

The Demolition of the Union Hill Quartz Roasting Kilns, Maldon

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SUMMARY.

The administrative processes leading up to the demolition of the Union Hill Mine Quartz Roasting Kilns at Maldon are reviewed. The inadequacies are highlighted and a more rational and systematic approach to the conservation of Victoria's significant historic mining sites is suggested.

1. INTRODUCTION

Quartz roasting kilns are bowl shaped masonry structures, similar to lime burning kilns. There were six kilns, the largest collection in Victoria, at Union Hill dating from between 1860 and 1890. The condition of these kilns varied from good to ruinous.

The kilns were located roughly in the centre of the mining lease held by Triad Minerals N.L. and were preventing the expansion of an open-cut mine.

The public land on which the kilns were located is within the Maldon Historic Reserve. In addition the kilns were recognised as significant within the local municipal planning controls and public land Management Plan. They were specifically protected by a condition on both the planning permit for the mining operation and the mining lease.

2. GOLD MINING AT MALDON

The discovery of alluvial gold at Maldon sparked a rush of 20,000 people in mid 1854. Gold in the quartz reefs was discovered soon after the alluvial find, yet alluvial mining remained the major employer until the 1870's. Nevertheless it was reef mining which produced the wealth necessary to establish the township of Maldon.

To win the gold from the quartz reefs the mining companies at Maldon had to extract gold from refractory ores of arsenical iron and copper pyrites. To drive off these impurities the stone was roasted, or calcined, in kilns before crushing. Although considerable gold was lost in this process, kilns were used at Maldon until the end of the 19th century, when a more efficient system involving chlorination and cyanidation was introduced.

Maldon's gold production from quartz peaked in the mid 1860's at around 40,000 ounces per annum before dropping to between 6,000 and 20,000 ounces during the 1870's and 1880's. Unemployment was a problem for miners during this period. There was a revival in the 1890's and between 1897 and 1908 annual yields exceeded 25,000 ounces. Gold production at Maldon declined in the years before World War 1. During the War, gold prices fell and most of the mines closed. The North British was the last mine to close in 1926 (1). At this time Maldon was the second to Bendigo as the most productive reef mining area in the State (2).

Among the principal mining companies at work during this period were the North British 203,307 ounces, the South

German 172,231 ounces, and the Union 177,870 ounces (3).

2.1 The Union Mine

The first company mine was working on the Eaglehawk reef in 1859. This company used the latest mining technology including two quartz roasting kilns (4). Debt forced the company to let the mine to a succession of tribute parties until rich stone was obtained. Two more kilns were built during this period and the plan in Dickers Mining Record of 1867 shows four kilns on the site with the northern kiln located within Leighton's Claim (5). Leighton and White, were the tributers whose success prompted the company to resume control of the mine in 1867 (6).

There was another upgrading of the mine in 1872 which included the construction of three additional kilns. These new kilns were apparently larger than the first four because the total capacity was given as 300 tons (7).

Operations were suspended in 1879 and did not resume until 1891 when the company acquired new ground. The Australian Mining Standard reported on the mine in 1892 as follows:

Much of the gold contained in the stone was very fine and accompanied by a deposit of flourey bismuth. Most of it would have been lost, but that the reducing plant includes some exceptional appliances, and that all the quartz was burnt in kilns before being crushed. Mr. White [manager] claims that the process of burning the quartz destroys all the base metal contained and also causes the very fine gold to collect together in larger particles, thus rendering it more easy to save. The Maldon quartz being so very rich in refractory mineral matter, and the gold being so fine, has resulted in the burning process being somewhat general throughout the district and many of the most experienced miners are warm supporters of the kilns (8).

David Bannear, who recorded, researched and supervised the dismantling of the kilns, was told by Laurie Lakey, who mined at Union Hill in the 1930's, that the two surviving kilns were built as part of the 1890's upgrading of the mine. This information was passed onto Mr. Lakey by a person who had worked at the mine during that period (9). No historical records have been found to verify this fact.

Lone Star Exploration N.L. attempted to work the upper levels without success in the early 1970's (10).

3. QUARTZ ROASTING

The London Mining Journal in 1862 describes how roasting rendered very hard quartz more brittle making it easier to crush, burnt out the sulphides, like pyrites and bismuth, which hindered amalgamation and separation of gold, and helped to congeal the gold which otherwise floated on the water surface during crushing and amalgamation (11).

Roasting involved heating the quartz to a temperature which was insufficient to smelt the ore. The London Mining Journal in 1865 contained the following description:

...in funnel-shaped kilns similar to those used for burning lime. A layer of wood is placed at the bottom of the kiln, upright pieces of wood also being put round the sides, then the kiln is built up with alternate layers of quartz and wood. The top is heaped, and closely covered with small stuff, the object being to obtain a slow combustion of the wood, and so to avoid an intense heat. A quick fire would melt the pyrites into slag. If properly calcined the quartz is friable, free from slag, and of a white colour streaked with red (12).

The roasting of quartz was practised at Maldon for forty years until the end of the nineteenth century and its use attracted some criticism. The Tarngower Times in the 1860's contains letters both criticising and supporting quartz roasting.

The article in the Australian Mining Standard in 1892 which was quoted earlier confirms the use of roasting to deal with the sulphides in the gold bearing ore at Maldon. And the Annual Report of the Secretary for Mines and Water Supply of 1886 contains the report of a test conducted by Mr. R. D. Oswald Maldon's most successful mine owner, who is quoted as being emphatically in favour of calcining (13).

4. EXTANT QUARTZ ROASTING KILNS

Quartz burning was practiced widely throughout Victoria although never as consistently as at Maldon. Christopher Davey noted in his report titled An Independent Report on the Historical Aspects of the Quartz Burning Kilns of the Union Mine, Maldon prepared in January 1990, that it was practiced at Stawell, Ballarat, Clunes, and Bendigo (14). The Mining Registrar's Reports also make references to roasting at Buckland and Mitta Mitta (15). There are also sets of kilns at the New Chum Mine and at Toombon in Gippsland. The known surviving sets of kilns in Victoria and the number of kilns in each set, most of which are in varying stages of collapse, are listed below :

Bells Reef, Maldon, 4.
Caledonian battery, Maldon, 5.
Cookmans Mine, Maldon, 1.
Fentimens Reef, Maldon, 3.
Grand Junction Mine, Maldon, 3.
North British Mine, Maldon, 5.
Green Gully, Newstead, 2.
Muckleford Forest, 1.
Site No.44, Castlemaine, 1.*
Site No.63-1, Castlemaine, 1.*
New Chum Mine, Gippsland, 2.
Toombon, Gippsland, 2.
Port Phillip Mine, Clunes 3.

* Sites 44 and 63 were identified in a survey of the Castlemaine area (16).

5. THE MALDON HISTORIC RESERVE

The Maldon Goldfield is primarily on the public land which surrounds the Maldon township and is designated as an Historic Reserve. It is significant principally as a historic

quartz mining area where surface features from several major mines are still extant and in close proximity to a relatively unaltered nineteenth century town. The features, which are among some of the best examples in North Central Victoria, reflect the development and evolution of the mining and methods used locally to win gold from the complex refractory ores. These features include 6 sets, or the largest concentration, of quartz roasting kilns in Victoria.

The Land Conservation Council (LCC) recommended that this historic reserve be established in 1981. Their recommendation was based on a broad brush survey of all the historic mining areas in North Central Victoria.

The Department of Conservation Forests and Lands formally reserved the area and published a detailed management plan in 1989. This plan included modifications based on public submissions and negotiations with other State government departments.

6. THE UNION HILL KILNS DISPUTE

Triad Minerals N. L. acquired an interest in the Union Hill Mine in 1983 and eventually became sole owner in 1986. In 1985 Triad obtained a planning permit from the Shire of Maldon for Limited Trial Open Pit Mining, and is still operating under the same planning permit. This permit has been amended several times without further public consultation. A separate ten year mining lease was granted in May 1986 by the Department of Industry Technology and Resources (DITR). Both approvals contained a condition specifying that the kilns had to be protected from damage by mining.

A planning permit to build a treatment plant at Porcupine Flat, 2km east of Union Hill, was not obtained so easily. The application was vigorously opposed by a section of the community and the approval process, including a Planning Appeal Hearing, took about twelve months. A permit was issued in September 1986. Since then opinion within the community has been divided over the mining issue. A separate ten year Mining Area Licence for the treatment plant was also granted by DITR in December 1986.

Triad commenced mining at Union Hill in 1987 and the Treatment Plant began operating in January 1988.

Between 1987 and 1989 the Department of Conservation Forests and Lands (DCFL) prepared a Management Plan which included detailed provisions designed to protect the kilns and the other significant historic sites within the Maldon Historic Reserve. The controls for mining in the Planning Scheme were also strengthened during this period.

In July 1989 the expiry date for the planning permit was extended and in September 1989 a minor amendment to the permit was approved by the Shire Council without consultation with DCFL or the public. This amendment allowed Triad to mine in the southern end of their lease. In Triad's application for the extension of time for their permit it was claimed that selective mining of high grade ore was uneconomic and mining of large volumes of ore was needed (17). Presumably it was at this time that Triad also discovered that it was impossible to mine under the kilns as originally proposed because of the instability caused by stress relieving around the underground openings mined last century (18). This instability also made it necessary to reduce the pit slopes of the haulage access, which brought the top of the excavation to within 5 meters of the rear of the kilns. With hindsight it seems that once the extension of time and amendment were approved the future of the kilns was in doubt.

A letter from Triad confirmed that the Shire had been aware of the company's desire to remove and relocate the kilns since July 1989 (19). That is, before the minor amendment

to the permit was approved. This amendment was granted without any detailed research or analysis of the effects that mining in the southern end of the lease might have on the kilns. The process defined by the Burra Charter, which should have been followed when making decisions about this historic structure, was apparently neither implemented nor thought to be relevant.

Before another minor amendment to the permit, allowing the kilns to be relocated, could be granted Triad had to obtain the consent of the landowner, DCFL. Thus involving a third government body in the decision making process. DCFL was asked to agree to the relocation of the kilns in February 1990. This approach to DCFL came to the Minister's office from the Minister for Manufacturing and Industry Development via one of his advisers.

Triad's relocation proposal was based on the report prepared by Christopher Davey in January 1990. This report concluded that the two substantially intact kilns were possibly built about 1860 and that they were the most complete extant quartz burning kilns in Victoria (20). David Bannear's subsequent more detailed research showed that these kilns were a later construction, with oral information suggesting that they were probably built in the 1890's.

The choice of the relocation option was made prior to the completion of this detailed research and without a proper understanding of the construction of the kilns.

Davey's report argued that:

The significance of the built environment is directly related to social culture and society's self image. Continuity of the fabric is therefore important. The success of the industrial environment, on the other hand, is largely dependent on change and development, and the motivating concepts and traditions behind the changes.

Davey then went on to say that:

Industrial relics originate from a utilitarian tradition and it is wrong to treat them like architectural relics which may be significant for social identity. Industrial relics are therefore less geographically dependent and more concerned with the existence of other relics and activities with which the relics are related than are architectural relics (21).

Cultural significance, as indicated by the Burra Charter, cannot be narrowly defined. It is dependent upon the association with other structures and features as well as on locality and context.

The report also argued that kilns were advertised for sale when mines closed and so they should be considered to be the same as all other mining equipment which was often moved from one mine to another.

It took four months of negotiation and political pressure to obtain the consent of the Department of Conservation and Environment (DCE, formerly DCFL) to the amendment to the planning permit. Some sections within DCE wanted more information, recommended that the matter be referred to the Historic Buildings Council, argued that compensation should be paid rather than the kilns be relocated, and questioned the legality of removing the condition protecting the kilns with a minor amendment. Minor amendments do not require a Shire to seek public comment. Nevertheless the Department accepted the opinions supplied by Triad's solicitors and the Minister, apparently at the request of the Minister for Industry and Economic Planning, cut negotiations short by consenting to the minor amendment to the permit.

The letter of consent from DCE was sent to the Shire on the 5th of June 1990 in time for a special meeting of the Shire

Council which approved the amendment and deleted the condition protecting the kilns.

Throughout this period mining continued at Union Hill.

Separately from the planning permit amendment process the National Trust, at the request of local members, applied to the Historic Buildings Council (HBC) to have the kilns added to the Register of Historic Buildings. Thus a fourth government body, and probably the one that should have been involved from the outset, became involved in the dispute.

The day following the Shire's decision to allow the kilns to be relocated. Triad, without recording any of the features on the site, demolished the four kilns which were in a ruinous state, had a surveyor measure and photograph the two intact kilns before commencing to dismantle them stone by stone. About two metres of stone from the facade was removed before the HBC issued an Interim Preservation Order on the 7th June, halting demolition.

6.1 Historic Buildings Council Hearing

Triad then applied to the HBC for permission to demolish the kilns. The HBC hearing was held on July 25th and August 3rd. Those attending included The National Trust as applicants and opponents to the demolition and relocation, Triad Minerals, The Shire of Maldon, The Department of Industry and Economic Planning, The Maldon Kilns Action Group, The Department of Conservation and Environment, The Victorian Chamber of Mines, The Maldon Historical Promotion League and a bus load of people from Maldon.

At the outset of the hearing all parties agreed that the kilns were of State significance. Dr. Peter Bell an expert witness for the National Trust went further and asserted that the kilns were of National significance because of their rarity. He compared them favourably to the only other set known to exist outside Victoria, at Hill End in NSW.

Having established that the kilns were of State significant, arguments were strongly put by the Company, the Shire and the local community about the economic hardship that would be experienced if the kilns remained in place. These groups also argued that kilns were now on unstable ground which might collapse at any time and that their architectural significance could be conserved if they were relocated

An independent report by Econsult Australia, commissioned by the HBC, assessed the information made available by Triad. The independent report concluded that:

- the figures outlined by Triad in their submission relating to ore production, gold value, and mine life were reasonable in relation to known mining industry criteria and standards
- the overall in-situ gold resource was between \$17 million and \$21 million, and around \$7 million of this could possibly be extracted without removing the two kilns.
- more information was required on the stability of the ground under the two remaining kilns (22).

The Econsult report also stated that the Union Hill Mine had a productive life of five months with a possible further five months if mining was permitted on the area where the four kilns had been demolished (23).

The National Trust, who applied to have the kilns listed on the Historic Buildings Register, opposed the relocation and argued that:

- the kilns were of National Significance based on the evidence of expert witness Dr. Peter Bell and Dr.

Peter Milner.

- since the kilns were of National Significance they should be retained in situ.
- detailed monitoring of the stability of the ground was required to prove conclusively that it was unstable.
- more research and archaeological analysis was required to determine the significance of the kilns and the quartz roasting process.
- the architectural and other significance of a rubble structure like the kilns would be lost unless the whole structure could be moved as a single mass. This was based largely on the evidence of Dr. Peter Milner.

The Government, represented by both DCE and DIEP, did not oppose Triad's application, as it had already consented to the relocation of the kilns. DIEP supported Triad's position that if the kilns were not removed then the project would not go ahead and this would result in a substantial loss of income for both the Maldon Community and the State of Victoria.

An expert witness for DIEP also explained that the ground supporting the kilns was in a very unstable condition and in great danger of collapse (24).

Individuals and representatives from the local action groups, local community, and the Shire spoke strongly in support of Triad's proposal to relocate the kilns, as did the representative of the Chamber of Mines.

Triad's arguments that the architectural significance could be retained if the kilns were relocated were presented by Chris Davey and were outlined earlier in this paper. The Company told the hearing that it anticipated spending \$250,000 on the relocation and recording of the kilns.

The HBC resolved on the 6th August to add the kilns to the Register of Historic Buildings and to grant a demolition permit. The permit conditions specified controlled demolition and recording of the kilns, and required that a report be prepared to assess whether the significance of the kilns could be retained if they were relocated.

The initial permit also specified that the report was to be prepared and the demolition supervised by a suitably qualified professional who was to be chosen from interested tenderers. Much to the surprise and annoyance of the National Trust, Triad successfully persuaded the HBC that it should be allowed to appoint a suitably qualified professional who was acceptable to the HBC.

David Bannear, an historical archaeologist, was retained by Triad and produced a report entitled Quartz Roasting Kilns at Union Hill, Maldon: A Report on the Efficacy of their Relocation. Part of the conclusion of this report states that:

The purpose of the Burra Charter is to determine appropriate ways in which cultural significance of places can be conserved. The essence of the kilns significance lies in their location, form, workmanship, and age. On all counts, the kilns significance will either be substantially diminished or completely destroyed by their removal and relocation (25).

This confirmed the views expressed by the National Trust and its witness at the HBC hearing and is in contrast to the views expressed by Chris Davey on behalf of Triad that Quartz Roasting Kilns should be regarded as a piece of mining equipment that could be relocated and still retain their significance.

Having received David Bannear's report the HBC no longer

believed that the relocation of the kilns was viable or worthwhile and agreed to their controlled demolition and recording. This was supervised by David Bannear, who with Robyn Annear, produced another report in December 1990 entitled Quartz Roasting Kilns at Union Hill: Archaeological Investigation and Dismantling

7. RECORDING AND DISMANTLING OF THE UNION HILL KILNS

The kilns were dismantled in stages to provide details of construction, materials, and the sequence of construction. A professional photographer recorded every detail during the dismantling process. Some of Triad's workforce assisted with the dismantling. Plans were drawn of each section as the kilns were dismantled. The kilns were also recorded photogrammetrically prior to and during this process.

The dismantling was mainly done by hand except where this became hazardous and earth moving machinery had to be used. Some of the stone crumbled during demolition but as much as possible was saved for possible later reuse.

7.1 Description of the Kilns

The two largely intact kilns, partial remains of a third kiln and traces of the bases of the three other kilns, which had been demolished in June 1990, were located on an island within the vast Union Hill open-cut.

The roasting bowls of the first two kilns were funnel shaped and made from hornfels slabs. Hornfels is a very hard dense rock which was formed when relatively soft sandstones and shales were subject to heat and pressure from an intrusion of granodiorite (26). The kilns were approximately 3.2m in diameter at the top and 3.5m deep. The space between the bowls and the outside walls was filled with rubble quartz and gravel. The overall dimensions of the standing structure were approximately 4.3m by 8.4m by 6m high at the front. The bowls were constructed of coursed hornfels which had been crudely repaired in a number of places and the floors were paved with hornfels slabs.

The facade of the first two kilns was a monumental skilfully made wall of coursed hornfels. The two arched portals tapered down from this front wall to openings into the base of the roasting bowls, while the base of the openings was constructed at a lower level to allow ore trucks to enter the opening for filling direct from the kiln.

The northern wall was constructed of quartz blocks with a timber tie beam across the top. There was no southern wall, the kilns having been constructed against the northern wall of kiln three which clearly predated kilns one and two. The kilns were cut into a slope and the space to the east of the roasting bowls was filled with quartz rubble.

7.2 Dismantling of the Kilns

The dismantling commenced with removal of rubble from the roasting bowls, portals and in the front of the kilns. The kilns were then dismantled in the following sequence:

1. The north west corner down to the floor of the roasting bowl, revealing the north wall of quartz blocks, the quartz rubble infill and the bowl of hornfels slabs and blocks in kiln one.
2. The south west corner down to the floor of the roasting bowl, revealing the sequence of construction between kilns two and three, the rubble infill and the hornfels slabs and blocks in the bowls of kilns two and three

3. The rest of the facade to the floor of the roasting bowls, revealing the front wall which had been set in very hard mortar, the rubble infill and the roasting bowls. During demolition of this part of the front wall a considerable amount of the stone set in the hard mortar crumbled. Similarly the hornfels blocks in the bowls which had been subject to so much intense heat crumbled during demolition.

4. The portals were then removed, followed by the rest of the kilns revealing how they were built into the natural surface. (27)

The demolition of the kilns showed clearly that the two kilns were built after kiln 3 and were probably the last two kilns built on the site. The report of the dismantling also states that the alignments of kilns 3 and 4 differed from that of kilns 5 and 6 suggesting that kilns 3 to 6 may have been built in two separate phases (28).

It may be possible to re-establish the position of Leighton's Claim and the Union Mine's Lease in relation to the position of the kilns. This might be one way of confirming the oral evidence presented by David Bannear that the kilns were built in the 1890's.

8. ANOTHER AMENDMENT TO THE PERMIT

Following the demolition of the kilns, Triad again applied to the Shire to amend their permit. The Department of Conservation and Environment (DCE) consented yet again to a minor amendment to the planning permit, and missed another opportunity to obtain a contribution from Triad toward the conservation of some of the other historic features at Maldon.

Triad's new proposal was to provide a model of the Union Mine instead of relocating the kilns. The Shire agreed to this further amendment because it apparently did not feel that it could insist on the relocation of the kilns when the HBC had decided that it was not interested in relocated kilns.

The permit was amended again with the provision requiring relocation being replaced with a requirement for the displaying of a model of the Union Mine in a shed near the viewing area which is to be provided at the northern end of the open-cut.

While permission was given by DCE to this additional minor amendment, the DCE regional staff still continued to pursue the possibility of obtaining a contribution from Triad for the conservation of some of the other historic sites around Maldon. However Triad felt unable to provide any support because of the amount of money it had already spent in contesting the registration of the kilns at the HBC (29).

As at 24 March 1992 the Shire was still trying to ascertain from Triad when the model would be provided (30).

9. CONCLUSIONS

While some sections of the community undoubtedly benefited from this multi million dollar mining operation, the State Government, the Shire, and Triad must share responsibility for a process which saw a structure of State, and probably National, significance demolished without any compensation to the State but at a cost to Triad of \$260,000. In addition to Triad's costs I estimate that the cost to the government agencies to be between \$60,000 to \$100,000.

This dispute points to the need for a Heritage Strategy to which all sections of government are committed. Too many government authorities and departments were involved in the decision making process. Decisions were made without

adequate research and background information, or a proper appreciation of the Burra Charter process that should be followed when deciding the future of historic mining sites. The application of the Charter to such sites needs to be accepted by both the mining industry and heritage conservation groups.

Some of the specific problems highlighted by this dispute include

* The present system is open to manipulation. There were far too many organisations involved in the decision making processes which allowed Triad to take advantage of what could be described as an incremental process.

* The initial recommendation for relocation, which was accepted by local and state government bodies, was based on insufficient research and a lack of a proper understanding of the structure of the kilns and whether they could be relocated. These facts were only known once the research and archaeological investigation were completed as part of the demolition permit from the HBC. Without sufficient research by people with the necessary qualifications and experience, significance can either be inflated to the point where a mining operation could be jeopardised or be deflated so that an important historic feature or site is lost sometimes without even being recorded.

* Decisions were made for political reasons by State government authorities who do not understand the Burra Charter process and without the all the necessary research information.

* The Shire did not have the commitment, expertise or the information available to it to deal with such a significant historic mining structure

* Under the present circumstances heritage conservation groups appear unwilling to accept anything other than conservation of historic features on the site on which they are found. The HBC decided that the kilns were of State significance and accepted that relocation would not have protected the significance of the kilns. The HBC was then prepared, taking into account the economic circumstances and the instability of the ground under the kilns, to agree to their demolition. This is an important precedent which shows that site recording and demolition may be appropriate in some cases.

* There is no recognised body that can oversee or set standards for research on the significance of historic mining sites in Victoria. This results in a great variation in how significance is determined and used by decision makers.

While it would be unrealistic to expect Victoria's fragmented decision making process to change overnight it seems to me that the key to some of these problems is adequate research, which if made available to all levels of government and the mining industry would go some way toward ensuring more consistent decisions.

Only about 5% of the resources expended on this dispute were spent on any new research. Yet just half of those resources would have allowed DCE to implement nearly all of the provisions within the Maldon Historic Reserve Management Plan or alternatively would have paid for research to determine the significance of all the historic mining areas in Central Victoria. This is an insignificant amount of money compared to the value of the gold that Triad obtained from Union Hill or to the money that mining companies spend on exploration or that may be spent on similar disputes in the future. Research to determine the

significance of historic mining sites has the potential to provide mining companies as well as land managers with useful information.

The Department of Conservation and Environment is convening a Committee that is working toward establishing a register of historic mining sites using the Burra Charter process. The Historic Mining Sites Assessment Committee consists of representatives from three State Government Departments plus people from the mining industry and the heritage conservation field with an interest and expertise in mining history. The committee has been able to obtain some resources and has engaged an historical archaeologist who is progressively surveying the historic mining areas around Bendigo. However without additional resources from both the State government and the mining industry this research will stop once the Bendigo area is completed. This would leave the register only partially complete and also prevent the Committee from satisfying the Mining Industry's concerns about the applicability of the Burra Charter process to historic mining sites.

If the Committee can continue, Victoria's historic mining sites could probably be assessed in five years. There may even be a role for such a Committee to provide advice about historic mining sites to organisations such as the HBC and local municipalities .

10. ACKNOWLEDGEMENTS

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