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ROSS ISLAND HISTORIC HUTS:

Report on Archaeological and restoration work and future management considerations Event K281 1988-89 for the Antarctic Heritage Trust

by

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1.0 Abstract and Introduction

In 1983 the Ross Dependency Research Committee adopted a five year programme (as recommended by the Historic Sites Management Committee) of evaluation, maintenance, restoration, and conservation work on the three 'Heroic Era' huts on Ross Island (see Quartermain 1963). The work schedule and the rationale for preserving the huts where they stand were outlined in a document known as the Corporate Strategic Plan (Turner and Harrowfield 1984). Fieldwork undertaken during the season constituted the fourth year of the programme. However, since its inception, several changes have been implemented in the work schedule and the Historic Sites Management Committee has been dissolved and replaced by a higher profile organisation, the Antarctic Heritage Trust. The latter body is charged with 'co-ordinating and raising funds for a programme of conservation and restoration (of historic sites) in the Ross Dependency, and elsewhere in Antarctica' (A.H.T. promotion pamphlet).

The 1988-89 field party (K281) spent three weeks on the Ice between December 28th 1988 and January 17th 1989. The team of Dr Neville Ritchie, the Event Leader, an archaeologist employed by the Dept of Conservation, Hamilton; Mr Nelson Cross, a historic buildings conservator (Dept. of Conservation, Alexandra); Mr John Newton, a self employed builder from Turangi, and Mr Rodger Buckinghame, a professional butylclad roofing speclalist from Invercargill. Ritchie was a member of the 1986-87 team (see Ritchie & Simmons 1987) and the event leader during the1987-88 season (Ritchie 1988). N. Cross was a member of the 1987-88 team. In addition to the above personnel, Mr D. Harrowfield, until recently the Executive Officer of the Antarctic Heritage Trust, joined the event from 10.1.89 until the conclusion of the work on 16.1.89. We were also ably assisted by Event K221 (the youth group, Greg Knowles, Jenny Role, Sarah Vallings, and Richard Wilson) who joined the party from 13.1.89 until 16.1.89. Pat Sole (surveyor) also ably assisted for a day when he found himself weatherbound.

Following the precedent set in 1987, the structural work on the hut is detailed in a separate report (see Cross 1989). This report centres on the archaeological work, artefact conservation matters, and general site management considerations.

26.12.88	K281 party assemble in Christchurch
27.12.88	flight postponed 24 hours
28.12.88	Dep. Christchurch 8.30am. Arr. Scott Base 4.30
29.12.88	am sleeping. pm organised field gear; spent 2 hours trying to find butylclad and other building materials.
30.12.88	R.C. & J.R on survival course, N.R. & N.C. organising equipment for helo lift
31.12.88	whole party on survival course. load of equipment helo'd to Cape Evans
1.1.89	New Year's Day.
2.1.89	gear organisation, carried out minor structural work at Hut Point
3.1.89	on stand by to fly to Cape Evans. No go.
4.1.89	Dep. for Cape Evans 3.30pm. Landed in 50kt blizzard.
5.1.89	am organised equipment, cleared snow from doors & windows pm started clearing ice from front of stables.
6.1.89	spent all day excavating narrow trench in front of stables
7.1.89	same work as on 6.1.89; original cladding removed from front of several stalls, numbered for replacement.
8.1.89	am 40kt plus winds . stayed in wannigan pm ice removal from doorways, framing for stable door, removed old tarpaulins of stable roof and prepared surface.
9.1.89	am. all involved in securing ply on stable roof. pm. removed ice and snow in front part of stall 1.
10.1.89	strong winds. pm. applied first sheet of butylclad. late pm. D Harrowfield arrived.
11.1.89	applied 2nd & 3rd sheets of butylclad, excavated drainage channel on NW side of hut.
12.1.89	am. generator problems delayed work; JN & RC working on roof, others discussing various artefact conservation matters; pm. finished butylclad laying on stables roof.
13.1.89	completed roof work, replacing battens etc, began excavation of stall 1 from front. Six unopened N.Z. butter boxes exposed. late pm. K221 youth group arrived.
14.1.89	am. C Roper (geophysicist) and P Sole (surveyor) arrived; excavation underway in stalls 1, 2, 5, 6, & 7. Many items exposed or recovered.
15.1.89	continued ice excavation. By end of day some 36cu. metres of ice had been removed (refer discussion). evening. Informed by Scott Base that party was to be transferred to Cape Royds the following morning, a day earlier than anticipated. Spent 2 hours securing stables and equipment in preparation for lift next am.
16.1.89	P Sole & K281 fly in 3 CG helo lifts to Cape Royds; returned to Scott Base in 2 lifts. K281 returned in 3 lifts to Scott Base in late pm after carrying out minor structural repairs, and tidying up.
17.1.89	am returned field gear to store; moved Butter Point artefacts (recovered during the 1987-88 season) to another wannigan. 9pm leave Scott Base for Willy Field and return to N.Z.
18.1.89	7am touch down Christchurch.

3.0 Outline of Main Tasks

The main tasks this year, in addition to routine maintenance and evaluating future priorities, were:

1. Snow/leak-proofing of the stables associated with Scott's Hut at Cape Evans. This required considerable structural work in Sect. 4.2 and described in detail by Cross 1989).

2. Systematic excavation of the ice and snow within the stables to recover artefacts and to make the stables accessible to visitors and suitable for storage of some items.

3. It was intended to complete the excavation of the Bowers' stores annexe commenced in January 1988. Lack of time precluded any possibility of this task being undertaken this season.

In the following sections the work at each hut is outlined.

4.0 CAPE EVANS

4.1 Introduction

Cape Evans was the primary work venue this summer. The K281 team spent two weeks at the site (January 4-16 1989). We were ably assisted by D Harrowfield from 10-16/1/89; the youth group from 13-16/1/89, and P Sole (surveyor) 14-15/1/89.

There was still considerable snow around the hut when we arrived. Some of it dated from a big dump just prior to Christmas. In the three successive years I have worked on the huts, it is the first time I have encountered thick deposits of snow and ice on the seaward side of the stables in January. This material had to be removed before we could commence work on the roof and front wall of the stables and 'cost us' two days time. As in the 1987-88 season, snow was banked up in Bowers' annexe to a depth of two metres. As lack of time prevented any excavation work in the stores annexe, the snow in this area was not removed. Most of the area surrounding the hut was covered with snow varying in depth from 50 cm to 1.5 m.

4.2 The Stables and the Need for Remedial Work

In 1911, upon completion of the over-wintering hut at Cape Evans, Scott set his men to constructing a lean-to stables along the sheltered north side. Prior to the construction of the stables, the ponies were tethered behind Bowers' stores annexe. No material had been taken south for the stables, so they had to make do with resources to hand. The framework for the roof was cut from deals which formed the 'tween deck of the 'Terra Nova'. This was overlaid with match boarding and rubberoid, sufficient of which were left over from the hut construction to cover the roof. The outer wall was formed from bales of pony fodder in front of which 13 kg (28lb) blocks of Cardiff patent fuel were stacked. A small blubber stove was at the NE end of the stables (Harrowfield 1981:45).

When the 'Terra Nova' returned in February 1912, Davies (using whatever labour was available), rebuilt the stables in two days. By this time only the roof and some blocks of patent fuel at the NE end remained. The reconstruction ensured shelter for the seven Indian mules. Four days later, a lean-to annexe (the 'cold porch'), also taken south on the second voyage, had been erected on the west side of the hut to provide additional (unheated) storage space (ibid. 45).

Despite the reconstruction work undertaken by Davis and Co in 1912, by 1960-61 the stables were in bad shape. Quartermain reported that "The front wall of the stables is in poor condition; considerable work is required if the snow is to be kept out". The weatherboards on the hut wall above the stable roof were in poor condition and badly warped. They re-nailed them.

In the intervening years, only minor work has been directed towards snow and leak-proofing the stables. Consequently despite intermittent excavation work in some of the seven stalls, they have remained semi-full of solid ice, creating dampness (and related conservation problems) on the inner wall of the hut and generally rendering the stables inaccessible to visitors. Much of the ice in the stables is the result of meltwater running off the main hut roof and down or behind the wallboards and into the stables through the interface between the hut wall and the stable roof. More meltwater entered the stables directly through holes in the NZR tarpaulins which were placed on the stable roof on 27/1/60 (Quartermain 1960 diary). The tarpaulins had, in effect, reached the end of their useful life.

The lack of effort towards snow/leak proofing the stables is understandable. The hut and its contents will always be the main priority, and the stable work could not be done effectively without some major reconstruction work, which required time, materials, and special attention to maintaining the historic appearance of the structure.

By the 1980s, however, it was obvious that the accumulated ice and meltwater in the stables were causing deterioration in the hut itself. The problem was addressed in the Strategic Corporate Plan (Turner and Harrowfield 1984) which allowed for a season of structural renovations and ice-excavation work with the intention of snow and leak proofing the stables, while maintaining its historical appearance (as far as possible while still achieving the primary objective of snow and leak-proofing the structure). Removal of the ice would enable visitors to have access to the stables, provide more covered storage, and enable the recovery, conservation and display of further artefacts associated with the expedition.

4.3 Chronological Summary of Restoration Activity and Excavations on the Stables between 1960-1988

Year	Activity	Reference
1960	NZR tarpaulins put on stable roof some ice removal at west end (Bays 1 & 2)	Quartermain diary
1961	'front wall of stables in poor condition' considerable work required if snow is to be kept out'. One unspecified bay excavated (bay 1?)	Quartermain 1961:14
1972	V Wilson cleared “Oates’ cubby hole” (Bay 7) exposed the blubber stove; rebuilt the wall of chaff bales and attempt to snow proof by erecting a tarpaulin behind the bales.	R & V Wilson 1972:9
1974	Ca. one week spent clearing ice from stables, exposed mule names on back wall; many pieces of harness and other equine gear uncovered; centre bay (#4) excavated to ground level. also excavated in bays 5 & 6.	Smith & Sylvester 1974-75:3
1977	All 7 stalls filled with ice & snow on arrival' By end of season, bay 4 clear of ice to 30CM above floor level; bay 5 clear of ice to floor; bay 6 clear of ice to 30cm above floor level over ¾ of area; bay 7 passageway lm wide cleared along hut wall, Oates stove exposed, many items of harness, and a hockey stick were uncovered. N.B. By 1977 only bay 3 appears to have had no excavation. Ice removal from stables described as 'about half completed but without permanent sealing the labour is wasted'.	Burton & Sutton-Pratt 1977:4
1978	Due to snow egress Bay 1 reported to have 'refilled completely with snow' which required two hours excavation in order to examine and record the blubber stove.	Harrowfield & Buckley 1978:11
1979	"Stables and annex (cold porch) in poor condition due to their inferior design"; western ½ of the stables completely iced up; "helping to hold it together". Strongly recommended that the front wall of the stables be rebuilt and the roof re-surfaced.	Oliver 1979: 23
1979	Used battened canvas to help weatherproof bay 5	Oliver & Patterson 1979
1987	Carried out minor sealing work and made specific recommendations for recladding and re-roofing the stables. Measured material requirements.	Garrick 1987
1988	Did further quantification of material requirements so that necessary items could be acquired and freighted to Cape Evans for the 1988-89 party.	Cochran 1988

4.4 Summary of Structural Modifications to Stables (1989 Season)

As noted in the introduction the structural modifications and renovations on the stables are described in a companion report by Cross (1989). The following is a brief summary of the work.

The Roof

1. The old NZR tarpaulins placed on the roof in 1960 and their securing battens were removed.
2. Tongue and grooved 12mm construction ply was screwed onto the rafters and the match boarding which forms the ceiling of the stables.
3. The stable roof was covered with grey butylclad sheeting attached by Ados adhesive.
4. The weatherboards on the adjacent hut and cold porch walls were removed so that the butylclad could be extended up the walls to create an effective weather seal. After adhesion of the butylclad, the weatherboards were replaced and all gaps (such as around the hut windows) were sealed with Expandite adhesive.
5. The original battens were reattached to the roof but placed in a vertical rather than a horizontal pattern to facilitate drainage of meltwater. Some of the old battens were replaced with new totara battens (which will weather rapidly).

The Stable Wall

1. The remnants of the original cladding and all subsequent patching (canvas, a sheet of steel, miscellaneous pieces of planking, and all but the lower two tiers of chaff bales) were removed from the front of the stables. All the original cladding was numbered so that it could be reinstated as authentically as possible.
2. A trench was excavated along the entire length of the stables to facilitate the attachment of new sheathing (t & g, 12 mm construction ply) and to ensure that the foot of the wall was well buried in scoria.
3. Each bay was measured and the construction ply precut so that sections could be installed in front of each bay and readily removed to facilitate excavation and ice removal.
4. Old pieces of canvas were attached to the outer surface of the construction ply in front of each bay and the original cladding was nailed on over it. Care was taken to ensure that each panel is discrete, so that they can be readily removed if necessary to remove ice etc. The upper sections of the panels covering bays 4 and 5 were screwed on so they can be removed and used as windows when people are working in the stables.
5. The stable door and the door into the cold porch were removed, repaired, snowproofed and reinstated. A sill was installed at the base of the stable door to weather-proofing.
6. The butylclad on the leading edge of the roof was rough cut and secured onto the top of the wall to create an effective weatherseal.
7. The chaff bales were re-stacked in front of bay 7 as they were originally (see R & V Wilson 1972:9).

4.5 Summary of Archaeological Work, Cape Evans Stables (1989 Season)

In addition to the structural and snowproofing work on the stables, the other major task was to remove the accumulated ice and snow. This was considered desirable for four main reasons:

1. to enable visitors to have access into the stables, which together with the associated equine equipment are important features of the overall site;
2. it is assumed the removal of the ice mass and the prevention of any future build-up will enable the adjacent hut wall to dry out and decrease moisture-related deterioration of artefacts in the main hut.
3. the removal of the ice will enable the stables to be used for short term secure storage of construction materials and excavated artefacts.
4. it was anticipated the excavation itself would result in the recovery of further artefacts and information of historical value and interest to visitors.

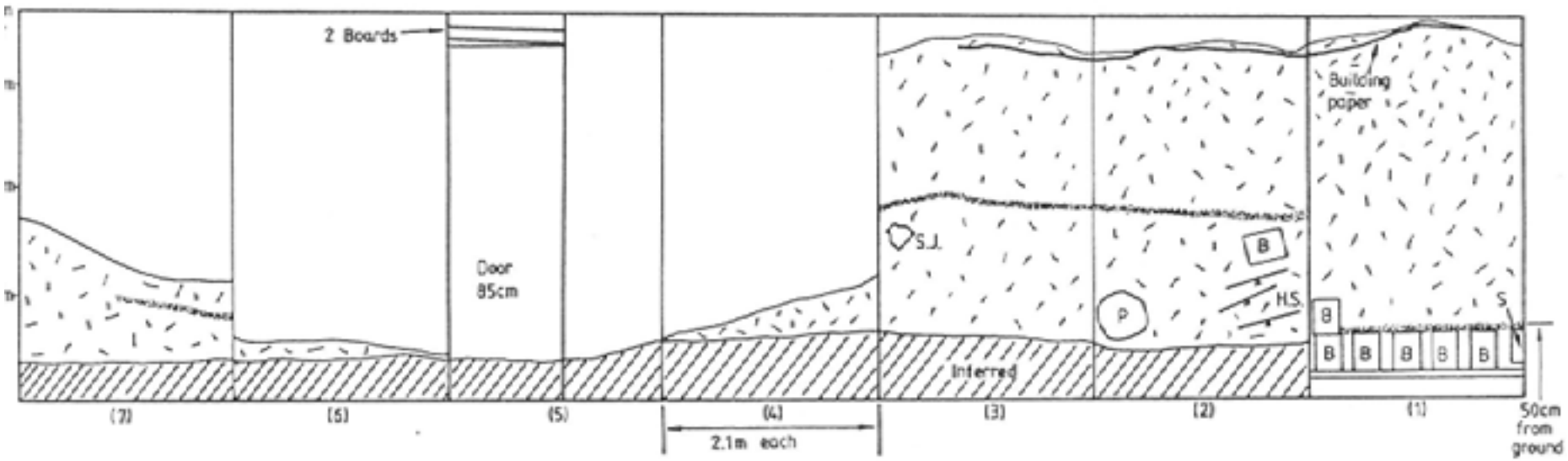
From the outset, the excavation was seen as a second priority compared to the structural work and weatherproofing the structure. As a consequence, only four days of excavating was achieved during which some 36 cu. metres of ice was removed from the stables. This is estimated to be about half the total volume. Another two cu. metres was removed from in front of the doorways in the northern end of the cold porch (an estimated 30% of the ice in this area).

The removal of the front wall of the stables enabled visual observation of the ice masses and some indication of their formation. This information and the amount of ice in each bay prior to the excavation is depicted in Fig. 1. The 2cm thick horizon of manure and fodder (at lm height) through bays 2 & 3 is attributed to wind eddies lifting the material from adjacent bays and depositing it on the ice in bays 2 & 3 where it subsequently was covered with further ice and snow. This also probably accounts for a similar horizon which covered the butter boxes in bay 1. The butter boxes had been uncovered previously, but in the absence of adequate weatherproofing had again been ice bound.

The numbering of the bays (1-7 from west to east) follows the precedent set by Burton and Sutton-Pratt (1977) and others. In summary bays 1-3 were virtually full to the roof with solid ice (ca.36 cu. metres), bay 4 contained c. 2 cu.m of frozen meltwater, bay 5 was virtually clear, bay 6 contained only a token amount, and bay 7 contained ca. 4 cu. m, most of which was on the seaward side. With the exception of bay 7, there is little doubt that the majority of the ice formation in recent years has been from egress of meltwater into the stables rather than ice formed from wind driven snow. When we arrived at the site, meltwater was constantly dripping into the stables from thawing snow on the roofs of the main hut, the cold porch, and the stables itself.

Although it was known from the outset that bay 3 is the only part of the stables in which there has been no significant previous excavation, it was decided to attack the ice mass systematically from each end. The position of artefacts is depicted in Fig.2. Due to the short time available for the excavation many of the exposed artefacts are now visible but are still firmly frozen into the ice. Excavation equipment is discussed later.

CAPE EVANS STABLES – FRONT WALL
SECTION SHOWING ICE PROFILE BEFORE EXCAVATION
(WALL REMOVED)

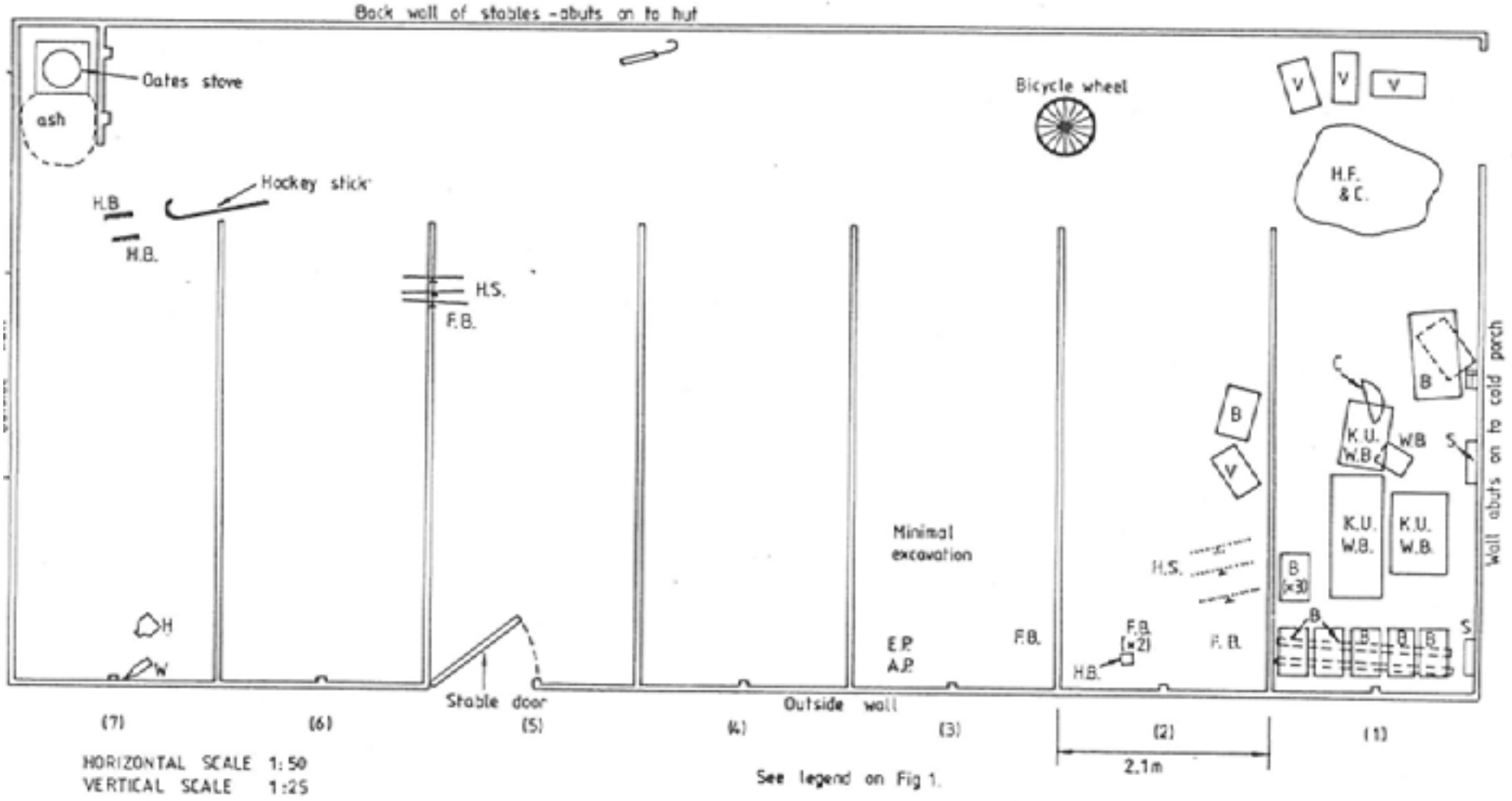


LEGEND (BOTH PLANS)

Manure layer 2cm thick	T Tea	H.B Horse brush	H.F.&C Human faeces & canvas	S Sieves
Manure	P Penguins	B Butter boxes	H Horse worming pills	W Whisky
Snow/ice layer	F.B. Fodder bag	V Venesta provision box	E.P. Emperor peguin	A.P. Adelie penguin
C Casserole	K.U. Kitchen Utensils	W.B. Wooden box	S.J. Salt jar	H.S Harness spacers?

FIG. 1

CAPE EVANS STABLES - FLOOR PLAN
SHOWING POSITIONS OF EXPOSED ARTEFACTS



See legend on Fig 1.

FIG 2

The following is a summary of the excavation of each bay and its status at the end of the field season:

Bay 1 was virtually full to the roof with frozen meltwater and snow-ice. On the western side meltwater had flowed through the door into the adjoining cold porch forming a sloping ice mass over one metre high and two metres long. By the end of the field season this bay had been cleared of ice (ca. 12 cu. m.) leaving the basal 40 cm which contains numerous artefacts. Their position is depicted in Fig.2. In terms of the number and variety of artefacts uncovered this season, this bay proved to be the most productive, but due to lack of time most of the exposed items are still firmly frozen in-situ. An sheet of orange canvas nailed across the 'door' and along the wall between bays 1 & 2 was exposed. As it is faintly marked 'NZR' it obviously post-dates 1960 and was presumably erected by early caretakers in an attempt to contain the snow and ice build-up.

The most notable items uncovered in bay 1 were as follows: 9 unopened boxes of N.Z. butter (see App. 2 for details & discussion), 3 wooden boxes containing miscellaneous kettles, pots, an aluminium? casserole dish lid, and other kitchen utensils, an ice axe, two wooden rimmed fine mesh sieves, a small wooden box (c.17 x 17 x 12cm), a wooden box marked "Balloon. To Be Taken South", an area of human excrement (the Ross Sea party's latrine, D. Harrowfield pers. comm.), and three unopened venesta provision cases. In terms of placement five of the butter boxes were sitting on two planks which appear to be supported by at least two more butter boxes. The three cases of kitchen utensils are notable for their disarray. The utensils appear to have been 'thrown' into the boxes which in turn appear to have been 'dumped' in the stables.

Bay 2 Ca. 50% of the ice in bay 2 had been removed by the end of the field season, leaving c. 1m depth remaining over the whole bay. Excavation proceeded on two fronts. Ice was removed from the front of the stables exposing a canvas fodder bag (containing oats and chaff), 3 wooden artefacts of unknown use (possibly 'spacers' for dog sled harness; 4 more were found in the rafters in the same bay), a N.Z. butter box (see App. 2), and an unopened plywood provision case. Both boxes lay at haphazard angles within the ice mass suggesting they had been placed there, probably by people excavating in bay 1 in the past. Excavating in the eastern side of the bay revealed two more canvas fodder bags, a rolled-up hock bandage, and the five penguin carcasses (4 Adelies and 1 Emperor). The penguins may have been acquired and stored there for food or research purposes. Once the penguins were encountered no further excavation was done in the vicinity. Excavation also proceeded progressively westwards along the stable corridor, from bay 5 to bay 2. At the conclusion of the field season, the upper metre of sterile ice had been removed exposing the mule name 'Rani' on the rear wall and a badly rusting cycle wheel. The latter is off Griffith-Taylor's bicycle (D Harrowfield pers. comm.). It is difficult to fathom how the wheel got to be where it is (it is now exposed but still ice-bound). Possibly it was hanging on the stable wall and has fallen and become incorporated into the ice mass, although there is no less likelihood that it was placed there in more recent times during the course of ice removal.

Bay 3 is the only bay that is believed to be more or less unexcavated previously. Lack of time prevented us getting into this bay, but the corridor adjacent to the hut wall was cleared. No significant artefacts were found in the corridor (within bay 3). Another canvas feed bag was exposed on the seaward side of the bay and recovered. All the

recovered fodder bags were air dried, re-shaped, and left suspended from a wooden pole in bay 5. A Marmoset brand aqua glass salt jar is visible on the eastern seaward side of the ice mass in Bay 3. It was left in situ.

Bay 4 had been cleared in the past (see Sect. 4.3). The back corridor was re-excavated through this bay. One notable artefact was uncovered. A wooden handled hook implement which may have been used for pulling thread through canvas. The artefact was air dried and hung on the wall above where it was found.

Bay 5 has also been cleared in the past, in part to enable access through the door to the outside. A small amount of manure and ice was removed from the vicinity of the door to enable it to be swung open properly, and recent ice along the corridor area of the bay was removed.

Bay 6 was not excavated, other than along the corridor part. No artefacts were recovered.

Bay 7 was completely excavated (see Sect 4.3 for previous excavation history) to facilitate placing plywood behind the in-situ chaff bales which form part of the outer wall, and to enable part of the bay to be used for conservation material storage. Ca. 5 cu. metres of ice was removed from the bay. The following notable artefacts were uncovered: a small clear glass bottle containing spherical white balls (believed to be horse worming medication), a hockey stick (similar to that found in the same general area by Burton and Sutton-Pratt 1977:4, although the '1989 model' is intact and in very sound condition), and two horse brushes. The excavation revealed that Oates blubber stove is on a low platform (of beach gravel?) contained by some planking. Immediately in front of the stove there is a concentration of ash. These features were not disturbed.

4.8 Work Still To Be Done in the Stables

At the conclusion of the field season an estimated 36 cu. metres of ice had been removed from the stables; estimated to be half of the total. Bays 4-7 now contain negligible amounts of ice. While there now only remains of snow in bay 1, it is riddled with artefacts and excavation progress is likely to be reasonably slow. In Bay 2, ca. one metre of ice remains. Within the ice there appears to be a cache (of unknown extent) of penguin carcasses, and there are likely to be further artefacts. Other than the corridor area, Bay 3 still remains largely unexcavated (this year or previously). There is no real indication of what might be expected in the bay, but it probably minimally contains items of harness and other equine gear.

Depending on the technology used, there is an estimated two weeks of archaeological work for four people in the stables. This would enable proper recordation, and removal of the ice down to either the beach gravel or consolidated manure. It is recommended that the corridor is excavated down to the gravel (for practical reasons), while excavation only extend to the surface of the manure in the stalls.

No decisions can be made about displaying artefacts in the stables until the excavations are entirely completed, and the extent and condition of the artefacts is apparent.

Due to lack of time, no further excavation was undertaken in Bowers' stores annexe this year, and the 30cm (average depth) ice build-up in the cold porch still has to be removed.

4.9 Comment on Excavation Equipment and Methodology

The horizontal and vertical position of uncovered items was plotted relation to the walls and interior divisions within the stables (see Figs. 1 & 2) rather than a string grid. Ice excavation involves an element of trial and error, and often considerable physical exertion. Over the past three years several techniques have been used including the use of ice axes (and other steel hand tools) to physically pick away ice, ice softening (using diverted meltwater), solar melting, heat guns, and an air heater. This season a percussion hammer drill with chisel blades (a Ramset Dynadrill, kindly loaned to N. Cross byRamset) and an electric chainsaw were used for the first time. Both tools (used with care) proved extremely effective. The Dynadrill was particularly efficient for bulk ice removal and for cracking hard ice around artefacts. Because the hammer end only moves c. 3mm the tool caused minimal damage if it came into contact with artefacts (except glass) or structural components. A major advantage of using the Dynadrill is that there is virtually no splattering of freed ice/water compared with the use of percussive and chopping hand tools, making the actual work of ice removal considerably more pleasant, especially when working amid ice containing horse manure and food residues. Obviously, an electric has considerable potential for mass destruction if used carelessly, but used with care it proved particularly efficient for cutting 'artefact-free' 'sugar-ice' into blocks for removal. Sugar-ice has a sugar-like texture. It is relatively soft compared with hard ice (but it is still involves considerable exertion to remove it by manual techniques). Unlike hard ice, it does not crack or shatter when struck, but tends to absorb the blow. However, it readily cuts with a chainsaw and can be efficiently removed in small blocks. We also used a small kanga hammer with a wide blade (offered to us by Greenpeace International) for breaking frozen meltwater. Although such tools are not advocated for controlled ‘archaeological excavation', it proved very effective for cutting drainage channels through the permafrosted beach gravel and for ice-cracking at ground level. There is, in my opinion, no optimum method of ice excavation; each method has advantages and disadvantages. The pros and cons of various ice excavation methodologies we have used and experimented with and the associated equipment will be discussed in detail in a forthcoming paper (Ritchie 1989).

5.0 Cape Royds

No major work was planned for Cape Royds this season. A four hour inspection trip was made on 16.1.89. During this time the following small tasks were undertaken:

1. D Harrowfield recorded visitor numbers in the visitors book, logging them by month and nationality.
2. Provision cans which had blown off the stockpile of stacked provisions on the SE side of the hut were gathered and restacked neatly (in what are hoped to be more wind resistant stacks).
3. A shackle for tightening the 'over hut' guywires was replaced.
4. Due to lack of light, only a cursory inspection could be made of the graded stockpiles of provision cans stored in Shackleton's bedroom. This suggested that they have not noticeably deteriorated in the three years they have been stored in the room.
5. Broken but diagnostic bottle necks and bases which were scattered around the north shoreline of Pony Lake were collected and placed in box in the stables.

6.0 Hut Point

Similarly, no major work was planned for Hut Point in the 1988-89 summer. The following small jobs were undertaken:

1. The Scott Base overwinter party found that there had been some snow egress into the hut during the early winter months. Some temporary but quite effective mitigation measures were undertaken by members of the winter party. Their work is documented in App. 1. As we were unaware until we arrived at Scott Base that this work had been undertaken we were poorly equipped to carry out more permanent repairs. However, all that is required, in the first instance, is some blackening of the sacking and battens so that they become less obtrusive.
2. A hole adjacent to the south side roof ridge (through which light was visible) and the apex of the roof were sealed with Expandite sealant. The latter needs a copper-sheet cap to create an effective long term seal.
3. The broken floorboards under the table (covered with socks, gloves etc) were replaced.
4. The wire supports put in place in 1987 to secure the collapsed ceiling at its present height were painted black to reduce their visibility.
5. Two daged battens on the north wall were replaced to prevent snow egress.
6. Deformation monitoring was carried out by the surveyors.
7. D Harrowfield recorded visitor numbers and distributed questionaires.

7.0 Priorities for 1989-90 and following season(s)

The No. 1 priority for the next field season (or two) should be efforts directed towards improving the environment for artefact preservation the huts at Cape Evans and Hut Point through further work aimed at fully weatherproofing the structures. Cape Evans should remain the top priority.

Cape Evans: Recommendations

1. Depending on the training of the personnel, the remaining ice masses in the stables (c.24 cu metres) need to be removed and artefacts recorded and recovered. It should be noted that much of the bulk 'empty and recent' ice has now been removed from the stables. Most of the remaining ice masses are likely to contain significant items associated with the early polar expeditions. These should be archaeologically uncovered, carefully documented and provision made for conservation (refer discussion re conservation in section 8.0).

2. Snowproofing of the cold porch and removal of the accumulated ice is the other major job. Cochran (1988) presented a schedule of the structural work involved in snowproofing the cold porch, and as noted in of this report most of the materials for this work are now on-site. As the ice-work (in the cold porch) mainly involves removal of post-1960 re-accumulation, it should be a fairly straightforward and will result in the freeing of many tools and other items which are presently frozen in. The cold porch needs to be 're-roofed' (and the walls rebattened or sealed) in the same manner as the work just completed on the stables.

3. The structural repairs on the cold porch should be done in conjunction with the following work. There is presently a tendency for meltwater to accumulate (and

freeze thaw) inside the cold porch immediately in front of the entrance to the hut. This happens because this area (of the original beach surface) is lower than the surrounding ground surfaces (possibly through scuffage). It is recommended that after the removal of the ice in this area, the ground level is built up with a few box-loads of beach gravel. At the same time the wide shallow drainage channel, excavated over the past two years, from just seaward of the hut door (and running towards the sea) should be deepened and broadened. When completed, this will in effect lower the ground surface outside the cold porch (in relation to that of the interior) and should prevent the build up of meltwater inside the cold porch. There is no point in removing the ice from inside the cold porch unless a real effort is made to improve the exterior drainage situation. This gravel relocation exercise should be fairly straightforward, but since the gravels are permafrosted, it will probably require a couple of days work for two people. A kanga hammer (of the type mentioned in Sect. 4.7) is an ideal tool for this job.

4. The stores annexe on the southern side of the hut should be reconstructed. The principle objective of this exercise is to provide a weather buffer on this most exposed side of the hut. Frosting and ice formation on the inside of the wall appears to be getting worse, and we believe is best solved by the creation of a physical buffer. The reconstructed annexe will also be invaluable for storing maintenance tools and equipment and some of the 'surplus' and inappropriate artefacts which are presently stored in the hut. One of tractor case sides (identical to that which was used to form the roof of the stores annexe) is lying against the eastern end of the hut. The side walls would ideally be made of replicated Colman's Flour boxes identical to those used originally. Reconstruction parties should be aware that there is still part of the basal tier of unopened provision cases lying within the annexe. Lack of time prevented the excavation being completed in the 1987-88 season, and there was no time to uncover these items in the 1988-89 season. The reconstruction work and the archaeological work should be undertaken in the same season (possibly 1991-92). Refer later comments about artefact conservation.

5. Some of the weatherboards (particularly those above the stables on the north side of the hut) will need replacing within the next few years. Some weatherboards of the appropriate specifications should be milled and stored at Cape Evans (in the reconstructed stores annexe) for use as needed.

Hut Point: Recommendations

1. Waterproofing the roof. It has been recognised for several years that there are several small and 'migratory' leaks in the roof of the Hut Point hut which allow intermittent entry of meltwater. The method (proposed some years ago) of dealing with this problem is to cover the roof with butlyclad. We consider that butylclad (on the surface) is totally unacceptible as a re-roofing medium on this hut with regard to maintaining its historical and aesthetic appearance. This contention was also maintained by Mr R Cunninghame, the professional butylclad applicator, who oversaw the work on Cape Evans. In his opinion it would be physically impossible to put butylclad on the roof of the hut and expect it to look historic. We recommend the following course of action which could if desired be done in four stages; one season on each roof quadrant.
a) remove the ridge battens, seal the gap, overlay with a strip of butylclad, and relay the battens;

b) remove the boards on the surface of each roof quadrant and lay butylclad under them and replace the boards; or alternatively check each board is properly secured and seal the joint between every board. Some boards would probably have to be removed and re-secured.

2. Hut Point Transition and Deformation of the Hut: We were surprised to see daylight through a small gap (now sealed) which had formed (we do not believe it was there the previous year) at the juncture of the SE and SW roof quadrants. There is a reasonable possibility that the damage was caused by vibration created by heavy vehicle movement en route to and from the Hut Point transistion. It is our contention, from a hut conservation point of view, that the sooner the transistion is closed the better. The best way to do this is to make a case and present objective evidence to the Americans of the deleterious effects of heavy vehicle activity immediately adjacent to the hut. Deformation measurements are already being made annually. These should continue for the foreseeable future. In addition, we recommend the installation of a seismograph (or similar vibration recording device) in the hut to the vibrations of heavy traffic using the transition and possibly relate it to structural damage within the hut. Obviously, it is imperative that such a device is in place as soon as possible, and preferably before the transition is used in the 1989-90 season.

Cape Royds: Recommendations

Although the box walls of the stables and garage at Cape Royds require some stabilising, the hut itself is remarkably weatherproof compared with those at Cape Evans and Royds, consequently it is considered a lower priority.

8.0 The Ross Island Huts: General Matters of Concern

D. Harrowfield, N. Cross, and myself discussed the question of artefact conservation priorities at length. We concurred on the following strategy, that while some conservation projects could be begun, it is essential that the stabilisation of the environments in each hut (by further structural work towards weatherproofing) be given priority, There is little percentage in spending scarce funds on artefact conservation if they are going to be replaced in the same situation which caused the deterioration in the first place. Nothwithstanding these comments, conservators should be consulted now, on the understanding the structural work will proceed apace. Urgent conservation work is needed on metal implements e.g. bed frames, stoves, pots and tools, as well as leather artefacts such as harness and boots. Conservation of provision containers in the huts should not proceed (except for experimentation) until the structural stabllisation work is completed. Although belated, it is essential that a competent conservator is actively involved with the programme in future. Conservation projects should be let in the form of specific contracts to ensure the work is done.

8.2 Conservation Projects

D. Harrowfield will be addressing this issue further in his report. Discrete conservation projects (and calls for funding) could be centred around the following categories of artefacts: the stoves; the tools; the cooking equipment; the photographic paraphanalia; the beds; the sleeping bags; the clothing, textiles, and canvas; the tinned and bottled foods, the harness and other equine gear, the paper/cardboard artefacts; and the scientific equipment.

A case for converting A or B block of the old Scott Base into a conservation lab was presented in my 1988 report (see Ritchie 1988). This is a long term need and also assists retention of a historically significant structure in its own right.

8.3 Need for Tidy Up

There is an urgent need for some tidying up work, particularly at the Cape Evans hut (and also at Hut Point). Ideally an industrial vacuum cleaner should be taken to the sites (along with the usual generator) and each hut should be given a good once over. This does not mean the removal of 'historic grime', just the accumulated grit etc brought into the huts on visitors boots, which eventually works its way to the farthermost corners. The present scene reflects badly on the hut conservators but the huts require more than a quick sweep with a broom. The other aspect which needs attention is the chaotic mess on the tables in the Cape Evans hut. Various people over the years have placed items picked up around the hut environs on the tables, to the point where they now present an unsightly mess. All the items on the tables and elsewhere in the huts should be assessed and any rubbish disposed of once and for all. According to D Harrowfield the last users of Cape Evans (Shackleton's Ross Sea party) left an unfinished meal on the table. At present artefacts associated with eating are conspicuously absent. Other things that need to be attended to are 'incongruous associations', e.g. the improvised dish rack which sits on top of the stove. It is important that items which belong together are grouped together.

It is imperative that all 'tidying up' work both inside and outside the huts is overseen by someone who is familiar with historic artefacts and the expedition history. We were concerned to hear that Scott Base staff intended to 'clean up' broken glass etc around the Cape Royds hut. While such debris maybe unsightly, it should not be moved without assessment of its archaeological value or historic significance. Also in this regard, O.I.C's should be told that if it is necessary to make alterations to the huts, such as installing new padlocks and tower bolts, this work should be done with regard to making minimal visible modifications.

8.4 Need for New Work Plan

The first five year work plan (Turner and Harrowfield 1984) is now in its final year. A new five-ten work plan should be formulated taking into consideration all the recommendations made by the 'site workers' (see references) over the past four years.

8.5 Butter Point Artefacts

The artefacts recovered from the Butter Point depot during the 1987-88 season are now located in an unheated wannigan at Scott Base. This season we moved them to another wannigan, because the original one was required for another purpose. It is recommended that the Butter Point artefacts be removed to Cape Evans (they are associated with Scott's 1910-13 expedition) and stored in the rebuilt stores annexe. It is important that each item is labelled on the base "Butter Point depot" and is not mixed with the other provisions in the hut. All the Items from Butter Point have been documented (see Ritchie 1988).

8.6 Interpretation

The need for better quality interpretation in each of the huts has been commented on previously (Ritchie & Simmons 1987; Ritchie 1988). N. Cross has suggested a solar powered 'endless tape' should be installed in the Hut Point hut (the hut which has the greatest visitation, and the least self-explanatory artefacts). This would provide a spoken commentary on the history of the hut as visitors moved around. Such a system would be visually unobtrusive and raise awareness of the historic events associated with the hut(s) and the work of the Antarctic Heritage Trust and the restoration programme.

8.7 Admission by Donation?

Funding towards interpretation technologies like that suggested above could be gained by instituting a system of admission to the historic huts in return for a donation. Such a system would require the installation of robust collection boxes inside the door of each hut and small signs indicating that a donation was expected, and the end-uses of the money.

8.8 Previous Recommendations

Several general site management recommendations were made in my previous reports (Ritchie and Simmons 1987, Ritchie 1988). As far as I am concerned these recommendations are still current. For convenience, the main points are briefly listed here: ...Specific recommendations were made in the 1988 report concerning the selection of event personnel, the need for technical advisors on conservation matters, the need for a long term conservation strategy (rather than ad hoc conservation projects); and the establishment of a conservation facility in Antarctica. In 1987, Ritchie & Simmons (1987) stressed the need for formal hut-site boundaries to be established (even if it is only an agreement between the U.S. and N.Z. authorities), the need for the compilation of a catalogue of significant artefacts taken from the huts and now held in museums etc elsewhere, and the need for a full bibliography of reports on all aspects of Ross Island historic site management.

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Hamilton
February 1989

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10.0 Appendices

10.1 Summary of Snowproofing Work undertaken by Scott Base winter-over staff at Hut Point.

10.2 Details of Excavated New Zealand Butter Boxes.

10.3 List of modern construction materials left in the stables (bay Cape Evans for future restoration work.

App. 10.1

To: OIC
From: Field Leader
Date: I July, 1988

NOTES ON REPAIR WORK UNDERTAKEN BY NZARP 1988 WINTER PARTY TO DISCOVERY HUT

In the early stages of the winter it was noted that there had been some snow accumulation inside Discovery Hut. Snow appeared to be entering in three places; above the top plate on the north and east wall, through the roof in the centre of the eastern aspect and the door. In June the OIC considered that the artefacts were under risk of damage due to the extent of the snow accumulation inside the hut. Work was carried out on two weekends in attempt to stop this accumulation.

Work undertaken:

Sacks fastened with stained pine 2 x ¼" slats were nailed on the inside of the hut above the top plate in the affected area. A sack was also nailed in place between the roof and a internal beam in an attempt to stop the snow coming in through a pinhole in the roof. The door surrounds were down in an attempt to obtain a better seal. Snow accumulation was removed from the artefacts.

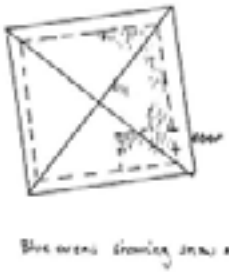
This work must be considered temporary in its:

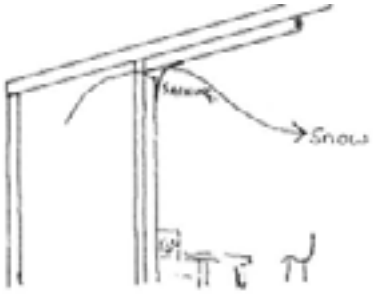
A. effectiveness.
B. compatibility with the historic nature of the hut.
C. ability to maintain the integrity of the site.

Work Required:

Remove temporary work and replace with material which is both effective and sympathetic to the integrity of the hut. Install two door bolts, top and bottom as the door appears to be bowed.

Paul Wilson





App. 10.2 Details of Excavated N.Z. Butter Boxes.

In addition to the two New Zealand butter boxes recovered from the remains of the Butter Point depot in January 1988 (see Ritchie for details), another nine unopened boxes were uncovered this year during excavations in bays 1 & 2 of the Cape Evans stables. All the boxes are believed to date from Scott's 1910-13 expedition. According to D. Harrowfield (pers. comm.) the boxes of butter were part of a consignment Scott acquired while in Lyttleton en route to Antarctica. There appear to be at least three other butter boxes protruding from the remaining unexcavated ice in bays 1 &2.

Notable features about the boxes uncovered in the stables are:

1. they are unopened and apart from minor seepage appear to contain their original contents (in a solidified mass). The boxes are all in sound condition, although the stencilled labels have faded a little.
2. they are derived from a diverse range of N.Z. dairy companies. The geographic origins of the butter boxes clearly reflect the changing nature of dairy product processing in New Zealand. Virtually all the dairy companies whose products are listed below have closed or been amalgamated.

Stenciled Labels	Dimensions L W H (mm)	N.Z. origin
Box #1 "NZ Produce" Lily Brand (& Crest) Reg'd #82, 56lbs nett * recovered from Butter Point depot site.	410 285 315	Omata Co-op Dairy Co Ltd, Omata, New Plymouth
Box #2 "NZ Produce" Reg'd # 1880, Hamilton, Pure Creamery Butter * recovered from Butter Point depot site.	415 285 320	Te Awamutu factory, N.Z. Dairy Co.
Box #3 "Eltham Dairy Co, Pure Creamery Butter, Etham 31, 56lbs nett, New Zealand Produce". * part of group of six, bay 1, Cape Evans stables.	410 285 315	Eltham Dairy Co, Eltham, Taranaki.
Box #4 same as box #1. (Lily Brand, Omata) * part of group of six, bay 1, Cape Evans stables.		
Box #5 "Cambridge Co-operative Dairy Co. Pure Creamery Butter, Cambridge New Zealand Produce". * part of group of six, bay 1, Cape Evans stables.	420 282 330	Cambridge Co-op Dairy Co, Cambridge, Waikato.
Box #6 "New Zealand Produce, Bay of Islands Dairy Co Ltd, Reg'd # 1312, Bay of Islands, 56lbs nett, Ohaeawai, N.Z. Pure Creamery Butter. * part of group of six, bay 1, Cape Evans stables.	415 290 330	Bay of Islands Dairy Co, Ohaeawai, Northland.

Box #7
same as Box #3. (Eltham)
* part of group of six, bay 1, Cape Evans stables.

Box #8 "Pure Creamery Butter Co-operative# 201, Frankley Road, 56 lbs nett, Taranaki, New Zealand. * part of group of six, bay 1, Cape Evans stables.	415 285 330	Frankley Road, Taranaki.
Box #9 "Pure Creamery Butter, Kakaramea 'Penguin Brand' #630, 56lbs nett (penguin crest), Reg'd Trade Mark N.Z. Produce". * part of stack of two, bay 1, Cape Evans stables.	420 290 330	Kakaramea Dairy Co.? Taranaki?
Box #10 "Oakura Co-operative Dairy Co, Reg'd # 729, Oakura… * part of stack of two, bay 1, Cape Evans stables.	415 285 330	Oakura Taranaki?.
Box #11 "New Zealand Produce, Waikiekie Co-operative Dairy Co Ltd, 56 lbs nett, Pure Creamery Butter". * in bay 2, Cape Evans stables, Reg'd 1593.	415285325	Waikiekie, Northland?

App. 10.3

Modern Construction Materials & Tools left in the Stables, Cape Evans, for future work

-3 rolls butylclad (one part roll precut for stables-cold porch wall); (others for cold porch roof).
- 1 and ½ drums Ados butylclad adhesive.
- 1 drum solvent (for above)
- 3 cartons Expandite sealant
- 1 plastic container of oil (for or generator) 2 litres.
- 3 snow shovels
- 1 rake
- 1 wrecking bar
- 1 Expandite gun
- several packets of 50mm woodscrews
- quantity of 50mm and 60mm galvanised nails
- 1 kg of galvanised clouts
- miscellaneous old canvas (off stable wall & roof) for lining purposes
- 1 empty 12 gall. fuel drum
- 2 full 12 gall. drums of Mogas (for generator)
- 7 1200 x 2400mm sheets of construction ply (for cold porch roof)
- 2 old tarpaulins for dragging loads of ice down to the beach.