

THE IMPORTANCE AND FUTURE OF MINING HISTORY: AN AUSTRALIAN PERSPECTIVE

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Mining is a pillar of civilisation, providing many of the materials needed for technologies. It has a long history dating back to the first use of surface stone to make simple hand tools. This history even predates the appearance of our own species and is dated to at least 2.6 million years BP when *Homo habilis* developed the earliest Oldowan tools in Africa (McCarthy and Rubidge 2005). Our Stone Age ancestors improved and continued this technology for most of the history of *Homo sapiens*. They also adopted the use of mineral pigments for decoration and art. Following the use of stone, the discovery and utilization of precious metals, particularly gold, as well as copper, lead, tin and iron played a major role in transforming the human condition (Raymond 1984). The production, consumption and coveting of gold shaped and influenced many cultures. In Australia, the gold rushes and gold mining history are a central part of the Australian psyche and national mythology. This is the mining history most familiar to most Australians.

The extraction of metals and other useful elements from the Earth's crust by mining and metallurgical processing is now so well established and widespread that the products of mining are more or less taken for granted and most people have only a vague or incomplete knowledge of the origin of many of these components that make up modern 'everyday' items and technological devices. Due to this knowledge disconnect between source and end product contemporary mining activity is probably not considered of heritage importance or future historical interest by the general public or even those in the mining industry. Despite the best efforts of the industry to indicate otherwise, mining is still widely perceived as a 'dirty and dangerous' industry, and the cause of significant human misery and environmental degradation. Much of the history of mining in fact underpins this perception. As the human population and related appetite for non-renewable mineral resources continue to increase exponentially there is also a moral dilemma associated with mining, related to concern for the supply of mineral products to future generations and the potential environmental impact of their increased extraction.

Australians have typically had an ambivalent attitude to mining. Mining has provided the nation with much wealth, frequently when other economic activity has been in a precarious state. The discovery of payable gold in 1851 helped transform an initial convict dumping ground and pastoral backwater into a liberated new nation. Gold mining provided the wealth and population to industrialise and modernise the entire country. Since the gold rushes, the Australian public has been fascinated by the numerous mineral booms and busts—benefiting directly and indirectly from the booms and losing national income from the busts (Raggatt 1968; Blainey 1969, 1970). Despite the benefits there has often been concern about the negative effects of mining on aspects of the economy, society and social structures, as well as the environment. Concern for environmental impacts has increased significantly since the 1970s with the rise of the environmental movement. Most recently, unease about societal impacts has returned, for example with the current debate about the detrimental effects on local communities of 'fly in–fly out' mine employment practices. While the current mining boom has helped insulate Australians from the recent global financial crisis, contributing around A\$121 billion *per annum* to the economy (Australian Bureau of Statistics 2012), there is concern about the uneven distributions of the benefits and the problems of a 'two-speed' economy.

During the peak of the environmental movement in the 1980s–1990s many in the community viewed mining at worst as a form of 'rape and pillage' of the land to at best as a necessary evil or dark activity tolerable if it was in remote, unseen regions. During this period, interest in mining history or any celebration of mining was not widely popular. Extreme attitudes appear to be waning, although there is still an active anti-mining lobby, presently focused on coal and unconventional fossil fuel mining/extraction. There is a growing interest in pre-21st century mining history by amateur historians and mining-related professionals driven by an increasing fascination with the narrative or 'story' in mining history, as well as a revival in history in general. There may even be a 're-awakening' in mining history amongst academic historians (Claughton and Mills 2011).

Mining history is closely intertwined with industrial, technological, economic, social and labour histories. In an academic context it has traditionally been considered a sub-discipline of industrial history or archaeology, although recent trends are towards a broader spectrum of topics and fields (Claughton and Mills 2011). As mining is critical to so many aspects of technological, economic and social activity and development and as its past, present and future environmental impacts become of greater concern, mining history would appear fundamental to all these areas of historical enquiry. Mining history in its broadest sense can inform much of history in general.

Mining history is important to the mining industry. Historical records such as plans, assays and reports are essential for establishing the full pre-mining nature of ore deposits and for the re-development of historic mines or even the extension of current mining. Preserved infrastructure such as shafts and other underground openings allow access for sampling or the re-development of a mine. As well as providing practical benefits, maintaining good records and archives at mine sites contributes to the bigger picture of mining history. Historic records can be used to document and understand the best and worst practices in mining, particularly related to engineering and environmental aspects. Miners can learn much to their benefit from the history of mining.

A key issue for mining history is the ongoing preservation of its multiple information and evidential sources. Mining history is built on a range of records including:

1. archaeological evidence of mining activities and practice preserved at mining sites;
2. portable artefacts such as mining tools, equipment and machinery stored in museums (this could also include rock and mineral collections from particular mines as well as drill core and cuttings);
3. written records such as those compiled and preserved by the miners and mining organisations, as well as contemporary reports in the press;
4. oral records from miners and people associated with or affected by mining activity;
5. pictorial records, including drawings, paintings, photographs and films.

Conserving the physical evidence of past and present mining activities is becoming a significant challenge. Increased awareness and justifiable concern for the natural environment by community and government is leading to stricter legislative requirements to rehabilitate mine sites. This has driven a trend towards total restoration and obliteration of the physical evidence of mining. There are also pressures related to alternative land uses, such as agricultural, forestry, industrial and urban development. These pressures are much greater as mines become larger, for example open-cast coal mines and open-pit metalliferous mines, where the expansive areas of disturbance need to be restored for alternative uses after mining. Most infrastructure from recent mining is commonly removed, particularly the portable components or recyclable materials. Mullock and tailings deposits are required to be stabilised, covered and vegetated to resemble the natural landscape. Shafts and pits are generally infilled or capped. At older historic sites, mine openings and mullock heaps were commonly left 'as is' on abandonment, with stone, concrete and heavy unsalvageable equipment also left behind, particularly where the mines were in remote areas. However, more recently many of these sites have also undergone rehabilitation by government agencies to ameliorate any environmental or public safety hazards. Preserving mining heritage features at mine sites comes with public liability risk and such features must be rendered as safe as possible with appropriate stabilization, fencing and signage. This can be expensive and it may be much cheaper and more convenient to completely infill or remove all physical evidence of mining.

New mining commonly, and in many cases inevitably, destroys the evidence of earlier mining activities, particularly where old underground mines are re-developed into open-pit operations. The 'Super Pit' at Kalgoorlie, which has taken out the surface infrastructure and most of the historic underground gold workings in the top 360 metres is a prime example. In some cases the juxtaposition of different mining periods presents a fascinating, if confusing, challenge to mining archaeologists. A small example would be the recently restored Gubur Dhaura site in the northern suburbs of Canberra. This site was worked for ochre and clay by aboriginal people, probably from 5,000 years ago and then highly disturbed by nineteenth-century gold prospecting and twentieth-century quarrying for kaolin and road metal.

Many artefacts from historic mining were commonly left on site to decay or to be rescued by local enthusiasts for preservation in collections and museums. There is typically little interest in preserving more modern mining artefacts and equipment, although some mining companies do make donations of their obsolete items to museums. In many cases mine operators may not be fully aware of the historic importance of some of their items of equipment. For example, parts of the first carbon-in-pulp gold extraction plant built in Australia (and one of the first in the world) were still being used at the revived Mount Boppy gold mine in western NSW until 2006 when the current operator ceased mining (McQueen 2005). The entire plant was to be auctioned for scrap, apparently without knowledge of its significance, before the company was advised of its historical importance.

Modern large scale and mechanised mining methods also mean that fewer mineral and ore specimens are collected and preserved, unlike some of the spectacular collections previously built up by miners working at the face, as well as by avid collectors who had ready access to active mine sites (the Chapman Collection of mineral specimens from Broken Hill is a classic example).

Written and pictorial records can be more easily conserved as long as the will exists to do so. Mining companies recognise the importance of historic records and mine plans to future development or re-development. Despite this, many appear to lack interest in maintaining archival material once their operations have ceased and some may even deliberately destroy records to avoid potential future liability. The cost of safe storage for archival material has been a determining factor in the past, but with digital storage this should not be so significant, although there is still a cost and rapid changes in information technology can result in compatibility problems. The recent trend to corporate 'unbundling' of mining companies (*i.e.* large companies breaking up into smaller companies) also makes it difficult to maintain archival records and corporate knowledge.

The future of mining history will depend largely on the level of interest by historians, the public and the mining industry. The Australian Mining History Association, founded in 1995, is successfully promoting and providing a focus for this interest amongst academic historians and sections of the general community, particularly retiring professionals linked to the mining industry. However, the field lacks 'new blood' (*cf.* Claughton and Mills, 2011). Younger historians need to be encouraged into the study of mining history, for example by providing them with incentives and support to select mining history topics for their higher degree studies. Geoffrey Blainey, one of Australia's leading scholars and the country's pre-eminent mining historian, chose the history of the Mount Lyell copper mine in Tasmania for his PhD thesis and went on to tell much of the Australian mining story in a series of popular books including *The Peaks of Lyell*, *Mines in the Spinifex*, *The Rush that Never Ended*, *The Rise of Broken Hill* and *The Golden Mile* (Blainey 1954, 1960, 1968, 1969, 1993). Indeed his work has shown how much of Australia's general history can usefully be seen through the prism of its mining history. But there is still much to uncover and interpret.

The mining industry needs to increase its interest and support for mining history and historians need to promote and encourage this interest. Not only is this history of practical use, as outlined above, but also it provides an important public relations link to the general community. The need for greater interest and support for mining history and heritage has been

highlighted by the recent demise of the 'Australian Prospectors and Miners Hall of Fame' in Kalgoorlie. Some companies do actively support aspects of mining history and many take steps to preserve heritage items on their leases. However, others consider mining heritage unimportant or even a costly liability if attention is drawn to it. Mining heritage is seen as adding an extra layer of complexity to environmental protection and compliance requirements. Preserving items of mining heritage can also be inconvenient for modern operations and may add expense if projects need to be designed around them. Some sites of extreme environmental devastation have developed into tourist attractions, for example the denuded hills or so called 'moonscape' around the historic Mt Lyell copper mine at Queenstown in Tasmania. Mining companies are keen to distance themselves from such forms of mining heritage and in the process perhaps tend to play down mining heritage in general. Certainly greater interest by the industry will assist in preserving key physical and documentary evidence. A way to enhance greater understanding and interest by the mining industry would be to include a mining history component in the undergraduate training of future mining professionals, such as mining engineers, metallurgists and geologists.

In a country such as Australia, with active on-going mining it is important to develop the right balance between heritage preservation and environmental management so that there is a good record of this activity for future generations of mining historians and the public. Currently the balance is probably more towards environmental restoration and there is a need to strengthen awareness and the requirements for mining heritage preservation at mine closure. Even with the best intentions and resources to preserve our physical mining heritage modern rehabilitation practice will inevitably result in much less preservation of primary evidence. It is critical therefore to preserve the sites and features that retain the most important information and particularly aspects that cannot be reconstructed from other evidence. Once the sites go, so does the potential for historical and archaeological research. For example, to this end Pearson and McGowan (2009) have recently proposed guidelines for preservation at mining sites, particularly non-listed sites, as part of a survey of abandoned mining sites in New South Wales.

Careful and well-informed preservation of physical evidence at mining sites can provide useful community and economic benefits into the future. The growing interest in mining history is driving a rising interest in mining history tourism, which can bring financial benefits to local communities and an appreciation of the positive contribution of mining to society. Tourist mines such as those at Sovereign Hill near Ballarat, the Dalprats and Day Dream mines at Broken Hill and the mining heritage sites at Gympie in Queensland and in the 'Copper Triangle' at Moonta–Wallaroo–Kadina and at Burra in South Australia are examples.

Mining will remain a fundamental activity for as long as our technologies and life styles require mineral products. Continued supply of these products in an environmentally sustainable way will be a huge challenge demanding exploitation of new and lower grade ores, major technological innovations in exploration, extraction and processing, much more efficient patterns of use and a high level of recycling. The mining history being forged today and in the near future will be of immense interest to the next generation of mining historians.

ACKNOWLEDGEMENTS

I would like to thank Warren Dym for his invitation to prepare this short contribution to a symposium on Mining History. I also thank David Oldroyd for his editorial advice and comments. The article has benefitted from the comments and suggestions of several colleagues including Mel Davies, Barry McGowan and Don Perkin.

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This article was published as part of a 'Symposium on Mining History' in *Earth Sciences History* (Journal of the History of the Earth Sciences Society) Vol 31 Number 2, pp. 316-320, 2012. The article is reproduced with the kind permission of the editor of the journal.