BRIEF PRELIMINARY REPORT ON THE SWANSEA MINE (ZEEHAN).

INTRODUCTION. The Swansea Mine was originally worked by adits and an underlay shaft to shallow levels. Later a vertical shaft was sunk to the 110 foot level and the lodes mined to that depth by the Swansea Syndicate. To mine at greater depths the Swansea Silver Lead Mining Company was formed, and a new main shaft was sunk to a depth of 156 feet. A crosscut was driven to the lodes, and it is in connection with the developments at that depth that the examination upon which the present report is based, was carried out.

MINING DEVELOPMENTS. The lodes have been opened up by five levels viz.--the tunnel level, 40 foot level, 80 foot level, 110 foot level, and the 150 foot level. These levels have the usual necessary crosscuts drives, rises winzes, etc. the 40 and 80 foot levels are connected with the old main shaft, while the 110 foot level is connected with the old and new main shafts. The 150-foot level is connected with the new main shaft only.

THE LODES. Several more or less independent lodes have been exposed by the above developments, viz.--Hills' lode, Murphy's lode, and the Main lode. These lodes have a general north-westerly strike and a north-easterly dip.

Hills' and Murphy's lodes junction on the dip near the 80-foot level. At the 110-foot level the Main lode appears to divide into two ore-bodies known as the Foot- and Hanging-wall ore-bodies, of which the Footwall body really corresponds to the Main lode, while the Hangingwall Body is a new lode.

Along the strike all the lodes junction at the north-westerly end, but they do not appear to form a strong and persistent lode as might reasonably be expected. At the upper levels, Hills' and Murphy's lodes also junction at the southeastern end while the Main lode appears to diverge from them. At the 110-foot level, Hills', Main, and the Hangingwall lodes appear to pursue independent and parallel courses to the south-east.

At the 150-foot level only one lode has been intersected up till the present, but only a small amount of developmental work has been carried out.

GEOLOGICAL CONDITIONS.

The geological structure cannot be completely and satisfactorily determined owing partly to the rather complicated nature of the geology, and also to the fact that many of the older workings cannot be enetered. It would appear, however, that the geological conditions are generally similar fromthe surface down to the 110-ft. level, and that the three lodes in this region occur at and near the contact of slates and grits which form the footwall country, and a rock-type generally referred to as "porphyry" which forms the hangingwall country. Hills' and Murphy's lodes generally occur in the slates, the Main lode occurs at the contact and trends into the porphyry. The porphyry forms a belt ranging in width up to 100 feet, especially at the 110 foot level.

At the 150 foot level, however, the footwall country is porphyry and the hanging wall country is slate. The new Main shaft has been sunk in the hanging wall of the lodes and is said to have passed out of the porphyry and entered slates at about a depth of 130 feet, the junction dipping to the south or south-east. It seems certain that faulting must have occurred to explain this

change in conditions, and to consist of a flat-dipping fault between the 110 and 150-foot levels. As the wall representing the footwall of the lodes was cut at the anticipated position, and one lode occurred above it, it appears that the above fault did not displace the footwall and one lode and so must have been pre-lode formation.

CONCLUSIONS. The problem at the 150-foot level is to explain the presence of one lode only, and to account for the apparent disappearance of the other two lodes. It is particularly desired to locate or account for the non-appearance of the Main lode which contained good-grade galena ore at the 110-foot level as the mine has no milling plant and can only profitably mine good-grade suitable for shipping.

It would appear from the position and dip of the Hills and Main lode that these have probably junctioned on the dip and continued down the footwall as one lode. It is also possible that the Hangingwall lode has similarly junctioned with the other two lodes, and thus the three lodes at the 110-foot level continue in depth as one lode represented by that cut at the 150-foot level. That the combined lode is not, where cut, as wide and rich as might be expected at such a junction is disappointing, but cannot be explained with the amount of information afforded by the mine workings.

The only other possible explanation is the fissure represented by the south dipping junction of the slates and porphyry in the shaft, which would intersect the lode fissure or fissures may have in some way affected the courses of the mineralising solutions and thus the occurrence of the lodes. This would mean that a lode may possibly occur along this fissure. It is stated that some siderite and sulphide minerals were actually found along this junction in the shaft, which lends support to this view.

RECOMMENDATIONS. In view of the present position regarding the lode the following work is recommended in the following order -

(1) Sinking the winze on the Main lode at the 110 ft. level to determine what happens to this ore-shoot and in particular to prove the pitch of it.

The same objective would begained by rising from the north-west drive at the 150-foot level.

(2) Driving south-east along the lode at the 150-ft. level. If the suggested south-easterly pitch of the Main lode at the 110-ft. level is proved by the winze recommended above, this drive is more strongly to be recommended.

(3) Driving north-westerly along the lode.

(Sgd.) P. B. Nye.
GOVERNMENT GEOLOGIST.

STRAHAN.

3/6/29.