Is There An Optimum System?: The Recording and Assessment of Historic Mining Sites

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Dr. Ritchie's paper concerns the recording of mining sites in New Zealand and some of the problems raised in this process. He outlines the major difficulties encountered when recording such sites, since an understanding of these matters is essential if the methodology and theoretical perspectives associated with the 'archaeology of mining' – as well as the recording of mining sites - are to be improved and developed.

The routine recording of historic archaeological sites in New Zealand has been undertaken since the mid 1970s. Prior to that, since the inception of the national site recording scheme (established by New Zealand Archaeological Association in 1959), only Maori sites were recorded. To date, a total of 44,000 archaeological sites have been recorded, of which just over 6,000 are historic - that is, they are identified by historic codes on the computer register. Probably less than one hundred are associated with events predating 1850.

Approximately 3,500 (58%) of the recorded historic sites are associated with goldmining, the majority being located in the three main mining areas of New Zealand, i.e. the provinces of Westland and Otago in the South Island, and the Coromandel Peninsula in the North Island. Table 1 is a summary of the principal goldmining surveys and the numbers of mining sites recorded in the main mining areas in New Zealand thus far.

The recording of goldmining sites has proceeded apace over the past decade: some fifty surveys have been conducted of all or parts of goldmining areas in New Zealand, and at least twenty predominantly pre-European site survey reports also document mining sites. It is, however, apparent with the benefit of hindsight, that the standard of recording mining sites has been both variable and inconsistent. This is not surprising. Site recording by its nature involves an element of experience and technical knowledge: few site recorders can claim great familiarity with mining sites in more than one or two regions, and sometimes the relative disposition of the mining features is not particularly clear during fieldwork.

Table 1: Principal goldmining surveys

Goldmining % of all sites in area	number of recorded goldmining sites	number of specific goldmining survey reports	% of total recorded historic sites in area
Otago/Central Otago 53%	2200	18	80
West Coast 80%	600	8	80
Hauraki 11%	400	7	70
Nelson/Marlborough 11%	175	6	80?
Southland 7%	65	7	42
Other Areas	50	2	
Totals	**3490**	**48**	

Because of the amount of goldfield site-recording undertaken in New Zealand to date with perhaps 70 percent of all goldfield sites having been recorded to some extent, and already cited in site and other reports, it is difficult at this stage to turn back the clock or make the associated site records more internally consistent. We should, however, be aware of the problems so they can be more adequately addressed in future.

Many of the difficulties stem from the fact that the recording of historic sites is a relatively recent development: unlike the recording of pre-European sites, the process has not been thought out as thoroughly as for more traditional categories of sites, especially, for example, when the mining sites are recorded as part of area surveys.

It is likely that, in New Zealand at least, if we were beginning to record mining sites from scratch now, we would adopt a totally different approach to the job. This is partly because we have the advantage of hindsight and collective experience to draw on, but also because in the case of New Zealand the main agencies involved in site recording, the former New Zealand Forest Service and Lands and Survey Department, and the archaeology section of the New Zealand Historic Places Trust have since 1987, been unified into a single institution – the Department of Conservation. For the record, the major historic mining areas in New Zealand are, or were until recently, owned by the Crown.

To highlight some of the problem areas associated with the recording and assessment of mining sites I am in part drawing on my own seventeen years of experience in recording, assessing, and managing both alluvial and hard-rock mining sites. I would stress that I do not offer either a blueprint or ultimate solutions for goldfield site recording. Rather I hope that promoting awareness of some of the inherent difficulties may be of benefit to future site recorders and recording schemes, and help to avoid compounding existing problems.

Most of the difficulties associated with mining sites revolve around the fact that the field remains usually comprise groups of interrelated features. These are often extensive, and are associated with various mining episodes on the same reefs or alluvial deposits. Sometimes the

interrelationships are clearly apparent during recording, but in many instances they are not.

WHAT CONSTITUTES A GOLDMINING SITE?

Sites associated with goldmining come in many different forms. These include mines, shafts, drives, tunnels, costeans (prospecting trenches), alluvial and hardrock tailings, elevator ponds, dredge hulks of different types, river diversions, haulage sites and winding gear (including cableways, inclines, tramways, whims and windlasses), water races, pipelines, aqueducts, bridges, trestles and fluming, reservoirs, sludge channels, wing dams, a wide range of milling and treatment sites with an often bewildering array of associated machinery and structures, smelters, boiler, winding, power, and engine houses, assay offices, retort buildings, tracks, flying foxes, strong rooms, powder magazines, houses/huts, rockshelters, *whares* (*punga* and other plant material shelters), camp sites (European and those of other ethnic groups, notably Chinese), settlements, stores, hotels, brothels, Wardens Courts, School of Mines and cemeteries and undoubtedly many more. Many of these categories can and often are divided into sub-categories, e.g. the different types of alluvial tailing formations.

By the generally accepted definition of a site, each of the site types/features listed above are commonly recorded as individual sites during the course of surveys. Equally often, however, many of these same site types are lumped together on site records as one site. For example, races, reservoirs, and sluicing sites are commonly treated as features or components of the one site, using the rationale that they represent a functionally linked and inter-connected system. When alluvial mining sites/features are grouped, the flow of water is usually the unifying factor as determined from its derivation points (headraces from streams), down through storage (dams) and usage (various types of mining) to its final discharge (e.g. via a sludge channel into a river).

HOW SHOULD SUCH SITES BE RECORDED?

The recording of sites individually or in groups is partly due to the human factor, since people generally tend to be either 'lumpers' or 'splitters'. In fact, the archaeological problem is not that simple. It essentially depends on whether one regards discrete features as individual sites, or whether one treats spatially separated but related features as single sites. In a recent paper on the archaeology of mining in Nevada, Hardesty described the latter as 'feature systems'.[1] The difficulties associated with deciding what to include in a single site record are clearly apparent when one looks at a range of site records and survey reports produced by different people.

Some recorders lump sites during one survey, then split them on the next. Judging from some survey reports recorders may lump or split site components almost on a daily basis during the course of field recording; others routinely give the remains of habitations separate site numbers, possibly because they consider they have excavation potential, but lump virtually all nearby field evidence of mining into one or more megasites. Elsewhere there are recorders who tend routinely to lump alluvial mining remains into megasites, and give individual site numbers to virtually every mining related feature when they are documenting sites in hard-rock mining areas. The one thing that is consistent about mining site surveys in New Zealand (and I am sure that the problem is not unique to New Zealand) is that there is little consistency.

If I may descend further into whimsy, one wonders whether any given population contains roughly 50% lumpers and 50% splitters or whether one group predominates. The lumping or splitting of sites/features is not necessarily a major problem, but it is frequently of more than minor nuisance value. For example, depending on one's point of view it artificially inflates or understates site numbers, with corresponding difficulty in comparison of 'sites' in one area with those in another. For example, there are about 400 recorded mining sites associated with the Hauraki goldfield on the Coromandel Peninsula. In other areas of New Zealand, similar sites, notably mine adits, would have been grouped to produce considerably lesser numbers of sites, perhaps as few as 200. Elsewhere recorders have allocated one site number to a wide array of sites associated with mining in relatively close proximity.

The question of what constitutes a site has of course been addressed by many before me, and of course there are the legal and formal definitions. These include those in the New Zealand Archaeological Association Site Recording Handbook. Defining sites in areas where there is extensive evidence and many forms of occupation has been the plague of prehistorians for years, but generally the problem has been resolved by recording all or many of the features as one site, at least initially. The problem is, of course, not unique to the pre-European landscape. It is perhaps nowhere more relevant than in regard to historic sites. The pragmatic commonsense response is to call all the features that appear to be associated one single site. Lumping features which are perceived to be related or that are associated with the same historic event into one site is a practical response. The rationale or justification for doing it, however, is often somewhat nebulous since sites which exist in close proximity are not necessarily contemporary. To use an analogy, in some ways it is comparable to giving all the Maori sites *pa*, *kainga*, middens, pits or other in one bay or small valley the same site number, rather than recording them individually as is usually done.

People lump mining features together for many reasons, not the least of which is that it is easy to do. It also reduces the number of site records one has to compile. They may also lump because they consider that the associations or links between the various features are obvious. Perhaps they are hydraulically linked and therefore it is only sensible to record them all as one site.

The following case study from Bannockburn, Central Otago demonstrates that things are not always as they appear, especially when additional information from historic records, contemporary photographs or informants is available. In this instance, visible field remains consist of two mining dams of different size and appearance on a terrace. Three supply races feed into the dams and headraces lead from both dams to two different sluice workings. Between the dams there are the ruins of a mud brick hut. Many site recorders would automatically call it all one site, considering it an interrelated system consisting of the supply races, the storage dams, the headraces, the sluiced areas and the miners' dwelling.

Now I will reconstruct what happened according to information drawn from historic records and photographs. In 1866 a small party of miners obtained a miners' right to work a claim. They duly constructed the smaller of the two dams mentioned previously, and the shortest of the three supply races, and commenced ground sluicing. From day one they suffered water shortage problems, but, because they were the first on the scene, they did reasonably well and eventually sold out and moved on. Eventually a larger company, which had been buying up

claims in the area, moved in. Perceiving that more water would be needed for hydraulic sluicing they contracted the construction of the second dam and a second supply race, and started working the abandoned ground, thereby obliterating the evidence of the original ground sluicing. They also opened up a second sluicing area, working it in a different manner from that employed on the other area. The mud brick hut erected by the original party appears by this stage to have been ruinous. The company miners lived in a nearby settlement and travelled by horse to the site each day. Failing to do well, the company abandoned the claim within a year and moved their plant to an adjoining claim in a gully nearby. Here they utilised the race they had contracted for the claim they had just abandoned, and built a new race to augment their water supply. Meanwhile the original claim was occupied by a party of locals who extended the third existing race, and put in additional headraces so that they could supply water to either working from either dam.

The purpose of the above narrative is to illustrate that what seemed a straightforward interrelated and contemporaneous system on the ground was in fact the product of the efforts of three different parties over several years. Knowledge of the historical background makes clear that there were three different episodes of activity and construction. In this instance since it is known who built each component they could have been recorded as three or more sites. Most archaeologists, I suspect, would have recorded the various mining features as one site on the grounds that each period of mining activity was in effect just building on the original system. Thus the final product, the site as it appears now, is presented as an interconnected system. Alternatively, some may have recorded the features as two sites because they occupy discrete geographical locations, a terrace and a gully, the latter being separated from the terrace by a prominent ridge. The latter option follows the 'ease of site relocation' philosophy enshrined in the New Zealand Archaeological Site Recording Scheme. Either option is valid, of course, but at the very least the historical information about the evolution of the system or site as it is today should not be ignored when sites or their limits are defined.

Those who are familiar with the mining history of specific regions will be aware of other examples of alluvial or hardrock mining sites which at first glance appear to be one interconnected contemporaneous system but in reality were not the product of single events or of one party's activities. Rather, they evolved as a result of a succession of mining operations on the same claim.

It is part of an archaeologist's job to decipher these developments if one can. But deciphering should not rely on historical records alone. The sites or features themselves should not only be documented but also analysed with a critical eye at the time of recording. Pattern recognition and comparative analysis is the very essence of archaeology. Too often it is neglected when archaeologists record mining sites, so that possible chronological or technical differences in construction and layout are not defined. Returning to the example just quoted, the two dams were of different size and construction. These differences should be clearly detailed on the site record forms.

Now let us look at splitters. What would happen if the same features, the three supply races, the two storage dams, the two areas of workings, and the hut site were in thick bush or impenetrable gorse or briar, and the links between them were not obvious? The chances are that each of these major features would be given a separate site number, or they would be grouped in combinations which would result in more than one site record. This is in part due to the fact that many recorders allocate field numbers as they record various features in the field. Later, when they type up the record forms, they simply convert these numbers directly to site record numbers, without giving much thought as to the inter-relationships of individual features, and which, if any, should be recorded as sites in combination with each other.

To take splitting a step further. I have mentioned one reason why site recorders split sites. Perhaps the links between them have been obliterated by ploughing or some other process, or are obscured by physical obstacles such as trees or scrub. Another reason for splitting sites is related to the size and the known or likely density of sites in the area they are surveying. There is a natural human tendency when recording on vast open landscapes to create megasites; to lump rather than split site features. This is not only because the mining features and their physical interrelationships are highly visible, but also because the job ahead is obviously a big enough task already without the complication of creating any more sites than one has to.

On the other hand, when archaeologists are recording sites on relatively small land parcels, especially if sites are few and far between, there is a equal tendency to upgrade discrete features to sites, perhaps to maximise site numbers. This trend towards splitting as opposed to lumping seems to come to the fore in mitigation situations. Several reasons can be advanced to explain this phenomenon. Recording the main features individually makes it easier to highlight or identify significant sites. Second, in situations where recorders know in advance that large numbers of sites will eventually be destroyed, as, for example, when recording the sites in a future hydroelectric dam reservoir, or in areas scheduled for forest clearance, there is a tendency to maximise the number of individual sites rather than lump them. This is probably because it gives a more graphic impression of the impact of a particular project if one states it is going to destroy, say, 75 sites, than saying it will impact parts of fifteen sites where those fifteen megasites have been created by recording them as such. A third factor is an understandable concern by archaeologists to create an impression that they are doing their job. If someone is paying big money to have sites recorded in a particular area, recorders, if not their clients, feel better if they have logged a fair few by the end of a recording project.

It is also easier to hold discussions with non-archaeologists, for example engineers, if one is talking about whole sites rather than sites as individual components of extensive systems and perhaps it is also easier to write them off. The relevant site records can be quickly amended and a note made that this site (dam, race, etc.) was obliterated by road construction or whatever on whatever day it happened. If the site in question was a component of a larger system its functional relationship to other sites should also be apparent and the site record form modified accordingly.

In New Zealand, another reason for recording extensive multi-feature sites in smaller units rather than creating megasites relates to the ground rules or objectives of the New Zealand Archaeological Association Site Recording scheme. One of the primary objectives of the scheme is to record sites in such a way that their location can subsequently be easily and unambiguously identified. With regard to mining sites this is often facilitated by giving contemporary but spatially separated components of the same mining company's operations different site numbers and thus different grid references: it is more than likely that the mine, mill, refinery, and powerhouse operated by a single mining company are located some

distance apart, and hence require individual map references.

Perhaps the best rationale or justification for recording major components as separate sites is that it facilitates comparative research. For example, someone studying the construction of mining dams in various parts of the country could theoretically get a printout listing all the recorded mining dams and draw out the appropriate site records. That would be difficult to do at present because many mining dams are recorded as components or features of goldworkings or alluvial mining sites or other megasite groupings.

The points I have tried to make in this discussion are, first, that there is no correct way to record mining sites; second, it is not easy to set hard and fast rules about what constitutes a mining site; third, it seems necessary to have the flexibility to decide whether to combine multiple site features into one site record or record them separately.

I have been recording mining sites for over fifteen years during which I have done my share of both lumping and splitting – although I know that a few of my colleagues think I am a rabid splitter. I do not deny that I am inclined towards splitting rather than lumping because I believe it is easier both to locate and to compare sites if they are recorded in discrete units rather than in masses. On the other hand there are many recorders who are perhaps too inclined to create megasites; driven, I suspect by the understandable desire to avoid having to compile too many site records.

I have, in short, attempted to analyse the reasons why people tend to maximise or minimise site numbers in the course of recording. At this stage, with a large proportion of the historic mining sites in New Zealand recorded, it seems almost too late to establish more specific guidelines for recording mining features, particularly in regard to what features should or may be considered one site and recorded as such. In fact it is never too late to establish at least some general guidelines. There are still sites to be recorded in New Zealand, and we know from hindsight that the record of many of those that have been recorded is inadequate, and there are many more mining sites elsewhere in our region. It is not my intention or desire to ram my opinions about what constitutes a site down the throats of others, but recorders need to be aware of the consequences of how they record mining sites, especially in terms of retrieving data from the site recording scheme.

Regardless of whether mining sites are recorded as single multi-featured interrelated megasites or on a feature by feature basis it is essential to document the known or inferred physical and historic linkages between them if they are apparent. Goldmining sites, regardless of how they are defined, consist of groups of interrelated features. This aspect is notably deficient in most earlier New Zealand goldfield survey reports. It has markedly improved since, partly because of more thorough historical research.

Three major factors affect how mining sites are recorded. First, the reasons why they are being recorded. Second, the resources available for the job such as the level of funding, the time frame for the fieldwork and report writing, the amount of background research that can be done or is available to the recorders, and the level of experience of the recorders or researchers. Third, the extent of the survey area, particularly whether mining systems in their entirety are encompassed. For example, a riverbank survey or a survey limited to the area to be actually flooded by a proposed hydroproject is likely to encompass only a portion of one or more extensive multifaceted mining sites.

Mining sites are usually recorded for some or all of the following reasons: resource management, resource protection, public education and interpretation, and mitigation purposes. In the past, particularly with regard to the smaller mining locations, they were documented in the course of wider area surveys of predominantly pre-European sites. Mining sites have seldom been recorded for purely research reasons, although original research over and above basic documentation has been achieved on a few of the better funded projects. Each of the reasons I have cited for recording mining sites has a bearing on how they are recorded. The manager may be principally interested in ascertaining which sites should be preserved in the longer term, for example identifying key or historically significant sites. Those concerned with interpretation are often more interested in a site's public interpretation potential rather than its significance. In fact this is often how they are assessed.

The funders of mitigation archaeology, including modern mining companies, are more concerned about getting a clearance for their project than how the sites are recorded, but one would expect the archaeologists involved to be cognisant of the fact that the record they make of the threatened sites may be the record of the sites in question for posterity given that they are likely to be destroyed in the not too distant future.

Whatever the reason for recording sites, the expertise and experience of the recorders and researchers (more often than not the same people) is undoubtedly the greatest determinant of the quality of the site records and the report. As in most things there is no substitute for experience in the field, together with a good technical knowledge of both the history, development, technology and machinery involved, and the socioeconomic role of the industry both locally and nationally. While this, of course, is true of archaeologists working with all industries, it is by no means always the situation. Some archaeologists, for example, are well versed in alluvial mining features and history, but are totally out of their depth when describing the technologies reflected by onsite relics on quartz reef gold mining sites - and vice versa. One would expect mining site recorders to be able to provide a good technical description of the remains on a site, if not actually capable of producing good measured drawings. In this regard I believe we should be compiling a national inventory of significant pieces of mining machinery, past and present, on sites and other locations as is being done in Victoria, and possibly elsewhere in Australia.

To answer my opening query, 'Is there a right system for recording mining sites?' I believe, for the reasons outlined above, that the answer is 'No'. There is a need for a system with the flexibility to record extensive multi-feature functionally related sites as megasites, as well as to highlight individual sites by recording them separately or in smaller clusters. Regardless of the precise system, the emphasis should be on the identification and defining of functional, cultural or historical linkages and the compilation of site records and reports which clearly demonstrate the linkages.

There is of course more to a site than the structural remains, a fact often overlooked by those employed to document sites for management and interpretation purposes. Too often they concentrate on structural remains, and, through lack of knowledge or lack of concern, provide minimal descriptions of other evidence of material culture and its context.

As Ian Smith has addressed elsewhere in this volume, there remains a need for greater theoretical and problem solving input into historical archaeology, and the

archaeology of mining sites is no exception. If sites are recorded within the context of a research strategy or what can be termed a questioning framework, it may influence how they are recorded and should generate new anthropological information. On the other side of the coin, however, many of those who call loudest for a greater concern for method and theory in historical archaeology frequently fail to deliver the very goods they call for in their own publications and reports. They also suggest avenues of inquiry for which archaeology is poorly suited. The fact is that in reality few people write in a totally theoretical and methodological vacuum. The theory and method in publications is often implicit rather than explicit. Nonetheless I am not trying to excuse the absence of such frameworks in a fair number of mining site recording projects. Few advances would be made in archaeology without new and questioning theoretical and methodological perspectives.

SITE SIGNIFICANCE

Much has been written on assessing the significance of sites, and many site-ranking systems have been developed in New Zealand and overseas, especially during the decade 1975-1985 when the subject was a hot issue. Ranking systems are invariably established or adapted to achieve specific management, research, or preservation objectives.[2]

Until relatively recently most ranking systems have involved attempts to evaluate various factors such as a site's architectural, historical, or archaeological significance. This is often done by giving them numerical values in order that the sites can be grouped into distinct priority categories. While there is still a need for such systems, for example, where many sites are threatened simultaneously or repeatedly such as by forestry operations, today there is a trend, and I believe a wise one, away from formal ranking systems. The complexities inherent in historic resource evaluations and the number of other factors that must be considered in establishing preservation priorities do not lend themselves either to simple numerical formulae nor the ranking of sites in isolation. I would argue that a reasoned assessment, based on a case-by-case evaluation and comparison of like historic resources, provides a more accurate and practical evaluation of the significance of individual sites or thematically linked groups of sites. This provides a more realistic basis for planning and prioritising anything to do with them, be it site development, restoration, protection or research.

Despite their differences, in practice most ranking or assessment systems have many factors in common and reflect a wide appreciation among cultural resource managers of what aspects are important. The criteria for ranking historic industrial sites in New Zealand are not formalised, but are generally similar to those used by the United States National Register and other overseas agencies. Today the notion of preserving a representative sample of an area's archaeological and historic resources is paramount, that is, aiming to preserve both major and minor sites associated with particular human activities in different areas and periods rather than merely identifying the most spectacular and unique sites for long term preservation.

In a recent survey undertaken by myself and assisted by Peter Douglas, of two of the main subfields of the Hauraki goldfield on the Coromandel Peninsula: the areas centred around Thames township and the Ohinemuri River between Waihi and Karangahake. I adopted a ranking system which, while not formalised, drew on the collective wisdom of historical precedents and considerable personal knowledge and experience of historic goldmining sites throughout New Zealand.[3] Each site was evaluated in terms of two all embracing major values; *historical significance* and the *potential for interpretation development*.

Historical significance was assessed principally on an evaluation of the site, industry, or company's local, regional, or national impact during its heyday and aftermath. Factors such as representativeness, rarity, scale, productivity, longevity, technical and engineering innovations, socio-economic impact and influential personalities were also important elements in the evaluation. Information on these assessment criteria was derived from documentary accounts, field observations and archaeological information, and the memories of living informants.

In addition to assessing each site's historical significance, a number of factors were taken into consideration when assessing their potential for the development of interpretation to the public. These included their condition, configuration and integrity, proximity to related sites, their role within an historic landscape or complex, local relevance, archaeological research potential, and present and potential accessibility to the public. Many mundane sites, such as mine adits, individually have minimal historic significance or potential for interpretation but are vital components of historic landscapes, and serve as important linkages. In other words they assume elevated significance when viewed holistically. The overriding concern was the maintenance of a good representative sample of the full spectrum of site types associated with the early goldmining industry in the areas in question. For the sites that are deemed to be most significant, a specific case has been made for their preservation or their interpretation potential has been highlighted in the survey report.

Both prior to and during the course of the survey the question arose as to what should be defined as a site. To understand the methodology adopted one needs to know something of the nature of the sites. In the Thames area the predominant site types now are literally hundreds of adits or drives driven into the bush-clad hills behind the town and a range of discrete mining-related sites, notably deep shaft and pumphouse sites in Thames itself. As there is now relatively little left on the sites in Thames they presented few problems in terms of field recording, but the adits were a different story. Most were excavated by early parties or by companies which bought up and consolidated many of the smaller claims in the two decades following the proclamation of the Thames goldfield in 1867. In most instances it is impossible to accurately state who drove each adit and when it was driven. The only certain feature was that geologists had mapped the main reefs in the area and we were able to say with a fair degree of certainty which reef system the adits were driven on to. As a consequence of this situation each site record describes distinct clusters of adits which have been driven on to particular reef systems and which lie within the boundaries of specific consolidated claims. While the Thames adits were thus grouped into functional and geological units, elsewhere on the Coromandel other site recorders have given every adit they have recorded a separate site number. The number of recorded mining sites on the Coromandel would be decreased markedly if the adits on other parts of the Peninsula were recorded as functional clusters rather than individually.

The sites in the other area we surveyed have a totally different character to those around Thames, and ideally should have been the subject of a separate recording project. The Karangahake-Waihi mines, with the

exception of the Waiuta mine on the West Coast, were the predominant hardrock gold mines in the country. There are substantial structural remains of the mine sites, batteries, powerhouses, and auxiliary features of the five largest mines, namely the Martha, Talisman, Grand Junction, Crown, and Woodstock mines. Here we gave each major facility a separate site number on the grounds that they are geographically separated, each facility was substantial, and the primary purpose of our documentation was for long term management and public access and interpretation purposes. Furthermore many of the sites are nationally significant in their own right. These comprise the following:

1. The Martha mine which operated from the late 1880s until 1952 (and has since been reopened) was New Zealand's premier hardrock goldmine having produced something like six times the output of the next most productive mine, the Blackwater mine at Waiuta on the West Coast;

2. The Martha Goldmining Company (G.M.C). operated three batteries, one of which, the Victoria battery, had 200 head of stamps, substantially more than any other in New Zealand. The company's three mills operated a total of 330 head of stamps. I am aware of only one other goldmining company in the world that operated more stamps simultaneously. In 1905 the Company (then the Waihi G.M.C.) employed 1400 men to transport the ore and operate the three mills alone.[4]

3. In 1889 the Crown G.M.C. was the first in the world to trial the cyanide process on a commercial scale. The process so greatly enhanced gold and silver recovery rates that most other gold recovery processes were rendered obsolete. The method was adopted by mining companies all over the world.

4. The Talisman G.M.C. ranks as the third greatest gold producer in New Zealand. There are substantial field remains of its activities amid regenerating bush on the site, and also those of the Woodstock G.M.C. which the Talisman Co acquired in 1904. One of the most spectacular is a massive underground pumphouse and shaft site constructed by the Woodstock Co. within the narrow confines of the Waitawheta River gorge.

The Karangahake-Waihi mills were considerably more efficient and innovative than those on the Thames goldfield and most of those elsewhere in New Zealand. Ironically, despite their historical significance and considerable structural remains there are relatively few technologically significant items of mining machinery left on the sites.

One of the reasons I avoided using a numerical ranking system for the sites recorded during the Thames Ohine muri survey is that these areas represent only a small portion of the greater Hauraki goldfield. If sites are to be ranked for management purposes, it should be done at a regional or goldfield level rather than in smaller units or subareas.

With the completion of the Thames Ohinemuri survey, recording of the main historic mining areas on the Coromandel Peninsula is now virtually complete, and we are now in a position to begin to rank them objectively for particular purposes, e.g. selecting sites for public interpretation. There are many combinations of possibilities in this regard which need to be evaluated, as well as a proven market. A survey commissioned by the Department of Conservation in 1988 revealed that about 21 percent of the visitors to the Coromandel are principally interested in visiting historic sites, a high percentage considering the broad recreational spectrum that the Peninsula affords.

I will conclude, perhaps as I should have started, by putting goldmining in New Zealand into economic perspective. Other than agriculture, which did not really flourish until the advent of refrigeration in the 1880s, gold mining was the predominant industry until about 1910 in terms of total value of production, export receipts, and numbers employed. The alluvial goldrushes of the 1860s put New Zealand on the world map, but it was investment associated with the later hard rock mining boom which provided the real economic development.

But like most non-replenishing extractive industries the high returns could not last. With the exception of a brief boom in the 1930s, gold production in New Zealand declined steadily until the last decade or so. The industry has recently undergone a major revival, the peak of which now seems to have passed. Despite goldmining's declining fortunes in the twentieth century, it was a major and innovative industry in the nineteenth, and perhaps more than any other has made an indelible mark on the landscape and character of many parts of New Zealand. This is reflected in the large numbers of mining sites that have been recorded to date. Archaeologically, there is a lot more that can be done than merely recording site remains, but the production of good, comparable and detailed site records is an important first step as it provides a critical platform to build upon.

NOTES

1. see Hardesty 1988:9.

2. for example, see Challis 1976; Coster & Johnstone 1975; Davidson 1971; Greenberg 1976; Hardesty 1988, 1990; Jones 1981; Lipe 1974; McGimsey & Davis 1977; Moratto & Kelly 1976; Otago Goldfields Park 1976; Parker 1977, Schiffer & Gumerman 1977; Sullivan & Bowdler 1984; Tainter & Lucas 1983.

3. Ritchie 1990.

4. see Thornton, 1982:73.

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APPENDIX 1 – Goldmining Surveys and Related Goldfield Histories. A List compiled by Neville A Ritchie, September 1990.

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ADDENDUM

Since 1990, HAMEL, J. has completed eight further goldfield surveys in Otago and Southland.