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A note on gold mineralization in County Tyrone.

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Abstract

Recent prospecting in the Sperrin Mountains of County Tyrone has located a number of gold-bearing quartz veins in Dalradian metasediments. The veins are up to 4m in width and extend for at least 600m along strike. Channel sampling has yielded grades of up to 126g/t Au. Gold is found intergrown with sulphides (principally pyrite), but free gold in quartz is also found.

Introduction

Free gold in stream sediments has been reported from the Sperrin Mountains for centuries. Panning to date has confirmed its presence over an area of 275km². Follow-up prospecting has detected gold in bedrock in four areas. One area, at Curraghinalt, has been the focus of intensive and on-going exploration by Ennex International PLC since 1983. In this area gold-bearing float has been found strewn on a hillside in a zone 1 750m long and 650m wide. The average gold content of a representative selection of these boulders is 20g/t. These boulders were derived from local sources as is evidenced by the fact that 16 mineralized vein structures have been discovered to date in the area. As exploration is at an early stage the potential for additional occurrences is considered high.

In Curraghinalt Burn itself, 12 gold-bearing quartz vein structures have been located. The structures vary from 0.4-4m in width, and have been shown to extend for at least 600m along strike. Channel samples across veins have yielded grades in the range of 2-126g/t.

Geology and mineralization

Geology

The gold-bearing quartz veins are hosted by Dalradian metasediments which occur NW of the Omagh Thrust (Fig. 1). The metasediments consist of quartz-rich psammites and graphitic and pelitic schists of the Southern Highland Group. Based on the relative abundances of the four main mineral phases, quartz, feldspar, chlorite and muscovite, and the dominant grain size, it is possible to differentiate, on a regional scale at least, three separate lithostratigraphic units; these are the Glenelly Formation, the Glengawna Member and the Mullaghcarne Formation.

The Glenelly Formation is considered to be the oldest unit. Typically it consists of interbedded psammites, semipelites and pelites. Feldspar, biotite and chlorite are dominant with little muscovite or quartz.

The Glengawna Member occurs as a transition between the Glenelly and Mullaghcarne Formations and is included within the latter. Arthurs (1976) describes the Glengawna Member as an assemblage of green schists, graphitic schists, epidote-quartz schists and calcite-quartz-muscovite schists.

The Mullaghcarne Formation, the youngest exposed in the southern Sperrins, is correlated with the Dart Formation (Hartley, 1938; Arthurs, 1976) which is exposed on the northern side of the Glenelly Valley. Compared to the Glengawna Member the lithologies are much more chloritic, finer-grained and contain ubiquitous muscovite.

These metasediments are all located NW of the Omagh Thrust. This structure has resulted in Dalradian metasediments overlying Ordovician volcanics, volcanoclastics and intrusives of the Tyrone Igneous Complex.

Mineralization

The gold mineralization has been found to be predominantly associated with quartz veins. Plotting of the float distribution and study of the mineralized outcrops has led to the identification of three separate gold-bearing environments. These are:—

1. Quartz veins, trending parallel to the regional strike (045°)
2. Quartz veins, cross cutting the regional strike (090°-135°) as shown in Figure 2.
3. Gold values associated with fault gouge.

The cross-cutting veins have been the main target of exploration to date. They have a general strike of 090°-135° with a northerly dip ranging from 45° to near-vertical. Individual veins range up to 4m wide and are often margined by tensional veinlets which are also auriferous.

In general, the vein structures have a quartz — ankerite gangue. Sulphides are common; pyrite is dominant with subordinate to accessory arsenopyrite, chalcopyrite, galena, sphalerite, tetrahedrite-tennantite and native copper. Gold-silver alloys are found typically as inclusions within, and as intergrowth with, sulphides. They are most common in pyrite, but also occur in arsenopyrite and chalcopyrite.

Free gold in quartz has also been noted. Native gold ranges in size from 20-130µm but is typically in the 40µm range. Electron microprobe analyses indicate some variability in composition with silver content ranging from 3.5-30% with an average of 16.5%. No obvious relations between Au:Ag ratios and tectonics or mineralogy have been recognized to date. Statistical analysis of limited multi-element analytical results indicates an intimate sympathetic

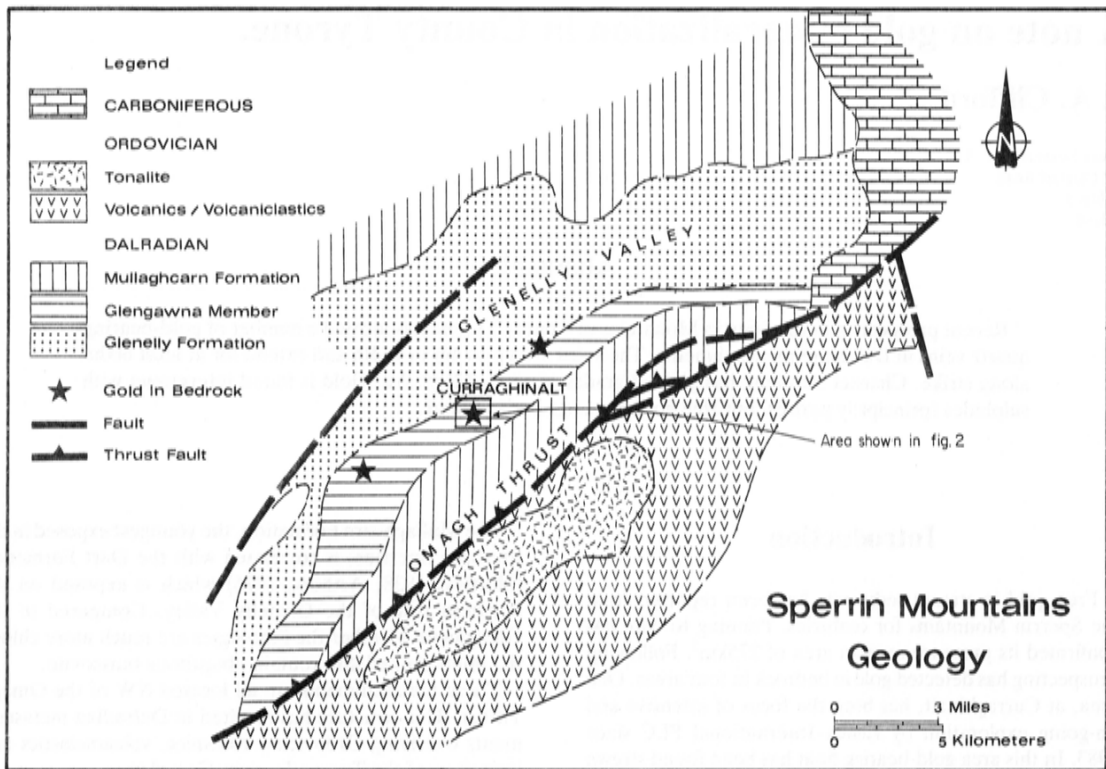


Figure 1. Regional geological map of the Sperrin Mountains.

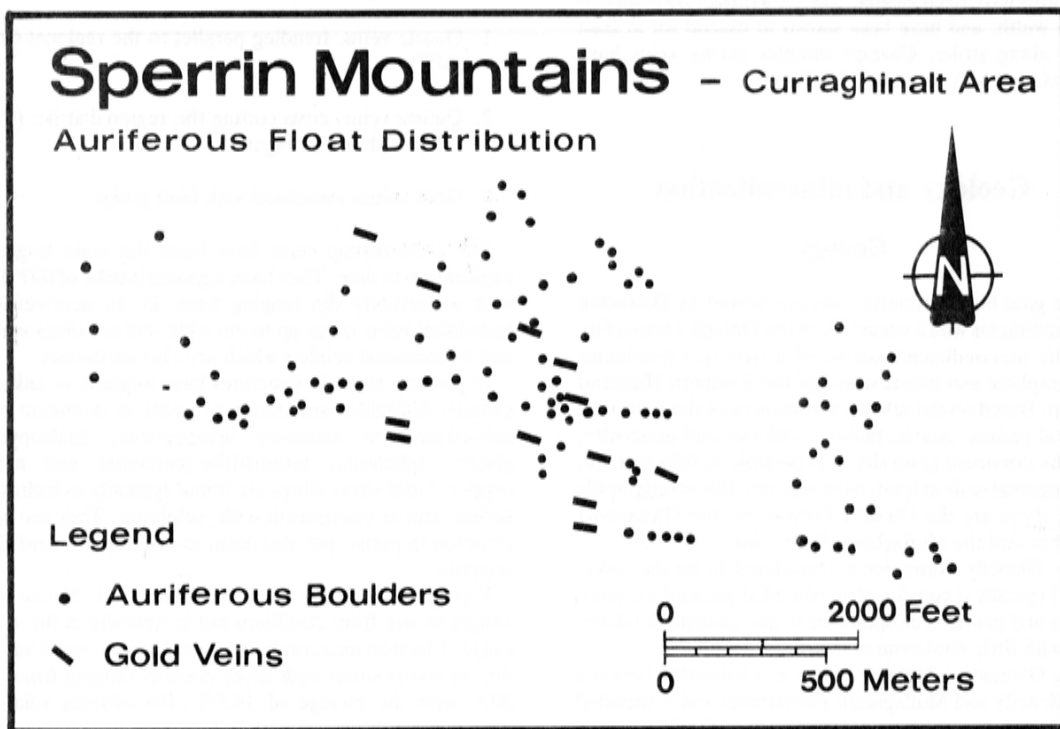


Figure 2. Distribution of auriferous float and mineralized showings in the Curraghinalt area.

relation between Au, Ag, Bi and Fe but not between Au, Cu, Zn, Pb, Hg and As.

Speculation on ore genesis is considered premature at this stage of the exploration programme. Indeed the mineralized settings identified to date may not be the only ones present in the area.

Acknowledgements

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Discussion

PAUL ARCHER (National Remote Sensing Centre, Farnborough, U.K.) said:

I would be very interested to hear details of the sampling programme on the vein gold structures e.g. the reliability of sampling, estimates of error, geostatistical techniques etc., bearing in mind the extremely erratic nature (nugget effect) of vein gold structures. How far down-dip is the author prepared to project a grade estimate and why?

REPLY:

Results to date are not sufficient to allow an in-depth geostatistical evaluation of the data. Where control has been possible, studies indicate that normal sampling methodologies give a reliable estimate of the grade. At this time we have no evidence to suggest that values are erratically distributed within the vein structures.