

# GEOLOGISTS AND THE BURRA COPPER BOOM, SOUTH AUSTRALIA, 1845-1851

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**Abstract.** Australia's first mining boom occurred in South Australia during the years 1845-1851, following a major copper discovery at Burra in 1845. The discovery also brought the migration and first concentration of experts with geological and mining knowledge to Australia. This expertise had three main origins: an educated elite from Great Britain, practical miners from the English county of Cornwall, and a group with both professional and practical experience from Germany. As a result of the Burra copper boom, numerous scientific reports were published, including the first geology book (and Government geological report) to be printed in Australia. At this time South Australia was also a base for geologists moving more widely around Australia. With the discovery of gold in Victoria in 1851, mining developments in South Australia were overshadowed. Most geologists, then based in South Australia, left the colony and joined the gold rush. The initial gold discovery in Victoria has been attributed to the efforts of a German geologist, G.H. Bruhn, who was first based in South Australia at the time of the Burra copper boom.

## 1. INTRODUCTION

Much of Australia's history since European colonisation has been dominated by mining and its associated developments. Gold mining in the latter half of the nineteenth century formed the springboard from which the modern nation of Australia evolved, whilst iron ore, coal and other mineral product extraction have arguably been the major drivers of Australian economic development since the 1960s. In this paper, we focus on Australia's earliest mining era, the little known "Burra Copper Boom" in South Australia 1845-1851 and the geologists from this period.

Whilst the first significant copper deposit in South Australia, and Australia generally, was discovered at Kapunda in 1842, the discovery of the "Monster Mine" at Burra in 1845 heralded Australia's first mineral boom (See Figure 1, Locality Map). Quickly the South Australian community was beset by "coppermania". Many additional small mines were established over the next five years. By 1850, the township of Burra was the largest inland settlement in Australia, more than double the size of the current major cities of Perth and Brisbane. Kapunda was also a town with significant population. At the same time, mineral products accounted for more than two thirds of South Australia's exports.

## 2. BACKGROUND TO THE BOOM

The Burra copper boom and the preceding foundation period in South Australia brought the first significant



Figure 1. Local map

influx of people with geological and mining knowledge to Australia. This event initially reflected the fact that South Australia, as a British colony, was distinctly different from other early British settlements in Australia, most of which had a function and economy based on convicted criminal (i.e. convict) labour expelled from Great Britain. In contrast South Australia was established in 1836 as a free colony under a separate Act of British Parliament and was a planned commercial enterprise with a founding colonisation company. (It served as a model for the similar colony in Canterbury, New Zealand, which was founded in 1850.)

The importance of geology to the founding enterprise is well illustrated by the efforts of the "South Australian Literary and Scientific Society", which met in London before establishment of the colony. At its second meeting held on 12 September 1834, the principal lecture was on "The Geology of Australia" (Minutes Book of the South Australian Literary Association-South Australian Archives). O'Neil (1982, p. 7) also records that as early as 1835 a public company was planned in England with an objective of exploring for minerals in the yet-to-be-established colony of South Australia.

In July 1836, the founding "South Australian Company" appointed a "Mine and Quarry Agent and Geologist", Johannes Menge. He is also certainly the first person to hold the title of "geologist" in South Australia (Cooper et al., 1986) and possibly in Australia as a whole. Despite dismissal from his post in 1838, Menge remained active in South Australia as an independent agent and promoter of mineral exploration and development until 1852. In this role he published numerous mineral lists as well as a series of articles dealing with geology in the local press (Menge, 1841a,b). In addition, Menge (1848) provided a description of his mineral exploration and assessment process. More recently, Menge has been given the sobriquet of "Father of South Australian Mineralogy" (Auhl and Marlett, 1975; O'Neil 1988). It is suggested here that Menge may be more generously labelled the "Father of Australian Mineral Exploration".

South Australia's colonial administrators also played an early role in describing the geology of South Australia. The colony's second Governor, George Gawler (1838-1841), even made some geological contributions (e.g. Gawler, 1839, 1841). With the colony's foundation, surveyors were also instructed to assess land for their mineral resources with the first Surveyor General, William Light, and his staff being requested to site the capital near water, coal and building stone resources (O'Neil, 1982, p.8). This tradition continued after Light, and during the 1840s Surveyor General Edward Frome reported on the geology during exploration (e.g. Frome, 1843) and provided instructions to his staff to make geological observations. His Deputy Surveyor General, Thomas



Figure 2. Kapunda copper mine 1847 (Lithograph after G.F.Angas, Art Gallery of South Australia).

Figure 3. Burra Mine showing chief portion of surface operations, 1850 (Painting by S.T. Gill, Art Gallery of South Australia).

Figure 4. Penny's Stopes, Burra Mine 1847 (Painting by S.T. Gill, Art Gallery of South Australia).

Figure 5. Glen Osmond Mine 1845 (Painting by S.T. Gill, Art Gallery of South Australia).

Figure 6. Opening of the Karkulto copper lode, 22 km south of Burra 1850 (Painting by S.T. Gill, Art Gallery of South Australia).

Burr, made a significant contribution in this regard, an early geological report being his account of exploration in the South Australia's southeast region in 1844 (Burr, 1845).

### 3. DEVELOPING "COPPERMANIA"

From the beginning of colonisation, South Australians established quarries for building stones. By 1840, further interest in the development of mineral resources was evinced through the establishment of slate quarrying

at Willunga, about 50km due south of Adelaide. Slightly earlier, and more significantly, traces of copper were recognised in 1838 in the hills only 10 km southeast from the centre of Adelaide at Glen Osmond. Both and Drew (2008) have discussed the different discovery accounts of this deposit and how it led to first Australia's metalliferous mine in 1841.

The discovery of the first large metalliferous resource, the Kapunda copper deposit, occurred in 1842. The mine was formally opened by Menge in January 1844, who also located another copper deposit in the surrounding region (Dutton, 1846, p. 287). Auhl (1986, p. 31) notes that by the end of 1844, there were exhibitions of South Australian ores in Sydney and Melbourne and, soon after, there was some consequential emigration into South Australia from the eastern colonies.

The recognition of valuable minerals also concerned the Government because, given the system of land sales and tenure initially established in South Australia, which invested mineral ownership with land ownership, their occurrence elevated the value of land. As early as 1840, a directive from London had ordered that potential mineral land "needed to be inspected by a Government Geologist and Mineral Surveyor". However no action was taken on this request until after the Burra discovery, even though Menge had expressed interest in a position of "colonial geologist" as early as 1841 (O'Neil, 1982, p 17).

In the period leading up to the discovery of Burra, there were others who were also interested in the geology and minerals of the new colony. A paper entitled "Geology of South Australia No. 1" was "read before the Council of the Adelaide Institute January 27, 1843" by B.T. Finnis (1843). Additional parts to the Finnis's contribution are not known, even though Finnis became a prominent South Australian public servant, and in 1856 the first Premier of the colony. Information on the geology of South Australia was also provided anonymously both to reporters in Great Britain (e.g. Binney, 1842) and in South Australia (Anon., 1843, 1844). And following the Kapunda discovery, its joint owner, F.S. Dutton (1846), published in London an extensive description, which publicised the developing copper province. It also gave due credit to Menge, Burr and another geologist, C.D. Fortnum. Fortnum is not known from any other source dealing with the geology of South Australia but is quoted at length by Dutton as a "chemist and mineralogist". In Dutton's book, Fortnum not only provided a description of the Montacute and Mukurta copper deposits but also considered in general the prospects for iron ore and coal occurrence. All these contributions confirm that geological expertise was available in South Australia from the outset, from an educated British elite in the colony. It was utilised in the developing mineral boom.

#### 4. THE BURRA COPPER BOOM

The discovery of the gigantic copper deposit at Burra in June 1845, the so called "Monster Mine", directed worldwide attention to the mineral resources of South Australia (and Australia generally) for the first time. The Burra Copper discovery also proved to be a magnet for many with geological expertise.

Soon after discovery, the second accountant at the South Australian Banking Company, John C. Dixon, wrote an official report on Burra mine geology for the mine purchasers (Dixon, 1846). Not only was this report published and distributed in Britain, it was also translated into German and circulated on continental Europe.

The Burra discovery also forced action by the Colonial Government, as in May 1846 Governor Frederick Robe assigned Deputy Surveyor General Burr to the new position of Mineral Surveyor. About the same time as his assignment Burr also published a thirty-two page book (Burr, 1846) that is today regarded as the first geology book published in Australia and certainly the first government geological report of any kind in the country (Cooper 1984). A succinct overview of South Australian geology was provided, in which rocks of Cambrian age

were identified for the first time in Australia (Cooper and Jago, 2007). Burr's work responsibilities, emphasising mineral resource assessment, also created what is arguably Australia's first Geological Survey (1846-1852) (Cooper 1985). Even though he left Government employment in October 1847 to accept an appointment as General Superintendent of the Burra mine, Burr was succeeded in his role by James Trewartha (1847-1850) and Benjamin Babbage (1851-1852), before these geological/mining appointments lapsed. Trewartha's mineral survey reports were published in the official Government Gazette as well as in the local press. Trewartha (1849), in addition to mineral survey reports, also discussed "the principal rocks of South Australia" from his personal experience. Trewartha (1850) provided comment on mineral deposits in Cornwall and South America (mostly Columbia) and extended his comments to South Australia, where he interpreted correctly that many South Australian copper deposits do not extend at depth below an enriched zone.

The Burra Copper Boom also attracted unattached geologists who undertook geological and mineral assessment as a consequence of the increasing number of mineral discoveries. The resident population generally quickly learned to recognise mineral indications, for example the colours of oxidised copper minerals, but expert geological and mineral knowledge was sought to prove an economic resource and to establish ongoing mining operations. By the end of 1850, it was recorded that there were forty-nine separate active metal mining operations in South Australia with thirty-eight individual copper mines. Although the Burra and Kapunda mines dominated the economy, it is notable that other operations also employed significant people. For example, it was reported that there were eighty-six people at a remote Eyre Peninsula mining operation in the far west of South Australia in July 1849 (First Annual Report of the Port Lincoln Mining Company. South Australian Gazette and Mining Journal 26 July 1849).

A significant feature of the geological expertise that entered South Australia was its association with the English county of Cornwall. From the earliest years of the colony, Cornish migrants entered South Australia in the role of well diggers and general labourers. According to Johns (2006) the decline in tin and copper mining in Cornwall at this time coupled with the offer of a free passage to South Australia and the prospect of improved living conditions stimulated this migration. With the discovery of metallic minerals, Dutton (1846) noted that it was an easy step to persuade the Cornish migrants to enter mining enterprises, given their mining associations. Moreover, it was a simple step to promote additional Cornish migration to assist mine development. Whilst the majority of Cornish miners were mine workers, there were also those who possessed significant expertise both in geological, mineral assessment and mine management skills. The Government Mineral Surveyor, James Trewartha, was of Cornish heritage and Cornish mining was discussed in his reports. Also of Cornish heritage was Henry Roach, who took over management of the Burra Mine following the dismissal of Thomas Burr in 1848 and who held this position until 1867 (Auhl, 1986). In addition there were numerous mining experts from the 1845-1852 period who had likely Cornish heritage, given that in reports that they were accorded the Cornish title of "Mine Captain". Individuals, included here, are Captains John Pascoe, Thomas Peters, John Phillips, Richard Rodda and John Alsop.

Another source of geological knowledge for the Burra copper boom was Germany. Johannes Menge was German in origin and his early appearance in South Australian history probably results from the special liaison that the South Australian Company Director, George Fife Angus, developed with potential German immigrants, especially religious refugees (Pike, 1967, pp.130-131, 208-211). Within a decade, Germans also left their homeland for South Australia as a consequence of political and economic factors. Following the Burra copper discovery, further geological expertise was sourced from Germany by the operating mining company and a "mineralogist", Dr Ferdinand Von Sommer, was employed to make drawings of the mining field (South Australian Gazette and Mining Journal 18 October 1845). In 1848, another German, Dr Georg Bruhn, was advertising his services as a mineralogist, geologist, miner and chemist in Adelaide (see advertisement in the South Austral-

ian Gazette and Mining Journal 29 April 1848) and provided his views on coal occurrence in South Australia (Bruhn 1848). Later he sourced local capital to finance an exploration expedition and his substantial report was published as a special supplement in the local press (Bruhn, 1849). By 1850, Carl Zaccharie was heading a group of German miners operating the Wheal Gawler mine at Glen Osmond. His geological report, which was originally written in German and published in the local German-language newspaper, was subsequently translated and published in the English press (Zachariae, 1850a). Likewise there was his report on the Burra Mine and the associated mineralisation (Zachariae, 1850b). In 1851, "Herr Zachariae" was also labelled as scientific superintendent of the "Lobethal Union Mining Company" (South Australian Gazette and Mining Journal 20 February 1851). Other Germans later recorded as working in South Australian mining and geology at this time include Gustav A.H. Thureau (McMullen, 1996) and J. Wilhelm T.L. von Blandowski (Darragh, 2009). In 1851, it has been estimated that there were approximately eighty German miners from the Harz Mountains working at Burra (See German Australia website [www.teachers.ash.org.au/dnutting/germanaustralia](http://www.teachers.ash.org.au/dnutting/germanaustralia), accessed 6 August 2010).

In addition to the English, Cornish, and German geological knowledge based in South Australia there were also short-term geological visitors. Notable among these was Joseph Beete Jukes, Naturalist abroad the famous *HMS Fly* expedition (to the Dutch East Indies, New Guinea, and Australia), which visited South Australia briefly in 1845. As a result of his visit, the first geological overview and geological map of Australia, including South Australia was later published (Jukes, 1850).

## 5. END OF THE BOOM

In the late 1840s, there were reports in the local South Australian press of mining expertise moving out from the colony to explore other regions of Australia. Ferdinand Van Sommers travelled to Western Australia in February 1847 where he assisted the search for coal and other minerals by the Western Australian Mining Company and later worked for the West Australian Government (Glover, 2005, 2006). In addition, there is also a positive geological report in the South Australian press on Van Diemen's Land (now Tasmania) by Richard Rodda (1849), who had also worked in South Australia. In addition, as subsequent history reveals, Georg Bruhn established in the newly proclaimed colony of Victoria in 1850. There he found gold and had a major role in initiating the Victorian gold rushes (For a general review of G.H. Bruhn's contribution to the Victorian Gold Rush, see Bendigo Advertiser 23 July 1988 page 4).

The gold discoveries in Victoria totally transformed the economic situation in South Australia as the richness and wealth-generating capacity of the new discoveries led to a depopulation of South Australia. Estimates have been made of nearly 28,000 people leaving the colony in 1852-1853 from a total European population of 63,700 (Carter, 1997, pp. 262-264). Despite their richness even the mining operations at Burra were largely suspended during this exodus as there was insufficient labour to continue mining (Auhl, 1986, p. 228). Smaller mines that were open in 1850 soon closed permanently.

Accompanying this population transfer were most of the geologists, who were based in South Australia during the boom, including Burr, Trewartha, and Zacchariae. Even Menge, who had lived in South Australia for fifteen years and was aged sixty-four departed on foot for Victoria only to die soon after his arrival. As a consequence, the progress of geology in South Australia as a discipline and profession was thensignificantly retarded only to recommence with the establishment of the University of Adelaide in 1874 and a permanent Geological Survey of South Australia in 1882.

During and after the Burra copper, boom the possibility of gold in South Australia was not ignored. In April

1846, a small pocket of gold had been discovered and mined at the Victoria Mine near Montacute, about ten kilometres east of Adelaide (South Australian Gazette and Mining Journal 11 April 1846). It was in fact Australia's first gold mine. Following the San Francisco Gold Rush in 1849, the "South Australian Gold Company" was established in January 1850 specifically to search for alluvial gold, similar to that found in Victoria and California, in South Australia (South Australian Gazette and Mining Journal 10 January 1850). A small alluvial gold discovery was made at Echunga in the Mount Lofty Ranges in 1852 and it attracted a short lived "rush" of diggers. These discoveries attracted little attention, however, following the succession of major discoveries in Victoria and New South Wales from 1852.

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