MERTON’S REWARD GOLD MINE:
RECONSTRUCTING THE MINE
AND
DECONSTRUCTING THE MYTH

Marianne Diane [Peta] Chappell
B.Sc (Hons)

This thesis is presented for the degree of
Master of Philosophy of Murdoch University

January 2013
I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary institution.

……………………………………

Marianne Diane [Peta] Chappell
Merton’s Reward Gold Mine: then …

Top: Merton’s Reward *circa* 1900. Fred Merton stands in front of a timber structure (a crib) supporting the roof (the back) of the underground workings. Bottom: *circa* 2004. These appear to be the same workings. The crib has been replaced with sturdy timber props. (Courtesy Navigator Resources Ltd, both images)
Prospector Fred Merton discovered gold near the town of Malcolm in Western Australia in March 1899 and took the bold step of developing his find as sole owner/manager. When he sold to British interests in January 1902, his audacity had won him fortune – approximately £84,202 worth of gold plus the proceeds of the sale – and fame. Or should that be infamy?

This thesis addresses two aspects of the history of Merton’s Reward gold mine. It analyses the evolution of the mythology that developed around Merton and his mine throughout the twentieth century, and it investigates how and why the mine developed as it did, firstly under Merton’s management and then that of a typical British mining company.

The Western Australian gold boom of the 1890s generated numerous tales of prospectors and bonanzas but there has been little discussion or analysis of the authenticity of these myths in either the reminiscence literature or scholarly histories. The well-documented mythology surrounding Merton and his mine provides an excellent subject for this type of investigation. Its origin is revealed in misinterpreted and biased newspaper reports of the time.

The mine itself developed into a sprawling confusion of randomly named quarries, shafts, and associated workings, sorely in need of clarification. Detailed examination of the records demonstrates the importance of geology as a factor in its development. When integrated with other factors including finance and the influence of the individual, Merton’s Reward provides a rare opportunity to compare management style in the two phases – the one-man show and the company operations – of the gold mine’s life. Although Merton ran the mine for his own benefit he followed locally accepted mining practice. He understood the limitations of his style of management and sold when changing conditions within the mine threatened to surpass them.

Despite a full complement of staff appointed to professionally manage development of Merton’s Reward and despite the company producing roughly twice as much gold as
Merton, it failed to achieve a return on its investment. The geology of the mine defeated it.

This case study starkly illustrates the insurmountable difficulties associated with chasing a failing orebody at depth, the main reason for closure of the majority of Western Australia’s outback mines. Merton is demonstrated to have been highly competent, both as prospector in his choice of ground and as mine owner in the timing of his departure.
CONTENTS

Abstract i
Contents iii
List of Tables in Text v
List of Figures in Text vi
List of Mine Plans vii
Derivation of the Plans vii
List of Abbreviations ix
Units of Measurement and Conversion Factors x
Acknowledgements xi

Chapter 1 - Introduction 1
The myth of the prospector 1
The prospector/entrepreneur/company interface 4
The structure and modus operandi of the free-standing mining company 6
The importance of understanding the mine itself 8
The significance of Fred Merton and Merton’s Reward 10
Sources, methodology and structure of the thesis 13

PART 1. Deconstructing the Myth - Introduction 18

Chapter 2 – Callagher versus Merton – the discovery and the lawsuit 23
The early stages 23
The trial and the appeal 28
The genesis and growth of the myth 35

Chapter 3 – The development of the mine and its sale 45
The fabulous results 46
The battery – an audacious purchase 50
Fraud and manipulation in the lead-up to the sale 58
The sale 64
The disparity between the results 71
PART 2. Reconstructing the Mine – Introduction

Chapter 4 – The mine as personal fiefdom
First impressions
The source of the gold – a plethora of pits
Under Court Orders – Robinson and Merton
Into the unknown
The technical expert versus the enthusiastic amateur – a snapshot in time
Developing the mine
The best one-man show in Australia

Chapter 5 – The company mine
The company
Re-organising the mine – Fred Morgan
Thomas Weekley – a stopgap solution?
Professional expertise – Erle Stafford Huntley and Bewick Moreing
The respectable mining company – Henry Judd
Into the shadows – Jones and the tributers
The true believer

Chapter 6 – Conclusion

APPENDIX

Quantifying the gold from the mine
Part 1 – general notes on gold production records, yields and reliability
The regulations
The reliability of the published returns
Part 2 – Merton’s Reward gold mine

BIBLIOGRAPHY

Primary Sources
Secondary Sources
Tables in Text

<table>
<thead>
<tr>
<th>No.</th>
<th>Table Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Gold Production Statistics for Merton’s Reward gold mine (RC 1C and GML 638C) for 1899</td>
<td>47</td>
</tr>
<tr>
<td>3.2</td>
<td>Monthly gold returns for selected gold mines in the Mt Margaret Goldfield, 1897-99</td>
<td>48</td>
</tr>
<tr>
<td>3.3</td>
<td>Monthly gold production for Merton’s Reward, March 1899 to February 1902</td>
<td>54</td>
</tr>
<tr>
<td>3.4</td>
<td>Allocation of shares in Merton’s Reward Gold Mining Company Ltd to the nominees of Fred Merton</td>
<td>69</td>
</tr>
<tr>
<td>4.1</td>
<td>Official gold production from the early Gold Mining Leases in the immediate vicinity of Merton’s Reward Gold Mine</td>
<td>87</td>
</tr>
<tr>
<td>4.2</td>
<td>Progress of workings 1900 – 1901</td>
<td>107</td>
</tr>
<tr>
<td>4.3</td>
<td>Work completed on Merton’s Reward Gold Mine, to 28 September 1901</td>
<td>116</td>
</tr>
<tr>
<td>5.1</td>
<td>Summary of development work and gold values on the West Vein off the No 2 Underlay Shaft, to 30 June 1903</td>
<td>131</td>
</tr>
<tr>
<td>5.2</td>
<td>Details of development, 1 July 1903 to 30 June 1904</td>
<td>143</td>
</tr>
<tr>
<td>5.3</td>
<td>Summary of Ore Reserves for Merton’s Reward at 30 June 1905</td>
<td>154</td>
</tr>
<tr>
<td>5.4</td>
<td>Gold production and costs by processing stream, January to end June 1907</td>
<td>158</td>
</tr>
</tbody>
</table>
## Figures in Text

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1.1</td>
<td>Location map for Merton’s Reward gold mine.</td>
<td>10</td>
</tr>
<tr>
<td>Figure 1.2</td>
<td>Fred Merton, proprietor of Merton’s Reward gold mine, <em>circa</em> late 1900</td>
<td>11</td>
</tr>
<tr>
<td>Figure 3.1</td>
<td>The Merton’s Reward battery, <em>circa</em> late 1900</td>
<td>55</td>
</tr>
<tr>
<td>Figure 3.2</td>
<td>Merton’s Reward – the owner and his gold</td>
<td>63</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Diagrammatic cross section of a saddle reef</td>
<td>83</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Gold Mining Leases in the immediate vicinity of Merton’s Reward Gold Mine which have recorded gold production</td>
<td>88</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Detail of No 1, No 2 and No 4 Open Cuts, showing lease boundaries, from 1903 General Plan, Merton’s Reward G.M. Company</td>
<td>91</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Merton’s No 1 North, General Plan, 1900</td>
<td>95</td>
</tr>
<tr>
<td>Figure 4.5</td>
<td>Merton’s No 1 North, Sketch Section showing probable dip of reefs, 1900</td>
<td>96</td>
</tr>
<tr>
<td>Figure 4.6</td>
<td>Miners at Merton’s Reward, November 1899</td>
<td>105</td>
</tr>
<tr>
<td>Figure 4.7</td>
<td>‘The appearance of a rabbit warren’; the No 2 Open Cut, Merton’s Reward</td>
<td>112</td>
</tr>
<tr>
<td>Figure 4.8</td>
<td>Breaking down ore in the No 1 Open Cut, Merton’s Reward</td>
<td>114</td>
</tr>
<tr>
<td>Figure 5.1</td>
<td>Detail from Plan 2 Longitudinal Section looking West, December 1903, annotated to clarify No 2 Workings</td>
<td>132</td>
</tr>
<tr>
<td>Figure 5.2</td>
<td>The cyanide plant, Merton’s Reward</td>
<td>145</td>
</tr>
<tr>
<td>Figure 5.3a</td>
<td>Idealised strain diagram [based on field and laboratory studies]</td>
<td>153</td>
</tr>
<tr>
<td>Figure 5.3b</td>
<td>Idealised plan view of the development of the intershear lodes at Merton’s Reward</td>
<td>153</td>
</tr>
</tbody>
</table>
Mine Plans

(located in map pockets at back of volume)

| No. | Plan | Plan Details | DMP Plan No.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan 1</td>
<td>Mertons Reward G.M. Coy.</td>
<td>General Plan</td>
<td>1/290</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[July 1903]</td>
<td></td>
</tr>
<tr>
<td>Plan 2</td>
<td>Mertons Reward G.M. Coy.</td>
<td>Longitudinal Section looking West</td>
<td>17/290</td>
</tr>
<tr>
<td></td>
<td></td>
<td>December 1903</td>
<td></td>
</tr>
<tr>
<td>Plan 3</td>
<td>Merton’s Reward G.M.</td>
<td>Longitudinal Section looking West [including assays]</td>
<td>4/290</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[April 1904?]</td>
<td></td>
</tr>
<tr>
<td>Plan 4</td>
<td>Mertons Reward Gold Mining Co. Ltd.</td>
<td>Mertons Reward Mine [Composite Plan]</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1907</td>
<td>[based on 14/290 &amp; 15/290]</td>
</tr>
</tbody>
</table>

Derivation of the plans

The DoIR disclaimer that appears on Plans 1, 2 and 4 applies also to Plan 3 and to DMP plans 11/290 and 12/290, which are reproduced as Figures 4.4 and 4.5. The originals of Plans 1 and 2 were prepared by the staff of Merton’s Reward Gold Mining Company Ltd in 1903; the copies reproduced here were obtained as scans from the DoIR, the predecessor of the DMP. They have not been materially altered but were ‘cleaned up’ – the background of one being very blue and of the other very orange.

The original of Plan 3 was prepared by Bewick Moreing personnel in 1904. The scanned copy obtained from the DoIR proved to be badly distorted so a folded paper copy in my personal possession was used as the basis for the reproduction included herein. Extensive cleaning up was necessary to remove the effects of years of folding but no alterations were made to the drawing itself.
Plan 4 is not strictly speaking an original mine plan. In 1990 the Department of Mines permitted Ashton Gold WA Pty Ltd to redraw original blueprints 14/290 and 15/290, which had been prepared by Merton’s Reward Gold Mining staff progressively up until April 1907 – the most recent date found labeling the workings on the plan. It is reproduced here as scanned by the DoIR.

In order to print the mine plans at A1 size the scales of Plans 1 and 4 had to be reduced; this was not necessary for the two Longitudinal Sections, Plans 2 and 3, which are printed at original scale.

Of the mine plans which are used as figures in text, DMP plans 11/290 and 12/290 are reproduced as drawn by Bewick Moreing personnel in 1900 as Figures 4.4 and 4.5, whereas Figures 4.3 and 5.1, based on DMP plans 1/290 and 17/290 respectively, have been amended and annotated by the author of this thesis to highlight specific details of the mine.

The DMP holds other historic mine plans for Merton’s Reward gold mine but the four large scale plans selected for inclusion in this thesis between them effectively illustrate the development of the mine and the difficulties in deciphering that development.
Abbreviations

AGSO  Australian Geological Survey Organisation
AIME  American Institute of Mining Engineers
AR    Annual Report
AusIMM The Australasian Institute of Mining and Metallurgy
BIF   banded iron formation (geological)
BM    Bewick Moreing Company Ltd files
CM    Coolgardie Miner
DoIR  Department of Industry and Resources, Western Australia
DMP  Department of Mines and Petroleum, Western Australia
E&MJ  Engineering and Mining Journal
E-W  direction of strike (trend) of veins or other geological features
GF    Goldfield
GGWA  Government Gazette of Western Australia
GM(s) Gold Mine(s)
GML   Gold Mining Lease
GSWA  Geological Survey of Western Australia
JCMWA Journal of the Chamber of Mines, Western Australia
KM    Kalgoorlie Miner
LMA   London Metropolitan Archives
MC    Malcolm Chronicle
MDAR  Western Australia Mines Department Annual Report
MH    Morning Herald
MRGM Co Ltd Merton’s Reward Gold Mining Company Limited
MRSEL Mining Reports of the Stock Exchange of London
NCH   North Coolgardie Herald
N-S  direction of strike (trend) of veins or other geological features
NSW  New South Wales
RC    Reward Claim
SROWA State Records Office of Western Australia
Trans IMM Transactions of the Institute of Mining and Metallurgy
USA  United States of America
WA   Western Australia
Units of Measurement and Conversion Factors

Original units have been used throughout this document. Gold was measured in Troy weight as fine ounces (oz), pennyweights (dwt) and grains (gr).

1 acre = 4840 square yards
= 0.404 685 6 ha

1 chain = 66 feet
= 22 yards
= 20.116 8 m

1 foot (ft) = 12 inches
= 0.3048 m

1 gallon = 4.546 09 x 10^{-3} m^3

1 grain (gr) = 0.041 667 pennyweight
= 0.064 798 918 g

1 inch (in) = 25.4 mm

1 mile = 1760 yards
= 80 chains
= 1.609 344 km

1 ounce, Troy (oz) = 20 pennyweights
= 480 grains
= 31.103 477 g

1 oz/long ton = 30.612 24 g/t
1 oz/short ton = 34.285 71 g/t

1 pennyweight (dwt) = 24 grains
= 1.555 173 8 g

1 dwt/long ton = 1.530 612 g/t
1 dwt/short ton = 1.714 286 g/t

1 ton, long = 2240 pounds
= 1.016 047 t

1 ton, short (U.S.) = 2000 pounds
= 0.907 185 t

1 yard = 3 feet
= 0.9144 m^3


Currency:
1 pound sterling (£1) = 20 shillings = 240 pence
1 sovereign = £1 as a gold coin
Acknowledgements

The research presented in this thesis would not have been possible without the permission and co-operation of the owners of the mining tenements which cover the old Merton’s Reward gold mine, originally Ashton Gold WA Pty Ltd and currently Navigator Resources Ltd. Particular thanks are due to Ian Walker of Ashton Gold, who first set me on the path of researching and assessing old gold mines, and to Tom Sanders at Navigator for generously granting me access to all available information on Merton’s Reward, both historical and recent exploration results generated by the various companies who have held the leases in the last twenty years.

In researching public and archival records I would like to acknowledge the considerable assistance received from the staff of several institutions. In Perth these were the Battye Library of Western Australian History, the State Records Office of Western Australia, the Department of Mines and Petroleum Mineral House Library and the old third floor Survey and Mapping Division of the former Department of Mines: in London the Guildhall Library, the London Metropolitan Archives, and the Geological Society of London: in Sydney the State Library of New South Wales, in Melbourne the University of Melbourne Archives and in Beechworth the Burke Museum. I also received assistance from the libraries of the University of Western Australia, Murdoch University, the School of Mines (Kalgoorlie) branch of Curtin University, Imperial College (London) and the Kalgoorlie branch of the Chamber of Mines and Industry.

I am particularly grateful to Richard Hartley whose knowledge of mines and technical personnel in the period covered by my thesis, and generosity in sharing it, knows no bounds. My thanks also to Bill Staunton and Greg Wardell-Johnson, formerly of the Gold Group based at Murdoch University, who cheerfully checked my metallurgical mathematics and ideas, to Frances Hammond who drew the saddle reef and to my son Tom Chappell who assisted in re-sizing and printing the large-scale mine plans.

I would also like to express my gratitude to Murdoch University, and in particular the School of Social Sciences and Humanities, for giving me – a geologist – the opportunity to undertake a research degree in history, albeit mining history. I am
particularly indebted to two people – Lawrie Davidson and Lenore Layman. Lawrie, as Associate Professor in the Extractive Metallurgy Programme, initially supported my application and directed me to Lenore as a possible supervisor. Through the years, he has never failed to give support, even viewing as a learning curve his extensive ‘repair’ work on the mine plans, the digital re-drafting of Figures 4.1, 4.2 and 5.3 and annotations to Figures 4.3 and 5.1. He also assisted in the final collating of the thesis. I am extremely grateful.

But my greatest debt of gratitude goes to my supervisor, Associate Professor Lenore Layman. Gradually she cajoled me into learning to write the type of history required at this level. If I have succeeded the credit is all hers; if I failed the blame is all mine for not following her advice closely enough.