78 South, 166 East: Archaeology in the Ross Dependency, Antarctica

NEVILLE A. RITCHIE

The objective of this paper is to outline archaeological work and problems associated with the management and maintenance of the historic huts in the Ross Dependency, Antarctica. New Zealand, through its agent the Department of Scientific and Industrial Research Antarctic, is concerned about the maintenance of the historic sites in the Dependency, because of their historical significance and its desire to comply with the provision of the Antarctic Treaty which requires all territorial claimants to maintain the historic 'monuments' (as they are called) in their territory. The author is employed by the Department of Conservation.

INTRODUCTION

New Zealand has territorial control over the Ross Dependency (Fig. 1), which is recognised as one of the more climatically and environmentally favourable parts of Antarctica. The Dependency and the Antarctic Peninsula contain the lion's share of the two per cent of the Antarctic landmass which is snowfree most of the time.

Within the Dependency there are nineteen historic sites, in the form of living and storage huts, the associated artefacts, rock shelters, provision depots, and historic cairns or markers. The sites were created by five British polar expeditions between 1899 and 1917, and the Norwegian Amundsen's expedition (1911–1913).

Although nineteen sites is not a large number, those within the Ross Dependency represent the highest density of historic sites on any part of the continent. There are only fifty three ratified historic sites on the whole continent (which is larger than the United States and Australia combined) and the number is unlikely to increase dramatically.

Most of the historic sites on the continent result from early polar explorations prior to 1917. This era, known as the Heroic Age of Antarctic exploration, is widely recognised as having pre-eminent historical significance. It is characterised by well documented feats of human endurance and courage in the face of formidable odds.

A partial explanation as to why the Ross Sea/McMurdo area was favoured by the early expeditions lies in both history and geography. The area was explored relatively thoroughly by the British James Clark Ross expedition in 1841–1842. Although he reported that southward navigation was blocked by the mass of the Ross Ice Shelf, the Sound and ice shelf, in effect, provided an opening into the interior of the continent. This understandably appealed to the later polar explorers because it decreased the distance they had to trek overland to the Pole, which was the main objective of all but one of the expeditions (even after reaching the head of McMurdo Sound, the Pole was still another 1280 km [800 miles] to the south).

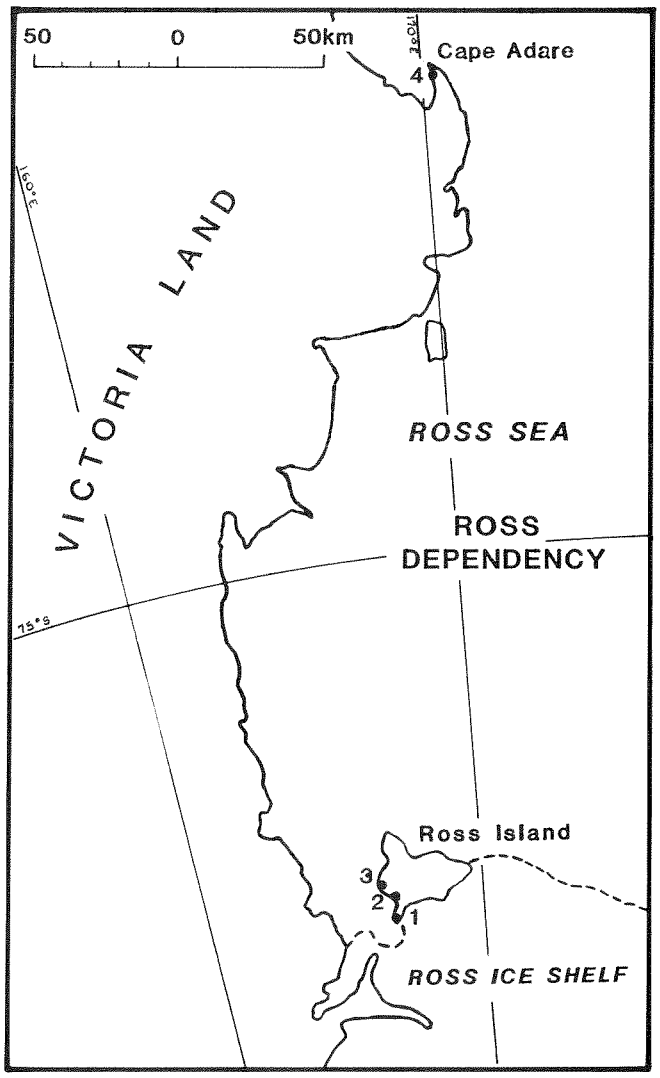

Fig. 1: Historic Sites in the Ross Dependency. 1 Hut Point, 2 Cape Evans, 3 Cape Royds, 4 Cape Adare.

THE SITES

Within the Ross Dependency there are four expedition base sites of exceptional historic merit.

These are the living and storage huts at Cape Adare built by members of the 'Southern Cross' expedition led by Carsten Borchgrevink (1899–1900), the first to overwinter in Antarctica.

A substantial hut on Hut Point, Ross Island built by Captain R.F. Scott's 'Discovery' expedition was used for storage and entertainment initially, and as a staging base by the later Scott and Shackleton expeditions. The

prefabricated hut was constructed in Melbourne and exhibited there before being taken south by Scott. Painted colour-coded marks on the panels are clearly visible today; in fact, due to weathering they stand in raised relief.

The third significant site is the overwintering hut at Cape Royds built by Ernest Shackleton's 1907–1909 'Nimrod' expedition (the base for their aborted Pole attempt). It was used again between 1914–1917 in the course of Shackleton's transcontinental exploration – the ill-fated 'Aurora' expedition. Scott's hut at Cape Evans established during his 1910–13 'Terra Nova' expedition is the other important site. Although Scott reached the Pole (after Amundsen), he and his companions succumbed on the return journey. The hut was later used by members of Shackleton's 1914–1917 'Aurora' expedition.

Unfortunately, no evidence remains of 'Framheim', the base-camp established on the Ross Ice Shelf by Roald Amundsen, the Norwegian who beat Scott to the South Pole in 1911. The Scandinavian huts, having a traditional upstairs sleeping quarters, differed from those of the British expeditions which were all on one level.

POST-ABANDONMENT HISTORY

After abandonment the various expedition huts deteriorated and gradually filled with snow. The sites were not visited for some thirty five years and were unmaintained for nearer fifty years. About 1960, however, this situation was to change. Shortly after the establishment of the New Zealand scientific research station, Scott Base, in 1957–1958, the New Zealand Antarctic Division established a Historic Sites Management Committee and turned its attention to restoring the more accessible historic huts and protecting the associated relics.

During the summer of 1960–1961 the Cape Evans and Cape Royds huts were restored, largely by volunteers, as was Scott's hut at Hut Point in 1963–1964. Restoration involved clearing the huts of ice and snow (major jobs), retrieving and listing relics, restoring the huts as far as possible to their original appearance, making them weatherproof, and clearing the hut environs of rubbish. Incidentally, the term 'hut' is somewhat of a misnomer, although its usage is well established; each structure is more akin to an open-plan house with bunks for between twelve and twenty-four men.

Commencing in 1970 and continuing until 1985–1986, the New Zealand Antarctic Society provided two volunteers each summer to 'caretake' the three huts on Ross Island, i.e. those at Hut Point, Cape Evans and Cape Royds, on behalf of the Antarctic Division. As the remote Cape Adare hut is seldom visited, it has had relatively low priority in terms of restoration, but some preventive maintenance was carried out in 1974. A major restoration exercise planned for the summer of 1986-1987 had to be postponed because of transport problems.

By the mid seventies, restoration and maintenance had progressed, the number of people having access to the huts had increased, and previously unforeseen problems, particularly concerning artefact conservation but also structural, were becoming all too apparent. The Historic Huts Management Committee decided it was timely to review the management regime. This culminated in a report titled 'A Strategy for the Preservation and Management of Historic Sites in the Ross Dependency'.

The Management Committee also accepted that there was a very real need to adopt more long-term goals and management strategies and to utilise modern, all be they costly, conservation techniques, if the huts and their contents were going to be preserved for as long as practically possible.

Specialists in artefact and historic building conservation were called in for the first time. It was on this basis that I was invited, along with Alexy Simmons and two carpenters, to participate in the 1986–1987 season, and again in the 1987–1988 season, with Chris Cochran, a Conservation Architect, employed by the Ministry of Works Department, and Nelson Cross, a historic buildings restoration specialist, employed by the Department of Conservation (see postscript).

During these two seasons (i.e. 1987 and 1988) the work schedule involved two main types of chores: structural repairs and measuring and evaluation for future structural repairs; and undertaking small archaeological excavations, and recording and assessment tasks related to the long-term maintenance of the structures, their contents and their historic integrity. The work is also a precursor to the development of more formal management plans for each site. Much of the work to date has been practical responses to immediate problems.

A key tenet of the management strategy is that the huts and their contents will be maintained for as long as practically possible in Antarctica, despite the uncompromising nature of the environment and the conservation difficulties. The policy accepts, particularly with regard to some artefact types, that we are caretakers of a diminishing resource. So it is necessary to adopt strategies to prolong the longevity of the artefacts or to maintain the illusion of their presence. I have proposed a three-facet strategy involving preventative and remedial conservation measures, replication of some items, and the permanent transfer of a representative range of items to controlled atmosphere facilities in Antarctica and New Zealand. The specifics are detailed in my 1988 report to the Antarctic Heritage Trust.

SPECIFIC CONSERVATION PROBLEMS

A notable feature of the huts is that each has a unique character and different conservation problems. This will be more evident now as I outline some of the major tasks undertaken in the 1987–1988 seasons.

Hut Point

The main structural work at Hut Point was undertaken in the 1986–1987 season. It involved securing a large section of collapsed ceiling which was resting on and gradually crushing an internal partition composed of empty plywood provision cases. The 'wall' had been erected by members of Scott's 1910–1913 expedition to create an inner living and cooking area within the main structure, when they were compelled by circumstances to overwinter in the hut with virtually no supplies and limited survival equipment. It is planned to leave the fallen section at its present level, that is, as it was when the hut was occupied after 1911 (since the rest of the contents of the hut represent this latter phase of the hut's usage).

The proximity of fuelling facilities and a vehicular track associated with the United States McMurdo base is an on-going concern with regard to the long-term retention of Scott's hut at Hut Point. In 1988–1989 a meeting was convened with United States personnel concerning the establishment of a historic precinct around the hut. The first step in this process involves closing an ice-transistion vehicular access (which by-passes the hut), and the gradual removal of fuel tanks and pipelines which are presently located near the hut. While the Americans were sympathetic, for economic reasons it will be some time before this essential element in the preservation strategy is achieved.

During the 1988–1989 season Vince's Cross, a monument to a member of Scott's 1901 expedition, was

repaired and re-erected. The cross had been uprooted and broken in half during a blizzard that winter.

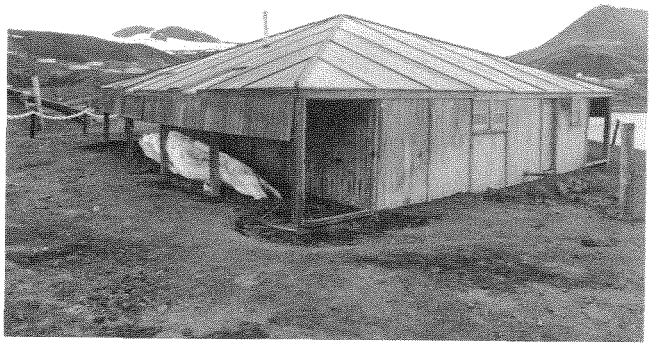

Fig. 2: Scott's 1902-1904 hut at Hut Point, Ross Island. The prefabricated hut, modelled on an Australian outback design, was erected in Melbourne before being taken to Antarctica.

Cape Evans

The major job at Cape Evans for the two seasons of 1987–1988 and 1988–1989 has involved assessment and resolution of problems resulting from snow accumulation against the southeast wall of the hut within the collapsed remains of the 1911 stores annexe. Every year in December-January the snow melts, and melt-water ponds within the trough-like remains of the annexe. Eventually some of it seeps into the interior of the hut causing dampness, high humidity and associated deterioration problems. Short of total reconstruction of the annexe and hence its weatherproofing (which may be financially feasible at a later date), the only practical immediate remedy was to remove all or part of the structural remains of the annexe to decrease the entrapment of snow and melt-water. Obviously, the removal of any part of the annexe takes away a portion of the original fabric which is undesirable, but in this instance, the work was considered necessary to improve the micro-climate and conditions for artefact conservation within the main structure. It was proposed to undertake this work during the summer of 1987–1988 as a systematic excavation and recording project. It constituted the major task during the 1988 season.

The job itself was quite straightforward in theory but proved a bit more difficult in practice. The plan was to remove the collapsed wall of provision cases (salvaging the Colmans Flour boxes which formed the wall in the process), then systematically record and recover any objects below the fallen wall, and finally excavate shallow trenches to drain melt-water away from the structure. After clearing some three metres of snow off the boxes we found they were tightly packed and virtually welded together with ice. Furthermore, the box wood had in effect freeze-dried and become so brittle that it was extremely difficult to remove the boxes without breaking them, despite working slowly and methodically and using all the techniques and technology at our disposal. In the end we had to resort to taking them apart board by board and reassembling them.

In my opinion, there is no optimum method of excavating in ice and snow. The methodology has to vary depending on whether one is working inside or outside, on the clarity or hardness of the ice, the likelihood of artefacts being present, the inferred age of the ice, the nature of the

Fig. 3: Scott's Hut at Cape Evans, Ross Island, January 1987.

area being excavated, on time available and other physical constraints like the equipment available. Of necessity, there has to be an element of trial and error. Usually the limitations of a particular technique are not apparent until some damage has been done. Another difference in comparison with ordinary terrestrial archaeology is that one is often involved in recovering items which are clearly visible on or above the ground surface but are permafrosted or frozen *in situ*. In these instances, the work involves freeing the objects from the surrounding ice mass without damaging them, and documenting spatial relationships.

There are two main means of excavating in ice and snow or permafrosted ground. They are dry or mechanical techniques and wet techniques (all of which have specific pros and cons). Dry techniques involve using various tools, notably ice saws, chisels, ice picks, levering bars and other percussive tools (see postscript) to remove ice and expose and free objects. Of the four main wet techniques, direct and indirect solar melting (often used in conjunction with mechanical techniques), hot air melting and using hot water or steam, we were equipped only for the first two. Our hot air melting equipment consisted of a heat gun and an Andrews air heater. Both devices are powered by a petrol generator.

Despite using a combination of the aforementioned techniques, in the end we had to resort to taking the boxes, which formed the collapsed wall, apart. For the most part the fallen wall lay on a wind blown gravel-ice matrix about 350 mm thick. In several places the ice-grit matrix contained clusters of food cans which had fallen out of the provision boxes when the wall collapsed.

The ice-grit matrix in turn overlay two discontinuous layers of plywood provision cases. The latter was unlikely to have been touched since Scott or Shackleton's men placed them there. We removed the upper layer of the two and formed drainage channels. Lack of time prevented us from removing the lower layer, which remains solidly frozen in the ground.

Many types of canned and bottled provisions were uncovered during the excavation. Those in good condition or rare were dried and added to the displays in the hut. Other recovered items included tins of dubbin, a small wooden box containing pieces of resinous pitch wrapped in brown paper, a tin box of candied orange peel, a Verey Pistol cartridge, 25 7mm Mauser cartridges, and a crude bracelet made from the tin plated ferrules which hold the bristles on fine paint brushes.

The main structural work at Cape Evans involved detailed architectural recording of the hut and an assessment of the materials required to weatherproof the

stables and cold porch as authentically as possible. This work is the top priority for the coming season. The ice-filled stables cause dampness in the adjoining wall and contribute to the relatively high humidity in the hut, which is detrimental to the artefacts. The hut, in fact all the huts, are in relatively good condition. The poorly built annexes and lean-to structures which were appended later are the main problems for conservation. While these additions are integral components of the huts, until they are properly weatherproofed they will present on-going problems. Obviously it is pointless spending money on conserving the artefacts if the structures themselves are not sound.

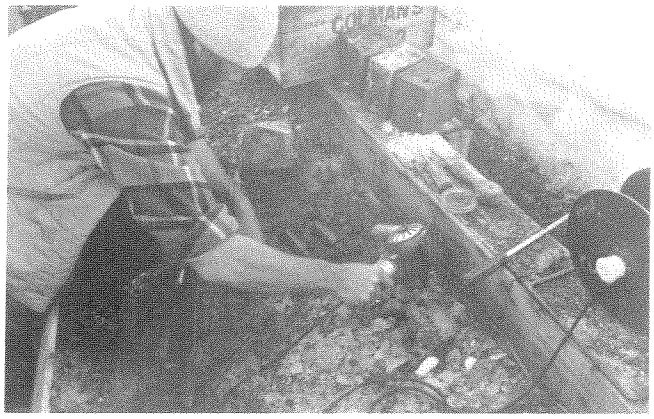

Fig. 4: Using a heatgun to expose artefacts during the excavation of Bowers' camp, Cape Evans. January 1988.

Cape Royds

The major job at Cape Royds in 1987 involved assessing what to do with several cubic metres of deteriorating provisions (mainly canned foods) which are stacked against the outside walls of the Cape Royds hut. It was felt that their continued presence was creating a damp area against the wall which would be detrimental to the hut itself. Many of the provision boxes were left there by Shackleton's men, but others have been stacked against the walls by various people over the years, in their efforts to tidy up the site. The stores are seen by some as an eyesore which should be removed, while others (including myself) regard them as a graphic illustration of the amount of provisions required to sustain humans in Antarctic. They also, of course, represent a lot of dietary information, and a wealth of information about container technology and product preferences.

In 1987 we returned to Royds with the intention of removing the stores and relocating them some distance away and at the same time making a detailed record of what was there. However, after removing a small portion of the stack and gaining a better appreciation of the condition of the hut wall (which was quite sound), the provisions and their plywood boxes (which were not), it was decided that this task should be postponed until there was an adequate covered storage for those which are still in reasonably good condition. We have recommended that Mawson's store, which is a small annexe built onto the front of the hut, would make a good long-term storage facility once it is weatherproofed and fitted with shelving. The cans which are or will be left outside have to all intents and purposes been written off. There is more than enough conservation work required on the better preserved cans inside.

We also reassessed the options for maintaining the

Fig. 5: Part of the interior of Shackleton's 1907-1909 over-wintering hut at Cape Royds, Ross Island.

stables and garage adjacent to the Cape Royds hut. These structures, which were restored by Quartermain's restoration party in 1961, are beginning to deteriorate.

The most practical option, in order to maintain its present appearance, involves gradually replacing the provision boxes which make up the walls with well-made replicas, as the originals deteriorate.

Butter Point

At Butter Point, on the continent proper, the task was to assess what remained of a food depot established during Scott's 1910-1913 expedition, and decide on a course of action. We were aware that the cache, which is located on the seaward end of the Bowers Piedmont glacier, was likely to disappear into the sea in the not too distant future, and that, since its discovery about four years ago, many items had been illegally removed. On arrival, we were somewhat surprised at the state of the cache. All that remained was a disorganised jumble of provision boxes (most of which had been broken open by humans with further damage caused by skuas); and the whole mess was virtually afloat in a big melt pool. Clearly, the remaining items would have been lost forever, if some immediate action was not taken. In the event we photographed and documented everything in the cache, and removed all the provisions and their containers which were in reasonably good condition (c. 300 kg) back to Scott Base.

The recovered products included a box of dates, a box of Fry's Caracas chocolate bars, parts of two cases of Danish pemmican, a case of Tru Milk powder, two boxes of New Zealand butter (in the form of dehydrated solidified masses), four boxes of Limmers's Flour, cans of French sardines, stearine candles, a box of Pearl Barley, parts of two cases of Hunter's Oatmeal, a case of cans of Beef Suet, and a case of Lyle's Golden Syrup. Interestingly, some of the products in the cache are not represented among those remaining in Scott's 1910-1913 expedition base hut at Cape Evans.

Everything was air-dried at Scott Base and stored in a secure and unheated spare building pending a decision on their ultimate repository. About 40 kg of the provisions representative of all the types recovered were packed for shipment to the Antarctic Division and eventual display in New Zealand.

RECOMMENDATIONS

In addition to the assigned tasks, we have also addressed several other matters related to the managment of the sites, such as:

1. The need for better interpretation.

2. The neglect of archaeological deposits in the past.

3. The need for the creation of historic precincts around each of the historic huts. I have already mentioned the proximity of United States fuelling facilities to the Discovery hut. At Cape Evans, Greenpeace established its base just outside the unofficial precinct boundary, but it still represents a modern visual intrusion in an otherwise historic setting. (The Greenpeace base was removed in 1991).

In conclusion, the long-term maintenance of the historic sites and associated artefacts in the Ross Dependency presents considerable challenges to both management and conservation. In 1987, the Antarctic Heritage Trust was formed. This body has the express purpose of raising a considerable sum of money for the long-term preservation and conservation of the historic sites and their contents in Antarctic. As a result of work done over the last 28 years, the huts themselves are now in pretty good shape, but there is clear evidence that some of the artefacts and provisions have deteriorated, in some cases quite drastically (in part attributed to an apparent warming of the summer temperatures in Antarctica). The principal aim of the Antarctic Heritage Trust is to maintain the integrity of the structures and halt or slow the deterioration of the portable artefacts by employing specialists who will apply modern conservation methods.

POSTSCRIPT

In January 1989 N. Ritchie led another conservation party. The stables of Scott's Cape Evans hut were the main work venue. The work included structural repairs and weatherproofing, archaeological excavations and general conservation work. The use of an electrically powered hammer drill proved particularly successful for efficient ice excavation. The conservation team led by R. Fyfe conducted excavations and weatherproofing of the cold porch, part of the Cape Evans hut, in January 1990. In November 1990, a working party, under the auspices of the Antarctic Heritage Trust, completed a Conservation Plan for the historic sites in the Ross Sea region.

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NOTES

1. Turner 1979.
2. Turner & Harrowfield 1984.
3. See Quartermain 1963.
4. Ritchie 1989a.
5. Ritchie 1989b.
6. Cochran *et al.* 1990.