ARCHAEOLOGICAL
REPORT
EMILY BAY
OUTLET

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1990
INTRODUCTION

This report involves the following numbered in the Wilson/Davies; "The Archaeological Survey of Kingston and Arthur's Vale", 1979

A 3 F CHANNEL
J 7 C STEPS
A 11 A BRIDGE
A 3 E TUNNEL

The extent of the work here recommended will depend on the Restoration Manager's funding allocation for 1989/1990 and the Authorities concerned with KAVHA.

The report is the result of a brief issued by the Restoration Manager, May 7, 1989, for work to be performed during the financial year, 1989/1990.

Imperial measurements are used where units of that system are perceived in measurements taken on site. Metric equivalents are given where thought relevant.

The compass convention adopted in descriptions is based on the Bridge facades as being "north" and "south".
STATEMENT OF SIGNIFICANCE

The Emily Bay Outlet is composed of a group of basic engineering features which include a tunnel cut through a hillock, a channel with retaining walls, a bridge and steps, all dating to ca 1836. The group is remarkable in that the features, apart from the steps, still function as originally constructed. The group remains substantially unaltered, although has suffered the ravages of time.

One section of the channel (trench only) almost certainly dates to ca 1796, part of an earlier drainage system. This trench formed the western boundary of the First Settlement cemetery and during the Second Settlement, the western boundary of the stone working yard: Archaeological evidence has been found to confirm both former functions in the bank supported by the east retaining wall.

The Emily Bay Outlet group is one of the many achievements of Major Anderson's far-reaching and enduring landscape/engineering reforms of the Kingston area. As a functional group, it represents a singular engineering survival of the early penal/colonial period in Australasia.

NOTE

The Outlet is symbolic of the human species' notorious impact on the natural environment. The Outlet is a relatively small feature but it has dramatically altered the natural appearance of Kingston by the draining of the great swamp and its consequent development. It also had consequences on the marine life of Emily Bay which had never been subjected to the fine volcanic origin silt beyond the calcarenite buffer of Kingston.

CONSERVATION AIMS

--- To preserve every detail of original fabric.
--- To preserve every detail and preserve its original functions by the replacement of missing parts.
PHASING

PHASE 1, by October 1796 - 1814.

By October 1796, a substantial ditch had been excavated around Chimney Hill to drain the marshy swamp, now known as Kingston Common, (See Chapman's plan).

Before this time there was no direct outlet into Emily Bay for the waters from the various streams entering Kingston. Previously the water filtered through the calcarenite buffer and the Common would have been a large swampy lake. Up to the present day, during flooding, small whirlpools may be seen near Chimney Hill caused by underground fissures which conduct water to some unknown destination.

It is not known how successful the ditch was but it must have been liable to silting because of the sand-dunes. Part of this early channel may be seen at the lowest point between Chimney Hill and Government House. A long pile of calcareous material may be seen from this point heading in the direction of the "Cattle Well", (A 12), and ends abruptly a few metres before it. The so called Cattle Well was thought to be a Third Settlement construction but archaeological evidence emerged in 1985 leaving no doubt of its Second Settlement or earlier construction. The long pile of calcareous matter is the result of the excavation of the ditch and has a relationship with the Cattle Well. The latter and the end of the pile also relate to the present channel from the elbow to its course into Emily Bay. If the line of the channel from the elbow to the bride is extended northwards it would intersect the Cattle Well.

From the above, it appears very likely that the present channel from the elbow to the Bay was created (ditch only) by 1796. Chapman's plan seems to show this part of the channel at a greater angle but as the channel formed the western boundary of the First Settlement cemetery and two European skeletons were unearthed near the channel's termination in 1936, it seems unlikely. The original course could be checked by boring a series of holes for core samples near the Cattle Well area: This should show up a layer of silt or matter foreign to the area.

PHASE 2, 1814 - ca 1829.

During the settlement lacuna of 1814 - 1825, the channel evidently silted up, as shown in Turton's plan of 1825.

PHASE 3, ca 1829 - ca 1836.

The open channel was cleared out around 1829, as shown in the 1834 "Plan of Settlement". Retaining walls of 10 feet in height were constructed but were washed out by the sea in 1834. (See Wilson/Davies Report).
1825
TURTON

CHANNEL Silted Up

1829
WAKEFIELD
See also 1832 and 1834 Plans

1838
BORDES
See Lucard 1839
PHASE 4, 1836 - 1941.

To achieve a more direct route, the present tunnel was cut through Chimney Hill, the channel was established and retained by a low stone walling, the stone bride and steps appear to have been constructed at the same time and all these features may be seen in the following plans; Bordes, 1838; Lugard, 1839; Barney, 1840; Hamilton, 1848 etc.

Major Anderson changed the Kingston landscape with a vast project, around 1836 which included massive sand retaining embankments, water channel rationalization, underground drainage including vaulted and flat topped tunnel sized drains, bridges, culverts, retaining walls, paved roads etc.

The Emily Bay Outlet received little attention after 1856 and nature took its course. The greatest damage to the group of structures occurred during the night of the 21st and 22nd of May 1936 when between 9 and 15 inches of rain fell on the Island. As a result and because of the regular flooding of the Common, it was decided to form a direct route from the Kingston "drain" into Emily Bay. Work commenced in 1938 and was finally completed after July 1941, (See Norfolk Island Annual Reports).

The new Outlet relieved pressure on the old one which continued to function at times during heavy rain.

PHASE 5, 1941 - Present.

Little has been done to maintain the Old Outlet since, the bridge received some minor work and was compo-mortared in 1962. Recently the bridge culvert and the retaining walls received some emergency stabilization work.

Even now, the two Outlets do not always cope with the volume of water and the Common floods. One unwelcome outcome of the New Outlet has been the increase of volcanic origin sediment, especially after heavy rains, exacerbated by the periodical mechanical clearing of Kingston creek. Some of the older generation remember the coral growth to be similar to Slaughter Bay and wonder what happened to change this, (pers. comm. Mr Jack Ralph Quintal). It has now been scientifically confirmed that this type of sediment destroys many coral types by smothering through the fine particles. The Kingston corals had been formerly protected by the calcarenite buffer.

PRESENT USE OF AREA

The area is used chiefly for recreation. The normally dry creek bed allows access to all parts of the Old Outlet area. Any damage to the original fabric is generally due to children burrowing, shifting stones and climbing up and down the banks. These activities are entirely innocent but are strong arguments for the full stabilization of the features of the area. The bridge should be monitored on a regular basis as it supports all traffic into Emily Bay and by any description of vehicle which may be able to cross it.
Upper and Lower: Undermining. The old sections of the wall have been eroded by the acidic water eventually causing the break down of the masonry, parts of which easily wash out.
DESCRIPTION AND CONDITION

TUNNEL, A 3 E.

This was cut through the calcarenite hillock, formerly part of Chimney Hill ca 1836, in order to create a more direct route for the Kingston creek and to allow the conversion of swamp land into land suitable for farming and building. The roof of the tunnel slopes due to the natural bedding of the stone, (known as "rubble calcarenite").

Condition.

The tunnel is sound and does not show any signs of deterioration. The entrance and exit areas may have frayed a little but are not unstable. The sides, along which the water flows, have been neatly dissolved to form grooves due to the slightly acidic water flowing along the calcareous rock. The grooves are testimony to the former regular water flow, (pre 1941).

CHANNEL RETAINING WALLS, A 3 F and Area J.

These were created by digging out the long ditch and retaining the sides with calcarenite stone and mortar of the same material. The ditch was dug through the sand and the bedrock and rubble deposits below. The spoils were heaped along the length of the ditch. A rough footing was established for the retaining walls on both sides, composed of large chunks of calcarenite embedded in the floor of the ditch. The wall commenced with the larger stones at the base and cemented together with a mortar composed of the same material, (burned at the nearby kilns). The stone was laid "on the flat" but were not coursed in the strict sense. The walls were back-filled with stone as the walls were built up and a rough mortar or lime kiln waste thrown in for good measure. The pre-1834 walls were reported to have been of stone but the reference to " 10' deep " could refer either to the depth of the "drain" or the "stone wall", (mentioned in connection with the overflowing and "giving way", See Wilson/Davies A 3). From the existing archaeological evidence, the wall of 1836 does not appear to have been higher than 3' 6" (1.065mm), depending on where one judges the footing ends and the wall proper commences. Where the best portions survive, an average of between 900mm and 1.065mm may be read. The channel continued beyond the the course of the modern outlet, the evidence of this has been obliterated. The older generation remember when it extended to near the stone outcrop beyond the modern outlet and discharged its waters at a rightangle, (pers comm., Mr Leo Mc Coy and Mr Jack Ralph Quintal, hence, they noted (independently), that the Emily Bay sand did not silt the channel).

Condition.

Very poor. In many sections it is entirely missing, in other areas it is undermined or only the back-fill remains, as illustrated:
CHANNEL FLOOR, A 3 F and Area J.

Much of the debris was excavated out of the channel in recent times, south side of the bridge. After heavy rains many elements were uncovered which had not been seen for many years as the result of the wash out. During the course of this survey heavy seas pushed sand back in to the channel to a depth of between 480mm and 510mm North of the bridge, (where it could be accurately measured). This cycle of flushing followed by sand ingress has been observed many times since the 1940s. The absence of the wall on the west side, along the channel south of the bridge, creates a funnel effect during heavy seas forcing sea water and sand far into the course of the channel.

In previous times, silting from the Kingston end was more of a problem. Evidence of a period of silting may be seen along the channel from the bend to the bridge, where sections of it were not excavated years ago when the channel was cleared out to a limited width. No clear evidence exists to show that the channel was floored in any way, usually by flagging or by lining the floor with small logs, though some pine knots were found recently which appeared to come from under the foundation of the retaining wall, (I only saw the pine knots).

For most of the time the channel floor remains dry and is covered with sand. It is now mainly used as a recreation area, (walkers, children etc).

Condition

Keeping in mind that the exact nature of the original floor is not clear, the floor appears to be stable, (as seen during the last flush-out).

BRIDGE, A 11 A.

The bridge was built ca 1836. The retaining walls are knitted into the masonry of the culvert of the bridge. Likewise, the bridge is constructed of the same material as the walls. The vaulting of the culvert is roughly on the same principle as a key-stone arch (barrel vault type). All evidence of mortar in the jointing of the stones composing the vault has vanished, although it may have been constructed as a dry arrangement. (The surface of the stone is very clean). The bridge has withstood the test of time well. The south end of the vault was reinforced with concrete set over a section of "bent" corrugated iron. The whole bridge, except for the culvert was compomortared in 1962. A large block of masonry was built onto the south face, west end to butress and prevent undermining. The base area of the culvert was recently stabilized due to serious undermining and the effect of the acidic water on the stone.

Condition.

Fair, but the base of the culvert needs some more attention. The bridge may not always carry the increasing road traffic which now includes, trucks, busses, earthmoving equipment as well as normal traffic.
Upper and lower: The upper two steps were exposed after heavy rains, the third step was found a little below the sand. The mid steps are entirely missing, three steps have washed out over the last ten years.
STEPS, J 7 C.

The steps were constructed during the same period as the retaining walls, compare earlier plans with those of Bordes, 1838, and Lugard, 1839. The steps appear on the plans like a "lug" attached to the channel, the bridge is more obviously rendered as such.

The location of the steps appear odd until note is taken of the character of the area. The area thronged with activity during the 1830s and 1840s; the constant working of the lime-kilns and lime processing which required water; the quarrying of rock and carting thereof; the burning of the nearby charcoal kilns; the Milking Yard across the road, after the quarrymen had finished with the area; the stone cutters, as distinct from the quarrymen, worked just across the stream, (note the chips of massive calcarenite in the bank): All these industries required a regular supply of water, as did the beasts of burden which did the carting etc.

It is concluded that the steps were constructed to facilitate the retrieval of water for the surrounding industries. The so called Officers' Bath was constructed for similar purposes and both had parallels along the Tank Stream at Sydney before it was fully enclosed. It should be mentioned here that neither the "Officers' Bath" or the Steps had any connection with the bathing of officers, soldiers etc., they bathed at the other end of Emily Bay beach, where a "bathing house" was located. The water of the Kingston streams were very obviously polluted at the time.

The Archaeological Evidence.

As no illustration or description of the Steps exact form are known, we must rely on the archaeological evidence and its relationship to the features connected with the Steps. For some minor details, contemporary parallels must be employed.

STEPS.

--Upper step (part), being the first step down from the top. Accounting for a bit of a slope, the upper remains agree with the level of the nearby convict road, as seen along the bank.
--Lowest three steps, (full length, the very lowest appears to have been part of the "landing".
--Single dislodged step (part), washed further down the channel.

Information derived from the above:

Treads tended to 12 inches in all examples, (as originally exposed: a horizontal line of mortar may be discerned, the original junction between tread and riser).
Risers tended to 8 inches in all examples. Each whole step, composed mostly of two stones, showed a maximum width of 5 feet, 10 inches. (See further).

FULL EXTENT OF STEPS.

The entire mid section of the Steps have eroded away, creating a large gap.
If the vertical of the gap is divided into units of 8 inches (height of risers), it almost perfectly indicates the former existence of six steps.
If the horizontal of the gap is divided into units of 12 inches (depth of treads), it also indicates the former existence of six steps, avoirdupois.

Information derived.

There appear to be six missing steps; (sets of treads and risers), a total of eleven steps, including the lowest and an initial step, as illustrated.

LANDING.

The lowest "step" is at a level which relates to the base of the retaining wall. As it is "two feet" short of the channel course, it can only be concluded that this step was part of a landing of about "three feet" deep.
The sediment adjoining the lowest step is of an almost clay like nature but evidenced a fair amount of stone chips. The stone chips were firmly wedged. A test trench here would require authorization but it should be noted that this level was water saturated, (water table).

Information derived.

The area of the lowest step plus "two feet" must represent the landing as such a space would be required for manoeuvrability. Whether the "two feet" were flagged in massive calcarenite as the lowest step or whether this area was merely gravelled in a bed of clay is not certain.

STEPS AND FLANKING WALLS.

A tiny fraction of masonry survives at the very top of the steps, overlapping onto the first step down. When a line is drawn from this overlap down to the lower steps, it suggests that a similar overlap existed there. This appears to be evidence of flanking, or retaining, walls built to either sides and partly overlapping onto the steps. There is evidence at the upper part of the Steps remains of a firm footing for the steps and well outside the line of the steps, suggesting a firm footing for a flanking wall as well. The footing is composed of rubble calcarenite; piled together with lashings of mortar.
STEPS AS RECONSTRUCTED

RECONSTRUCTED SECTION A-B

SCHEMATIC REPRESENTATION
Information derived.

The steps as originally exposed appear to have been about five feet wide. (i.e., the observable five feet, 10 inches minus the flanking wall overlap).
There is no solid evidence of the original height of the flanking walls and so an analogy must be sought from surviving similar examples, H 6 and H 1 K.

STEPS RELATION TO RETAINING WALL.

The shortfall of "two feet" were previously noted in regard to the position of the steps in relation to the channel, (the channel width was originally between four feet, nine and ten inches).
The channel retaining wall must have diverted to the sides of the steps at rightangles (no evidence of a curved arrangement) and from there continue up to the top of the steps as flanking walls.

Information derived.

See above.
The transition from channel wall to Steps flanking wall can only be speculated. A very close example of the same situation are the front steps of the Civil Hospital (H 6) which also pierces a retaining wall.

BASIN?
Theoretically, evidence of a deep basin should be found in the floor of the channel in front of the stairs, (as at the Officers' Bath). The basin allowed depth of water for the filling of tubs and barrels. An exploratory excavation would require authorization but would be difficult in any case as it would be well below the water table.

CONDITION.
The remains of the upper steps are in serious peril of collapse. A small Lagunaria patersonia grows at the very top of the Steps area and has no doubt preserved the upper section by restricting human access. In time the tree will dislodge the remains if they are left unsupported. The lowest three steps appear to be stable but are at the mercy of human activity and may eventually be dislodged by storm water or heavy seas if not protected.
RECOMMENDATIONS

CONSERVATION SUMMARY

To summarize, no original elements should be removed. The conservation/stabilization work should be combined to preserve the original fabric that remains to allow the whole to continue to function as it has since it was first constructed.

The pressure of natural wear has diminished since the New Outlet was completed in 1941. However, the new work should be strong enough to withstand the periodical flooding of Kingston Common. The recreational use of the area is now the greatest destructor and can not be practically controlled: The only realistic solution is to securely support the surviving parts by replacing the missing elements. This is additionally important regarding the retaining walls as deposits relating to the First and Second Settlements are in danger of eroding away. Where there are significant difficulties, options are offered.

BROAD RECOMMENDATIONS

Note: To avoid repetition under the specific headings, the broad outlines are given here:

CONSTRUCTION.

The chief conservation work involves masonry construction: The Team is skilled at this type of work and need no further instruction than to lay the stone and finish off the mortar as seen in the original construction on the site. The stone should be laid "on the flat". The new work will be distinguishable from the original work by the type of mortar in use and the limited choice of stone, (as found in the channel or brought in from elsewhere).

HEIGHT OF CHANNEL RETAINING WALLS.

The most complete section of the wall survives to the north of the bridge, west channel wall. Measurements taken seem to suggest a height of about 3' 6" (1.065). Other measurements taken ranged between 900mm and 1.065 but as the wall was not coped, it was impossible to determine how much of the top coursing was missing. The border between the footing and the wall proper was also difficult to determine as the sand had returned to the channel.
It appears that the height tallies with the point of the springing of the arch of the vault. It is not known what the gradient is from the tunnel to the sea. The height throughout the length should remain constant unless unforseen practical problems should emerge.

**WIDTH OF CHANNEL BETWEEN RETAINING WALLS.**

Where sections survive intact, the approximate width varies between 1.440mm and 1.485mm. The width of the bridge culvert varies between 1.450mm and 1.470mm. The original specification may have been 4 feet, 9 or 10 inches.

Any missing sections of retaining should conform to the width of about 4 feet, 9½ inches. or between the limits of the metric measurements taken, 1.440mm and 1.485mm where practical circumstance necessitate variance: (For example, where the new work incorporates sections of the original wall).

**EXTENT OF CHANNEL.**

Except for section B 1 and B 2, all sections of the channel should be made good. This is recommended as the most expeditious way to preserve the original fabric as remains and to halt the erosion of the banks. The retaining walls should be extended to as far as the new channel on both sides. The footing of the east side channel wall may be found under the sand.

**ERODED AREAS.**

Sections D, H, I and J have been subject to severe erosion. When the retaining walls are restored to these areas, they will require a substantial amount of back fill.

If possible, the walls in these areas should be back filled with as much stone and concrete as can be spared, the remainder should be back filled with sand. Sections D, H, I and J are particularly subject to flood water stress.

Volcanic soil should be avoided as fill anywhere near the beaches as it is now known to be detrimental to the Kingston type of coral growth.

**EXCAVATION.**

Some excavation will be required to achieve a firm footing for the retaining walls. The slumped soil and sand, sediment etc., should be carefully scraped away so as not to damage any hidden footings.

The removal of the debris should be done with archaeological supervision, (discuss problem with archaeologist).
The following recommendations are presented according to location along the retaining walls.

**TUNNEL TO BRIDGE**

North-East Sections: A, 0 - 3.6m (approx); B 1, 3.6m - 13.2m; D, 13.2m - 30.1m; F, 30.1m - 40.1m; G, 40.1m - Bridge.

North-West Sections: B 2, 0 - 14m; C, 14m - 18m; E, 18m - Bridge.

**SECTION A.**

A small part of the original wall survives at this section. The section of wall has fractured horizontally near the base and leans into the channel course due to slumping behind it.

Option 1

If practicable, thoroughly scoop out the soil from behind and the sides and lever the fractured section back into place. Strengthen by pouring concrete behind the wall. Connect the wall with the natural stone of the tunnel where there is a gap so as to hinder future slumping and undermining.

Remove rubble from the channel floor after completion of work.

Option 2

Thoroughly scoop out the soil as above and pour in concrete and stone. Make good any loose stone and add jointing where necessary. Connect the wall as above.

This option will stabilize the wall in its present state.

**SECTION B 1.**

Almost all trace of the original retaining wall has gone, apart from some of the stone fill.

The banks in this area are quite stable and are retained by outcrops of stone and a number of naturally sown endemic trees, (Lagunaria patersonia). The disruption of this beautiful area seems unnecessary. As the course of the channel is free and the banks are stable, I would recommend that this section be left as it is. In the future the plants growing in the area should stabilize the upper banks more completely.

As appropriate for all areas at KAVHA, this area should be monitored on an annual basis.
NOTE: THE EXTENT OF SECTIONS A, B1, B2, C ETC., AS EXPLAINED IN TEXT.
SECTION D.

This section of wall is entirely missing, the elbow section of the bank has been considerably eroded away by swirling floodwaters and to a minor degree by water washing in from above. Renew the wall as recommended and reinforce the elbow area with a stone and concrete backing. Fill behind with sand.

SECTION F.

Remove carefully the parts of the retaining wall which are at present face-down in the course of the channal an incorporate in the new work.

SECTION G.

Parts of the footing an fill survive here and a small section of wall adjoining the bridge. Renew the wall as recommended, incorporating any sections of the original construction. Some clearing of silt will be necessary to clarify parts of the footings. This will require some archaeological supervision.

NORTH-WEST SECTIONS, (TUNNEL TO BRIDGE).

SECTION B 2.

See Section B 1.

SECTION C.

A section of original wall which requires action to prevent further undermining and disintegration. Make good the base and masonry where lost or dislodged.

SECTION E.

This section is largely intact but has had some recent emergency work done to it. Clear the top surface of the wall and make good the top coursing where missing, especially at the elbow (where a track leading into the channel has resulted in a reduction of the wall). The masonry requires minor stabilization action throughout.
FIRST SETTLEMENT
Cemetery

SECOND SETTLEMENT
STONE CUTTERS' SHEDS

1840s PINES
BRIDGE TO EMILY BAY

East Sections: H, Bridge to end of recently constructed wall; I, footings under sand.

West Sections: J, Bridge to Steps; K, Steps to New Outlet.

EAST SECTIONS.

SECTION H.

Parts of the retaining wall have undergone emergency stabilization. The recent excavation of the debris and subsequent heavy rain revealed that the reconstructed section was not set deep enough and became undermined: This section should be underpinned. Continue the retaining wall over the footings which were exposed during the last heavy rains. The last section of reconstructed wall is slightly misaligned, (at its termination). This section should either be rebuilt or a compromise made according to the footings located at Section I.

SECTION I.

This section should be extended to the termination of the tracable footings, now under the sand. The wall should be strongly reinforced by a stone and cement backfil. The extension should protect the original footings and reduce the sand ingress. The extreme end of this wall should be reinforced with a short wall at right angles or be butressed in some manner. It is expected that the sand should build up behind the extension.

WEST SECTIONS.

SECTION J.

Rebuild wall with a sound footing and a strong backing for extra strength. Backfill with sand.

SECTION J.

Rebuild up to the junction of the New Outlet and backfill with sand. This wall will block up a track (which was widened in recent years). This section of the retaining wall will contribute to the future protection of the remains of the convict road.
Footings of the further extent of the retaining wall, as exposed after heavy Rains.
BRIDGE, A 11 A.

It is recommended that the bridge be monitored on a half yearly basis, considering the traffic subjected to it. The bridge should receive a complete assessment by an engineer skilled in examining historic structures. The other KAVHA bridges should also be assessed. The walls of the culvert require some minor attention.

STEPS, J 7 C.

Option 1.
Where missing reconstruct steps and retaining walls, providing a solid footing, or base, for both. The Steps as described; approximately five feet wide (1.524mm) with risers of eight inches (203mm) and treads of twelve inches (304mm) and flanking retaining walls, as illustrated. The measurements should be checked on site using the skills and equipment of Restoration and any adjustments made as found necessary. Any steps found in the channel or rock piles originating from the original structure should be incorporated with the new work. Where there is no other choice, cast new steps in concrete based on sizes as found on site, coat in sand. This option is considered preferable in view of the efficient and long-term protection of the surviving elements. Option 2 will in effect create a new feature in the area (of bulk proportion) and detract from the future interpretation of the area as a whole.

Option 2.
Continue the channel retaining wall as if the steps had never existed and back fill. Encase the upper remains in masonry blocking. As this part is about 1.500mm from the surface of the lower steps, it will require a massive amount of masonry work.
Convict Road.

Constructed of kiln waste and given a smooth surface, the remains of it may be seen at Section K along the bank and up to the New Outlet. Children like to play in this area and make holes in the banks. The road has not been previously listed.

New Outlet Channel.

The sides of this channel are no longer fully protected and fossiliferous deposits wash out of the eroding banks after heavy seas or rain. From discoveries made when the channel was first excavated, it appears that the First Settlement was extended in this direction. Remains of the convict road (near to Old Outlet) and the remains of the charcoal burners (near to the "Milking Yard") also erode into the channel. The above have not been previously listed.

Stone Cutters Spoils.

Composed exclusively of chips of massive calcarenite, this considerable deposit has been eroding out of the bank, opposite the Steps, for many years. The deposit not previously listed.

First Settlement Cemetery.

The original boundary on the west side was the Outlet channel of the period. Two skeletons were washed out in 1936 when a large pine was undermined, located near the termination of Section I. The later yard for the stone cutters were located during the Second Settlement over a part of the Old cemetery.

Except for the Cemetery, the other items listed above are in varying degrees of disintegration through natural and human forces. These should be the subject of future consideration.
APPENDIX

JUNE 7TH 1990

Finances apparently precluded the archaeological component.

A square stone-lined drain was discovered at the base of the channel when the deposits were dug out, (area F). The channel led off at right angles to the channel. The team working there asked me to examine the drain (private capacity).

The channel at the elbows, area D, was made wider as footing stones were found when the floor of the channel was dug out.

The drain and some other details have been left for a future stage when funding becomes available. If there is any unsolvable question regarding the lowest step, none so exists. The break in the channel wall at the stairs has been closed up.

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