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**PRELIMINARY REPORT:
VIGRA - CLOGAU - ST DAVIDS MINE AREAS**

G.W. Madoc-Jones

HISTORICAL

It has been affirmed that Merioneth ores were smelted for copper in Roman or pre-Roman times, the records of which are lost in antiquity.

The earliest recorded reference to the identification of gold in this area is attributed to about 1845, although the date of recognition as having possible commercial value is accepted as 1854. In that year local residents collected nearly a ton of fragments of enriched quartz, from the St. Davids vein outcrop, which yielded gold to the value of several thousand pounds according to a report dated August 1862.

The first mining effort resulting in recorded production of gold commenced in 1861, although prior to that date the deposits had been worked for copper without recognition of the presence of gold as the most valuable mineral constituent.

PRODUCTION RECORDS

From January 1861 to June 1862 a total of 873 tons of ore was mined from which 6244 ounces of gold were produced. The recorded recovery during this period indicates an arithmetical average in excess of 7.15 oz per ton in fine gold.

For the period 1862 to 1867 the ore mined is reported as 7342 tons from which 10403 oz of gold were extracted. The recovery during this period indicates an arithmetical average in excess of 1.32 oz in gold per ton of ore.

For the period 1874 to 1880 gold production is reported as 2458 oz, but the corresponding figures of ore tonnage for this period are not reported.

(It would be of interest to know what proportion of the gold in the ore was actually recovered. This is a matter for conjecture but it is doubtful if recovery exceeded two-thirds of the total content during these periods. It is also not known what proportion of the gold recovered was actually reported officially for deduction of royalties payable at that time.)

During the period 1899 to 1903 production is reported as 71019 tons of ore from which 28163 oz was recovered. The operating company, [63] St Davids Copper & Gold Mining Co. paid dividends on its £60,000 capital as follows: 1900 - 40%, 1901 - 20%, 1902 - 10% or a total of 70% in three years.

The payment of dividends on a lavish basis at the commencement of operations during this period was an economic blunder. No reserve of capital was created for the purpose of future development in advance of mining and milling requirements, with disastrous results to the company.

In the succeeding period (1904 to 1909) an additional total of 30273 oz of gold was produced by mining the immediately available ore that could be cheaply won by simple methods.

In total, for the period 1861 to 1910, the above reported production is approximately 77,500 oz in gold having a present day value of nearly one million pounds sterling.

An appraisal of the Clogau-St Davids mine area clearly indicates that, had good economic judgement and sound technical management been applied in the active mining period of fifty years ago, there would not exist today the ore potential and mining possibilities that are now found in this area. The same comment may be made in regard to the Gwynfynydd mine area.

The Vigra, Price of Wales and Prince Edward mine areas are in a different category. In these areas the work done in the past is confined to the upper sedimentary series overlying the Clogau beds within which beds the auriferous veins are confined. These mine areas, therefore, constitute virgin ground awaiting exploration by diamond drilling.

All of the pertinent historical facts indicate mismanagement, inefficiency and failure to appreciate the geological factors controlling gold deposition. Nevertheless the substantial gold production from small segments of the favourable structure serves to prove the concentrations of gold in ore of high payability.

GENERAL GEOLOGY

The auriferous veins occupy persistent shears in the Clogau slate and shale beds. These shears strike 18 to 20 degrees North of East and dip steeply (approximately 80 degrees) to the South in the Vigra-Clogau-St.Davids mine areas.

The Clogau shales comprise the middle member of three easily recognisable sedimentary series of which the Vigra beds are the upper and the Gamlan the lower of the series. The gold-bearing ore is [64] chiefly confined to the veins where they penetrate the Clogau beds and this fact provides a guide of first rate importance in ore development.

The sediments are injected by sills and dykes of fine grained igneous rock having the composition of diorite. Although these injections are older than the mineralization including gold deposition they appear to have influenced deposition locally.

In the area under immediate consideration there are three well defined shears with remarkable persistence through the Clogau beds, all of which are occupied in part by mineralized quartz containing gold and silver in varying amounts as part of the general mineralization. Concentrations of gold occur under structural control and more particularly at the junctures of the numerous branching veins.

THE VIGRA MINE

The development at this mine is confined to the Vigra, or upper bed and the old workings do not penetrate the-favourable Clogau structure lying immediately below the workings. At this mine copper mineralization was strongly developed into the overlying Vigra beds and the mine was opened as a copper producer. It is reported that the presence of gold in association with copper was not detected by the earlier operators and there is reason to believe that this report is correct. In any event the occurrence of copper (with gold) in the upper or Vigra beds argues very strongly in favour of gold deposition and concentration in the more favourable Clogau beds immediately below.

It is a fortunate circumstance that the former operators drove a cross-cut 1400 feet in length to a point near to but not quite into the favourable Clogau structure. This cross-cut is clearly designed as a main haulage way being an unusually large adit driven straight and now in perfect condition. Why it was not continued a short distance further to penetrate the favourable structure remains a mystery.

The present technical examiners are of the opinion that the Vigra mine provides an opportunity of first rate importance for the development at small cost of a particularly attractive and promising segment of the favourable structure. It is pointed out that all known factors may be construed to indicate that ore equal to any that has been mined in the past should be found by entry into the favourable ground to be reached by extension northward from the end of the existing adit.

CLOGAU MINE

The main adit in this mine extends as a drift on a mineralized shear from Cwmllechan River to a point 2150 feet easterly along the [65] strike. High grade gold ore has been partially mined from stopes extending from the portal to 300 feet easterly, according to local report. An enriched ore-shoot has been stoped downward for a distance of twenty five feet below the adit level. Examination indicates that this shoot carries on downward to unknown depth and may be expected to yield ore for extraction by winze in conditions favourable to low cost mining.

A fault at 350 feet from the portal appears to have thrown the vein to the north and since the former miners continued on through the fault eastward for more than 1700 feet with no adequate attempt to open the parallel shears it now seems apparent that much of this length may be regarded as virgin ground. Strong support is lent to this view as a result of later work when a cross-cut northward from the easterly end of the drift intersected a main shearing only seventy-five feet to the north. The vein in this shear is well mineralized and extensive stoping upward from the level indicates the presence of good ore here.

The main adit is connected by inclined shaft to the level above and thence by cross-cut to the surface. There is, in consequence, a very large block of favourable ground still unexplored in this section of the Clogau mine with entry already provided through openings in excellent condition ready for use. Again easterly for a distance of five hundred feet the favourable structure has been opened by two levels and several sub-levels. In this segment the best ore chances are noted to be at or near the junction of branch or off-set veins with the main vein.

In general, those parts of the Clogau mine to which access is provided by means of the above described openings is similar to the segment, six hundred feet in length, lying to the east and from which a total of nearly 60,000 ounces of gold was produced fifty years ago. All of these segments comprise a geological unit with similar conditions of structure and mineralization reproduced throughout.

It is difficult to understand why the former operators have left in place almost all of the ore below the floors of working levels underneath productive stopes. Throughout the mine it is obvious that their methods of mining were ill-conceived and badly carried out but it is quite inexplicable that winzes were not sunk on these ore-shoots which are capable of producing ore equal in grade to the ore mined above.

The Clogau Mine is worthy of exploitation and because of the available working entries,, otherwise costly to provide,, this mine can be restored to production on some scale at very modest capital outlay. [66]

ST DAVIDS MINE

Upon reference to the Production Records it will be noted that during the period 1861 to 1867 a total of 16,647 ounces of gold were produced. The greater part of this production must have come from the St. Davids Mine as distinct from the Clogau Mine, these mines being separated by a fault.

Ore has been extracted from the St. Davids Mine to a depth of two hundred feet only. Below the stoped area a shaft has been sunk to a further depth of about 230 feet where connection is made with a drift from the Clogau Mine. Some ore was extracted from this lower level in 1902, but otherwise this highly attractive ground immediately below the stoped area which yielded very high grade gold ore in 1861-1867 remains wholly untouched.

No examination in detail of this mine has yet been made by the present technical examiners but it is clearly imperative that it be fully investigated as having distinct ore possibilities. It may not have been realized ninety years ago that the ore-shoots in these mines are raking to the west as they go down so that vertical workings may well pass out of the ore zone entirely.

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Since the St. Davids mine is likewise provided with the necessary means of entry by shaft, and drift, and being self draining is free of water, a full examination is to be made in view of its productive record.

PRINCE EDWARD MINE

This mine has received preliminary examination to confirm the belief that the former workings are confined to the beds overlying the favourable Clogau series. Sulphidic mineralization, including arseno-pyrite, is well developed in quartz vein fillings with finely divided gold. Exploration by diamond drilling is well justified in the expectation that ore similar to that obtained from the Gwynfynydd Mine will be encountered in the Clogau beds as the vein structure crosses these.

It is noteworthy that no diamond drilling, has been done at any time in gold field of North Wales. In view of our present knowledge of the factors involved in gold deposition in this field it is considered a most reasonable assumption that where mineralization is strongly developed in shears extending through the Vigra beds overlying the Clogau beds then deposition of gold preferentially in the Clogau beds is probable.

It is proposed to carry out diamond drilling in due course at the [67] Prince Edward Mine.

PRINCE OF WALES MINE

The workings at this mine lie at a higher horizon than others referred to and in consequence base metals are in evidence here. The deposits occur in the upper beds of the Vigra sediments which overlie the favourable Clogau beds.

The comments made in reference to the Prince Edward Mine may be applied to the Prince of Wales Mine and likewise diamond drilling appears to be warranted at a later date following detailed survey.

EXPLANATORY NOTE

Reference has repeatedly been made to the fact that gold deposition takes place preferentially in the Clogau beds of shale and slate. These beds are black, carbonaceous shales and slates as compared to the blue-gray slates of the Gamlan series and the more silicious beds comprising the Vigra series. The high carbon content of the Clogau beds is probably the chief agency in causing preferential deposition of gold in the Clogau sediments. The same agency has long been recognized elsewhere (as in the Pre-Cambrian gold deposits of Canada) as a precipitating agency in precipitation of gold. Hence the Clogau beds constitute a particularly favourable horizon in the North Wales goldfield as evidenced by past production records.

Structural features play a notable part in localization of gold deposition in this field. Folding and irregularities in wall rocks have led to concentrations resulting in high grade ore-bodies and similarly the conjunctions of branch

veins with the main shear veins provide loci for concentration of values. Many of the stopes from which very rich ore has been obtained occur at such conjunctions.

G.W. Madoc-Jones,
Borthwen,
The Green,
Denbigh
LL16 5TL.