

Geology Group

THE YEA GOLDFIELDS

Talk given by Clem Earp to the Geology Group, Wed 23 November

The town of Yea is situated at the junction of the Melba and Goulburn Valley Highways, about 90 minutes drive north of Melbourne. At the present day, geological interest in the area mainly centres on the palaeontology, because it is claimed that fossil plants found there, particularly the lycopod *Baragwanathia longifolia*, are the oldest advanced land plant fossils yet discovered.

But for a very short period in the 1860's, Yea was better known as a district with several very promising goldfields. One of these, at Ghin Ghin north of Yea, was touted as a new Bendigo, and lured miners away from truly rich fields like Woods Point. In turn, Ghin Ghin was deserted as miners rushed to the Higinbotham field south of Yea.

The gold occurrences of the Yea district are located in Siluro-Devonian bedrock. During the Silurian age (439-409 million years ago) the shoreline of Western Victoria lay just to the west of Heathcote, while Eastern Victoria was a land lying very much further to the east than it does today. Central Victoria was a wide sea, into which sediments poured from the old land masses. These sediments contained gold and other minerals weathered from the Ordovician rocks which we still see today at Bendigo and other parts of Western Victoria. Yea was in deep water; at intervals sand and silt poured down the undersea slopes to the west and settled to form the bedrock of Yea.

At some time during the Devonian age, probably in the period 390 to 380 million years ago, plate tectonics carried Eastern Victoria westwards. The sediments of Central Victoria, which by that time had just about filled the sea, were concertained as they became crushed between Eastern and Western Victoria. The strata in the Yea area, and eastwards, show this with high angles of dip and chevron folds. This was the first phase of the Tabberabbera Orogeny, as this event is called. In a second phase, the whole Central Melbourne zone was twisted so that at Yea the folds of the first phase are bent from northwest to southeast in a zig-zag line.

The subduction of part of Eastern Victoria resulted in time (about 10 million years later) in melting at depth beneath Central Victoria. Molten rock rose as granite, and occasionally erupted above the surface as volcanics. Superheated groundwater dissolved quartz, gold and other minerals from the sediments and carried them upwards into cracks and fissures where reefs formed on cooling. Disseminated gold was also deposited in any porous rocks (e.g. sandstones) on the 'hanging wall' (upper) side of faults and antisynclinal folds. Because plate tectonics collisions are characterised by reverse faults (dipping opposite to the direction from which force is applied) these gold deposits occur primarily on the western sides of folds.

Since igneous activity ceased about 355 million years ago, in the Carboniferous, erosion has worn away much of the bedrock, exposing the granite of the Strathbogie Ranges to the north of Yea, and some of the granodiorite in the Black Range south of Yea. Between these two igneous plutons, the Goulburn River and its tributaries

including the Yea River meandered over a wide area, cutting a peneplain known today as the Hume or Kinglake Surface. The plain was littered with river gravels (the White Hills Gravel) which contains gold eroded from the reefs and sandstones. During the Ice Ages, the rivers dissected the peneplain; during interglacials, gravels washed off, filling the river valleys to depths of more than 25 m near Yea.

In terms of human history, up to recent times Yea was occupied by the Daung wurrung group of the Kulin people. In 1824 Hume and Hovell put Yea on the map as Muddy Creek. The first squatter, Peter Snodgrass, arrived in 1837, and arranged for a mass arrest of the Daung wurrung in 1840, precipitating their decline. In 1851 the great Victorian gold rush began, principally at Mt Alexander (Castlemaine), and there were unsubstantiated rumours of gold at Muddy Creek. In 1855 the township of Yea was surveyed and proclaimed. In 1857 gold was discovered at Reedy Creek less than 30 km west of Yea. Further discoveries were made at Junction Hill and TeaTree Creek nearer Yea, and finally in 1859 the first confirmed discovery of gold at Yea was made.

The first goldfield, at the Providence claim about 1.5 km northwest of Yea, did not excite much interest because it is limited to a small ridge and requires quartz mining techniques. After about 6 months the few companies who were able to peg claims had to amalgamate, and before a year had passed the mine had gone below river level and was flooded. Mining with the aid of pumps continued sporadically for about 50 years, but financing the machinery was often difficult. The Providence mine has not been worked for many decades, but still attracts prospectors, and was studied as recently as 1998 by the University of Ballarat on behalf of the Perseverance Mining Corporation. The mine is easy to access, being mostly in a reserve at the side of the Killingworth West Road.

The Ghin Ghin goldfield, also known as the Palestine diggings, was first discovered in 1867 as an alluvial field in a valley north of where the Goulburn River is joined by the Yea River. Within a few weeks the population had ballooned to a thousand miners, a town sprang up overnight with 30 stores and hotels, and Ghin Ghin acquired a reputation for unprecedented claim-jumping, rioting and lawlessness. A special detachment of police was sent from Melbourne to keep order, those arrested being chained to a tree in Yea's High St., there being not a jail to hold them nearer than Kilmore. Less than 12 months later, the alluvial gold seemed to be worked out, miners were deserting en masse, and not even the discovery of the reefs which were the source of the eroded gold could stem the tide. Near the end of the nineteenth century a few people were still eking a living working the gravels, but today there is not a sign of the town that once existed at the intersection of Ghin Ghin Road and Old Ghin Ghin Road.

Gold was discovered in the Murrindindi area in 1866. In 1867 further reefs were found, and 1868 a minor gold rush occurred. A township called Higinbotham sprang up, probably where Myles Bend Road is today, and later that year the rich George Higinbotham reef was discovered. Higinbotham was the Attorney-General of Victoria at the time, and a popular politician among the miners. But the gold quickly ran out, and by the end of 1868 the goldfield was struggling. In the 1870's and 1890's there were further attempts to revive the mine, but by then the town of Higinbotham had vanished.

All the above gold deposits are located on the western sides of a major fold, the Yea Anticline, and so fall into the pattern outlined earlier. More problematic are the Flat Lead reefs, which occur in an area of siltstone 3 km southwest of Yea. Although there does not seem to be a major fold or fault here, there is evidence of minor folding which may have been enough to allow infiltration of mineralised water*. The Flat Lead reefs were discovered soon after the Providence mine, and with the associated alluvials in nearby creeks were worked for about 50 years.

Also problematic is the exact age of the Yea bedrock in which the gold occurs. This is of international interest because of the early land plant fossils which are found in the same formation, having been originally washed out to sea. It has been claimed that graptolites (fossils of an extinct type of planktonic animal) indicate that the bedrock was laid down in Late Silurian time (at least 424 million years ago). However, in the course of this study I have located numerous fossils of a brachiopod, *Boucotia australis*, which is generally understood to be not older than Early Devonian (no more than about 400 million years ago).

Clem Earp

* Since this was written, a bushfire which occurred in this area in February 2006 has revealed the location of a number of old diggings. Fresh rock from these demonstrates that the siltstone is altered to slate and S-mylonite schist over a wide belt at the Flat Lead. This area is therefore a shear zone, which is sufficient to explain the quartz and gold mineralisation.