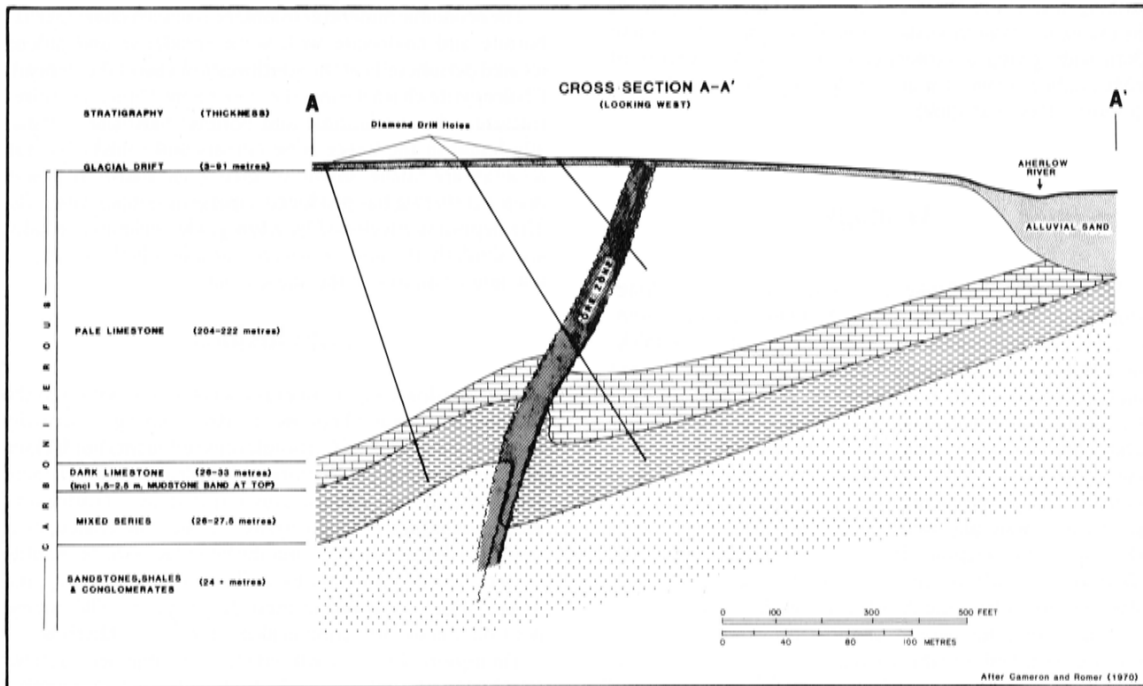


Figure 2. N-S cross-section through the Aherlow deposit.

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