

When is a Store not a Store? When it's a Smelting House

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The Burra Burra (or 'Monster') Mine in South Australia was once a thriving and significant copper mining undertaking, with an active life for almost the entire period 1845-77. Initially worked by the South Australian Mining Association (SAMA) from underground, in 1868 it became an open-cut pit on the advice of London consultant, John Darlington.¹ The mine's richer ores were from the outset shipped to Swansea for smelting but SAMA, seeking to deal with lower-quality ores not worth exporting, heroically built and attempted to operate its own smelter for two years from late 1845. Their early efforts, limited in their way by naivety, failed to achieve success and were wound up a year before the arrival in the colony of Schneiders' Patent Copper Company (PCC), which built a substantial smelter across the Creek from the mine. This provided the local smelting option SAMA was looking for, and the PCC's management gradually wore away SAMA's resolve to only allow it poorer ores.

The Burra townships (including the mine site) have been nominated for World Heritage listing, the mine site itself boasting a plethora of significant mining remains, although the original SAMA smelter is not in evidence. Apart from the renovated Morphett's Engine House, only two roofed buildings are still standing: the sturdy powder magazine and the mine's store with its lean-to storekeeper's cottage. The store is the only Burra mine feature which is in private hands and occupied, if one discounts the original mine 'hospital' that lies beyond the immediate mine site, which is owned by the same family as the store.

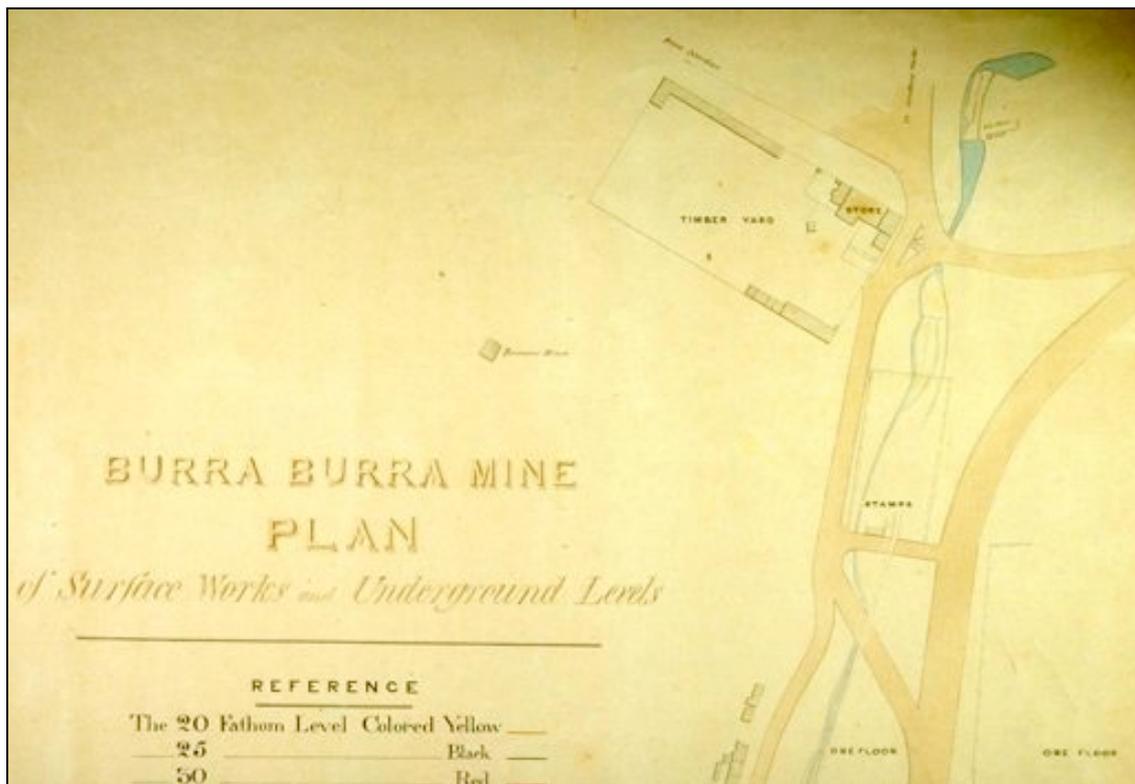
After taking an interest in James Charles Coke from South Wales,² who took charge of the stores from October 1849 to mid 1851,³ the author approached the owner for a viewing of the building's interior, which was kindly organised in late 2002. A result of this closer inspection was the firming of a theory that the author was already developing – strongly shared, as it turned out, by the owner – that the store had a 'pre-history' as SAMA's speculative smelting house. While several previous writers⁴ had discussed SAMA's early aspiration to smelt, none had gone on to consider what may or may not have happened to the building. The store complex and its walled yard had been studied by architectural and historical experts in the mid 1990s without firm conclusions being drawn as to the whereabouts of any remains of the original SAMA smelter. The consensus seemed to be that the smelter's remains must lie somewhere within the walled area around the store. The watercolour illustrations of the building, done by celebrated colonial artist S.T. Gill around 1850, contained thought-provoking evidence, as did SAMA records. Add contemporary newspaper reporting to these, and there emerges a dossier of evidence which the author contends supports his case and potentially further enhances Burra's heritage value: that what is currently recognised as the mine's store, dating from 1847, was under construction at least a year earlier than

this, and is the building that housed Australia's first copper smelter. The following arguments support the proposition that SAMA's smelter stood not just near to the store, but was in fact the same building.

Prosecuting the case

From what one might call first principles, it initially seemed to the author that it would be an unusual and, business-wise, impractical way of proceeding to erect what was reportedly a substantial smelter building, planned for and commenced towards the end of 1845 – mere weeks after the Burra Mine was opened – only to knock it down a couple of years later and start from scratch in constructing another substantial building to act as the mine's store. One would have thought that SAMA's hard-headed Adelaide men of business, who generally watched their pennies very carefully, would have rather 'recycled' the sizeable stone-built smelting house for the secondary purpose.

Figure 1: *Burra Burra Mine Plan (1852) of surface works and underground levels. This is the northern portion of the Burra mine site. Apart from the then store and yard, the tributary creek, alluded to in the text regarding the construction of a railway track from ore floors to smelting house, is seen running down, to debouch into the Burra Creek proper beyond the store.*



Source: By courtesy of the Department of Manufacturing, Innovation, Trade, Energy and Resources, South Australia.

Study of several of the Gill watercolours, housed in the Art Gallery of South Australia, immediately indicated that the building in question was clearly standing in 1847 on the same site as a smelting house, as he later depicted (twice, the author contends) during 1850. By that year it had acted in its current accepted rôle as the mine's store for the previous eighteen months or so. Gill's depictions help the case thus

far but also, unfortunately, pose a major question as evidence for the transformation theory: they depict what appears to be a two-storeyed building whereas the building as we see it today is single-storeyed, although closely resembling the Gill illustrations in its other main features. This was a problem the author set out to resolve.

Documentary evidence

Some little while after the author's inspection of the premises, while trawling through the SAMA's records, the following instruction, under the heading 'Stores and Offices' was noted: 'The Directors intend having the Smelting House fitted out for a store of which you will receive particular instructions'. The letter dated 26 August 1848, was written by SAMA's Secretary, Henry Ayers from Adelaide Head Office to the Superintendent of the Burra Mine, Thomas Burr.⁵

On the face of it, this directive is proof-positive that the building presently characterised as the Burra Mine's store is very likely to be none other than the Mining Association's smelting house, and that the author's earlier surmise about sensible business practice is probably correct. It would seem to be confirmed and underlined as fact when, almost a year later, Ayers wrote to Edward Strike, temporarily Storekeeper at the mine prior to Coke's taking up the post, under the heading 'Smelting or Storehouse'.⁶ That the two buildings are in fact one seems unequivocal.

However, certain views have been taken over the years as to whether the building seen today fits the bill as far as being SAMA's smelting house is concerned. Apart from the belief of the authority on the Burra town and mine, Ian Auhl that it stood on the eastern side of the Burra Creek, both David Bannear⁷ and Peter Bell⁸ look for it somewhere in the store's large walled yard. But no one is really happy with the idea that it is to be found in the ruinous stone-built range in the yard's south-west corner. All authorities would concede that those remains are just too long and narrow, with inadequate doorways, and therefore impractical for working at a furnace (or two) within. The author would add that those remains stand on such sloping ground that trying to power bellows off a horse-whim anywhere in their vicinity would have been an impracticable proposition. There also exists a red herring of a description (as the author believes) pointing to these ruins as the possible smelter, which is discussed towards the end of this paper. Habitable Places and Phillips and Pilkington, Architects (HPP&P), in their 1996 study⁹ of the Store and its associated buildings, come nearest to the author's position by observing in passing that the Store itself, of all the remains in the vicinity, most nearly fits the description in *The South Australian Register* of 28 November 1846 of the SAMA's smelter, though they go no further in that direction. Although various other records and descriptions are quoted in HPP&P's historical assessment, Ayers' directive to make the simple conversion, quoted above, is not.

Evidence in the brushstrokes

What can be gleaned from the visual evidence contained in S.T. Gill's watercolour series which records the developments in the Burra area during the mine's first five years that culminated in the maturing of the PCC's smelting innovations by 1850? In his

painting dated 21 February 1850,¹⁰ Gill provides a westward view, taking in the PCC's first smelting house – over-elegantly built by the standards of Swansea works in the estimation of some at the time – and across to the mine-site itself, where the relatively new Roach's Engine puffs centrally (Fig. 2).

Figure 2: *A view, dated 21 February 1850, from the east side of the Patent Copper Company's first smelting house (foreground), the SAMA's smelting house-become-store beyond it, with the mine site in the distance, smoke rising from the chimney of Roach's engine.*



Source: The Graham family's 'original' picture, by courtesy of the Art Gallery of South Australia.
Reference: 0.1350.

In the middle ground between the smelter and mine, with the Burra Creek lying between, he shows a sizeable building together with its walled yard. Uncontroversially, this occupies the site of today's store and its yard. The store as it appeared in early 1850 consists of a central portion, with an arched double door and pair of windows on either side of that, plus lean-to constructions on both ends. The yard extends well to the building's right, the far wall climbing the slope to westward.

The fly in the ointment is, as already noted, the roofline as viewed in 1850 when compared with today, and this is controversial. It can be read in either of two ways: a) the building appears two-storied or, as suggested by HPP&P, b) we are seeing, over the roof, the range of workshops in the top left-hand (or south-west) corner of the yard, making an illusory 'upper storey' by chance of Gill's chosen sketching position.

Does Gill's 'copy'¹¹ of the February painting clarify anything further? The author's strong contention is that this second watercolour is by no means a mere copy of the first, and consideration of both versions is necessary (Figs 2 & 3).

Why, in any case, would a copy be done? The SAMA's largest shareholder, J.B. Graham, had gone on a fact-and-bridge-finding visit to the Home country in early 1848.¹² He managed to find facts and a wife but she would not return with him to South

Australia. He had a need, therefore, to be kept up to date with developments at his prize asset. The new PCC works having gone up in his absence, it was necessary for this aspect to be covered to add to the copies of the Burra paintings he had taken with him and, as it were, complete the set (he had managed to get some [eight] of these featured in the *Illustrated London News* of December 1848).¹³ If one of the two PCC works paintings of 1850 were clearly a copy of the other, little extra could be learned from the study of the two. However, there is much to be gained from their separate study. It is a little like a puzzle for sharp-eyed children where two almost identical drawings have to be compared and a range of minor differences spotted.

Figure 3: *The 'winter' version of the same view – possibly done in July 1850 – the 'copy' which hung in the SAMA's boardroom.*



Source: By courtesy of the Art Gallery of South Australia. Reference HQ-0.653.

From its colouring and the bullocky with rolled up sleeves, the February painting clearly depicts Burra in summer. In the second picture, not only is the colouring that of a South Australian winter, but our bullocky is wrapped up as he heads to the scrub for more timber. Just charming detail one might say – perhaps moving towards a set of 'Four Seasons' illustrations – but, for further evidence of time having passed, the PCC's brick-built chimney-stacks should be studied. In the February picture, No. 7 chimney is being completed, No. 1 appears as though its furnace below has never been lit, and both the tallish chimneys of the 'casting house'¹⁴ (to the left of the smelting house) and of Roach's Engine are be-smutted with soot only down to a certain level. When attention is turned to the winter picture, there are still a couple of men up the No.7 stack but, looking closely, it can be seen they are in fact completing the task of white-washing the stacks, and the casting house, while Roach's chimneys show the progress of soot further down them over the intervening few months. If dealing with an original and a simple copy, it would have to be concluded that Fig. 2 was the original, and Fig. 3 the copy. The author contends Fig. 3 is by no means a simple copy of Fig. 2. Rather, it is a later original in its own right.

The provenance of the two paintings goes a good way to elucidating the situation: the February painting (Fig. 2), which came to the Art Gallery of South Australia directly from the Graham family,¹⁵ is the 'original'. It is neatly titled and dated (21 February 1850), probably by Gill himself. The winter picture 'copy' (Fig. 3) came directly from SAMA itself, at its closure in 1914, one of a collection that had hung in the boardroom. Whether Graham had taken copies of all the earlier paintings with him is unknown. Certainly, not all existing images had been reproduced in the *Illustrated London News*¹⁶ and, in addition to his 'update' – or in fact 'updates' because, as can be seen below, another painting appears to have been done from the selfsame vantage point as Gill adopted to paint the PCC works – a small parcel of Gills appears to have crisscrossed the oceans in early 1850. For some reason, maybe through missing the deadline for the monthly mail-ship's departure, the author suggests these two *original* paintings were sent away and 'copies' had to be done from scratch for local consumption. The winter version and one of Kooringa township from the same position,¹⁷ that is, to the south-east of the PCC's works, looks to have been done in perhaps July 1850, with Gill, receiving a 12-guinea cheque from SAMA the following month.¹⁸ It has been noted that Gill was given £15/8/- for his 1847 work in the August of that year.¹⁹ Significance may also be read into the fact that the two mid-1850 pictures – one of the works, one of the township – are of an equal, though markedly smaller dimension than the rest. Gill appears to have tried to station himself in the exact spot from where he sketched the February painting but, if notice is taken of the slight shift in overlap between the PCC furnace chimney and the store's door, and the PCC's fence and the first archway in the side of its own smelter, it appears that for the 'winter' picture, the artist's position is ever so slightly more northerly than previously.

Further, we need both summer and winter PCC works paintings in our consideration of the characteristics of the store, as Gill is, one might say, just a touch careless with his detail, particularly in the winter picture (Fig. 3) where he paints only one window either side of the central door and completely misses out the slim chimneys rising from the centres of the two lean-tos. This feature is still intact today in the northern lean-to, though since taken down in the southern, as compared with his representation of them in February (Fig. 2). Conversely, in the Graham family's February picture (Fig. 2) he has neglected putting any detail in the apparent upper storey, whereas, in the SAMA's winter picture (Fig. 3), he shows five windows, or apertures of some kind. In the later picture, he chose, perhaps accidentally, a slightly more elevated position from where to sketch; the ground to the east of the PCC's works rises steadily. The 'illusion' of two storeys, if this is what is being seen, might have been cleared up with a glimpse of any ground in the yard between store and carpenters' workshop behind, but this is not the case.

As opposed to an illusion of upper storey, HPP&P's 1996 report suggests that any real upper part might be considered a clerestory. This is a description that had independently suggested itself to the author when first studying Gills works prior to learning of the firm's report. Supposing the building were the SAMA's smelting house, this upper feature would, as in a large church, have avoided pillars in the 'nave'. Such would have encumbered the place, making it inconvenient and dangerous for the

smelters, who we know were required to be both strong and agile²⁰ in handling their extremely dangerous materials – the last thing one would have wanted in managing molten copper, hot ladles and rabbles, would be to be dodging around pillars. Lofty headroom and apertures for venting heat and fumes would also have been an enormous advantage, as noted in the Welsh works that had circular vents high in their walls,²¹ as is well illustrated in Gill's rendering of the PCC's own smelter.²² (See Figs 2 & 3)

Figure 4: *From the western side, the smelting house/store with ruined carpenters' shop (ordered November 1849 for this, the SW-corner of the yard) in the foreground. The remains of the shop's interior walls are standing, the exterior formed by the yard wall itself now rubble in the foreground. Site of the PCC/E&ACC's smelting works the open area in the middle distance. The Burra Creek lies along the tree line between the two.*



Source: Photo by the author, May 2011.

A further question worth contemplating at this point is whether there *was* any building in the south-west corner of the store's yard by February 1850 which might have provided this appearance of a clerestory in Gill. The directive to build the carpenters' workshop in that position had only come from Ayers' pen ten weeks earlier²³ in the height of the South Australian summer – no mention of a conversion job from any other function for this. Was it completed in that time frame? Perhaps it was, perhaps it was not; its ruinous remains are still to be seen on site (Fig. 4).

During the author's visit to the vicinity in May 2011, prior to presenting the original of this paper at the Australian Mining History Association's conference at Hahndorf, he did not think to check the sight-line which could have provided the

accidental impression of a clerestory on Gill's part. However, photographs taken at the time suggest that it could only have lined up if Gill had been positioned further north than he appears to have been.

Be the illusory clerestory as it may, another Gill picture featuring the building is considered. The painting²⁴ was executed roughly three years before the two 1850 portrayals. The 'original,' via the Graham family, which is dated 12 April 1847 and titled, has better detail of the smelting house/store but is too pale to reproduce well here. For the purposes of illustration in this paper, the 'copy' (Fig. 5)²⁵ from the SAMA boardroom is used rather than the Graham version. Gill tells us he is presenting a view towards the Nor-Nor-East across the mine-site. He was positioned to the west of the later Morphett's Engine House, which still stands. The sweep down towards the Burra Creek is seen at centre right of the picture and, there, where we would expect to find it, is our smelter. It can be nothing other; it is the only 'most substantial' building in the vicinity – described as such, and 'handsome', by the *Register's* reporter²⁶ on his visit just five months earlier. From the author's close-up study of the original painting, he can say that it appears with all the detail of sandstone quoins and brick surrounds to door and windows, as can be seen as features of the store today.

Figure 5: *A view of the Burra mine site, towards the Nor-Nor-East, 12 April 1847. The SAMA's smelting house (yet to acquire its yard) in the middle distance at Right. This is about three weeks before Chipman expected full-scale smelting now the Dreyers had their bellows for blast.*



Source: By courtesy of the Art Gallery of South Australia. Reference 2006P13.

In this 1847 depiction, is shown the reverse side of the building which Gill shows in the 1850 paintings: the back side of the building which, nevertheless, has the similar large central door, two windows on either side, plus the two lean-to structures and – it has a clerestory! No tricks of positioning here; this is long before the construction of even a yard wall, let alone a carpenters' workshop that could provide the illusion from the other side. The smelter stands in splendid isolation, at the gateway to the mine. That there is no carpenters' shop building present in the Gill of 1847, and that

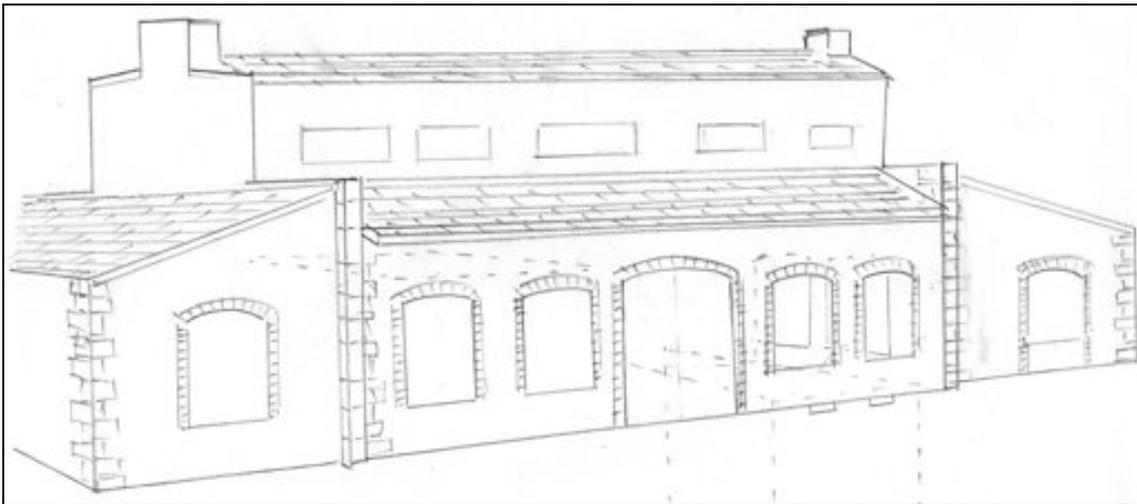
Ayers does not instruct its construction (no suggestion of a conversion job, as noted above) until late 1849, safely rules it out as the possible early smelting house – and it was ‘opposite’ that smelting house, Ayers tells Graham, the PCC is leasing land for its smelter early that same year.

Evidence set in stone

If the case has been reasonably well made so far, that today’s mine store was formerly SAMA’s smelting house, why does the building as seen today have a completely different roof line, if otherwise resembling the mid-19th Century depictions? What evidence can be gleaned from the building’s interior matched with the SAMA’s own records?

As HPP&P remark, the dimensions are certainly not too far adrift from a description of late 1846²⁷ giving dimensions of ‘about 105 feet by 35 feet’. The lack of an exact correspondence does not undermine the present argument, since it is clear that the original description was only a guesstimate on the part of the *Register*’s reporter.

Figure 6: *Smelting house/Store when it still had its clerestory.*



Source: Author’s rough sketch.

The main, central part of the building is a rectangle, roughly 60 feet by 30; two cubes, then. Their exterior symmetry was, however, utilised asymmetrically: the interior contains a cellar to the right of the door (as seen from the road side) and, to the left, is a mezzanine floor, currently extending a shorter distance from the southern wall than it clearly once did. This would seem to support the view that the two furnaces we know the smelter could boast were to the right of the entrance (seen from the creek, or road, side). The presence of a mezzanine could possibly have facilitated access to some sort of platform between the two furnaces, allowing for charging them.

In the north wall of this main building, there are two sizeable archways which have been in-filled with masonry. This is strongly suggestive of the two points of access for bellows to the furnaces which designer George Strickland Kingston had omitted to provide, initially, through failing to consult with Dr. von Sommer, on-site manager over the turn of 1845-46.²⁸ Kingston is always at the centre of controversy, whether with

Colonel Light at the outset of the colony,²⁹ with Surveyor-General Frome at the pegging out of the Burra Special Survey,³⁰ or in his gruff handling of proceedings in the House of Assembly as Speaker³¹ – although it may be noted that he was regarded as ‘a trump’³² by Secretary Ayers at the time of a strike, in September 1848, by which time he had become a SAMA director.

Figure 7: *The nogging wall bounding the insertion from the southern lean-to of two bedrooms into the main chamber under the foreshortened mezzanine floor.*



Source: photo by author, September 2012.

The author speculates that the sizeable chimneys at either end of the main building had been designed when Kingston had intended a furnace at each end – which would have meant *two* horse-whims to drive two bellows mechanisms, and meant limited access to the furnace mouths, observed on and complained of by von Sommer.³³ The furnaces were then required to be moved, at a cost of £30, to ‘the back’,³⁴ and these two in-filled archways would suggest that the northern wall of this main chamber is the back wall – that is, the furthest from anywhere, from the mine’s perspective.

One could well conceive that the two archways were closed up at the time of the smelter’s conversion in later 1848, when plans and specifications for the task were sent from the SAMA office.³⁵ Why would one, in a new purpose-built construction, have put in large archways – certainly ‘not of domestic proportions’³⁶ – giving only onto the northern lean-to? As access points, the two, facing, main entrances, would surely have been sufficient; one on the mine side, the other opening onto the roadway.

Figure 8: *One of the two in-filled archways in the central chamber's northern wall visible behind shelving.*



Source: photo by the author, *September 2012*

The cellar in that same area – and the author only puts this idea forward extremely tentatively – could have started out as the ash-pit beneath the furnaces (one might compare the PCC's flooded ash-pits during the rains of 1851 which kept their furnaces extinguished).³⁷ Otherwise, what necessity was there for the digging of a cellar with two-brick-lined vents through the wall to the right of the main door, if the building was constructed from scratch just as a store? There was surely space enough, with the addition of a large yard, and what could possibly have been needed to be kept cool in summer, with powders being kept in the magazine, well away from everything else? Only the storekeeper's wine collection comes to mind! Were the £265-worth of pine 'gurdens' [sic], ordered for the smelter in November 1845,³⁸ either to support furnaces over this pit,³⁹ or could they, for example, have been required to support a venting clerestory? Perhaps we shall never know. If the latter, perhaps they may still have been doing their job in 1850 when Gill depicted the clerestory, but maybe the structure – probably lightweight, possibly even flimsy – became unsafe some time afterwards, causing the roof to be realigned as we see it today. The jutting masonry, virtually piers, at either end of the main building seems needlessly prominent and overly engineered just to provide sufficient width or headroom for the lean-tos. To the author's mind, the original purpose was to support the clerestory and tallish chimneystacks. When the pitched roof of the main part of the building was instituted, at whatever period, it would appear that the new alignment of the gable-end capping stones was put in place, the

southern chimney lowered, whilst still remaining practical, and the northern chimney demolished – the chimney breast is still in situ up to the apex. It was no longer required for any furnace and was superseded by the slim chimney in the centre of the northern lean-to. This, it should be noted, served a new, back-to-back pair of fireplaces in that lean-to, when the latter was ordered to be cleared out and redeveloped. This provided a residence and an office, probably for either the bookkeeper's assistant or perhaps the weighbridge clerk, or both, on the 2 June 1849, when Ayers was still describing the building under the heading 'Smelting or Storehouse'.⁴⁰ He told Edward Strike it was to replicate the division of Storekeeper S.W. Humble's accommodation in the southern lean-to. This was itself a step-up from the two-room division for the first smelters, the Dreyers, father and son, probably 'enjoying' only the most Spartan of conditions. It is pertinent that a month after the *main* conversion job had been ordered, Ayers enquired whether plasterers had finished Humble's accommodation as Storekeeper in the 'House adjoining the Smelting House'.⁴¹

Humble, we know, had a family with him, but when Ayers' friend James Charles Coke (not Cole as mentioned in the HPP&P report) took over as Storekeeper, in October 1849, we know he had not only his wife with him but also the Ayers' eldest son, seven-year-old Frank.⁴² A further upgrade of existing accommodation might have been considered appropriate, and it may conceivably have been at this period that the two extra bedrooms were created by knocking through the southern wall of the main building, forming two bedrooms under the mezzanine.

Timber Top

There remains one further clue: the roof of today's Store is supported by timber-work still bearing the stencil-marks of the Adelaide maker designed to facilitate reassembly at Burra. Jennifer Carter and Roger Cross's 1997 paper⁴³ on early smelting in the colony mentions a March 1846 report of the roof-components being sent up to complete SAMA's smelter. Confusingly, however, they go on in the following sentence to quote the reporter's phrase 'substantial and handsome' in describing the smelting house, words which in fact appear later in the year, in the November 1846 edition of the *Register*,⁴⁴ as quoted above. This conflation of ostensibly two separate descriptions queers the pitch, if only slightly, regarding possible dating.

A further question mark arises through the HPP&P report, in which they cite a date of March 1847. Which year is correct? If '46, the roof timbers are for our smelter; if March '47, what are they intended for? There is no store being constructed at that period, indeed the then store – if we are to believe Ayers' instruction of ten months earlier – had been established in 'the township'.⁴⁵ The question is resolved for us by a quote from *The Observer* (the weekly round-up of the *Register*) of late February 1846, which was reported in *The Maitland Mercury and Hunter River General Advertiser*⁴⁶ (quite clearly the denizens of the Hunter coal-producing area were watching developments in South Australian copper closely with an eye to their own potential interests): Bowen, the Adelaide maker, was constructing a 'capacious and well-ventilated' roof which was being sent up to complete the smelting house. The dating of the relevant quote now clarified and solid, all points further to the conclusion that

today's store is yesterday's smelting house. An interior inspection of 25 September 2012, during the second workshop of the Leverhulme Trust-funded 'Copperopolis' (Swansea 'moment': 1840-70) research project, revealed apparent remnant verticals of the clerestory support roughly lopped off to accommodate a later pitched roof alignment.

Figure 9: *Roofing timbers exhibiting clear loppings-off where supports had extended upwards for the venting clerestory.*



Source: photo the author, September 2012).

The Auhl view addressed

While there is general consensus that the smelter was at least in the vicinity of the later store, the differing opinion of Ian Auhl⁴⁷ that the smelter was on the other side of the Burra Creek from the mine site is now addressed. How might he have arrived at that conclusion? In the middle of June 1847, Ayers had a suggestion to make with the intention of improving the efficiency of the whole operation. A track of wooden rails was to be laid from Grey's to Kingston's shaft and Ayers wanted to know from Henry Chipman how much he thought it would cost to run one from the ore floors to the smelting house, including the construction of a 'rough bridge for crossing the Creek'.⁴⁸ This last phrase, the author believes, had a significant bearing upon Auhl's perception of the location of the SAMA's smelter. He is no longer with us to speak for himself, and the author would certainly not presume to speak on his behalf, but the query about a 'rough bridge' appears to be the only reference which might – and the author stresses *might* – have led Auhl to consider that the SAMA smelter stood on the other side of the

Burra Creek from the mine site, over towards where the PCC's smelter was later built. The author is of the opinion that, if the mine store building really is the converted SAMA smelter, the 'Creek' to which Ayers referred is not the Burra Creek proper, but the generally dry water-course that under normal conditions descended from the mine site which, in heavy rain, acted as a tributary to the Burra Creek, hence the need for only a 'rough bridge'. Corroboration for the way this tributary could certainly flow comes to us from the experience of Henry Rymill, former Ayers acolyte-turned-critic, and now also SAMA director, who went on a tour of inspection in early 1870 with Harry Ayers, standing in for his father who was in England.⁴⁹ The train from Adelaide, as yet terminating a few miles short of Burra, dropped the two in torrential rain, with not even a dray to meet them. They found the Burra Hotel full and had no choice but to splosh on to the Superintendent's house at the mine, getting their feet even more thoroughly soaked in fording the creek. This had to be the tributary creek spoken of above, coming down through the mine site. No one in his right mind, in such a state and in such weather, could be imagined adding to his walk by crossing the Burra Creek (over the bridge in town) only to wade back *through* it somewhere near the mine site. If Ayers (in 1847) had been suggesting a bridge for regular and reliable access across the Burra Creek, it would certainly have involved a fairly substantial construction, something of the order of that later erected by the PCC and damaged in the floods of mid 1851. The line of the tributary watercourse would have run roughly where the modern road-entrance to the mine is today. That the SAMA smelter stood/stands on the west side of the Burra Creek tends to be given further corroboration by Ayers' description of where the PCC were building their smelter. As he reported it to absent shareholder J.B. Graham,⁵⁰ the PCC were erecting their works in the field across the Creek from the SAMA smelter: 'We lease them forty acres of land opposite our old Smelting House'. He does not say 'behind' or 'beyond' our old smelting house, which he might have if it had stood (as Auhl believed) on the lower ground in that field to the east of the Burra Creek: Ayers says 'opposite'.

Smelting leaving its mark?

Before concluding, arising out of one or two questions and observations following presentation of the paper at the Hahndorf conference, several issues are worth further discussion. One of these was the question of whether there are any surviving marks on the fabric of the interior to indicate smelting operations had taken place within that building. The author had to reply that, as it was then nearly nine years since he had been inside it, he could not recollect having noticed anything significant at the time. If we assume that the furnaces were to the right of the main door from the roadside, the masonry in-fill of the arches would represent a period that was post any smelting operations and would account for a considerable area of that wall. A normal sized doorway also pierces that wall in its north-western portion, connecting the main chamber with the north-east lean-to for pedestrian purposes. Also, a doorway pierces the western wall of the chamber – that is, to the left of one of the putative furnaces – leading into built-on office space, so that wall is no longer as it was. However, it was noticed, during the recent Swansea 'moment' tour through the building, that there are

extensive marks of considerable heat on the brickwork either side of this door. The height at which these marks can be seen would be consistent with being the brick surround of the window opening – or simple aperture – that was subsequently converted into a doorway. Only the interior wall to the right of the main door could be considered to be as it always was but, as the whole of the interior has been whitewashed, at some period, no immediate traces of smelting residues can be easily spotted. The floor of that entire section (upon which furnaces might once have stood) presents itself now as ageing floorboards that could have been installed over the putative ash-pit, turning it into a cellar, at the period of the building's conversion. The floor to the left of the doorway, as far as the wall marking the extent of the cut-back mezzanine, has been concreted over within living memory, so that can offer us no visible signs of earlier activity.

Fire Hazard?

One or two people raised the question of what a smelting house was doing with a wooden-framed roof. From email communication with Peter Bell post the Hahndorf conference, it appears that he accepted the author's basic premise, given the evidence adduced on the day, although the question still nagged at his mind: why, in a furnace house where temperatures of 1,000°C were to be generated, would anyone have installed hefty wooden roof timbers, and windows? The author's answer to these understandable questions was that the smelting house was ordered by SAMA's board that was almost entirely made up of men of ordinary business acumen but with no knowledge of the copper trade, let alone smelting. With the possible exception of the Pennys, they were novices. Add to that the fact that the man they commissioned to design the building, along with some workers' cottages, also had no specialist knowledge of what was required. Dr von Sommer, a man with expertise in the subject, commented on the shortcomings as the building was being constructed. However, the latter then disappeared almost immediately from SAMA's employ when employment terms could not be agreed, so his further input was necessarily withdrawn. As with the PCC's first smelting house of three years later, where it is clear that a furnace (at least) was being used for experimental smelting even while the building itself was being erected around it, it appears as though two furnaces had already been installed in the SAMA's smelter well before the walls had got very far up around them. That they were substantially present is corroborated by the fact that von Sommer could see they were not only poorly placed (as mentioned above) but that they were constructed of a non-heat-resistant soft clay slate.⁵¹ The question of the timber roof supports and possible windows can be addressed in the following terms. It is known for certain from the newspaper report⁵² that the stencilled roof-timbers were indeed destined as a roof for the SAMA smelter, although whether there were any windows, as opposed to mere apertures in the side walls, in the building's early days, is a matter of conjecture. The author suggested (above) that the openings in the clerestory were probably just apertures; they may have been glazed later, or perhaps shuttered, with the building's serving as a store – the Gill depictions are not explicit about this.

If a question is being raised as to the SAMA's smelter's roof beams, perhaps it follows that we should likewise wonder about the construction of the larger example, the PCC's first smelting house of 1848-49. It was a building of comparable width, although 200 feet and more in length. The *Register* carried⁵³ a detailed description of all the necessaries the PCC brought to South Australia aboard the *Richardson* for the establishing of a works. However, there is no mention of, say, large cast-iron girders for a roof, although the quoted 45 tons of rather nebulous 'castings' aboard could conceivably have had some part to play. The walls of their works were clearly of local bluestone, and what looks quite possibly like a slate roof, in Gill, and is most likely to have been supported by locally-sourced timber. David Bannear cites a call in *The Register* for tenders for the supply of slates, though without citing the edition, and records the purchase of 20,000 tons from Dawes, as found in the PCC's 'bookkeeping journals for April 1849.'⁵⁴ That the PCC's first smelting house was roofed with slate is therefore almost a certainty, but the same could not be said for the Apoinga smelter of Penny and Owen, for that was roofed with shingles, as were also the first two furnaces of the 1849 Kapunda smelter.⁵⁵ *The South Australian's* description of the Apoinga smelter had its furnaces under a shingle roof, while the refinery was specifically in a stone-built building – no roofing material was described. There are some earlier shingles remaining in our Burra smelting/store house under a more modern corrugated roof. There is just the outside possibility that the PCC's works was roofed with galvanised sheets or 'tiles': Andrew Pollock, as representative of the specialists Morewood and Rogers, travelled (uncomfortably) to Burra in 1851,⁵⁶ as the firm had provided the roof of the PCC's smelting works, although this is clearly intended for the PCC's second smelting house. This was begun soon after the first (depicted in Gill, Figs 2 & 3) had been completed. Morewood and Rogers had only set up an Australian office, in Melbourne, in 1850, followed swiftly by an Adelaide branch. They were specialists in entire iron churches, so could well have provided the large and far less elegant shed-affair which was the PCC's second smelting house as evidenced by the much later photograph of the deteriorating building.⁵⁷ That this building was not yet roofed by the time of Pollock's visit is most likely, as he passed no (proud) comment on how his firm's roof looked, though he gave fairly full descriptions of the journey, the mine – and indeed the pub.

One might further mention, in discussing appropriate materials for the job, the iron, brass and bell foundry in Adelaide's Leigh Street, belonging to William Pybus, which burned down,⁵⁸ whether by accident or possible arson, and this despite the efforts of neighbours, police and some soldiers. It was reported that the fire had broken out in the part of the building that had a *thatched* roof!

Smelting House, Carpenters' Shop, Store?

There remains one last 'awkward' (for the case) topic, not addressed in the Hahndorf (2011) presentation for lack of time, and which was not raised as a question, but which the author did address at the 2012 'Copperopolis' Burra workshop. The HPP&P report includes the following quote: 'A large Yard is now walled round for the carpenters, and the old smelting works converted into a workshop for their use. On the opposite side is

the store...’ It is that short, throw-away final phrase which really lets the cat loose among the pigeons.

HPP&P cite as the source for this quote both the Deed of Settlement and the first annual report (1852) of the former PCC (by then, having required an injection of fresh capital, transformed into the English and Australian Copper Company). Both at Burra in September 2012 and in the version of the present paper submitted for referees’ comments, the author had addressed the ‘awkwardness’ of this quote on the basis of the HPP&P’s citation. He felt he made a plausible case, making reference to a probable denuded mine store in the wake of the Victorian gold rush, being utilised by the carpenters as occasion demanded – and SAMA Secretary Ayers had been inveigling a carpenter from the Kapunda mine with the blandishment of a loyalty bonus, for example. However, just recently, ‘Copperopolis’ and Flinders colleague Peter Birt has drawn the author’s attention to a reference to the store and smelting house which he came across through the blessing of the ‘Trove’ website, which contained the selfsame wording. This was contained in an 1850 *South Australian* article,⁵⁹ the report of a ‘gentleman’ who had just visited Burra after a spell of fifteen months, conveying his observations on developments in the interim at both mine and PCC smelter.

It seems to the present author that this is too much of a coincidence and raises serious doubts about the citation in the HPP&P report – they had, for example, been in error over dating the report of the roofing structure of the store/smelting house, as described above, and had mistranscribed Coke’s name as ‘Cole’ (an easy slip). The passage *could* have figured in the annual report of 1852 as a quotation. It is true it would have been two years out of date by that time, and probably of little significance. Their citation of the quote’s appearing in the E&ACC’s Deed of Settlement is most unlikely, as that was a legal document setting out the foundations of the new concern. Most unfortunately, it is no longer possible to verify the citation as the sole printed volume⁶⁰ of both Deed of Settlement (‘Indenture’), and the many annual reports and relevant correspondence of the E&ACC, has been declared missing in the State Library of South Australia since 2005.⁶¹

As a fallback, all the author has are his extensive notes he took from the volume, some verbatim, in the mid 1990s. Having rechecked these, he has no note of that quotation in the annual report of mid 1852, and associated correspondence, nor in the ‘Indenture’, although he would not necessarily have been as closely interested in the particular topic at that time. What this does do, undoubtedly, is throw out his former explanation for the quote’s awkwardness in the context of 1852 – that is, the effects of the gold rush.

In its context as a newspaper quote of February 1850, a different argument would have to be put which the author is considering at present. For example, the time-line comes into play regarding Ayers’ order for the construction of the carpenters’ workshop in the south-west corner of the yard; it was only ten weeks old at the point of this quote, as mentioned above (with reference to the perception of a clerestory). What had been the carpenters’ practice prior to its completion? The conversion of smelting house to store had been ordered eighteen months previously and Peter Birt has therefore raised the idea of a possible joint usage of the building for carpentry and stores. In this

case, had an increasingly awkward rubbing along of parallel activities become the cause of the order to build a new carpenters' workshop? This building is not big enough for both of us! It had only been three-and-a-half weeks since Coke, the new-broom, with his pernicky accountant's mind, had taken over as Storekeeper, before the order for the new carpenters' workshop was issued.

The absence of a newly erected carpenters' workshop across the yard until roughly the moment of the quote, causes the author to now question whether 'opposite' means across the yard at all. Might it not have equally meant outwardly rather than inwardly? Pending the completion of the new carpenters' workshop, might not the carpenters have indeed been using the old smelting house? And 'opposite', southerly, across the entrance to the mine site, may still have been the old store that S.W. Humble had been instructed to erect in 'the township'⁶² on his taking over responsibility. Humble's store was better placed there than where his predecessor had been erecting it, which had proved a handicap to mining development. Now the author has never considered this 'township' to mean the site of Kooringa as we know it, its being implausible that the mine's stores would ever have been kept at such a distance from the mine site. Instead, the author has always considered that this 'township' was indeed on the mine site, originally intended to have been called Redruth,⁶³ but almost immediately changed to 'Cooringa' (with a 'C')⁶⁴ – the cottages commissioned from Kingston at the same time as his design for the smelting house.⁶⁵ Ayers would shortly refer to the 'Smelting house buildings at the township'.⁶⁶ Underlining the existence of a community in the vicinity of the smelting house is the letter Ayers sent to the Rev Pollitt⁶⁷ in which he refused land for the building of a schoolroom there as SAMA did not intend to encourage any further settlement in that area. This 'township' must later have been cleared away when it too impeded the mine's expansion. Cottages and an assay house are clearly visible on the south/southwest side of the mine entrance in Gill's paintings of 1847. At any rate, 'opposite' might have more meanings than what had seemed the obvious, initially.

Mentioning Gill, it occurs to the author that he was potentially this newspaper report's 'gentleman'.⁶⁸ This was published five days after he sketched the PCC works for the J.B. Graham watercolour of February 1850. His observations on developments there, and on above-and belowground changes at the mine, are consistent with a person who has previously been up at Burra with a keen eye. The one word 'opposite' is, in any case, a small fulcrum on which to turn an argument when set against the large body of documentary and pictorial evidence adduced above.

Winding up for the Defence

These are abstruse and complicated arguments. Nevertheless, the author hopes that, when the circumstantial and the categorical evidence, such as the board's directive to convert smelter to store is put together, the reader will feel that a very reasonable case has been presented. In the light of *all* the evidence it calls at the very least, for archaeological work to be done to more thoroughly assess whether Burra can now claim to be still in possession of the gem of Australia's first copper smelter.

Endnotes

- ¹ Henry Ayers to John Benjamin Graham (SAMA's largest shareholder), 26 March 1867 and 22 May 1868, and Ayers to Graham 13 October 1868 where it is noted that Consulting Engineer, Darlington, is contracted to direct his reforms from London following his visit to Burra earlier in the year, while his deputy, Swansborough, would be getting down to business late in 1869, J.B. Graham Papers, PRG 100, State Library of South Australia (hereafter PRG 100 - SLSA).
- ² The papers of James Charles Coke were proffered for the author's consideration as soon as they were acquired (at auction in London) by the State Library of South Australia while the author was researching in the records of the PCC/E&ACC in the mid 1990s. Coke turned out to be a friend of Henry Ayers, the two having coincidentally migrated aboard the *Fairfield* in 1840 – and hailing from the same home town as the author, he led him to his biographical subject of Ayers (*Henry Ayers: The Man who became a Rock*, IB Tauris, London, 2011).
- ³ Coke Papers, PRG 1114/1,2,3,4,5 – SLSA.
- ⁴ Donald Chaput, 'The Burra Burra Question: To Ship or to Smelt?', *Journal of the Historical Society of South Australia*, no. 12, 1984, pp. 60-62; J.M.T. Carter & R. Cross, 'Success and Failure: Earliest attempts at the commercial smelting of the 'Monster Mine's' copper ore in the Province of South Australia', *Journal of the Historical Society of South Australia*, no. 25, 1997, pp. 21, 24-28; Ian Auhl, *The story of the 'Monster Mine': The Burra Burra Mine and its townships 1845-1877*, Investigator Press, Hawthorndean, 1986, p. 166.
- ⁵ Letters to SAMA mine officials, 26 August 1848, series and file BRG 22/4, SLSA.
- ⁶ H. Ayers to E. Strike, 2 June 1849, BRG 22/4, SLSA.
- ⁷ David Bannear and Robyn Annear, *The Burra Smelting Works. A survey of its history and archaeology*, for District Council of Burra Burra, 1990.
- ⁸ Peter Bell, *A Note on the Burra Mines Storeroom Yard and Walls Conservation Plan*, 27 November 1994. A copy is incorporated with the report next listed at note 9.
- ⁹ Habitable Places, and Phillips and Pilkington, Architects, *Burra Mines Storeroom, Yard and Wall Conservation Plan*, for the District Council of Burra Burra, 1996. Copy in the Heritage Branch, Department of the Environment and Natural Resources, 1 Richmond Road, Keswick, South Australia, 5035.
- ¹⁰ Art Gallery of South Australia (hereafter AGSA), Reference 0.1350
- ¹¹ AGSA, Reference HQ-0.653.
- ¹² Journal of J.B. Graham, Graham Papers, PRG 100, SLSA, and FM4 1537/8/9/40, Mitchell Library, Sydney.
- ¹³ *Illustrated London News*, 2 December 1848.
- ¹⁴ Thus, in Bannear & Annear, *The Burra Smelting Works*, although marked today as the 'assay office', Fig. 2, p. 142. Also see p. 79, where the authors deduce that this must have been the 'casting house'.
- ¹⁵ Provenance records of the AGSA: donation of (the second) Mrs F.M. Graham, 1947.
- ¹⁶ Four of those reproduced were images of the underground workings.
- ¹⁷ AGSA, Reference HQ-0.653.
- ¹⁸ Minutes of SAMA board meetings, 30 August 1850, BRG 22/2, SLSA.
- ¹⁹ *Ibid.*, 10 August 1847.
- ²⁰ Robert Toomey, 'The Vivians, Swansea Copper Smelters', Ph.D. thesis, University of Wales, 1979.
- ²¹ Author's (fairly reliable) youthful recollection.
- ²² AGSA, References 0.1350 and HQ-0.653.
- ²³ Ayers to Henry Roach, Chief Captain (and tacitly Superintendent) of the Burra Mine, 26 November 1849, BRG 22/4, SLSA.
- ²⁴ AGSA, Reference IID-0651.
- ²⁵ AGSA, Reference RP-0.1351.
- ²⁶ 'A Visit to the Northern Mines', *The South Australian Register*, 28 November 1846.
- ²⁷ *Ibid.*
- ²⁸ Ferdinand von Sommer to Ayers, 12 January 1846, BRG 22/63, SLSA.
- ²⁹ For example, William Light, *Brief Journal and Australian Diaries*, Wakefield Press, Adelaide, 1984, introduction and notes by David Elder, pp. 30, 37, 42.
- ³⁰ George Strickland Kingston, on the SAMA's behalf, to the South Australian government, 29 August 1845, BRG 22/5, SLSA.
- ³¹ See his handling of the close of the South Australian Parliamentary Session under the departing Governor Fergusson, *The South Australian Register*, 2 December 1872.
- ³² Ayers to Graham, 14 February 1849, PRG 100, SLSA, and FM4 1537/8/9/40, Mitchell Library, Sydney.

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- ³³ Ferdinand von Sommer to Ayers, 12 January 1846, BRG 22/63, SLSA.
- ³⁴ Ayers to Resident Director Samuel Stocks, *Jnr.*, 30 January 1846, BRG 22/4, SLSA.
- ³⁵ Ayers to Mine Accountant William Challoner, 12 October 1848, BRG 22/4, SLSA.
- ³⁶ Robert Protheroe Jones (Heavy Industry Curator, of the National Museum of Wales) to the author during the ‘Copperopolis’ research project’s Burra workshop tour of the store/smelting house, September 2012.
- ³⁷ *The South Australian Register*, report of June 1851, cited in Bannear & Annear, *The Burra Smelting Works*, p. 37, quoting *The Register*, but not specifying the edition.
- ³⁸ Minutes of SAMA board meetings, 25 November 1845, BRG 22/2, SLSA.
- ³⁹ Mention of the report of “furnace bearers” in inventory of PCC’s stores, *The South Australian Register*, 4 October 1848.
- ⁴⁰ H. Ayers to E. Strike, 2 June 1849, BRG 22/4, SLSA.
- ⁴¹ Ayers to Mine Accountant William Challoner (in the aftermath of Burr’s dismissal as Superintendent), 20 September 1848, SLSA, BRG 22/4, SLSA.
- ⁴² Ayers to Graham, 21 February 1850, Graham Papers, PRG 100, SLSA.
- ⁴³ Carter & Cross, ‘Success and Failure’, p. 25.
- ⁴⁴ ‘A Visit to the Northern Mines’, *The South Australian Register*, 28 November 1846.
- ⁴⁵ Ayers to Resident Director at the Burra Mine, Samuel Stocks, *Jnr.*, 18 May 1846, BRG 22/4, SLSA.
- ⁴⁶ *Maitland Mercury and Hunter River General Advertiser*, 4 March 1846, quoting the *Observer* article of 28 February.
- ⁴⁷ Auhl, *The story of the ‘Monster Mine’*, p. 166.
- ⁴⁸ Ayers to Burra Mine Superintendent, Captain Chipman, 16 June 1847, BRG 22/4, SLSA.
- ⁴⁹ Letter of Henry Rymill to brother-in-law J.B. Graham, 16 July 1870, Graham Papers, PRG 100, SLSA.
- ⁵⁰ Ayers to Graham, 14 February 1849, Graham Papers, PRG 100, SLSA.
- ⁵¹ Ferdinand von Sommer to Ayers, January 1845, BRG 22/63, SLSA.
- ⁵² ‘A Visit to the Northern Mines’, *The South Australian Register*, 28 November 1846.
- ⁵³ *The South Australian Register*, 4 October 1848.
- ⁵⁴ Journals of the Patent Copper Company, BRG 30/2, SLSA.
- ⁵⁵ Verbal communication from Greg Drew.
- ⁵⁶ ‘The Pollock Letters – 1850-52, E. Wells of Normanville, South Australia,’ *Journal of the Historical Society of South Australia*, 24 November 1996, p. 140.
- ⁵⁷ Shown in Auhl, *The Monster Mine*, p. 178.
- ⁵⁸ ‘THE LATE FIRE’, Report in *The South Australian Register*, 14 April 1847, p. 2, being a brief thank you item from Pybus to those who had helped, and with the full story, p. 3 (no heading).
- ⁵⁹ ‘Local News’, *The South Australian*, 26 February 1850, p. 2.
- ⁶⁰ The volume housed in the SLSA, but declared lost since 2005, was, formerly, catalogued by the Library as ZPER 622.343a.
- ⁶¹ This was discovered when ‘Copperopolis’ research colleagues from South Wales were hoping to consult the volume while over for the Burra workshop in September 2012. Although the Library had digitised the hand-written records of the PCC/E&ACC (ledgers, journals and cash-books), this volume had not been digitised, and no one has been able to locate an extant copy in the UK. It may well have been lost, or has been mislocated, following the rebuilding of the State Library around 2000.
- ⁶² Ayers to Resident Director Samuel Stocks, *Jnr.*, 18 May 1846, BRG 22/4, vol. 1, SLSA.
- ⁶³ Minutes of the SAMA board meeting, 14 October 1845, BRG 22/2, vol. 1, SLSA.
- ⁶⁴ What we know as Kooringa (the main part of today’s Burra) had become that – and with a ‘K’, by the SAMA board meeting of 28 April 1846, although its expansion to forty acres plus roads and reserves had already been ordered a month before, see BRG 22/ 2, vol. 1, SLSA.
- ⁶⁵ SAMA’s contract with Kingston of 18 November 1845, BRG 22/5, SLSA.
- ⁶⁶ Ayers to Stocks, letter of instruction on his taking up the post as Resident Director, 20 January 1846, BRG 22/4, vol. 1, SLSA.
- ⁶⁷ Ayers to the Rev Pollitt, 26 November 1849, BRG 22/5, SLSA.
- ⁶⁸ *The South Australian*, 26 February 1850.