LUCKNOW: THE REFORM MINE SITE

VOLUME 1

Historical and Archaeological Analysis of the Reform Mine Site, with Recommendations for its Future Management

R Ian Jack
for the University of Sydney

Presented to the Council of the City of Orange, August 1997
LUCKNOW: THE REFORM MINE SITE

VOLUME 1

Historical and Archaeological Analysis of the Reform Mine Site, with Recommendations for its Future Management

R Ian Jack
for the University of Sydney

Presented to the Council of the City of Orange, August 1997
## CONTENTS

### VOLUME 1

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Acknowledgments</td>
<td>4</td>
</tr>
<tr>
<td>II. Executive Summary</td>
<td>5</td>
</tr>
<tr>
<td>III. History of Reform site</td>
<td>6</td>
</tr>
<tr>
<td>IV. Description of component parts of the site</td>
<td></td>
</tr>
<tr>
<td>1. Windlass</td>
<td>13</td>
</tr>
<tr>
<td>2. Reservoir</td>
<td>14</td>
</tr>
<tr>
<td>3. Golden Point shaft and winding house</td>
<td>15</td>
</tr>
<tr>
<td>4. Mill</td>
<td>16</td>
</tr>
<tr>
<td>4.1 Top mill, batteries</td>
<td>19</td>
</tr>
<tr>
<td>4.2 Middle mill, amalgamation tables</td>
<td>21</td>
</tr>
<tr>
<td>4.3 Lower mill, concentration and drying</td>
<td>22</td>
</tr>
<tr>
<td>5. Mullock (5.1) and tailings (5.2)</td>
<td>23</td>
</tr>
<tr>
<td>6. Hoist</td>
<td>24</td>
</tr>
<tr>
<td>7. Homeward Bound shafts</td>
<td>25</td>
</tr>
<tr>
<td>8. Tunnel</td>
<td>26</td>
</tr>
<tr>
<td>9. Water-tank</td>
<td>27</td>
</tr>
<tr>
<td>10. Engine-base for rock-crushers</td>
<td>28</td>
</tr>
<tr>
<td>11. Winch-house for Reform shaft</td>
<td>29</td>
</tr>
<tr>
<td>12. Reform shaft and head-frame</td>
<td>30</td>
</tr>
<tr>
<td>13. Site of foundry (approximate)</td>
<td>32</td>
</tr>
<tr>
<td>14. Site of stables</td>
<td>33</td>
</tr>
<tr>
<td>15. Internal roadway</td>
<td>34</td>
</tr>
<tr>
<td>16. Buildings, various</td>
<td>35</td>
</tr>
<tr>
<td>17. Pipes for dewatering</td>
<td>36</td>
</tr>
<tr>
<td>18. House-site B (possible)</td>
<td>37</td>
</tr>
<tr>
<td>19. House-site A</td>
<td>38</td>
</tr>
<tr>
<td>20. Depression</td>
<td>39</td>
</tr>
<tr>
<td>21. Uncle Tom mullock</td>
<td>40</td>
</tr>
<tr>
<td>22. Winch-house for Uncle Tom shaft</td>
<td>41</td>
</tr>
<tr>
<td>23. Uncle Tom shaft</td>
<td>42</td>
</tr>
<tr>
<td>24. Volkswagen car</td>
<td>43</td>
</tr>
<tr>
<td>25. Metal debris</td>
<td>44</td>
</tr>
<tr>
<td>26. Tree</td>
<td>45</td>
</tr>
<tr>
<td>27. Pressure vessel</td>
<td>46</td>
</tr>
<tr>
<td>28. Tank</td>
<td>47</td>
</tr>
<tr>
<td>29. Mine offices and assay office chimney</td>
<td>48</td>
</tr>
<tr>
<td>V. Statement of significance</td>
<td>49</td>
</tr>
<tr>
<td>VI. Recommendations</td>
<td>53</td>
</tr>
<tr>
<td>VII. Bibliography</td>
<td>57</td>
</tr>
<tr>
<td>VIII. Plan of Site by Ian and Jan Jack</td>
<td>attached</td>
</tr>
</tbody>
</table>
VOLUME 2

ILLUSTRATIONS

Part 1: Maps and Plans

Fig. 1  Lucknow and its mines
Fig. 2  Reform Mine site today, dimensions
Fig. 3  Plan of PGL 44, 1914
Fig. 4  Lucknow goldfield, 1898
Fig. 5  Underground workings, 1890s

Part 2: Historic Photographs

Fig. 6  Golden Point mine, 1862
Fig. 7  Homeward Bound mine, 1863
Fig. 8  Golden Point mine, 1871-2
Fig. 9  Golden Point mine, 1871-2
Fig. 10 Mill, front, 1895
Fig. 11 Mill, back, 1895
Fig. 12 Mill, side, c. 1896
Fig. 13 Mill, Reform head-frame, 1897
Fig. 14 Mill, tailings, dam, c. 1898-9
Fig. 15 Mill, side, 1899
Fig. 16 Reform site, c. 1900
Fig. 17 Mill, back, c. 1900
Fig. 18 Mill, front, c. 1900
Fig. 19 Mill, front, 1903
Fig. 20 Mill, side, c. 1903
Fig. 21 Stamp battery box at foundry, c. 1900
Fig. 22 Company offices, c. 1896
Fig. 23 Company offices, assay chimney, c. 1903
Fig. 24 Site with company offices, 1903
Fig. 25 Area surrounding office, 1903
Fig. 26 Cyanide processing plant, c. 1903
Fig. 27 Homeward Bound, Uncle Tom, new Reform, late 1930s
Fig. 28 New Reform head-frame, 1935
Fig. 29 New Reform head-frame, n.d.
Fig. 30 New Reform winch-house, n.d.
Fig. 31 Underground timbering, 1899
Fig. 32 Model of ore-mill, Columbia Museum, 1986
Fig. 33 Ore-mill of 1890s, Nevada, 1988
Fig. 34 Stamper battery, component parts
Fig. 35 Buddle, plan.
Part 3: The Site Today

Fig. 36 Whole site
Fig. 37 1: windlass
Fig. 38 2: reservoir
Fig. 39 2: reservoir
Fig. 40 3.1 Golden Point
Fig. 41 3.1, 3.2: Golden Point
Fig. 42 4: Mill
Fig. 43 4.1c: battery base
Fig. 44 4.1a,e: bluestone wall
Fig. 45 4.1g: sustraining wall
Fig. 46 4.1h: sustraining wall
Fig. 47 4.1i: bolts
Fig. 48 4.1j: pit wall
Fig. 49 4.1j: outer wall
Fig. 50 4.1j, l: outer wall and internal foundations
Fig. 51 4.1k, l: walls and main engine-base
Fig. 52 4.11 main engine-base
Fig. 53 4.11 main engine-base
Fig. 54 4.2a: middle mill NW wall
Fig. 55 4.2a, 4.3b,10: lower levels of mill
Fig. 56 4.2b: battered wall
Fig. 57 4.3, 5.2: lower mill, tailings
Fig. 58 6: hoist-base
Fig. 59 7.1: Homeward Bound 1
Fig. 60 7.2: Homeward Bound 2
Fig. 61 8: tunnel entrance
Fig. 62 8: tunnel interior
Fig. 63: 10: engine-base for rock-breakers
Fig. 64: 11,12: Reform winch-house, head-frame
Fig. 65: 11, 17.2,3: Reform winch-house, metal shields
Fig. 66 11: Reform winch
Fig. 67 12: Reform head-frame, advertisement
Fig. 68 12: bailing cages
Fig. 69 16d, 17.1: concrete base, pipes
Fig. 70 18.1: house-site B, possible
Fig. 71 19.1: house-site A
Fig. 72 21, 22: Uncle Tom mullock, winch-house
Fig. 73 22: Uncle Tom winch-house, interior
Fig. 74 23: Uncle Tom shaft
Fig. 75 22,24,28: Uncle Tom shaft, winch-house, Volkswagen, tank
Fig. 76 28: tank
Fig. 77 27: pressure vessel
Fig. 78 29.1: mine offices site

Part 4: other Lucknow mining sites

Fig. 79 Wentworth Main head-frame, mullock, sheds
Fig. 80 Bismarck Range winch-house, mullock, equipment
Fig. 81 St. Aignan’s Cornish boiler
Fig. 82 Tangye dam
I. ACKNOWLEDGMENTS

I am grateful to the Council of the City of Orange and specifically to Mr Michael Milston, the Director, Human Services, for supplying necessary background information about the site today.

For access to historic photographs I am indebted to Kerry Condon, Kerrin Cook, Ray Powell and Bruce Wilson, to the Mitchell Library section of the State Library of New South Wales, to the Department of Mineral Resources and to Orange City Library. Kerrin Cook was particularly generous in allowing me to rephotograph for the purposes of this report the good modern prints which she has prepared of a number of relevant historic images. Mr Bruce Wilson and Mr Geoff Beasley both of Lucknow, and members of old mining families, were generous in sharing their local knowledge.

For expert advice and encouragement, I owe much to Jyoti Somerville, Heritage Advisor to Orange City Council. John Gibson of the Faculty of Education at the University of Sydney gave valuable opinions on some of the engineering features on the site.

The physical survey of the difficult and overgrown site, which proved so startlingly full of important and identifiable features, could not have been achieved without Jan Barkley Jack who at all stages from the first tape measurements to the final drawing of the plan was an indispensable partner.
II. EXECUTIVE SUMMARY

The Reform mine site in Lucknow is of state significance and a major potential asset to Orange City Council and the people of Lucknow. It is a complex, fragile and dangerous site which demands professional decisions implemented under the supervision of heritage professionals: reliance on local labour and schemes such as Skillshare is inappropriate.

Within its small area of only 1.8 hectares the Reform incorporates five of the principal gold-producing shafts and one tunnel in what has been described as the world’s most concentratedly rich small goldfield. These shafts, Golden Point, Homeward Bound 1, Homeward Bound 2, Uncle Tom and Reform, and the 1893 tunnel present the entire period of Lucknow’s success in the last forty years of the nineteenth century. Around these shafts much of the story of underground gold-mining in Lucknow can be interpreted and displayed to visitors.

The site, moreover, contained one of the great ore-processing mills in nineteenth-century New South Wales and the archaeological remains of the mill, with foundation walls and massive engine bases constructed largely of handsome bluestone have the potential to be a first-rate open-air museum of crushing and processing techniques.

The statement of significance concludes that the site fulfils all four criteria for heritage significance established by the Heritage Council of New South Wales. It has state significance overall and specifically it is rare and of state significance under both the historic and scientific (technical/research) criteria, while it is of regional significance under the aesthetic and social criteria.

The recommendations for progressive implementation by Council are:

1. reduce the vegetation on the site, including a preliminary briefing to fire officers by Ian Jack in the light of this report.

2. make the site safer, with discussion of appropriate fencing, stabilisation of key areas, possible pathways and control of access; identified rubbish, such as washing-machines and a car, must be carefully removed under appropriate professional supervision.

3. commission an interpretive study of the site, using funds already earmarked in the Council’s application to the Heritage 2001 programme.
4. develop strategies for interpreting the site to a wide audience, by commissioning a good-quality, professional book and/or pamphlet about the site and its gold-mining context, and by commissioning good-quality, vandal-resistant, legible but unobtrusive signage for the site.

5. reallocate some of the Heritage 2001 funds, if the application is successful, away from the less important Wentworth Main site to the critically important Reform site, so that vital stabilisation, conservation and interpretation can be expeditiously undertaken under the supervision of a heritage professional.

6. plan for an interpretive centre within Lucknow, perhaps utilising the School of Arts (which was paid for from Reform mine profits), approaching Newcrest PL, the owners of Wentworth Main for the gift or loan of mining and processing equipment stored there and ensuring that mining relics and sites elsewhere in Lucknow are conserved on site and explained in the proposed new interpretive centre.

In the presentation of these recommendations specific actions to implement each are clearly enunciated (pp. 53-56).
III. History of Reform Site

Within its small area of 1.8 hectares, the Reform Mine site is testimony to every phase of Lucknow's rise and fall. It lies within the 400 hectares of a land-grant made in 1837 to the lawyer-politician William Charles Wentworth. Like the other early grantees in the vicinity, John Gosling and John Betts, Wentworth ran stock on his portion 61 in the parish of Huntley and on adjacent grants. He was an absentee grazier and the estate was run by managers for the first few years. In the 1840s most of Wentworth's Lucknow estate, including portion 61, was leased to Tom Raine. Raine's homestead lay to the south, however, and he did not develop the area of the Reform mine.1

Raine's lease of portion 61 had expired by 1850; Wentworth then appointed a manager called Daniels and encouraged the creation of small leasehold farms.2

Everything changed, however, with the discovery of gold. The gold-rush of 1851 had started around Ophir, which lies downstream on Summer Hill Creek, the watercourse running through Wentworth's grant. Naturally the whole creek system was explored by eager gold-prospectors and local people. By August 1851 there was a good deal of surreptitious digging and alluvial panning on Wentworth's land. Finding it difficult to profit directly by taxing the gold-seekers, Wentworth soon decided (in December 1851) to sell portion 61 where most of the gold seemed to lie. The purchaser was a new company, the Wentworth Gold Field Co. Thereafter, although the name of Wentworth recurs in the name of Lucknow companies and mines, W.C. Wentworth himself was not involved.3

Throughout the half-century of major gold-extraction at Lucknow, the area around the later Reform shaft was of critical importance. Below the surface are some of the richest veins in a very rich (though uncertain) field: the Uncle Tom, Homeward Bound and Golden Point veins all made fortunes, for a time, for some of their mining syndicates. It took time, however, for the potential of the field to be tested and its complex geology understood.4

1 K. Cook, Lucknow: a Veritable Goldmine, Orange 1995, 4-6, 9,15: parish map of Huntley, co. Bathurst
2 Cook 1995, 29.
3 Ibid., 28-9.
In the 1850s the Wentworth Gold Field Co. eased reluctant tenant farmers off the Reform area and in 1852-3 sank three shafts in the neighbourhood. All these early shafts were abandoned in the mid-1850s and the bugbear of water in the underground workings was already noticeable.5

In 1861 the assets of the Wentworth Gold Field Co. were sold to a local landowner, Andrew Kerr of Wellwood. Although primarily a Scottish grazier (from an Ayrshire sheepfarm), Kerr had entrepreneurial instincts and had found and processed gold-ore on his own estate of Wellwood in the 1850s. In 1861, however, he chose not to develop the Lucknow field himself and after thirteen months sold portion 61 to a surveyor with political ambitions, Edward Combes.6

In 1863 Combes offered the area around the future Reform to small prospectors for a monthly payment, but the dry weather inhibited success and Combes in turn sold out after only months to the local butcher Robert Frost and Frost's brother-in-law William Carroll of Summer Hill, a property opposite Kerr's Wellwood. In 1864 Frost bought out Carroll's interest.7

During these years 1862 to 1864 Lucknow finally began to realise its potential as a serious gold-producer. No fewer than four major shafts were sunk within the Reform mine site. In 1862 a penniless 22 year-old called Henry Newman arrived from Forbes and sank his Homeward Bound shaft, which produced £28,000 from gold in nine months. Just to the south, a German syndicate, headed by an engineer, Heinrich Krauss, had a spectacular success in 1862-4 with the Golden Point mine, realising at least £42,000 in six months. To the north-west, Uncle Tom shaft was opened early in 1863 and for two years was highly prosperous: Uncle Tom pioneered pumping of water from the shafts and remained a principal player in Lucknow until the 1880s.8

Finally Newman, whose first shaft lost the seam in 1863, opened a second Homeward Bound shaft which instantly hit one of the richest parts of the lode.9

6 Ibid., 7-8, 31.
7 Ibid., 31, 104.
8 Ibid., 31, 35-6, 40; Mitchell Library, Sheridan collection, Pic Acc 2351, annotations to 1862 photograph of Golden Point by Krauss family.
9 Cook 1995, 36.
Although other mines were sunk with some success, all within portion 61, such as Spicer's and Snobs just to the south-east of the Reform site,\textsuperscript{10} the critical importance of the four shafts of 1862-4 on the Reform site gives a special historical significance to this small area. What is more remarkable, all four shafts can be identified today and can be presented as focal points for interpretation of early Lucknow.

The Homeward Bound shafts faltered in 1866 and Newman had over-extended himself in opening stores not only at Lucknow but also at Cadia and Icely, so he left Lucknow for about six years.\textsuperscript{11} His return in 1872 coincided with renewed mining activity. In January 1873 Robert Frost, who still owned portion 61, leased 4.4 hectares, including the Reform site, to a Sydney merchant C.T. Moore. The principal shaft seems to have been Uncle Tom but the company was not well managed and in 1878 sold out to Henry Newman.\textsuperscript{12}

Only now in 1878 was the Reform shaft sunk. Newman had an aptitude for striking rich lodes but he was far more than intuitive: he was an extremely able and hard-working mining executive who made a substantial second fortune in the 1880s and has left a powerful impress on Lucknow.\textsuperscript{13}

Under Newman's guidance, a new company was formed in 1881 to operate the 4.4 hectares which included the Reform shaft. This was the New Reform Gold Mining Co., with 40,000 shares, reasonable capitalisation, sound management and, throughout the 1880s, productive seams. The new company invested heavily. In 1881 it built a new head-frame over the Reform shaft, which appears unmistakably on all historic photographs of the next quarter century.\textsuperscript{14} It seems almost certain that the mill which is so important a part of the site today was begun in the early 1880s, utilising the fall in the ground to create three levels of mill activity, each feeding the lower by gravity, from stamp-battery down to amalgamation table and finally down to concentrating equipment.\textsuperscript{15}

\textsuperscript{10} Ibid. 39; for locations see Sketch Plan of Lucknow Gold Field, Department of Mines, \textit{Annual Report} 1898, after p. 30.

\textsuperscript{11} 'The King of Lucknow', \textit{Bismarck Bulletin} 3, Dec. 1934, 4.

\textsuperscript{12} Cook 1995, 77.

\textsuperscript{13} Ibid., 77-8; \textit{Bismarck Bulletin} 3, Dec. 1934, 4.

\textsuperscript{14} Cook, 1995, 78-9; see the historic photographs in vol. 2 of this present report.

With poor returns in 1889, Newman and others sold many of their Lucknow interests to a syndicate headed by Frank Gardner. Gardner then in 1890 floated a new company, the Wentworth Goldfields Proprietary Co. Ltd, on the London Stock Exchange. This company then became the major player on the Lucknow stage through the 1890s, opening new mines and a significant tunnel on the Reform site. With a wider range of mines than the New Reform Gold Mining Co., the mill on the Reform became still more important, crushing ore for several mines. 16 Although the Wentworth Goldfields company built a smaller mill at its new venture to the south-west, the Aladdin’s Lamp, in 1894, it closed this mill, consolidated all its crushing at the Reform in 1896 and doubled the size of the existing mill. 17

This enlarged mill with four bays in the top area which appears in the standard books on Lucknow in fact operated for only some eight years, 1896 to around 1904, whereas its smaller predecessor (of which two photographic images survive, figs. 10, 11) had operated for rather longer. The mill was one of the most impressive on any New South Wales goldfield and was the equal of famous mills overseas. 18

The company also built in 1896 a fine two-storeyed administration building on the extreme north-west of the Reform site: this was the most dominant building in Lucknow for a decade or so after 1896. 19

Mining and milling wound down early in the twentieth century and energies turned instead into using the new cyanide process to extract residual gold from the huge mound of tailings between the Reform mill and the road to Orange. This was pioneered by the Wentworth Goldfields company itself in 1899, which piped new tailings from the lower mill straight across the main road to a cyanide plant just downstream from the Tangye dam over Summer Hill Creek. 20 This operation was continued by other companies such as the Australian Gold Mining and Gold Recovery Co. and was sporadically prosperous. 21

16 Cook 1995, 82-3; for the tunnel, see Harper 1920, 31.
17 Canning 1898-9, 257: Department of Mineral Resources, Bathurst 1354, 1424 (pre-1896); Australian Town and Country Journal, 13 Jan 1904, 28 (post 1896).
18 For examples, see D.L. Hardesty, The Archaeology of Mining and Miners: a View from the Silver State, Society for Historical Archaeology, Special Publication 6, 1988, 38-47.
19 Cook 1995, 82.
20 Canning 1898-9, 259; Department of Mines, Annual Report 1899, 24.
The Reform site was basically neglected from c. 1904 until 1935. Some of the 4.4 hectares was sub-divided for agriculture after 1912.\textsuperscript{22} The 1.8 hectares of the present site was first defined in 1914 during this process of sub-division when it became a provisional gold lease, PGL 44, held by A.G.M. Davis (1914-17), N.C. Seale and partner (1919-28), P.H. Galloway (1928-34) and W.A.J. Marshall after 1934.\textsuperscript{23} It is the estate of W.A.J. Marshall with which Orange City Council still treats when matters concerning the site are under investigation.\textsuperscript{24}

Under W.A.J. and other members of the Marshall family, a new company, the Wentworth (Lucknow) Goldfield NL, was launched in 1935. At its shareholders' meeting in December 1935, Alexander Marshall could report on activities such as the partial dewatering of the underground workings, the retimbering of the Reform shaft, the installation of a new head-frame (the present one) and a second-hand winch, renewed activity in treating tailings with cyanide and the re-opening of the 1893 tunnel.\textsuperscript{25} But in fact very little happened and primary gold-mining never flourished again, although a bewilderment of companies, usually associated with the Marshall family, came and went amid a number of optimistic but unfulfilled claims.\textsuperscript{26} In 1958 the Orange City Council toyed with the idea of using the water which had reinvaded the Lucknow mines as an emergency supply during the current drought. Although a pump was installed in the Reform shaft, the drought broke and so did the machinery. Although some pumping was achieved later in 1958 and the Reform shaft was explored, the prospectors, Bradley and Wills, sold out in 1959 to Commonweal Promotions Pty Ltd, financed from Melbourne, but again with a Marshall closely in attendance. This did not flourish and the next activity at the Reform was not until 1983 when Ken Trotman, who had been involved in 1959, succeeded in supplying some local orchardists with water pumped electrically from the Reform shafts.\textsuperscript{27}

\textsuperscript{22} Cook 1995, 54.

\textsuperscript{23} Department of Mineral Resources, annotated plan of PGL 44.

\textsuperscript{24} Notices from Orange City Council to the Marshall estate are at present (August 1997) affixed to the Reform winch-house.


\textsuperscript{27} Ibid., 58; Cook 1995, 86.
Despite some casual occupation - beds in the Uncle Tom winch-house, a vernacular cottage up near the back fence - the site has since 1992 been entirely untouched, becoming ever more overgrown. The result of such neglect has been in some ways beneficent, however, since the five shafts have not been filled in, the mill foundations of fine bluestone are remarkable archaeological features unequalled in the region and the totality of the site, so central in Lucknow's history since the 1850s, has a high potential for cultural and educational tourism.
IV. DESCRIPTION OF COMPONENT PARTS OF THE SITE

1. Windlass (fig. 37). This iron windlass, operated by two men each with one handle and controlled by a single-speed reduction gearing system, sits on its wooden base just outside the S corner of the Reform site. It was manufactured in Britain by Nicholls Williamson of Tavistock, an old tin-mining centre in Devon. It is in excellent condition and was most probably used about 1936 by the tributors who reopened the Homeward Bound shaft (7.1) nearby.

Significance: It is a rare piece of moveable heritage, reflecting mining activities of tributors, whose modest undertakings co-existed with the larger operations of the major companies. At the same time, it is more sophisticated than most surviving hand windlasses and, because of its large barrel and reduction gearing, had the capacity to service quite a deep mine safely.
2. **Reservoir** (figs. 38, 39). This reservoir, 20.30 x 12.40 m and 2.08 m deep, built strongly of bricks, and lined with cement, is buttressed on the downward, NE side by a massive rubble embankment and strengthened with supports at the N and E corners, while there are also three vertical buttresses of rendered brick against this NE wall. The NE (front) wall of the reservoir aligns with the SW (back) wall of the mill (4.1g). In the 1890s (and probably before) the reservoir was supplied with water pumped from the Reform shaft, which like other Lucknow mines, needed frequent dewatering. 'The mine water', a mining engineer wrote in 1899, 'is raised to the 300 [foot] level by means of air pumps, whence it is lifted direct to a reservoir on the hill above the battery by means of a Cornish pump.'

   Water from the reservoir was fed to the batteries through a narrow pipe shown on a photograph of 1895 (fig. 11).

   The reservoir is heavily overgrown with medium-size trees and the SE wall has largely collapsed. Some stabilisation will be required when it is cleared.

   **Significance:** The reservoir is a significant part of the well-planned total operation of the Reform site and presents some unusual features because of its vulnerable position on the side of a steep slope.

---


29 Department of Mineral Resources, Bathurst 1354. This shows the D'Arcy headframe built only in 1895 but also shows the Reform battery with only two rear bays: the Reform battery was extended in 1896.
3.1, 3.2 Golden Point Shaft (figs. 6, 8, 9, 40, 41). One of the famous early mines on the Lucknow field, the Golden Point was owned by a German syndicate headed by an engineer, Heinrich Krauss (fig. 6). A horse-whim and a bark-covered head-frame were erected in 1862 and within six months the mine produced £42,000 in gold. Despite problems with water, endemic on the field, the mine continued to function off and on under different owners in the 1870s and 1880s. Under Robert Frost or his lessee in 1871/2 the horse-whim was replaced by a steam engine and the head-frame was rebuilt (figs. 8, 9). The last known exploitation of the shaft was in 1905 when tributors had some good luck.

The site of the whim and the later engine-house (3.2) lies beyond the Reform site on land owned by Mr Geoff Beasley: there are no clear above-ground remains but there is archaeological potential. The mine-shaft itself seems to retain its timbering but a quantity of corrugated iron sheet and metal tins largely fills the circular cavity some 3 m in diameter. It is not known whether the shaft has been filled in: since it was at least 45 metres deep it is likely that it remains hazardous.

Significance: The Golden Point mine has high significance historically as the most concentratedly rich gold-producer in the 1860s phase of Lucknow: it was, moreover, one of the richest small mines in Australia. Since it is uncommonly well documented by the Krauss (1862) and Holtermann photographs (1871/2), its head-frame and winding-house site also has scientific importance.


32 ML, Holtermann Collection, Box 1/160, 171.

33 Cook 1995, 36.

34 Ibid.
4. Mill (figs. 10-20, 42-57)

**Purpose.** Gold-bearing ore must be broken up into smallish pieces before it can undergo processes which will separate gold from dross. The area where the crushing and processing were done is usually called a mill and on larger enterprises round the world is arranged where feasible in a sequence of sheds on a sloping site, using gravity to feed the raw ore and partly processed ore from one stage to the next. The mill on the Reform site is an excellent example, with a sophisticated documentation and an uncommonly rich range of photographic evidence for change over time.

**History.** Ore-processing on the Reform site began in the 1860s but details are not available until 1881. At the top of the mill the ore (already reduced in size by a rock-crusher to the NW of the mill (10) was fed into two four-stamp batteries. A stamp-battery consists of a strong rectangular vertical framework of wood or iron within which there are very heavy iron cylinders called stamps attached to vertical iron stems. These stems are equipped with projecting tappets which are caught by cams on a rotating cam-shaft so that the stamps are raised and dropped in sequence (fig. 34).

The Reform mill grew rapidly in the 1880s and by 1886 there were 20 stamps in all, each weighing 386 kilograms, powered by a 25 horsepower horizontal steam engine. Ore-bins were built at the topmost level and from the bins ore was fed to the various batteries by mechanical means on Templeton rollers.

The crushing plant required constant water flowing over the ore around the stamps. The wet crushed material passed through metal screens down on to mercury-coated amalgamation tables, each 5 x 1.5 metres. The amalgam of gold and mercury remained on the table-plates and was scraped off for further retorting either in the mill or later in a separate retort house of which there are no distinctive remains.

A good deal of wet slurry flowed over and off the amalgamation tables: these tailings also contained some gold and to retrieve this gold they were concentrated at the lowest level of the mill. In the 1880s at the Reform concentration took place in buddles, which, by this

---

35 Department of Mines, Annual Report 1881, 134; H.W. Newman, Extracts and Reports on the Lucknow or Wentworth Gold-field Western Advocate, Orange 1882; Canning 1898-9, 258.

36 Department of Mines, Annual Report 1886, 53; Canning, 1898-9, 258.

37 Canning 1898-9, 258.
stage in gold technology, had taken the form of circular pits lined with cement-covered bricks. Henry Newman, the critical figure in Victorian Lucknow, himself took a famous buddle-design patented overseas by Mundy in the 1870s (fig. 35) and modified it for the Reform mill. Such a buddle took up a lot of space: at Charters Towers in 1878 a Mundy buddle was 8 m in diameter, with a revolving sweep circulating and concentrating the wet tailings poured in by gravity feed.38 The number of buddies used at the Reform is not stated but is likely to have been either two or three, taking up most of the lowest level.

This arrangement of the mill complex persisted until 1896 when the Wentworth Goldfields Pty. Co. Ltd. greatly expanded the building. In 1894 the company had built another, smaller, mill at its Aladdin’s Lamp mine to the NW but closed this in 1896 and doubled the size of the Reform mill to accommodate more plant.39 As a result the top section of the battery which had hitherto had two gables facing NE now had two more gables added on the SE side almost exactly doubling the size. This brought the steam-engine, previously housed in a separate shed outside the S corner, within the expanded mill: it is not clear whether the fine engine-base (4.1e) was already within the earlier shed or was built only in 1896. The number of stamps was now 35 in 1896 and the buddies on the lowest level were scrapped and replaced with Frue vanners.40 These were endless shaking belts used for concentrating the tailings.41 Like the buddies, the vanners took up a good deal of space, which explains the dimensions of the lower mill. There were twelve Frue vanners in all, two for each of six five-stamp batteries.42 In another chamber of the lower battery the concentrates from the vanners were dried on a sheet iron floor heated by exhaust from the single steam-engine.43 From a bagging room, the dried concentrates were transported initially to Wales but by 1899 the bagged concentrate was sold instead to the copper-smelting company at Dapto on the Illawarra.44


39 Canning 1898-9, 257; Department of Mineral Resources, Bathurst 1354, 1424 (1895); Australian Town and Country Journal, 13 Jan 1904, 28 (post-1896).

40 Canning 1898-9, 258.


42 The final five-head stamp-battery was reserved for high quality ore which was sent straight to Wales or Germany without going into buddies or vanners (Canning 1898-9, 260).

43 Canning 1898-9, 258-9.

44 Ibid., 259.
The residual wet tailings, which still contained a small percentage of gold, were then raised in the middle bottom room by a bucket-wheel to a 6-inch (15 cm) iron pipe (5) leading N right over the main road to a dump NW of the Tangye dam-wall.45 in the first three decades of the twentieth century these tailings were from time to time effectively treated with cyanide on the dump site to extract the remaining gold (figs. 14, 18, 26).46

The mill complex ceased to operate after around 1906 and was demolished down to its foundation and sustaining walls soon afterwards. Only a ten-head battery renamed in 191447. The great mound of tailings, however, which had built up over two decades and more between the mill and the main road continued to be removed across the road to successive cyanide plants off and on until c. 1936. This had the effect of changing the appearance of the Reform site as the mullock was quarried out directly in front of the mill area, bringing back something closer to the ground level of the 1860s.

**Description.** After ninety years since closure, the mill is extremely overgrown with grasses, bushes, blackberries and trees. The remains, in bluestone, brick and concrete, with machinery bolts, joist holes and the like, are very substantial. The archaeological features clearly reflect changes on the site over the 1880s and 1890s but they do not readily reveal all of their nature. To make the large structure comprehensible (it is 39 m. square), I have used photographic evidence to separate out the top mill with its stamp batteries (4.1), the middle mill with its amalgamation tables (4.2) and the bottom mill where concentrating and drying took place (4.3). Within each of these three levels, individual archaeological items of significance have been labelled a, b ...: thus 4.1a is the outer NW wall of the top mill while 4.2a is the room at the W corner of the middle mill.

Although the photographic evidence leaves no doubt that the SE wall of the top mill before 1896 was situated halfway along the extended building of 1896+, there is no above-ground evidence of this break. I have shown the location of this demolished wall with a dotted line SW/NE on the plan. It follows that features 4.1a to 4.1f were all within the pre-1896 mill, and that 4.1g to 4.1l belong to the 1896 extension (although 4.1l may have existed before 1896 in a separate building).

---


47 Department of Mineral Resources, plan of PGL 44, 1914.
4.1a (fig. 44) The long bluestone foundation supporting the NW wall (made of corrugated iron) in the pre-1896 mill is impressively built. It is visible to three or four courses of shaped stone where the ground level is lower towards the bottom of the top mill. The upper section has collapsed. Its W corner is conjectural, but has been shown provisionally on the plan together with the back wall of the original mill, using the evidence of photographs (figs. 11, 17).

4.1b Two separate sections of a single brick wall define the lower limit of the top room in the mill. This is the area where the ore from the external rock-crusher (10) was delivered through an opening at roof-level.

4.1c (fig. 43) is a small internal chamber with bluestone foundations on the NW and NE sides, approximately 5 m. square. Its SE and SW walls are conjectural. Its floor is concreted. A particularly stable surface, this is likely to have held one of the stamp-batteries.

4.1d (fig. 44) is another internal chamber, 6 x 7 m., with well defined and strongly built bluestone foundations. This is clearly the end of the top mill: there is a 70 cm. gap between the bottom (NE) wall and the wall of 4.2a in the middle mill.

4.1e (fig. 44) is a small rectangular space, 6 x 3 m, at the N corner of the top mill. Its bluestone wall foundations are continuous with 4.1d on the SW and NE sides. It lies adjacent to the external hoist base and ore bin. Its position and size make it possible that the five-head battery which ground only the best quality ore for processing abroad was situated here.

4.1f The big room at the E corner of the pre-1896 top mill was 9 x 12 m, with remains of a brick wall at the top (4.1b) which I assume to enclose this space. The bluestone walling at the lower side (NE) and the lower part of the NW wall were extended after 1896 to go into the new part of the mill: similarly a wall running SE/NW from the W corner of 4.1l (the engine-base) in the new mill extends into 4.1f and presumably separated it into two rooms after 1896. The original function of the room was almost certainly to hold some of the stamp batteries and it probably continued this function in its modified appearance after 1896.

4.1g (fig. 45). An extensive stone wall retains the steep hillside at the extreme back of the mill complex. On the evidence of the only good photograph of the back of the pre-1896 mill (fig. 11) this wall was already in existence, protecting a flat terraced area beyond the back wall of the two-bayed mill. A rectangular wooden palisade had been built on this terrace before 1896: its purpose is not at present known. The stone retaining wall has been
obscured at its S corner, where it presumably met wall 4.1h. The SW end of 4.1g at present seems to be on the line of the SE end of the original top mill (shown as a conjectural dotted line): this is consistent with the pre-1896 photograph.

An unexplained feature of the retaining wall 4.1g is the presence of beam-holes. Two bricked recesses near ground level and two likely but now decayed recesses at a higher level appear to have been footings for horizontal beams. This whole area requires further investigation after the site is cleared.

4.1h (figs. 46, 47) This is a large area some 13 x 12 m with few visible defining features. A short section of a good bluestone wall and some collapsed remains (fig. 46) show how the hillside below the reservoir was buttressed by this continuation of the external wall 4.1j. It is clearly bounded on the SW by 4.1g, the other sustaining wall. In the midst of the area there is a short section of brick wall with two engine bolts to the NW marked on the plan (fig. 47): it is on this line that the back wall of the 1896 mill extension is likely to have been located, indented from the back of the earlier top mill.

4.1i (fig. 48). On the NW side of 4.1h there is a pit some 3 m. deep and 7m. in diameter with collapse on all sides except the SW, where a strong bluestone wall survives. Since the postulated back wall of the 1896 extension runs through the NE third of the pit, it is likely that the pit was originally rectangular and that the NE section is collapse resulting from the demolition of the mill. The purpose of the pit is not known.

4.1j (fig. 50) The outside SE bluestone wall of the whole mill is captured impressively in a postcard of c. 1898-9 (fig.14). Part of this wall, built in 1896, capped with concrete, survives, marking the SE perimeter of the mill. It slopes downwards, with a maximum of 12 bluestone courses.

4.1k (fig. 51) Just inside the SE perimeter wall of the 1896 top mill there is a 10.5 x 12 m. chamber with bluestone walls. The SE wall is separated from the perimeter wall by a gap of 50 cms. This room is adjacent to the engine-base (4.1l) and almost certainly housed additional stamp batteries.

4.1l (figs. 51-53) The most impressive single section surviving within the mill, this is a massive engine-base 6.9 x 5.5 m. It is constructed of bluestone walling up to 8 courses high, enclosing rubble on a sloping site: the N corner is rounded, with some brick repairs to the stone work. The base was built in two parts, with a small stone extension to the SE: the E corner of the larger section was rebuilt at some stage with brick. The top of the levelled base is paved with bricks, all laid as headers: the bricks were not concreted over. On the
larger, earlier section there are important signs of the horizontal steam-engine which was almost certainly mounted here. On one side of a central pit with a slot for a large fly-wheel, there are two long bolts: on the other side, beside the fly-wheel are four shorter bolts, matched at the NE end by a similar grouping. Just beyond the edge of the bricked base on the SW are two more bolts, one lining up with the long bolts, the other with the fly-wheel.

Photographic evidence suggests that before 1896 the steam-engine was housed outside the original mill in a shed close to the location of 4.11 (fig. 11). It is possible, therefore, that this massive base predates 1896.

It was the heart of the power system in the mill, providing power by belts to all the stamp batteries, activating the concentrating equipment and piping hot air to warm the drying floor in the lower mill: the rounded corner may been explained by the route chosen for the pipes to reach the drying room, which cannot be identified but could have been sited in the E corner.

Because this engine-base is so legible and so well built, it has a high potential value in future interpretation and presentation of the whole mill-site. The hypothesis that it was originally the engine-base outside the pre-1896 mill is attractive, but requires more examination.

4.2a (figs. 54, 55) Only two rooms of the middle mill, which would have housed the amalgamation tables, can be discerned. 4.2a, 8 x 10 m. occupies the NW corner. Its bluestone NW, SW and NE walls are well made with stones shaped on three sides. The site slopes steadily downwards and the lower part of the NW wall has largely gone: the best preserved walling is at the back (SW) and front (NE). The upper (SW) wall is separated from the top mill by a 70 cm gap.

4.2b (fig. 56) The larger of the middle mill chambers, 10 x 12 m. straddles the two stages of the top mill. Its upper (SW) wall is also the indented part of the lower wall of the top mill but it extends beyond the original E corner of the pre-1896 top mill. The front (NE) wall is particularly fine bluestone, up to 8 courses, with some brick repairs and slightly battered to give strength. If 4.1f indeed held several stamp-batteries then the direct gravity flow on to the amalgamation tables in 4.2b was a simple, direct operation. Since the tables are known to have measured 5 x 1.5 m.\textsuperscript{48}, there is ample room in 4.2b and 4.2a to accommodate the

\textsuperscript{48} Canning 1898-9, 258.
six tables: there was one table to each battery and the 30 stamps feeding tables in 1896 are likely to have been arranged in six groups of five.

4.3a Projecting from the lower mill into the area to the SE of 4.2b and separated from its SE stone wall, are two low brick walls, which meet a coursed bluestone wall at the back (SW).

4.3b (fig. 55) This is a low stone wall largely reduced to rubble running SE/NW for some 4.5 m. within the lower mill. Its purpose is unclear.

4.3c (fig. 57) The lowest (NE) part of the lower mill has left few surface indications. The ground dips and rises again to a peak about 6m. from the bottom end of 4.3a and the line of 4.3b. Details of the rooms which contained the concentrating and drying equipment and of the central room where the last of the tailings were raised by a wheel to be piped across the road are all lacking. This section on more level ground may well have needed much less elaborate foundations than the top and middle mill which came down a steep slope in a series of artificial terraces, but sensitive clearing might allow a clearer plan to be compiled.

4.3d The length of 6 inch (15 cm) iron piping largely buried in the debris just outside the perimeter of the lower mill is highly meaningful. The pipe which, at an elevation, ran the final tailings from the centre of the lower mill to a slurry pond (ultimately a cyanide plant) across the main road, is known to have been of 6 inch diameter. It is extremely likely that this stretch of the 1890s pipe has survived close to where it was dismantled soon after 1906. In conjunction with the excellent photographs which show the pipe in use (figs. 14, 18), this artefact can be used tellingly in interpretation.

49 Canning 1898-9, 259.
5.1 Piles of mullock, barren rock from excavating the shafts and tunnels are commonplace on mining sites. The largest mullock-heap on the Reform site, on the SE boundary below the reservoir, extends beyond the fence into Mr Beasley's paddock and came originally from Spicer's shaft there.

5.2 Tailings are the residue from ore-processing and in front of the Reform mill, on its NE side, huge quantities of tailings built up. By 1900, after over 20 years of milling, the tailings had created a huge terrace to the main road, as far as the Reform shaft on the NW and the boundary of the present Reform site on the SE. The top was wet slurry which glinted an evil off-white in the nineteenth-century sunshine (fig. 14). These were the tailings which were quarried from c. 1903 to c. 1936 by companies using the cyanide plant across the road. As a result there now appear, misleadingly, to be two heaps of tailings, one near the shaft, the other near the SE boundary: the middle portion was taken across the road over the years, its considerable gold content extracted and the final residue added to the tailings near Newman Lane.
6. (fig. 58) To raise ore, already broken up in the rock-crushers (10), from the surface to the high mill building, a hoist was constructed by the early 1890s. This hoist raised the ore-skips vertically to the roof-level of the top mill, and a skip-way, probably with rails, ran along the NW side of the mill towards the top W corner, then, up to 1896, turned at right angles along the SW roof and the ore was tipped into large bins in the topmost area through an opening in the roof, halfway along the pre-1896 mill (fig. 11). After the extension of 1896 this arrangement was changed, the skip-way terminated on the NW side of the mill and the ore entered the mill through a small upper chamber connecting the mill with the high skip-way (figs. 17, 18).

The hoist also had a large ore-bin added after 1896 which presumably stockpiled material until the mill was able to cope (figs. 15, 16, 20).

The footings of the hoist were on a rock shelf just beside the top mill. The flattened area where they were established can be detected but no footings are visible.
7.1, 7.2 Homeward Bound Shafts (figs. 7, 59, 60). Henry Newman sank the Homeward Bound shaft in 1862 and made the first major strike at Lucknow, raising gold worth £28,000 in nine months. When the prospectors lost this vein, they sank another shaft some 7 m. away in 1863 and this too was highly successful. Both these shafts seem to have been abandoned soon after because of water (dewatering is shown in 1863, fig. 7) although the underground seams continued to be explored from other shafts and the shafts may have been used in the 1870s.

After the partial dewatering of the field in the 1930s, Homeward Bound 7.1 seems to have been reopened by tributors using a simple whip and, perhaps, the windlass which survives nearby (1). The evidence for this is a photograph of the late 1930s (fig. 27) and the local knowledge of Mr Bruce Wilson. The two shafts still visible are in the same relationship to each other as indicated by Newman, though it is not possible to say which was sunk in 1862 and which in 1863.7.2 has largely fallen in and is obscured by four fence-posts, numerous boulders, a piece of brickwork and a sheet of corrugated iron (fig. 60). Shaft 7.1, however, is more impressive, with about 1 m of rock-cut walls and fill below with a minimum of rubbish (fig. 59).

Both shafts are entirely unprotected and the question of public safety consistent with the conservation of their historic identity needs to be considered urgently.

8. **Tunnel** (figs. 61, 62). This horizontal tunnel is the only visible example of mining by adit on the entire Lucknow field. The tunnel was begun by the Wentworth Goldfields Pty. Co. in 1893 but was too wet to be worked in 1894-7. In 1898, however, the tunnel was reopened. The company report discusses the two purposes of this work:

>'The first was to prospect for certain low-grade "wash", or broken down or scattered reef that had not been found payable to remove in the old days .... Secondly, to drive for new country lying to the south-east, of the worked-out alluvial ground.'

In 1898 the first 44 m. of the tunnel (part of which is at present visible from the entrance before the tunnel curves to the W) were in good order, as they still are today, though untimbered, but the next phase had to be recut and in places closely timbered. By 1900 the tunnel had gone in 400 m. when it reached an old shaft. The workings in this area had been extensive, little gold was found and the tunnel was for the time being abandoned.51

In 1935, however, the Wentworth (Lucknow) Goldfield NL reopened and retimbered the tunnel and was optimistic of success in finding more gold. The optimism was ill-founded and the tunnel has remained idle, though easy of access, for the last 60 years.52

The entrance to the tunnel is now silted with fallen earth but the tunnel itself seems reasonably intact. Its breadth is about 1.8 m., its height, though very uneven, about 1.5 m. It curves to the S immediately after the entrance, then turns away to the W.

No disused adit is a safe place to explore and, as with the four open and unprotected shafts, some consideration for public safety is urgently needed.

---

51 Harper 1920, 31-2, quoting the company reports which are otherwise lost.

9. Water tank (fig. 63). A twentieth-century water-tank is a prominent feature on the hillside above the tunnel (8). Its use is not known.
10. **Engine-base for rock-crushers** (fig. 63). This is a strong bluestone engine-base, 1.4 m. high, 1.2 m. across and 3 m. long. It has five bolts still in place. This seems to have supported the steam-engine (a 'special engine of most suitable type') which drove the rock-breakers.\(^53\) These rock-breakers, set on the bed-rock immediately adjacent to the SE, broke up the ore from the mine to egg-sized pieces. The broken ore was then taken across to the nearby hoist and raised to the level of the top mill.\(^54\)


\(^{54}\) Canning 1898-9, 258.
11. Reform winch-house (figs. 64-66). This corrugated iron building on a round-timber frame was constructed in 1935 at the same time as the present head-frame over the Reform shaft. Its purpose was to operate the two cages which moved vertically up and down the shaft. The shed still contains the double-barrelled winch, with its dual horizontal cylinders mounted on a heavy wooden base (fig. 66). No maker's name is visible, though it bears the number 384. Traces of the wire-rope for winding survive.

The style of the winch suggests that it was originally used on a steam-ship some forty years before it was purchased for the Reform. Its barrels have limited capacity and were designed for short hauls, probably not exceeding 120 m. The winch was first used in August 1935 by the Wentworth (Lucknow) Goldfield NL to dewater the Reform shaft down to the 100 m. level, which seems to have been as deep as the company intended. The full depth of the vertical Reform shaft was 130 m.

Work stopped at the Reform about 1940 and did not resume until 1957-9 when various dewatering attempts were made. These were, however, operated by an electric pump and the winch may not have been used.

55 I am indebted to John Gibson, Faculty of Education, University of Sydney, for this diagnosis.
57 Canning 1898-9, 254.
12. Reform shaft and head-frame (figs. 12, 13). The shaft was sunk in 1878 by a company dominated by Henry Newman, who built the first head-frame. When the company was reinvented in 1881 as the New Reform Gold Mining Co. a new head-frame was erected. It is this second head-frame which appears on all photographs of the mine in the late nineteenth and early twentieth century (figs. 12-16, 18-20). A vertical pole projecting above the top wheel-housing made it very distinctive: no other Lucknow head-frame had this feature. It does not survive.

The shaft in the late nineteenth century was in three compartments: two took the cages and the third, smaller, compartment had a ladder and pumping equipment. The depth of the vertical shaft was 130 m. (400 feet): the mine was much deeper but the lower levels were reached by a transverse shaft (a winze), as shown clearly in the longitudinal underground section of the mining field (fig.5). The underground workings required consistent pumping to prevent flooding and some very heavy timbering was required in many of the horizontal drives. Fig. 31 shows one of the most remarkable examples of timbering in a triangular shape in one of the drives below the Reform in 1899.

The Reform shaft, like the mill, closed around 1906 and the mine filled with water. It seems unlikely that the 1881 head-frame was used again.

In 1935 the present metal head-frame was erected by the Wentworth (Lucknow) Company NL which also retimbered the shaft. At the same time the new company erected the present head-frame over the Wentworth Main shaft. Both mines were dewatered by means of bailing cages: the winch raised a cage pull of water and lowered an empty cage simultaneously. Two metal bailing cages survive beside the Reform shaft, inside the protective fence: the larger bailing cage at Wentworth Main is jammed deep down the shaft. Such bailing devices are rare, much rarer than the cages which took men underground, and the two at the Reform are important items of moveable heritage.

The bailing cages were superseded when electric pumps were installed at the Reform: the connection to the mains is still in place on the head-frame. The extensive pumping began

59 Canning 1898-9, 254.
60 Harper 1920, attached plan.
in 1957 with an abortive scheme to supply Orange with mine-water during drought and continued in 1958-9, when exploration of the 300 foot drives was again made possible though dangerous. In 1983 the pumps were briefly restarted by Ken Trotman who installed pipes (17) to lift the water over the hill above to irrigate orchards.

The shaft is now surrounded by a strong wire fence, with a padlocked gate. The whereabouts of the key is not known. A prominent sign on the head-frame saying 'Welcome to the Skin Shop' (fig. 67) is intrusive and should be removed from the site.

---

63 Cook 1995, 86.

64 Information from Mr Ken Trotman, Orange, 1984.
13. **Site of foundry** (figs. 15, 20). No specific foundations are visible but among the numerous ancillary buildings the foundry was of unusual significance. Close to the winch-house, a rectangular corrugated iron shed housed the foundry which manufactured not only all the small iron items needed around a mine but also the stamp battery boxes themselves. In the 1890s and early 1900s both the grandfather and father of Mr Bruce Wilson (still resident in Lucknow) worked in this foundry and supplied parts and complete boxes to the Reform mill (fig. 21).\(^{65}\) When the area between the shaft/winch-house and the car-park is cleared, particular attention should be paid to identifying more closely (using the old photographs brought together in this report) the location of this rare and significant aspect of the Reform site: most mines had a blacksmith's shop but few had a full-scale foundry.

\[^{65}\text{Information from Mr Bruce Wilson, Lucknow, 1997.}\]
14. Site of stables. Adjacent to the present car-park, marked with precision on a plan of portion PGL44 (fig.3) made in 1914, there were rectangular stables presumably surviving from the late nineteenth century. Their foundations are likely to become more evident when this area is cleared and identification from a plan is much more straightforward than from a photograph.
15. **Roadway.** Photographs (fig. 15, 20) show an internal system of roadways. These seem to have been modified over the 1890s but a principal thoroughfare led across the site SE/NW from the lower end of the mill past the back (SW) of the winch-house along to the present car-park. This is shown very provisionally on my plan.
16. Various buildings. Photographs of the 1890s (figs. 12-16, 19, 20) show several structures, which were modified or replaced over a decade or so in the area between the NW side of the mill and the present car-park. Most of them cannot be identified with precision and because of their impermanence I have not attempted to indicate the whereabouts of all of them. The following may, however, be singled out:

16a. This corrugated iron building added to the N corner of the middle mill is shown in unequivocal photographs (figs. 18, 19). No footings are visible in this disturbed area, but I have shown its approximate dimensions.

16b. Again from a photograph, (fig. 18) it is known that a raised skip-way brought ore-trucks from the shaft-area to the N corner of the mill and then, presumably, to the rock-breaker or hoist. It was a significant wooden structure essential to part of the cartage system.

16c. This is an area of disturbed ground with iron and other rubbish, in the approximate area of a small building shown in photographs (figs. 15, 20).

16d. (fig. 69) An extensive concrete base of uncertain dimensions was the flooring of another shed shown on photographs (figs. 15, 20).

16e. Beyond the mill near the SW boundary of the site, just N of the Golden Point shaft and placed with precision half-way along the 1896 mill, was a small wooden building with what resembles a flag-pole. Its use is not known and no footings can be found until dense undergrowth is cleared.
17. Pipes (fig. 69). Two pipes, one metal, the lower synthetic, lead straight up the site SW/NE from the Reform shaft to the SW boundary and beyond. These are evidence of the dewatering operations in the 1950s and again in 1983, described in 12.
18.1 House B (possible) (fig. 70). There is a long swathe of building debris, wooden and corrugated iron that perhaps represents a rectangular house, erected after 1952. Alternatively it is simply a dump. No structure is shown here in an aerial photograph of 1952.66

18.2, 18.3 Washing-machines. Two electric washing-machines have been discarded close to the site interpreted as house B.

---

66 Mitchell Library, Small Picture File sub Lucknow. Because of copyright restrictions, the aerial photograph cannot be reproduced.
19.1 House A (fig. 71). Remains of a rectangular house lie close to the SW boundary fence. Linoleum still lies on the floor and wooden and corrugated iron litter the 5 x 2 m area. A modern iron water-tank lies beyond the SE end of the house, with further debris beyond that, where the dunny is shown in a 1952 aerial photograph (which is subject to copyright and cannot be reproduced).67 It was demolished because of complaints from local residents about 1992.68

19.2 Depression with rubbish. This depression with a small accumulation of rubbish, including corrugated iron sheeting, was originally interpreted as the site of the dunny to house A (19.1). But since the 1952 aerial photograph unequivocally locates the dunny on the other side of the house,69 the reason for this feature is uncertain.

---

67 Mitchell Library, Small Picture File, sub Lucknow.

68 Information from Mr Geoff Beasley, Lucknow, 1997.

69 Mitchell Library, Small Picture File, sub Lucknow.
20. Depression. A small depression, less than 2m in diameter, is located near to the SW fence. Its purpose is unknown.
21. **Mullock heap** (fig. 72). A mound of mullock is located to the SSE of Uncle Tom shaft. It is clearly waste from excavating the shaft or drives and is overgrown. It is a significant feature of the mining complex in this part of the Reform site and must be retained.
22. **Uncle Tom winch-house** (figs. 72, 73, 75). The Uncle Tom mine opened in January 1863 and was one of the leading early gold-producers. This winch-house does not, however, date from an early period. The first winch-house, with a 16 h.p. winding and pumping engine had already disappeared in the 1890s, and the present building was almost certainly quite new when it is first seen on a photograph of the late 1930s (fig. 27). Although there is no direct statement, it seems likely that it was put up about the same time as the present Reform winch-house of 1936.

It is constructed of Orb corrugated iron around vertical posts of round timbers, with sawn cross timbers. The small doorway is centrally placed on the NW side. The E post has been dislodged and half of the SE side has fallen outwards. On the shaft side (NE) the E end is open for the winding ropes to reach the head-frame.

The double-drum winch, still *in situ* in 1965, has now been removed and there is no obvious sign of its footings. The interior is richly bestrewed with miscellaneous domestic artefacts: two washing-machines, one round, one square, both with wringers; remains of at least two beds; the axle and pedals of a vehicle; a kerosene tin; and various broken glass and wadding.

Although the structure itself is not significant, the location and relationship with an important shaft have historic and scientific significance. The building should be stabilised and retained as an essential element in the interpretation of the whole site.

---

70 *Sydney Mail*, 4 March 1903, 546, Newman 1882.

23. **Uncle Tom Shaft** (figs. 74, 75). Uncle Tom, the name both of one of the most famously rich veins of gold-ore and of an actual shaft-mine, is a highly significant part of Lucknow’s early history. Opened in January 1863, the mine prospered and, alone among the early mines, employed pumps consistently to keep water at bay. It seems to have closed in the later 1860s and reopened in the 1870s. Newman used its 100 m. shaft after 1878, when Uncle Tom was known as Reform No. 1 and the Reform Shaft as No. 2 and Uncle Tom continued open under the New Reform Gold Mining Co. in the 1880s. At some stage before 1903 the mine was closed and the head-frame removed, together with the winch-house: this part of the Reform site was shown as derelict in a photograph published in 1903 (fig. 19).

After the Reform was dewatered in 1935, a new timber head-frame was erected over Uncle Tom, probably by tributors in 1936: the underground workings interconnected and accordingly dewatering the Reform also dewatered Uncle Tom. This phase of mining did not survive the 1930s but the headframe remained in place.

By 1965 the headframe was 'in a dangerous condition' and the inspector of mines recommended that it 'should be demolished as a matter of urgency'. And so it was.

The shaft remains open and unprotected. It is the most dangerous of all the five shafts on the Reform site. But it is of considerable interest and importance. The sides of the shaft have collapsed at the top and heavy timbers, probably from the 1936 head-frame, have fallen across the entrance. But one of the massive beams defining the shaft proper is still just visible below all the rubbish and the water-filled shaft below is likely to survive with its timbering largely intact. The shaft is an essential element in the presentation of this site, which encapsulates the whole of Lucknow’s mining history.

---


73 *Sydney Mail*, 4 March 1903, 546.

74 Report of Reid 1965, Department of Mineral Resources, Orange branch, Lucknow file 65/9686.
24. *Volkswagen* (fig. 75). The carcase of a Volkswagen car of the 1970s has been abandoned close to Uncle Tom shaft. This should be removed.
25. **Metal debris.** A small accumulation of various metal pieces lies near the Volkswagen. It is not known whether these have any significance.
26. **Tree.** An isolated small bushy tree flourishes W of the Uncle Tom winch-house. It is not known whether this marks some item or not, but no building is visible on photographs.
27. Pressure vessel (fig. 77). A handsome iron pressure vessel probably from the dewatering phase is lying just outside the site behind the Skin Shop.
28. **Tank** (figs. 75, 76). Superficially resembling a long cylindrical boiler, this metal tank 1.4 m. long with a diameter of 0.9 m., is badly corroded. It has two openings for circular pipes, one to insert liquid, one to extract it. Its purpose and original location are not known.
29.1, 29.2 Mine Offices (figs. 22-26, 78). When the Wentworth Goldfields Pty. Co. was formed in 1890 with control of most of Lucknow, it erected mine offices at the extreme NW end of the Reform site. The two-storeyed brick building, with a front verandah on both storeys, was erected on a levelled site, with a four-tread wooden stair up to the front verandah. It had as an annexe on the NW side a small assay office, from which the fumes escaped up a double flue to a substantial square chimney further up the slope (29.2). In the 1890s the offices occupied the most impressive brick building in the whole of Lucknow.

Both the office building and the chimney were demolished by 1936. On the basis of photographic evidence, I have given approximate locations for this important aspect of the site. They are an important element in the interpretation of the site.
V. Statement of Significance

Preamble

The NSW Heritage Manual, 1996, defines the criteria used to assess significance of a heritage place as

- historical
- aesthetic
- technical/research (or scientific)
- social.

Within each criterion a place may be either representative or rare. Matters such as integrity of the place are also relevant to the statement of significance.

The Reform site at Lucknow is of high significance under all four criteria, rare in the categories historical and scientific, representative in the categories aesthetic and social. Its overall importance is such that it should be regarded as an item of state significance.

Within a compact and accessible area of 1.8 hectares, the Reform site presents a remarkable depth of legible gold-mining relics illuminating the whole period of gold extraction in New South Wales by shaft and tunnel. With a strategic position on a major highway (unusual among gold sites), it is a focal point for local Lucknow pride in the mining past and the touristic future.

Historical significance

The Reform site has state significance because of its history alone. Within an area of a mere 1.8 hectares, it contains four of the earliest and most important shafts which created the fame of the Lucknow goldfield in 1862-4. These shafts can be specifically identified and documented, Golden Point, Homeward Bound 1 and 2 and Uncle Tom, all emotive names in mining history. The fifth shaft, the Reform itself, was throughout the last quarter of the nineteenth century a central part of Lucknow, giving underground access to the entire range of deep leads the length and breadth of the field.

These five shafts are known to have produced gold in the period 1862 to 1900 of a value of at least £600,000: the total gold produced from the Lucknow field was conservatively valued by the Senior Geological Surveyor of NSW in 1920 as £2 million,
which he claimed as 'probably a World's record' from a total area of only some 20 hectares. The total of over £600,000 from the 1.8 hectares of the Reform site shows a productivity 3.3 times higher than the whole field, and therefore extremely impressive in world terms. The Reform site was the richest part of a phenomenal field.

The large ore-processing mill, far and away the largest in Lucknow by the 1880s, and one of the largest in New South Wales, pioneered up-to-date technology adapted for local conditions (such as Newman's adaptation of Munday buddles or, in the late 1890s, the replacement of buddles by relatively new-fangled Frue vanners).

The transition from individual prospectors in the 1850s to syndicates in the 1860s to capitalised companies in the 1870s to 1900 seeking money in Sydney, Melbourne and London and finally the return in the twentieth century to small-scale enterprise is a microcosm of Australian mining history.

For all these reasons, the historical significance of the Reform site is of a high state level and rare.

Aesthetic significance. The Reform site has two strong claims to regional significance for its aesthetic qualities, although these are at present partially obscured by the growth of high grasses and trees over much of the 1.8 hectares. The qualities are there, however, in two forms. The more conventional is the quality of very extensive bluestone walls and foundations throughout the 39 metre square ruins of the ore-processing mill: these walls are coursed using partly shaped bluestone blocks and survive up to twelve courses high.

The other aesthetic quality of the site is its legible lay-out. As the site has developed from a group of simple shafts to a much more sophisticated industrial complex, the spatial relationships and linkages among its component parts - shafts, tunnel, skipways, winding equipment, processing mill, ore-hoist, foundry, assay office, administration - develop and change in a rational way (described at length by the engineer-manager in a lecture in London in 1899). There are pleasures in well-ordered mining sites and the Reform offers these to those who will take the trouble to understand.

---

Scientific (technical/research) significance. Because of the wealth of documentary and photographic evidence, the extensive archaeological remains can be interpreted in depth. The really significant area in this context is the ore-processing mill. This covers an area 39 metres square on a steep slope, with the sequence of levels interconnected by gravity-feed as the ore went through various stages of gold-extraction. The mill, which had been impressive in its first form, was doubled in size in 1896. The changes in structure created by this reduplication and the developments in technology, particularly at the concentrating level, have left their impress on the archaeological remains. A high potential, very rare in the state, exists for learning from the bluestone and brick foundations and other features such as bolts the detailed functioning of a mill which processed gold worth in excess of £1 million at nineteenth-century prices. This is rare and of state significance.

Social Significance

Today the people of Lucknow display a pride and an interest in the gold-mining sites which created Lucknow 140 years ago. Because the Reform site has a headframe prominent beside the Mitchell Highway, because of the centrality of the site and because of the fame of its name and its most prominent entrepreneur, Henry Newman, the Reform has a powerful symbolic quality in the locality. This quality is shared with the Wentworth Main but the recent Lucknow Village Heritage Analysis is mistaken in regarding the Wentworth as more significant: it is the Reform, not the Wentworth, which contains 'the greatest amount of original significant fabric relating to early mining activities' and I believe that the historical and archaeological conclusions of this present report are shared by those Lucknow people who understand the two sites. If Lucknow is to have a future in educated and educational tourism, the Reform site is seen as the key element in this development.

Since Henry Newman, storekeeper, post-master, and most of all miner, is still a name to conjure with in Lucknow, with his fine house Mamhead nearby in public ownership and well presented externally, the intimate association of Newman with almost all phases of the Reform site (no other site has such a strong Newman connection) is also a matter for local interest.

77 I have assembled in chronological order no fewer than 32 historic photographs directly relating to the Reform site from 1862 onwards.

In the past the mine-shafts, mill and offices gave the Reform a uniquely central place in the economic and social life of Lucknow. Not only did employment flow from the Reform site and its corollary, housing, but its profits paid for the surviving School of Arts building and many of the social activities of Lucknow in the last thirty years of Victoria's reign owed much to Newman and other managers of the Reform site.

All this combines to give regional social significance to this representative site.
VI. Recommendations

Preamble

The Reform site in Lucknow is a major potential asset to Orange City Council. It is of state significance overall and is of regional or state significance in all four of the Heritage Council criteria (historical, aesthetic, scientific and social).

Unusual among mining sites, it is situated on a major state highway, with tourist facilities either already available or capable of development. It has the capacity, if properly presented and interpreted, of being the focal point for an important presentation to visitors of gold-mining and its impact in the state as well as Orange and Lucknow in particular.

The site is, however, at present derelict, overgrown and hazardous. It lacks interpretation and existing publications have not attempted to present the site in any coherent way. The following recommendations address the problems and the potential of the site.

Recommendation 1: Reduce the vegetation on the site

At present grass is very long and tinder-dry over much of the 1.8 hectare site. There are also many blackberries and as notifiable noxious weeds there is a responsibility to control these. There are also a large number of self-seeded trees, mostly deciduous, known locally as 'mongrel trees': the root systems are damaging important archaeological features, in particular the ore-processing mill and the reservoir.

Action 1a. Arrange for an inspection of the site by the Fire Brigade in company with the consultant who prepared this report. Before burning is undertaken it is essential that those responsible understand the need to do minimal disturbance to the relics, walls and foundations on the site and have an understanding of the site's geography. This is also important for the safety of the Fire Officers, since there are four unprotected mine shafts and other hazards on the site.

Action 1b. Seek specialist advice on the best way to kill and/or remove the blackberry bushes and trees on the site in a way which will not damage the archaeological remains. No trees grew on the site while it was a centre for mining, so no heritage implications attach to the removal of this recent vegetation.

Action 1c. Act upon the advice received under 1a and 1b.
Recommendation 2: Make the site safer

At present the site is lightly fenced round most of the perimeter but beside the Skin Shop, where there is a public car park, there is no fence and anyone can enter the site. There is evidence of recent exploration throughout the site. There is, however, no clear path through any part of the site.

In my report I have identified four open mine-shafts as being particularly dangerous. Although each is partly blocked with rubbish, there is a high level of risk around these vertical shafts above flooded underground workings. Only the Reform shaft is fenced (and it is very secure). There is also a tunnel which is beguilingly easy to enter.

As well as the obvious hazard of open shafts and tunnels, there are dangers from the unevenness of the ground everywhere, the steep slopes, the ruined state of the mill and reservoir and the number of vicious blackberries. There is also likely to be some hazard from snakes in the summer months: there are many hiding places for snakes, including a good number of corrugated iron sheets.

Action 2a. Put a fence around each of Golden Point, Homeward Bound 1, Homeward Bound 2 and Uncle Tom mine shafts and the tunnel entrance. The fence should not be too obtrusive nor obscure the shaft or tunnel entrance from inspection. A decision should be taken in conjunction with the Council's Heritage Advisor about the precise nature of the fencing.

Action 2b. Develop a policy for systematic stabilisation of key areas of the site, in particular the mill foundations and walls and the reservoir, in conjunction with specialist archaeological advice. Assistance from a specialist engineer with conservation expertise may also be required.

Action 2c. In the light of this report, develop a policy for pathways through the site to be available once the site is stabilised and interpretation is available. These pathways should be laid out and detailed by appropriately qualified heritage professionals. (See Recommendation 3).

Action 2d. Develop a policy for controlling access to the site in general. Since there is private property adjacent to the site on all sides except the frontage on to the Mitchell Highway, discussions with Mr Geoff Beasley (who owns the land to the SE and SW) and the owners of the land to the NW should be opened. Adequate fencing of the NE side, on
the highway, requires urgent consideration, together with a policy on access. All fencing decisions should be made in conjunction with Council’s Heritage Advisor.

**Recommendation 3:** Commission an interpretive study of the site

**Action 3.1.** If the Council’s application for funds under the Heritage 2001 programme is successful, then $33,000 has been earmarked for a general interpretive study of Lucknow village and mine. This interpretive study should focus on the Reform site in the broader context of the presentation of Lucknow as a gold-mining community. It is essential that this study should be done by an experienced heritage professional in conjunction with the Council’s Heritage Advisor. Even if only lesser funding is available, it must be a priority to carry out an interpretive study focussing on the Reform site.

**Recommendation 4:** Develop strategies for interpreting the site to a wide audience.

**Action 4.1** Commission a good-quality, illustrated book and/or pamphlet about the Reform site in the context of gold-mining and Lucknow generally. If the Heritage 2001 project is approved and funded, then the $27,500 earmarked for restoration and interpretation of the Reform site in year 2 should be partly applied to commissioning and publishing such a work. An indicative cost estimate for a worthwhile pamphlet would be $15,000.

**Action 4.2** Commission good-quality, vandal-resistant, legible and unobtrusive signage for the site. These signs should be placed outside the site for general information in the first instance, but when it is decided to open the site to visitors, also at strategic locations to explain the elements of the site clearly with brief text, good plans and a well-chosen historic photograph.

**Recommendation 5:** Reallocate some of the Heritage 2001 funds

**Action 5.1** If the Heritage 2001 application for funds is successful, reallocate some of the $220,000 allocated in year 3 for the Wentworth Main site to conservation and interpretation of the Reform site, particularly on the bluestone walling throughout the site of the important ore-mill and on the five mining shafts.
Recommendation 6: Plan for an interpretive centre within Lucknow

Action 6.1 Following the conservation of the School of Arts (which was paid for from Reform mine profits), develop a strategy for incorporating the Reform site and the School of Arts into a first-rate interpretive centre and mining museum.

Action 6.2 Approach Newcrest PL, the owners of Wentworth Main, for the gift or loan of mining equipment which is known to be stored in sheds on that site: in particular, items such as a stamp battery are crucial in assisting visitors to understand how the Reform mill worked. Since the Wentworth Main equipment did not necessarily originate at that mine, the collection there is of importance to the whole of Lucknow.

Action 6.3 Ensure that other mining relics in Lucknow are conserved on site but explained in the interpretive centre: e.g.

Cornish boiler at the Orange (north) end of Lucknow on its seems, the St. Aignan's mine site to the west of the Mitchell Highway (fig. 81).

Winch-house, equipment and mining disturbance at Bismarck Range mine to the west of the Mitchell Highway (fig. 80).

Tangye Dam on Summer Hill Creek directly opposite the Reform and the adjacent site of the cyanide processing works and tailings (fig. 82).
VII. Bibliography

Published works:


Department of Mines *Annual Reports* 1875-1951


Unpublished works


Lucknow files in Department of Mineral Resources, Orange including report by Inspector A.G. Reid on machinery still on Lucknow mining sites, 19 November 1965.

Historic Photographs

I am indebted to the following sources for historic photographs of Lucknow.

Kerry Condon, D'Arcy's Old Wares, Lucknow

Kerrin Cook, 22 Kumali Circuit, Orange

Department of Mineral Resources, Christie Street, St. Leonards

Department of Mines, Annual Report 1899, after p. 24

Mitchell Library, Sheridan Collection, Pic. Acc. 2951

Mitchell Library, Small Picture File sub Lucknow

Orange City Library

R.A. Powell, formerly 33 Ebony Avenue, Carlingford

Bruce Wilson, 11 Newman Lane, Lucknow

Historic Plans

Department of Mineral Resources, St. Leonards, plan of PGL 44

Department of Mines, Annual Report 1898 after p. 30

Plan prepared for Orange City Council by Ian and Jan Jack and drawn by Ian Jack, August 1997.

Key

- Winding
- Reservoir
- Golden Point shaft and winding house
- Top mill
- Middle mill
- Bottom mill
- Homeward Bound shafts
- Engine-base for rock-crushers
- Machine rooms for the rock
- Site of headway (approximate)
- Site of mine offices and assay office
- Site of foundry (approximate)
- Site of stables
- Internal roadway
- Buildings, various
- Pipes for dewatering
- House-site B (possible)
- House-site A
- Depression
- Uncle Tom mullock
- Winch-house for Uncle Tom shaft
- Uncle Tom shaft
- Volkswagen car
- Mine offices
- Terrace
- Mine offices and assay office