NOTES ON THE OCCURRENCE OF GOLD AT PORT CYGNET.

By T. Stephens, M.A.

A visit recently paid to Port Cygnet has resulted in a discovery which is not without interest from a scientific point of view, if nothing more. Having had to traverse the Huon district in all directions for several years past, in the discharge of official duties, I had become tolerably familiar with its principal geological features, which present few variations from those that prevail in the neighbourhood of Hobart Town, and the greater part of the Derwent basin. If a line be drawn from the East Coast through Campbell Town to the Great Lake, and thence southwards to Recherche Bay in a direction nearly corresponding with the course of the 147th meridian, the area included between this and the coastline is the only large section of Tasmania in which there is no ground for expecting discoveries of gold or other valuable metals. The sedimentary rocks of the whole of this area may be described in general terms as Upper Palæozoic. They comprise the carboniferous series, and probably pass upwards into the counterparts of rocks now established in Victoria as Mesozoic, and they are here and there overlaid by Tertiary and Post-tertiary deposits. The whole series, to the Tertiary inclusive, has been penetrated and intersected to an extraordinary extent by trappean and basaltic rocks, which frequently hide the sedimentary strata altogether from view over extensive tracts of country.

But none of the older rocks, the recognised source of gold wherever it has been found in paying quantities, have hitherto been known to exist within this area, and as the greater part of it has been pretty well explored by the geologist, it is only in an odd corner, here and there, that their presence comes within the range of possibility. The oft repeated announcement of the discovery of gold in small quantities at Port Cygnet, added to a previous acquaintance with the indications of extensive denudation of the upper Palæozoic sandstones and mudstones in that neighbourhood, suggested to me the idea of paying closer attention to the spots where any of the primary rocks, which by any chance had been elevated above the sea level, might be expected to show themselves. And after a brief examination of the rock exposed in a quarry near the southern extremity of the township, and in a small tributary

of the Agnes Rivulet, I have little hesitation in pronouncing it to be of earlier date than any which has hitherto been recognised in the above-mentioned area. It varies in character from a soft arenaceous clay slate to a hard compact grit, containing in places rolled pebbles and boulders of schistose or metamorphic rocks, with porphyries and granite, and is in all respects analogous to portions of the old conglomerates of the North Coast, which are undoubtedly of Silurian age. It occurs on both sides of the Agnes Rivulet, which seems to occupy a synclinal hollow, and it is evidently unconformable to the Upper Palæozoic mudstones by whose denudation it has been exposed. The ruling angle of dip is about 60°, the strike being nearly north and south. The rock is in places highly impregnated with iron pyrites, and I noticed faint impressions, apparently of organic origin, but too indistinct to be made out on the spot, and the matrix too perishable to allow of its removal for examination. Until some fossils have been discovered and identified, all further speculations as to geological age are quite futile, but the search for them I must leave to those who have plenty of leisure time.

The existence in this neighbourhood of an interesting porphyritic rock, containing large crystals of felspar, has long been known. Though peculiar to the district it is analogous in several respects to many common members of the trappean series, but the entire absence of hornblende, which in them is a distinguishing feature, is noticeable. It is clearly newer than the grit just described, which it intersects in the form of a vast dyke on the western side of the township, another branch showing itself in a quarry near the new slab road; and it seems probable that the quartzose veinstones, which have been quite recently met with, and which appear to traverse the porphyry near some of its points of contact with the older rocks, are the source of the gold which has been sparingly found in the alluvium of adjacent gullies. Whether a careful assay of specimens from these veinstones will result in the establishment of this theory remains yet to be proved. Unfortunately the most interesting part of the quarry last referred to, is now under water, and there is no other spot in the neighbourhood which affords similar facilities for investigating the subject. There are well authenticated instances in Victoria of the occurrence of auriferous veins of similar character in diorites closely allied by their geological relations to the porphyry of Port Cygnet, but I see no grounds at present for advising any large outlay in the search for gold. It is clear that in the shallow alluvium, where it has hitherto been found, there is no prospect of an adequate return for the expenditure of labour and capital, and it is equally clear that

the deep ground, where there is only a remote probability of the existence of an auriferous lead, could not be worked except at very great expense. Again, the quartzose veins of the porphyry have not yet been seen developed in any practicable shape. Attention has however been directed to the subject, and it is by no means improbable that continuations of these veins will some day be traced into the more substantial forms by which, under similar geological conditions, they are elsewhere represented.