Chapter 8 Mary Kathleen: Site Two, The Township

8.1 Site Visits

The approach to the town site of Mary Kathleen is along a rough dirt road which, if one continues along a further few dusty kilometres, leads to the now defunct open-cut uranium mine explored in Chapter 7. The old town site, Site Two, is linked to the other sites by terrain, history (Indigenous and Caucasian), and visually by the road and bridge one crosses over to enter or exit the old town site The town site proper is accessed by driving between metre high stone plinths (Plate 8.1.1) on to and then over a stone arched bridge which spans a sandy creek bed surrounded by large eucalypts.

Plate 8.1.1 J. Mulcahy Entry to the Mary Kathleen town site 2000

The roads, laid out in an organised grid are in fairly good condition with the odd pot hole or clump of spinifex breaking through the bitumen. Cattle wander leisurely along the roads and over the concrete slab floors which are all that remain of the once busy

township. Someone has gone around the streets with a spray can of paint and sprayed the names of the various places on the relevant slabs as can be seen in Plate 8.1.2 where the Town Office has been identified. Thus we can visit the Bank or the Post Office that once was, or even wander over to the Pottery Shed or the Wet Canteen for an imagined drink after a busy shift at the mine.

Plate 8.1.2 J. Mulcahy Town Office site 2000

Some slabs have the remains of tiled floors, as can be seen in Plate 8.1.2; some of these are now beginning to come adrift from the concrete, their edges curling and fragmented, their colours faded to the extent that it is hard to imagine the original design. Stone walls can be glimpsed in a few areas but apart from these, the roads, slabs, and a few introduced weeds, the feeling is one of peace and tranquillity with the natural environment slowly regenerating.

It is a slow regeneration with little difference being noticeable between the first site visit by the artist in 1998, the second in 2000 and the third in 2005. Probably the most significant difference relates to the number of visitors to the site. When first visited in 1998, no other people were present; on the second occasion there was the occasional car and a few backpackers; however on the final visit there were a number of vehicles and

people at each site. Recent verbal anecdotal information (2007) suggests that many people are now actually using the old slabs as camp sites.

As stated in 7.1 the three field trips that were undertaken during the period of research resulted in comprehensive visual documentation of the town site. In addition, relevant historical records studied at the Mt Isa Library and at the Mary Kathleen Museum at Cloncurry provided a valuable insight into the social structure of the isolated mining community. Having a copy of an old map of the town (Figure 8.1.1) obtained from the Mary Kathleen Museum in Cloncurry proved invaluable when trying to identify unlabelled concrete slabs and other artefacts, such as a wooden cross, found in a paddock near where the churches had been located.

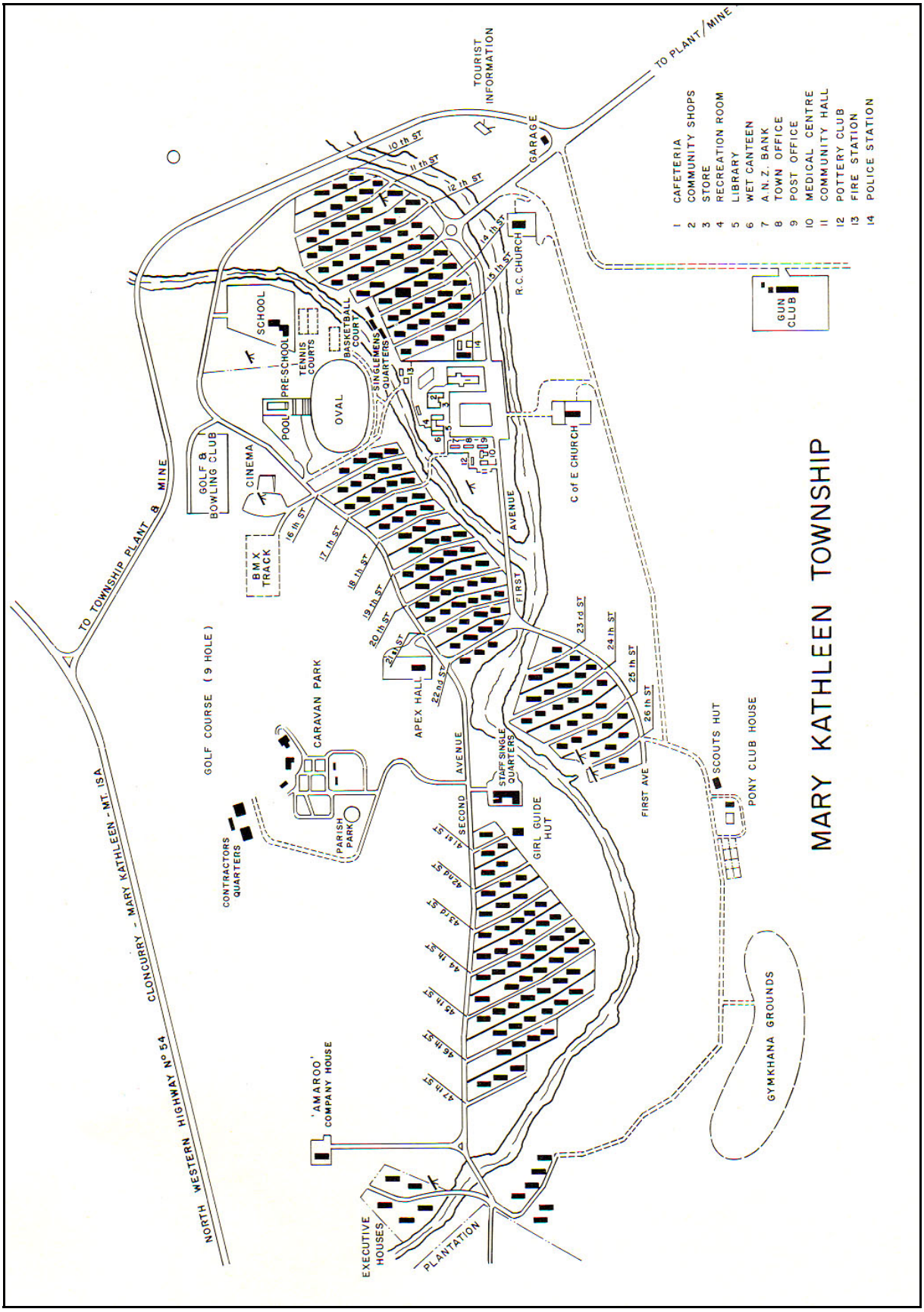

Figure 8.1.1 **Plan of Mary Kathleen township circa 1980**

8.2 Visual research

What became apparent from reading the newsletters and viewing photographic collections held by the Mt Isa Library and the Mary Kathleen Museum in Cloncurry, was that it appeared to have been an idyllic small community with the Mary Kathleen mine management keen to ensure that the social and economic needs of families were well catered for. This impression was reinforced after interviewing ex-residents; all fondly remembered the time spent at Mary Kathleen and had positive anecdotes to relate. Plate 8.2.1 from the Cloncurry Mary Kathleen Museum collection shows a view of part the township from a nearby rocky outcrop. Another image, taken from a similar vantage point (Plate 8.2.2) in 2005, shows the natural regeneration and revegetation of the town site.

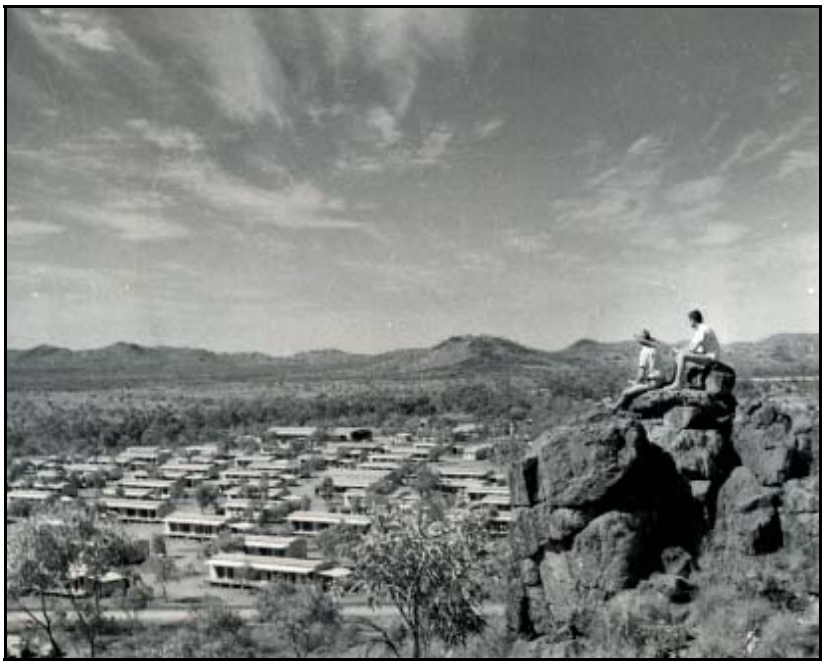

Plate 8.2.1 View of part of the Mary Kathleen township Circa 1980

According to Mary Kathleen Uranium Limited's *Description of Operations,* the total population of the Mary Kathleen township was "… about 1000 of whom approximately

175 are single employees" (MKU LTD, 1982:20). The company provided and maintained the following facilities: 221 houses, single men's quarters, canteen, sports oval, basketball court, tennis courts, community hall, open air cinema, fire station, recreation centre, library and post office, the layout of which can be seen in the Mary Kathleen Plan (Figure 8.1.1). A bus service was supplied to and from Mt Isa to take children to secondary school, housewives shopping and bring commuting workers to and fro. Additional on site facilities included a supermarket, cafeteria, chemist, bank, newsagency, bowls club, police station, primary school, pre-school centre, medical centre, ambulance service, pony club, dance classes, mini bike club, BMX track, pottery club, dog obedience classes and a golf club. There was also a nine hectare plantation of mainly citrus trees and a nursery where plants could be purchased at nominal cost.

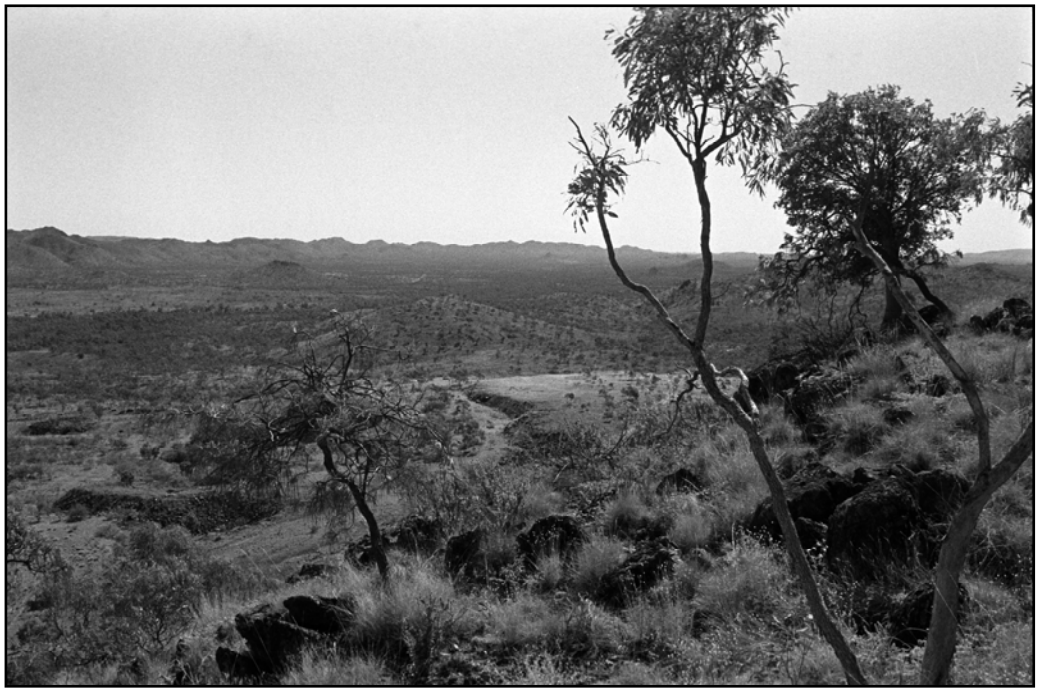

Plate 8.2.2 J.Mulcahy View of old Mary Kathleen town site (2005)

After the contracts to supply uranium were met and the mine finally closed in 1984 (see Chapter 4), the buildings and removable plant were sold off. Ex Mary Kathleen houses with their unique architecture can now be spotted in towns throughout the north-west including Cloncurry, Richmond, Julia Creek and Mt Isa. The police station was relocated to Cloncurry where it became the Mary Kathleen Museum housing numerous collections and memorabilia relating to Mary Kathleen.

8.3 Conceptual framework

Identified in 4.5 and illustrated in Tables 4.5.1 and 4.5.2, Site No 2 rated highly when measured against the specified criteria, most notably an immediately sensed atmosphere, a sense of loss, a feeling of the silence influenced by human intervention and historical knowledge as well as an underlying sense of tranquillity.

The initial conceptual framework of the artwork to be constructed in response to Site No 2, the township of Mary Kathleen, focused on the cyclical nature of life, or states of being, of both animate and inanimate objects, and how every state of being resonates with implications from the past, present and towards the future. The artwork therefore had to be made of a medium suited to convey the silence unique to the site visually, as well as energies intuited there whilst referencing the ephemeral states of being, and the inevitable ultimate metamorphosis.

At the beginning of the experimental and construction phase, the means of encapsulating and portraying the ethereality felt at the site concentrated on using images from the Mary Kathleen Museum collection which had captured everyday scenes of the

town and its people. The images of the Post Office (Plate 8.3.1) and the Dance Class (8.3.2) are examples of the types of images that were incorporated into the conceptual framework along with images of the town as it is now (Plate 8.3.3) to depict the transitory nature of the town and its inhabitants and the changes to the landscape over several decades.

Plate 8.3.1 Post Office (MKU, /1981:1)

Plate 8.3.2 Dance Class (MKU, /1981:1)

Plate 8.3.3 J. Mulcahy Town site 2005

Figure 8.3.1 on page 146 is copied from my research journal and exemplifies the preliminary sketches and concepts which were made in response to this site. The sketches on the top half of the page give a rough idea of the format that was explored

and is detailed in 8.4.1. The lower half of the page depicts the initial concept and conceptual drawings from a further series of works reflecting the metamorphosis or transition of being undergone by every animate and inanimate form. While both series of works, the photo silk-screened images on paper thin clay, and the huge heavy coffin-like forms had the same conceptual base, (referencing the morphing from one state of being to another, and the ephemeral quality of the different states of existence), highly disparate approaches were taken to the construction. The paper-thin wall series have a light, transitory quality while the large heavy floor works with their connotations of figures sinking into the earth illustrate the inevitability of change that is a part of life.

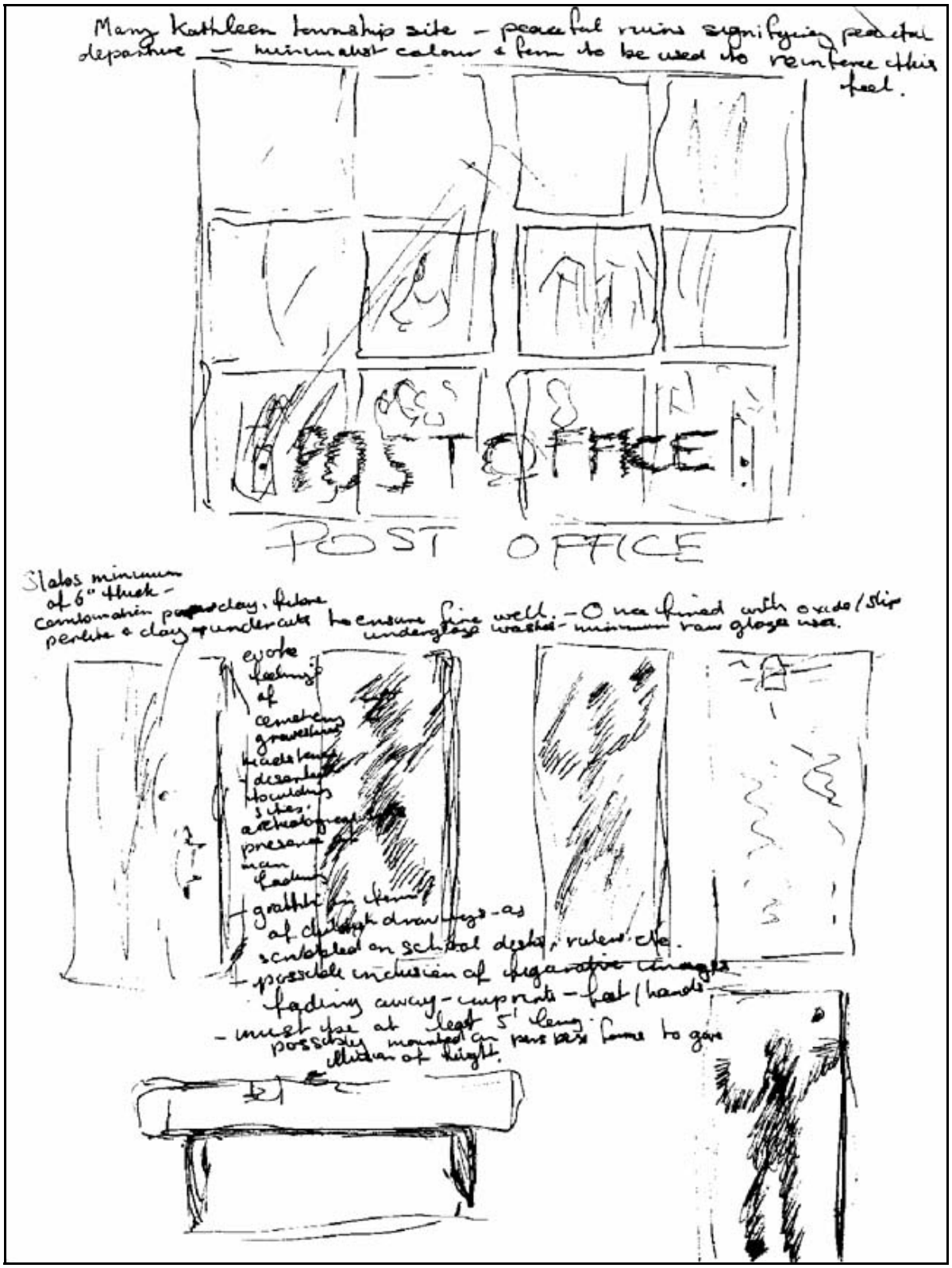

Figure 8. 3.1 J. Mulcahy **Page from visual journal 2006**

8.4 Processes relevant to construction of artwork relating to this site

8.4.1 Paperclay and photographic silk-screened images

The first works constructed included photographic silk-screened images of the town and its inhabitants as they went about their daily lives. Wishing to convey a sense of fragmented memories of what life in the town had been like, images of daily events and special occasions were sourced from town newsletters held by the Mary Kathleen Museum at Cloncurry, copied, transferred to silk-screens and finally printed on fragile, paper thin sheets of porcelain paper clay arranged to resemble the now curling and decaying floor tiles on some of the concrete house slabs as seen in Plates 8.4.1 and the finished works in Plate 8.4.2.

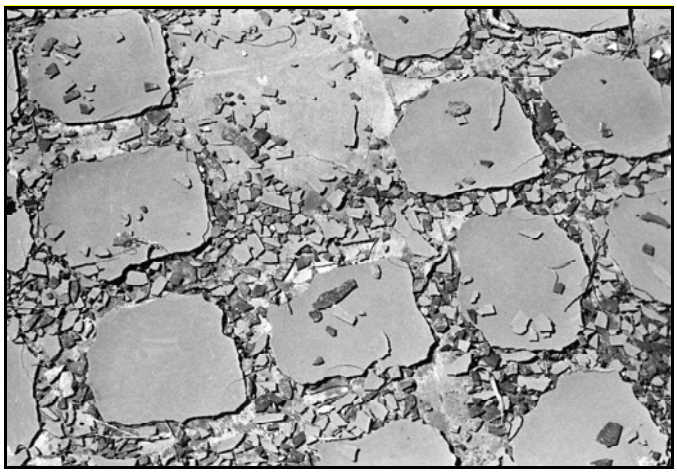

Plate 8.4.1 J. Mulcahy Decaying floor tiles, Mary Kathleen 2000

Plate 8.4.2 J. Mulcahy Screen printed paper clay 2006

Another series of larger wall works were made using a heavier clay body and, rather than using representative silk-screened images, were finished with a series of overlaid glazes, the colours and textures of which related to the town site (Plate 8.4.3). Both series were designed to be wall mounted and to convey a sense of fragility and the ultimate transient ephemeral nature of our existence.

Plate 8.4.3 J Mulcahy Test Tiles (2006)

Examples of the experimental works documented more fully in 6.5 involved

- placing thin, fired slabs of paper porcelain between sheets of glass and then firing the work to fuse the glass sections together thus effectively encasing the paper clay segment within the glass sections.
- firing glaze to its melting point on a special ceramic fibre paper (to which the glaze would not adhere) and then peeling the fired glaze segments from the ceramic paper and placing them between sheets of glass and firing them to fuse the glass sheets together, thus encasing the glaze segments.

Yet this experimental work (Plates 8.4.2 and 8.4.3), although visually and intellectually satisfying, did not, because of its fragility and ephemeral connotations, contain the solid earthy feel the artist associated with decomposition, and of life returning to the earth. Because of this fragility (both literal and aesthetic) the paperclay slabs were also conceptually and aesthetically at odds with works made in response to the other three sites which were on a more monumental scale. Thus it was decided to leave further investigation into this potentially exciting area of experimentation for post-doctoral research and to concentrate on the areas of research that were more successful in meeting the desired conceptual outcomes for this project.

8.4.2 Construction of the artwork relating to the township

As mentioned in 8.3, in conjunction with these delicate paperclay works, three large heavy, coffin-like forms entitled *Transitions 1, 2 and 3,* were made. These three works were conceptually further advanced than the series printed on the paperclay sheets as the images became less literal, pertaining more to existence itself rather than ephemeral

images of a community destined to fade away. The larger works also had a sense of symbolism with the figures deeply etched and carved into the body of the heavy clay slab having the appearance of slowly sinking down into the earth. The simple human forms of man, woman and child are reminiscent of universally understood pictograms. These works, reminiscent of sarcophagi, reference the subsuming of organic matter, the death, decay and ultimate regeneration and cyclical renewal of life.

8.4.3 Transitions 1, 2 and 3

The desire for sculptural works of this monumental nature, combined with the need for them to relate aesthetically to works created in response to the other three sites, determined the media used. A decision to construct the works from a similar ceramic/perlite medium to that used on previous works was therefore reached, with however, additional strands of ceramic fibre being added to minimize warping. The works were constructed on canvas-covered boards mounted on trolleys to ensure easier and minimal handling once they were ready to be fired.

Constructed over a three-month period, the pieces were left until almost dry before the male, female and child figurative images were carved out. Slips, oxides and underglaze washes were then applied to reinforce the carved and incised design. An attempt was made to apply a smooth slipped surface in selected areas to enable the application of photographic silk-screened images of symbolic male and female figures. However, after much experimentation, this idea had to be abandoned for, as soon as the squeegee

pressure necessary for the transfer of the image was applied, the rough textured surface would protrude through the smoothed area causing the image to become blurred and fragmented. If just a little more detail had been retained, this would have worked well but, as it was, it just looked a smudged mess.

The graven images on the coffin-like works seen in Plates 8.4 4 and 8.4.5 (depicting as they do stylised male, female and child figures) represent the cycles of life; the female figure, smeared with blood, breasts heavy with milk has her legs bent at the knees and is depicted in the act of giving birth but could equally be seen as waiting to conceive life. The male figure is depicted as rigid, as though flattening and merging into the clay body his penis pointing to the ground, while the figure of the child has a simple transient feel, a stick figure with a triangle shape for a skirt and fading outline of shorts, it could be either gender and is representative of the transience of childhood.

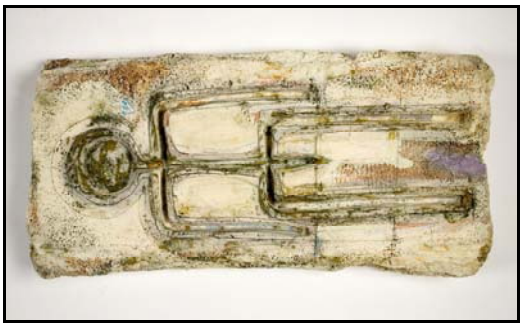

Plate No 8.4.4 J.Mulcahy *Transition No 1* 2006

Plate No 8.4.5 J. Mulcahy *Transition No 2* 2006

The intensity of these works which are large, heavy and low, with each piece measuring approximately 103 x 44 x 15 centimetres and weighing 60 kilograms, was increased by mounting them on plinths just 16 centimetres high with the width and length dimensions almost identical to that of the works themselves. In the concept drawings (Figure 8.3.1),

the support structure was initially conceived as a bench type support to be of minimum visibility. However, with the work for this site forming just one section of the whole exhibition, it was felt that plinths would be a more suitable option to allow for continuity of support structures throughout the exhibition especially given that some of the work from other sites required plinths. The aim of the plinths (or originally bench type stands) was to give the works a disembodied and spiritual essence to assist in creating a feeling of silence imbued with a sense of the transitory and ephemeral aspects of life with the figurative images carved and drawn on the top surface of the work appearing to sink lower and lower towards the earth until it could be imagined they were completely interred.

8.4.4 Heads

The heads, each approximately two centimetres in length and of variable but related thicknesses (see Plate 8.4.6), were constructed from a mixture of porcelain and stoneware clays. The variety of clays used was a deliberate strategy to ensure that the finished pieces would have a subtle range of colours reflective of different ethnic groups.

Plate No 8.4.6 J. Mulcahy *Heads* (detail) 2006

First bisque fired, the heads were then coated with a black copper wash to achieve an aged appearance before being refired to 1100° C to make the copper oxide used permanent.

The first dozen or so of the heads/skulls were made to be incorporated into either the ceramic body or the *pậte de verre* sections of the works made in response to the silences endemic to Sites 1 and 3. However, their tactile and visual appeal when placed in a random pile was such that hundreds more were made with the idea of placing them in piles as though they had no more import than a pile of pebbles on the side of the road. Yet if you ventured to pick one up to feel and caress its smoothness, as you turned it you would be visually confronted by a skull-like head frozen in an endless scream echoing our inevitable mortality.

This inevitable mortality that we all face is at times unduly hastened by contact with man-made disasters or atrocities. It is also at times a by-product of the industries we work in. The pile of heads resonates with a feel of disaster, their placement in a pile reminiscent of skulls exhumed from mass graves and also mass deaths such as those suffered by whole populations exposed to nuclear radiation or slaughtered by deliberate acts of genocide as were the original indigenous occupants of the Mary Kathleen township and mine sites.

Chapter 9 Mary Kathleen: Site Three, Existing Natural Landscape

9.1 Description of the site

In 4.5 the various possible sites were mapped against selection criteria to determine the most suitable for further research. When measured against the *site selection* criteria, Site Three scored the highest of all the proposed sites because of the significant variation in landscape, the distinctive type of silence, the artist's affinity for the site, the ongoing historical associations from indigenous and mining perspectives, the easily accessible location and the fact that no approval needed to be obtained for visual research as the site was open to the public. When measured against the criterion to determine the sites that contained the most *profound* silence, Site Three was rated second with the following strong attributes: an immediate sense of tranquillity accompanied by an atmosphere of primal earth energy and silence influenced by both human intervention and historical knowledge.

The dry terrain that surrounds and encompasses the Mary Kathleen mine site is rugged hilly country dotted with stands of Gidgee (a species of wattle), small creeks and clumps of Spinifex grass. The varied geology of the region is apparent in the multi coloured rock formations which advertise the diversity of minerals in the area including copper, gold, lead, zinc and uranium.

Once the sole domain of traditional owners, the Kalkadoon tribe, it is a region rich in Indigenous history with nearby Battle Mountain the site of the largest pitched battle between black and white in Australia's history (see Appendix D).

9.2 Site visits

Plate 9.2.1 J. Mulcahy Surrounding Natural Landscape 2005

This third site was selected as an embodiment of the intrinsic silence of the natural landscape that surrounds the defunct mine and town site as seen in Plate 9.2.1 The site visits for this location were undertaken concurrently with those for Sites One, Two and Four.

Prior to trying to locate this and other nearby sacred sites and, in order to determine the importance of the site to the traditional owners, a visit was made to the Kalkadoon Tribal Centre in Mt Isa to seek further information and also to ask the Elders'

permission to visit these sites as indicated in 7.2. I was referred to Mr Mick Collins who, in addition to being an elder and spokesperson for the tribe, was co-ordinator of the Kalkadoon Tribal Council Night Patrol.[1]

When Mr Collins was interviewed about Kalkadoon sacred sites that may be located within the Mt Isa Mine's mining extensive leasehold as seen in Figure 9.2.1, his comment was that the tribe had excised the area from their minds and hearts and were concentrating on protecting other sites, of which there were many.

[1] The Night Patrol, a crime preventative initiative, was established as a rescue service to aid local Indigenous people in crisis before they harmed themselves, each other or committed offences for which they could be jailed. The night watch, on receiving information or on regular patrols would collect persons at risk and take them to the appropriate safe place such as the Salvation Army Women's Shelter or local hospital if necessary.

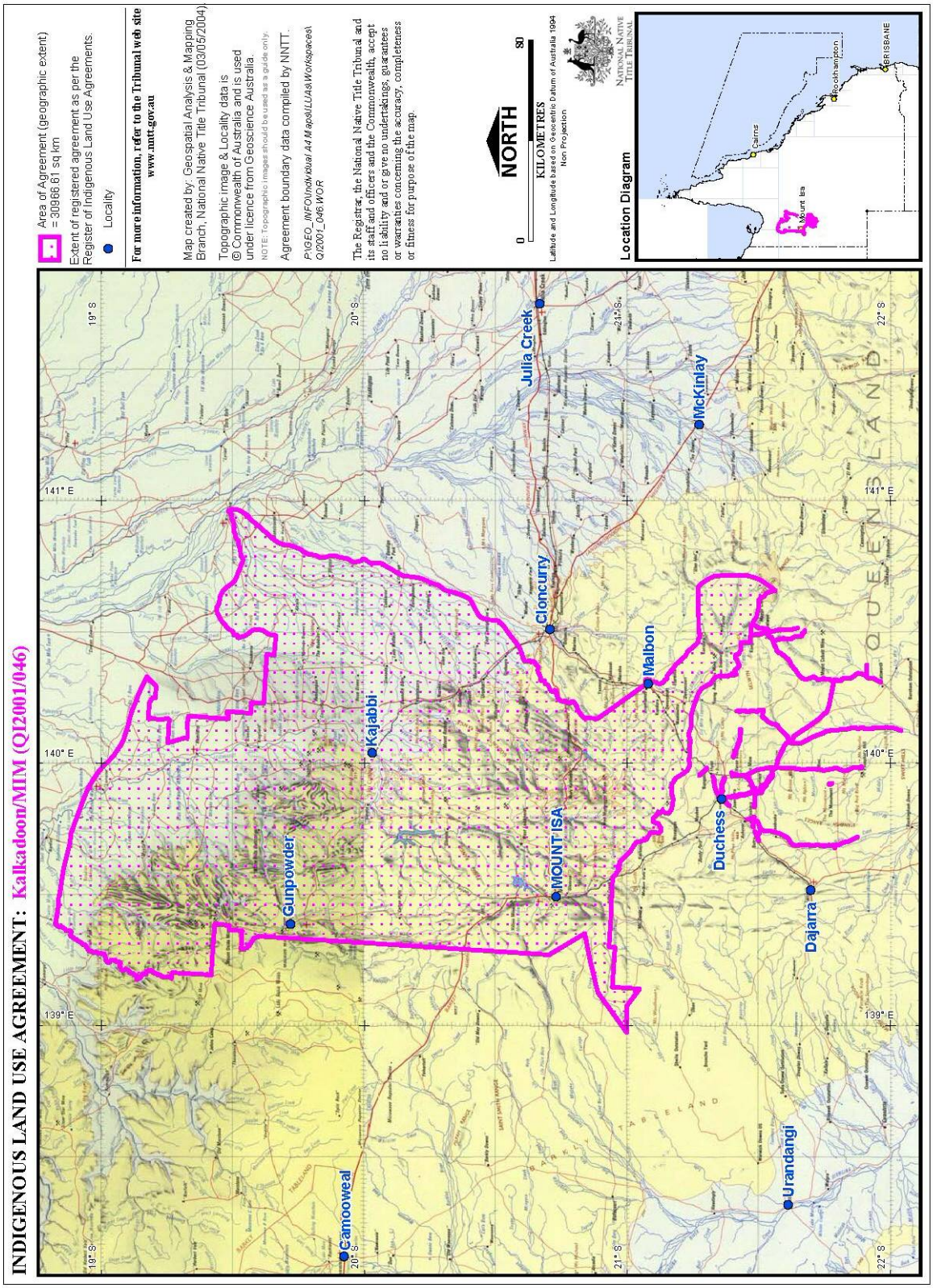

Figure 9.2.1 Map showing Indigenous land use agreement with Mt Isa Mines

Some of these sites are accessible to the general public and others are kept for Indigenous access only. He said there would be no objection to my producing artwork made in response to energies intuited at the site within the mine lease and hence provided information and directions to the sacred sites in the area not usually made available to non-Indigenous people. One of the main reasons for trying to keep the locations secret is the danger of theft and vandalism.

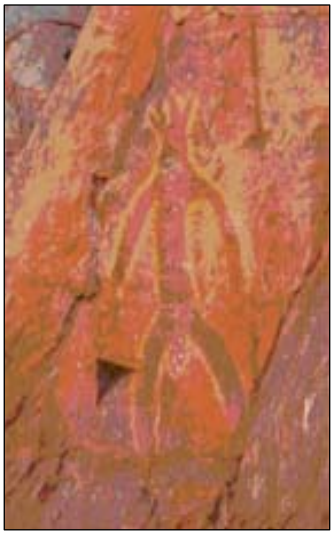

Plate 9.2.2 Kalkadoon Rock Art 2005

The image in Plate 9.2.2 was taken from a rock near a waterhole approximately 30 kilometres (over rugged terrain) from the Mary Kathleen site and is indicative of the style of art found in the region.

The exploration of the indigenous sacred sites in the area was exceedingly important to the research for this project as I did not in any way wish to cause offence to the traditional owners nor accidentally intrude on any areas regarded as sacred. However the fact that area was rich in sacred sites was remarkable as it acknowledged that the

traditional owners had recognised and responded to the essences intuited at various places as was I doing.

9.3 Visual research

Photographic documentation of the mine's immediate surrounds and the adjoining terrain which included rugged hills and both dry and still creek beds was taken on the initial and subsequent visits. Only subtle changes, such as the further slight deterioration of roads, a few changed fence lines and an increase in some introduced flora such as Chinee apples (ziziphus mauritiana) were noted in the landscape during the seven year period (1998-2005) over which visual observations were made; none of these had any identified detrimental impact on the visual terrain.

A variety of photographs taken in the area prior to the establishment of the mine and during its operational period (1956-84) were viewed at the Mary Kathleen Museum in Cloncurry and in the Mt Isa Library's Reserve Stack. The office of the *North West Star,* Mt Isa's local newspaper, was also visited in an attempt to locate good quality images relating to the area prior to, during and after the mine's closure. Surprisingly staff at the paper (who were interested and helpful in emailing progress reports of their search for photographic evidence), could not locate any images of that particular location or era. It was surmised that photographers of the period had not been employed by the newspaper but rather freelanced on commission and thus maintained ownership of negatives and prints. As the photographer's names were not available, it was decided not to pursue this avenue further unless the images already sourced proved unsatisfactory.

9.4 Conceptual framework – bronzes, altars, arch, & pate de verre / ceramic works

My initial aesthetic responses to the site resonated with the peaceful energy that seems now to permeate the area. However, as the artwork progressed, it assumed an energy that belied the peaceful surrounds and grew until it encapsulated not only the silence felt in the surrounding visible landscape but also the innate power, essence and energy of what lies beneath the earth's surface.

The artworks made in response to the silence intuited at this site proved conceptually challenging, frustrating and immensely time consuming to create. Identified against the established criteria in Chapter 4, the site required the artworks to respond to the descriptors of silence that had been felt there. These descriptors included an immediately sensed atmosphere, a contrast, a diversity of silences within a specific area, a sense of tranquillity and also of earth energy.

Initial aesthetic responses such as the *Blue Arch* and the *Altar* series were in keeping with the tranquil, colour rich landscape, and the peaceful meditative silence intuited there. However, as the artwork progressed, it developed a strong metaphysical energy that reverberated with connotations of the energy of the earth. It is this energy which came to permeate the subsequent *Message Sticks*.

As the construction of the artworks progressed, the energies which were identified as permeating the landscape became almost sub-consciously transferred to or merged into the works. For example, the pictograph imagery on the bronzes represented an inchoate

response to the work which, when first conceived, was not as concerned with fertility, male/ female symbolism and the life cycle but initially concentrated on the analogy of the cast crystal acting as a metaphor for the earth's energy and, as believed by some, its source of healing. Likewise, the use of bronze as the main medium for the *Message Sticks Series* was primarily developed as a metaphor for the ore we remove from the earth, then converted to elements to be used for our own destruction, bronze being a metal primarily developed as a war tool to make weapons and armoury. It also had connotations referencing elemental/cave type pictograms engraved in or fastened on to the bronze of the hard battle fought in the area by the Kalkadoon tribe (Appendix D).

9.4.1 Blue Arch.

The *Blue Arch* (Plate 9.4.1) is a pivotal conceptual work relating directly to the stone bridge providing access to the town site, either from or into, the natural landscape.

The heavily textured and striated ceramic surface is coloured to imbue the work with similar perceptions engendered when one views the mosses and lichens growing over the stonework of the bridge (Plates 9.4.1 & 9.4.2) and provides an aesthetic link to the work made in response to Sites One and Two.

Plate 9.4.1 J. Mulcahy *Blue Arch* (detail) 2006

Bridges are frequently used as metaphors for change, linking the past to the present, breaking or crossing barriers of race or religion. The *Blue Arch* is symbolic of the stone

bridge one crosses from the natural environment to the man-made. The purity and translucency of the cast glass centre-piece acts as a metaphor for the earth's innate energy, and references the belief of many that naturally occurring crystal contains healing powers derived from the earth's innate energy, and ability to regenerate (See 5.1).

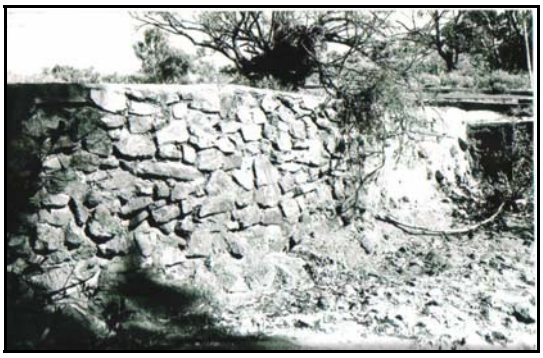

Plate 9.4.2 J. Mulcahy Bridge (detail) 2006

Initially constructed as a solid form, as the clay body firmed up, the mid-section which was eventually to be cast in glass was painstakingly cut from the work and then, just as carefully placed back in position with a thin layer of plastic separating the two surfaces to prevent them sticking together.

The sections needed to dry at the same rate and be as close a fit as possible. After several months of slow drying, the work was bisque fired as one piece. It was also then glazed as one piece to ensure continuity of colour over the entire surface but, prior to the glaze firing, the mid section was removed (Plate 9.4.3) and fired separately as the two sections would otherwise have become joined together by the glaze as it melted.

Plate 9.4.3 Arch without mid-section

Plate 9.4.4 Arch with ceramic mid -section in position

The initial glaze firing was not successful (see 6.3.1); however, once the two sections had been successfully glaze fired, a cast was made of the mid-section which was to be cast in glass (see 9.7.2). Once this was completed the glass was kiln–cast, annealed, removed from the cast and the sprue seen in Plate 9.4.5, ground off and the glass finished as explained in 9.7.2. The glass section was then placed in position.

Plate 9.4.5 Cast glass after removal from mould showing sprue

9.4.2 The Altar Series

The encasing ceramic outer section, in the shape of an arch of each of the four *Altar* pieces, reminiscent of church windows and steeples, has a rough textured surface similar in colour and texture to an old rock wall covered in mosses and lichens (Plate

9.4.6). This texture references the personal shrines that are to be found in many parts of the world and which are frequently constructed from rock or found materials.

Plate 9. 4. 6 J. Mulcahy *Male Altar* 2006

From wayside shrines to sacred rocks, caves, and holy water containers, the rituals associated with these shrines are an integral part of life for many, as is the belief in the different deities to which each pays homage.

The *Altar Series* references those beliefs which encompass the recognition of the earth's energy which, since Pagan times, has been a major component of many religions and/or cults throughout the world.

9.4.3 Message Stick Series

The concept behind the *Message Sticks Series* was based on humankind's earliest forms of non verbal communication and the recording of information. The first crude mark making and symbols on cave walls evolved into petroglyphs (carving on rock walls) around 10,000 years ago where they depicted events. Around a thousand years later

these evolved into pictographs/pictograms where ideas were transmitted through drawings. Thus a story could be told in chronological order although images were limited to representing the actual form; for example, a circle could represent the sun but not concepts like heat, light or the Great God of the Sun. Pictograms developed in many ancient cultures around the same time and tokens marked with simple pictures were frequently used to label produce with early merchants using clay tokens to record quantities of materials shipped or traded. As use of these tokens increased, the pictures became simplified, thus slowly losing their pictorial detail and becoming abstract figures.

Pictograms in turn evolved into ideograms, which were graphic symbols that represented an idea and could convey more abstract concepts such that an image of two legs can be taken to mean walk as well as simply legs. As some ideas are universal to many different cultures, unbeknown to each other similar ideographic symbols developed. Modern day ideograms include way-finding signs such as those found in airports where a number of people may be unfamiliar with the language but are able to recognise universal symbols.

Thus the use of pictograms and ideograms on the bronze Message Sticks relay the story, (evolving with each piece) of the cyclical nature of male/female relations (Plate 9.4.7). The use of images such as the male figure spilling sperm from his penis and the female figure, legs wide apart, giving birth are images able to be universally read and, as such, were integral to the concept of the works which was to convey pictorial and symbolic

messages. The symbolic messages found in the pictograms and ideograms are also contained within the bronze and glass media from which the works were constructed.

Plate 9.4.7 J. Mulcahy ***Message Stick No 4*** **(detail) 2006**

The glass/crystal sections serve to mediate between human kind and the innate energy contained deep below the earth's surface (referred to by some as the energy of the Earth Mother) and as a metaphor for the healing properties associated with crystals formed under intense pressure deep below the earth's surface. The bronze sections convey a sense of hardness/endurance of the earth and also reference the way in which raw materials harvested from the earth can be worked or manipulated to create life as well as death, bronze being one of the first of man-made alloys, which also formed some of the earliest weapons and tools.

9.4.4 Wall works including *The Departed, The Key* and *Inheritance from Mary Kathleen Series 1*

This series, which included works entitled *Inheritance from Mary Kathleen, Series 1*, *The Key* and *The Departed,* was made in a similar style and of the same materials

(ceramic with ceramic, metal and *pâte de verre* inclusions) as those used for the triptychs *Inheritance from Mary Kathleen Series Two & Three* made in response to Site One, the mine site.

Plate 9.4.8 J. Mulcahy *The Key* (detail) 2006

However, the works made for the mine site were concerned with the depiction of mutation and deformity arising from contact with uranium or nuclear weapons while these works depict the life cycles of those who had had no contact with uranium ore.

Thus the triptych *Inheritance from Mary Kathleen, Series 1* depicts perfect human figures encased in pure crystal, while *The Key* (Plate 9.4.8) references the natural journey from embryo to adulthood, and *The Departed,* the natural cycle of life and death.

9.5 Processes relevant to construction of artwork relating to this site

A number of works, including the *Blue Arch, Altars*, the *Inheritance from Mary Kathleen Series Two* triptych, and wall works, *The Departed, Mary Kathleen,*and *The Key,* were made using the same techniques and types of materials as those used when constructing the further *Inheritance from Mary Kathleen* (Series Three and Four), *Green Arch* and *Ruins* works as described in 7.4. The main variations were in the colour

and the different intensities of colours used. For example the *pâte de verre* in the *Inheritance* series relating to the natural landscape is clear, pure translucent glass whereas, in the later *Inheritance* works, the ceramic figures which are encased within the *pâte de verre* are mutated and the *pâte de verre* is tainted with yellow representing contamination from contact with uranium ore. Likewise the cast glass segment in the *Blue Arch* is clear and translucent, its purity a contrast to the green glass found in the *Green Arch* with the green representing contamination from minerals including uranium.

9.6 Altar works

Initially the figures encased within the glass of the *Altar Series* were to be made of bronze. However, on testing the melt temperatures of the bronze, it was found that the recycled bronze used melted at around 600° C when it began to shell (peel off in layers) as can be seen in Plate 9.6.1

Plate 9.6.1 Bronze melt test

As a firing incorporating *pâte de verre* required a temperature of 750° C to reach glass melting point, and a further one and a half hours soak time at this temperature to enable the glass frit to meld properly, the higher temperature, coupled with the long soak time, was too much for the bronze causing it to slump and start to flow as can see in Plate 9.6.2.

As a consequence, symbolic male and female ceramic figures, similar to those made and incorporated into the *Inheritance* works were constructed, fired and then integrated into the glazed Altar forms which were then packed with *pâte de verre* and fired again

Plate 9.6.2 Bronze (soak) melt

following a similar firing pattern as that used for the previously constructed *Inheritance* works.

9.7 Message Sticks

As I had never worked with bronze before, I was unaware of what an extremely difficult and time-consuming project I was undertaking and, in hindsight, most likely would have used a different medium, made fewer or, at least, smaller works. However at the time, and even now, the combination of bronze and glass seemed the most appropriate and also the most beguiling of mediums to use to convey the particular concepts idiosyncratic to the Site (9.4.3).

Initially seven message sticks were constructed in clay. The three smaller works were made in single pieces of solid clay. However the five works that were designed to have glass inserts as the centre section had to be constructed in separate sections, with just a thin wall of clay rather than a solid mass to enable internal cavities that would help

support the glass to be incorporated. External and internal latex and then plaster mother moulds needed to be made of the different parts prior to hollow casting these in wax. Great care had to be taken to ensure the components of each work which had been made in sections were able to be slotted together and the parts aligned accurately. Innovative ways of hollow casting and of preparing methods of fastening the glass sections seamlessly and securely in the middle of the heavy bronze sections needed to be resolved.

After the original clay works had been textured and relevant designs either carved on or added as sprigs, the pieces were allowed to dry to the leather-hard stage prior to each piece being coated with three coats of shellac. This coating was to preserve the integrity of the carving and fine design work from becoming damaged by consequent applications of latex. The moulds for the works that were to be cast in one piece required two equal part moulds to be made. Thus one half of the work (at a time) was covered in a protective clay wall as seen in Figure 9.7.1 while the other half was coated in the requisite number of latex coats.

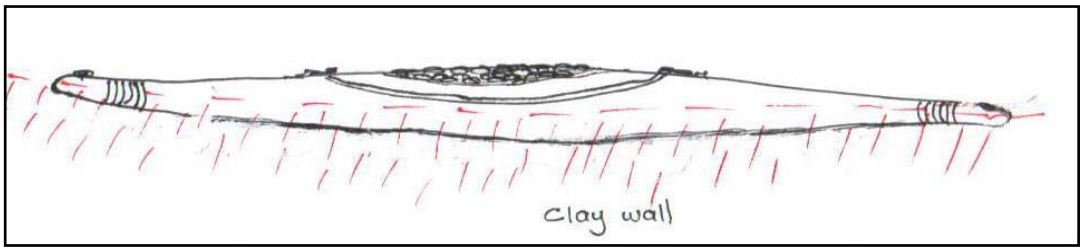

Figure 9.7.1 Sketch of single work and of hollow end sections

Special support structures as seen in Figure 9.7.2 were required for the multi-sectioned works to enable a clean edge for the join where the internal moulds met the external mould. Initially a slab of clay supported by scrunched up newspapers was placed

across the opening and, once the external surface had been coated with sufficient coats of latex, the clay was removed and the internal section then coated in a similar fashion.

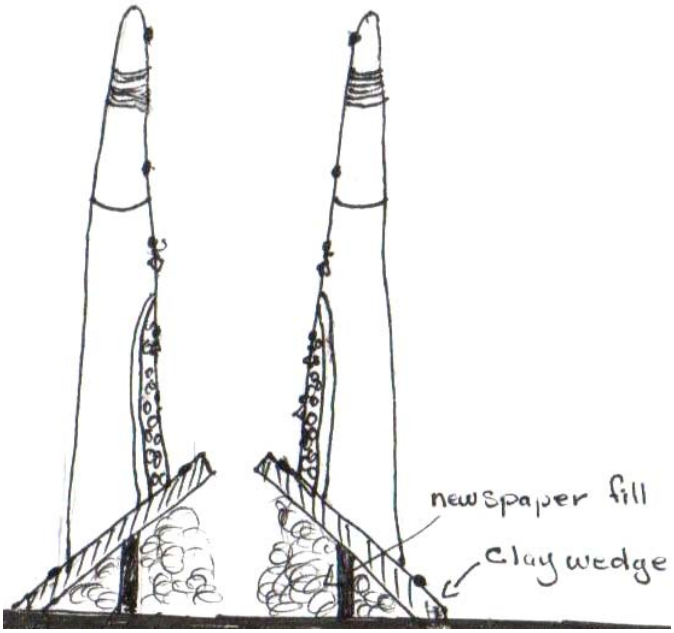

Figure 9.7.2 Sections of work mounted on steel support

Once all sections had been coated with the requisite coats of latex they were left to dry for three days prior to work starting on the plaster mother moulds (external support moulds) which would act as supports for the inner latex moulds.

Due to the humid weather and the fact that latex has to be dry before additional coats can be applied, no more than three coats per day were able to be added. As twelve coats of latex were required to build up the strength of the mould and to maintain integrity of the design, this process took a number of weeks to complete. The intricate mid-sections that were to eventually be cast in glass (as seen in Figure 9.7.3) required up to six divisions/parts to be made for each mould in order to avoid undercuts and be able to

successfully remove (eventually) the hollow cast wax which would be contained within the mould.

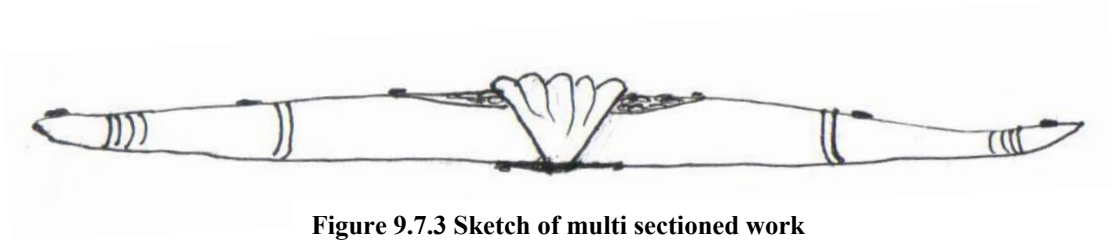

Figure 9.7.3 Sketch of multi sectioned work

Registration divits were made in the sections of the mould that needed to align with the parts yet to be cast as can be seen in Figure 9.7.4.

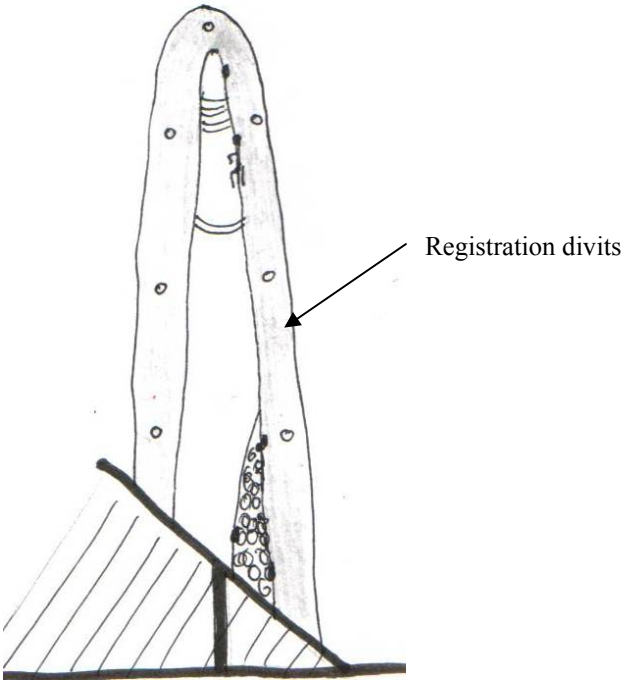

Figure 9.7.4 Sketch showing construction of mother mould and registration divits

The latex-coated ceramic works were then made stable, divided in half with a clay wall reinforced with clay joiners (buttresses) at the back. Registration hollows (divits) were then made in the clay, joins checked for gaps, and then a thin coat of Vaseline applied over the entire exposed latex mould to facilitate the eventual removal from the plaster mother mould.

Plaster was then applied over the Vaseline to a depth of approximately four centimetres. When the plaster was dry the clay wall was removed with any residue being carefully removed from the latex mould. This other side of the form was then coated with Vaseline as was the plaster edge that had abutted the clay wall, and then plaster was applied as per the first half of the mould. When the plaster was completely dry, the work was taken off the steel supports (where applicable), cleaned up and the placed in a supporting structure of bricks as seen in the cross-section of Figure 9.7.5 in preparation for casting the inner sleeve which would eventually provide support for the glass mid-section.

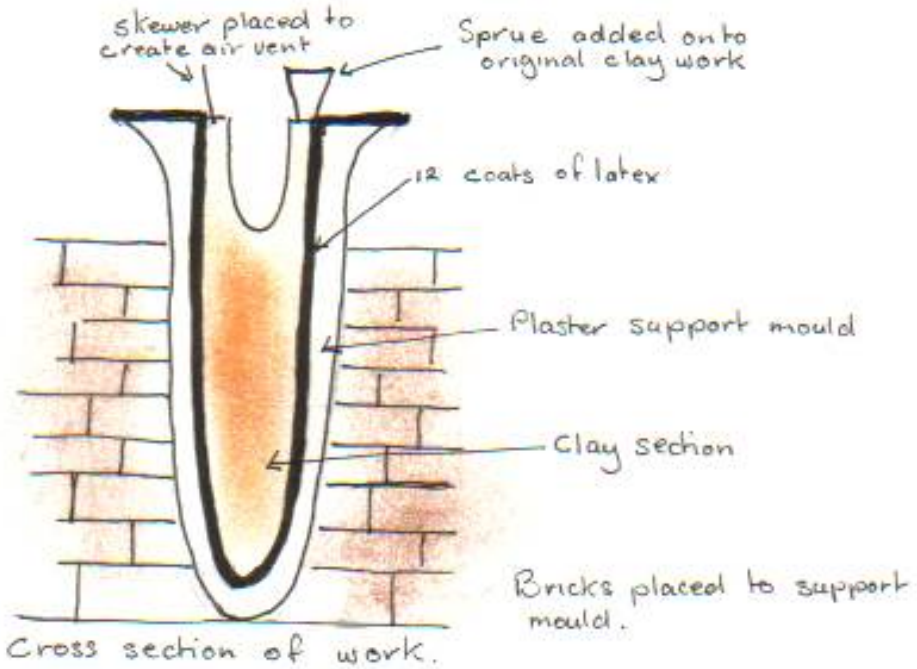

Figure 9.7.5 Casting the mould for the inner bronze sleeve

In comparison, the moulds for the three works whose bronze sections were to be cast in one piece were relatively straightforward requiring only division in half with the top section being one long piece and the bottom or underside of the works moulded in two sections to allow the incorporation of the sprue as can be seen in Plates 9.7.1.and 9.7.2.

Plate 9.7.1 Mould casting in progress showing pouring sprue in centre

Plate 9.7.2 Top section divided into two parts to accommodate the sprue

Combining cast bronze and cast glass in a single sculpture is not at all common and, given the unique design of each work, there were no known or easy ways of making or joining the discrete sections. Given that one material in use is heavy (the bronze) and rigid and the other fragile (the glass), it took an inordinate amount of testing to devise what was hoped would be a successful method of joining the various components into a seamless and unified work. The devised method of joining the component parts consisted of incorporating an additional *handle or arm type* appendage on to the original section to be cast in glass. It was planned that these appendages would then be nestled into a bronze sheath purpose cast inside of the bronze sections at the point where they would adjoin the glass section. Threaded rod would then run through a hole, cast in the two layers of bronze down into the holes that had been incorporated into the glass appendages when they were cast. This inner sleeve, as seen in Figure 9.7.6 (within end

sections), eventually to be cast in wax, and then bronze would act as housing and support for the cast glass

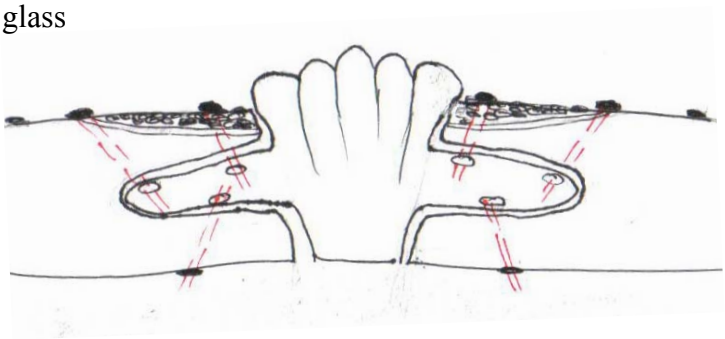

Figure 9.7.6 Appendages and sheath

A clay sprue was added on the high side of this sleeve, and a skewer, to act as an air vent, on the opposite side (refer back to Figure 9.7.5). Vaseline was then applied to all areas to be coated with latex which included the inner clay wall, the latex flat section on top, the sides of the sprue, and the skewer. In all twelve coats of latex were applied. When the latex was dry a plaster support mould was made in two parts, the first section including the centre or inner core area and flat section of the top and half the sprue area with the second part covering the remainder of the latex area. Plate 9.7.3 shows the latex mould with the sprue and air vent after it has been peeled off the original clay work and removed from its plaster mother mould support. The complex arrangement of the support mould, and how one latex mould fits inside another can be seen in Plate 9.7.4.

Plate 9.7.3 Latex mould for appendage sheath

Plate 9.7.4 Showing placement of latex appendage sheath mould in mother mould

9.7.1 Casting the mould for the mid (glass) section

The procedure for casting the sections that would eventually be cast in glass differed from the moulds for the bronze in that, instead of coating the originals in shellac prior to applying the latex, the entire surface of the original ceramic centre section was coated with wax resist to ensure that no remnant of shellac would be left to contaminate the purity of the glass. The originals were then divided into up to seven sections to avoid undercuts in the moulds. Figure 9.7.7 shows the clay collar applied at the outside edge of the end *rib* or edge of the section of work. Indent marks were made in the clay for registration purpose, as were drill holes, which had to correspond exactly with those made in the bronze (which would eventually house the supporting rod).

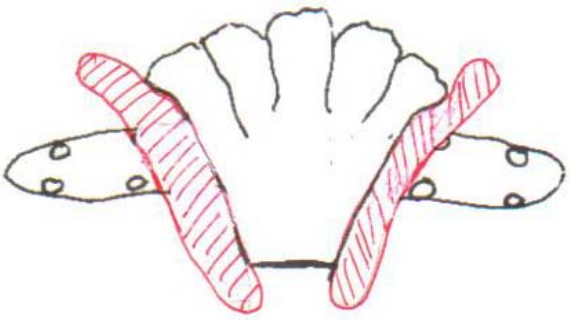

Figure 9.7.7 Clay collar (red section) showing initial division

Latex coats were applied and, once sufficient coats had been applied and dried, the clay collars were removed, the edges of the latex trimmed and all traces of clay removed from the latex. A light coating of canola oil was then sprayed on the latex and wax-resist coated central section.

This was then divided to create three more sections to be cast with the joints placed in the centre of both top and bottom (Figure 9.7.8) with a small separate wall to be cast for the base.

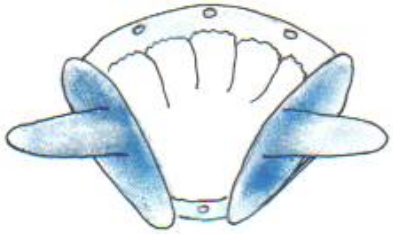

Figure 9.7.8 Further divided into sections

Once the latex moulds had been made for every section, plaster support moulds were made following the same order of precedence as with the latex sections. The first area to have the mother mould made was one of the end sections which was initially cast in one piece as can be seen in Figure 9.7.9.

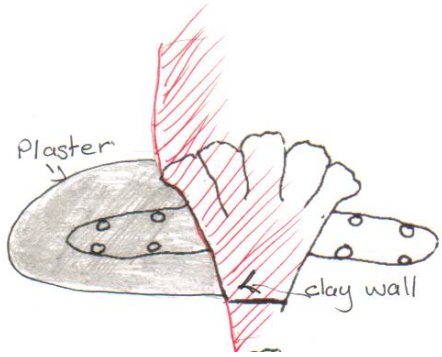

Figure 9.7.9 Initial cast of one piece section of mother mould

However this proved to be very difficult to remove and, as the plaster support moulds would eventually be removed from the thin, hollow-cast wax, it was imperative that they could be removed without causing damage and so this section was re-cast in two parts (refer Figure 9.7.10) as were the similar shaped sections on the other works.

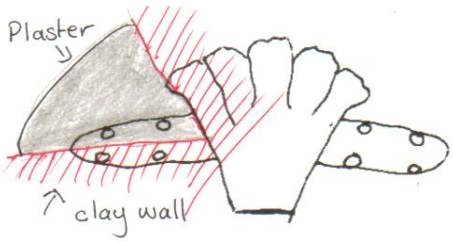

Figure 9.7.10 Re-casting of mother-mould for appendage in two parts

Plate 9.7.5 shows the multitude of inner latex and external plaster mother (or support) moulds required for each individual work. Once the moulds had been completed the next step was to hollow cast all component parts (those to be cast in glass as well as those to be cast in bronze) in wax.

Plate 9.7.5 Latex and mother moulds for one of the *Message Stick* works

After the support (mother) moulds were completed, they were removed from around the ceramic original and meticulously cleaned of any impurities and frayed edges. The latex sections were dried and reassembled while the plaster sections were soaked in a cold water bath (Plate 9.7.6.) for a minimum of two hours before being dried off, placed around the latex inner mould, and securely fastened with rubber banding (made from old car tyre tubes) to prevent the hot wax from escaping.

Plate 9.7.6 Plaster moulds soaking in water bath

Once all moulds had been prepared as described above they were placed on a level surface to ensure an even distribution of wax within the moulds. The casting wax, a 50/50 mix of paraffin wax and rosin was mixed, melted and, when completely molten, allowed to cool down a little to 150° F (65.55° C) (or until it had formed a ¼ inch thick wall in a test mould) prior to being poured into the waiting moulds. Once poured into the moulds, the moulds needed to be jiggled to ensure that there were no air pockets and that all sections were fully covered. After the walls had built up to the required thickness, which was judged by looking into the sprue hole at the top, the excess molten wax was poured back into the wax pan and the mould placed in cold water to aid in the setting and consequent release of the cast wax section.

After several hours, dependent upon size and complexity and when the wax was completely set, the moulds were removed from the water, un-banded and the plaster support moulds removed and the latex inner moulds carefully peeled off to reveal the hollow wax cast contained within as seen in Plates 9.7.7 and 9.7.8

In addition to casting the actual works, pouring cups and runners (through which the molten bronze would flow) also needed to be constructed and joined to the sections of work to be bronze cast. Both runners (Plate 9.7.9) and pouring cups (Plate 9.7.10) were

Plate 9.7.7 latex inner moulds

Plate 9.7 .8 wax cast of section to be cast in glass

cast in purpose-made moulds and, when firm, joined in appropriate places to the wax cast with molten wax to ensure that the molten bronze flowed to all areas of the cast.

Plate 9.7.9 Runner mould

Plate 9.7.10 Pouring cup mould

One of the challenges of producing these pieces was to cast the bronze sections as thinly as possible and, to do this the barest minimum of wax was required. It was estimated that the middle sections of solid cast glass would vary in weight from seven to twelve pounds depending upon the incremental sizes of the works. Therefore a significant effort was invested in ensuring that the bronze sections were as light as possible to

lessen the disparity between the mediums, thus reducing tension that may, at a later date, cause the glass to fracture.

The medium or middle-sized pieces to be cast were tested first as these could then be used as indicators for works either shorter or longer. The first cast was reasonably successful in appearance; however the hollow section that was to provide a compartment for the glass support broke away quite significantly when the latex mould was peeled off the wax. The three subsequent wax castings resulted in a cast that was significantly lighter than that first achieved although it had proved difficult to obtain a satisfactory cast of the inner compartment as it just kept fragmenting and breaking away. Attempts were made to cast this separately and join the inner and outer layers but this also proved difficult to join in exactly the correct place and angle and, ultimately, it proved most effective to repair the fragmented sections with modelling wax although it did tend to make them thicker than they might otherwise have been. Table 9.7.1 shows the decreasing weight of the wax cast relative to the decreased amount of cooling time allocated.

Table 9.7.1 **Weights of wax casts**

	Wax cool time Poured at 150° F (65.55 Celsius)	**Resultant imperial weight**	**Resultant metric weight**
		Medium work	
1	35mins	2lb 10 ozs	1kg 283grams
2	30 mins	2 lb 7 ozs	1kg 198grams
3	25mins	2lb 3ozs	1kg 85 grams
4	20 mins	1lb 12ozs	793 grams
		Extra long sections	
1	18mins	1lb14oz	850 grams
2	14 mins	1lb 8ozs	680 grams
		Smallest section	
1	12 mins	1lb 4ozs	566 grams

The lightest cast however, was not selected as the one to be used in the final work as where the areas were heavily textured, the wax, at the deepest indentations was too thin to be strong enough to withstand further the processes required of it. The final casts chosen were those in the mid-weight range which required the minimum amount of repair work.

Modelling wax (casting wax mixed with baby oil) was used to carry out the large number of repairs required on each piece with the internal sections which were to support the glass appendages having mostly to be re-built by hand which can be seen in the lighter coloured wax in Plate 9.7.11.

Plate 9.7.11 Wax cast showing repairs to internal sleeve and holes for threaded rod

In Plates 9.7.11 and 9.7.12 (mid section) repaired external sections are visible as the lighter coloured wax.

Plate 9.7.12 Re-built sections visible in lighter coloured wax

Modelling wax was also used to strengthen the joins of the runners and pouring cups and around the holes as seen in Plate 9.7.11 which would eventually house the threaded rod.

The sections to be eventually cast in glass were made and repaired in the same fashion as those to be cast in bronze without, however, the addition of pouring cups and runners, but with the addition of sprues and air vents which were required for the glass casting process. The separate sections were then all fitted together as can be seen in Plate 9.7.13 with numerous alterations needing to be made to ensure the tightest possible join between what would eventually be bronze and glass.

Plate 9.7.13 Assembled hollow cast wax form

Before the runners and pouring cups were joined to the sections to be cast in bronze, stainless steel pins (a little thinner than a skewer) were inserted at intervals in appropriate positions, their purpose being to hold the plaster inner core in position (as illustrated in Figure 9.7.11) once the wax had been melted out.

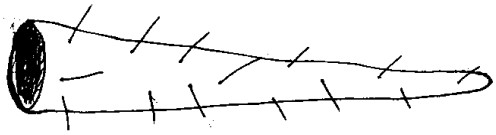

Figure 9.7.11 Stainless steel pins inserted into the wax

They needed to be inserted at least an inch or so and have a similar length protruding on the external surface. Once the pins were in place and secured with a little extra wax, the internal hollow spaces were filled with a plaster and grog (GFC 0.5mm 16 – 30#) core mixed with water to the consistency of what feels like runny sand. When the core set the runners and pouring cups were added to the works as seen in Figure 9.7.12 and Plate 9.7.14.

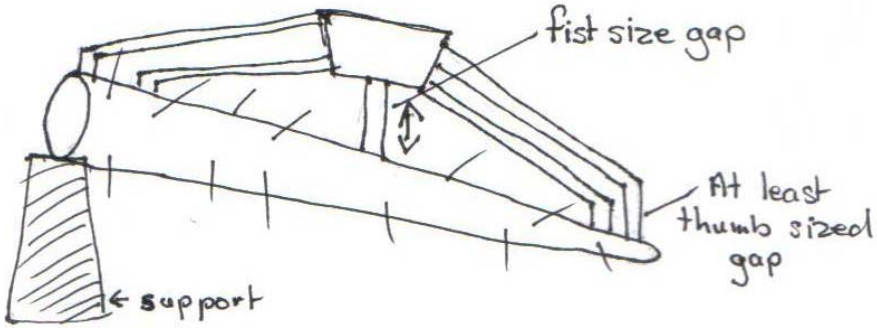

Figure 9.7.12. Location of pins, runners and pouring cup

Plate 9.7.14 Internal plaster core and steel pins

The number of runners and air vents varied with the different works, the larger sections requiring three runners and two air vents each (Plate 9.7.15). Once the wax had

hardened, a thin coat of shellac was applied to all surfaces with the exception of the inside of the pouring cup. Its purpose was to provide a sticky coat to which a slurry (Plate 9.7.16) made of zircon flour and water (mixed to a glaze-like creamy consistency) would stick more readily.

Plate 9.7.15 Bronze section with runners, air vents and pouring cup attached

While the slurry was still wet, the pieces were coated in a fine coat of zircon sand (Plate 9.7 17).

Plate 9.7.16 Slurry mixer

Plate 9.7.17 Zircon sand

Plate 9.7.18 Coated works

After allowing at least 24 hours for the layer of sand to dry thoroughly, five subsequent coats of slurry and grog were applied (Plate 9.7.21) with a minimum of 24 hours (or more as the layers became thicker), between each coating. Once the works were all coated and dried as can be seen in Plate 9.7.19, any grog that had accidentally adhered to the rim of the pouring cup was ground off.

Plate 9.7.19 Pouring cup rim cleared of any accidental coating of grog

The works were then, a few at a time, placed upside down in the burn-out kiln (Plate 9.7.20) to have the wax melted out leaving the impression imbedded in the coatings of slip and grog and ready for the next stage (Plate 9.7.21), that of the actual bronze pour.

Plate 9.7.20 Wax burn-out kiln

Plate 9.7.21 Shells after wax has been burnt out and now ready for the actual bronze casting

The bronze scraps were heated in a crucible inside a purpose built kiln. As the bronze became molten, additional scraps (seen placed in readiness around the base of the kiln in Plate 9.7.22) were carefully added to the molten mass.

Plate 9.7.22 Kiln containing crucible

When it was judged there was sufficient molten bronze, the top of the kiln was removed, scum skimmed off the surface of the melt (Plate 9.7.23) and the crucible carefully lifted out of the kiln (using the tongs as seen in Plate 9.7.24) and its contents poured into the waiting moulds which had been carefully laid out in a bed of sand which also served as a support to keep the moulds in position.

Plate 9.7.23 Skimming the surface of the molten bronze

Plate 9.7.24 Crucible tongs

When the molten bronze cooled and hardened the grog and plaster shells were carefully chipped away exposing the bronze beneath (Plate 9.7.25). The bronze that had overflowed into the runners and that which remained in the pouring cup was ground off leaving large holes as seen in Plate 9.7.26.

Plate 9.7.25 Bronzes with outer shell removed

Plate 9.7.26 Bronzes with cups and runners removed

An unfortunate side effect of casting the bronze as thinly as possible (in an attempt to minimise the weight of the works), was that the bronze layer was spread too thinly to allow for the adequate penetration of the deeper depressions of the textured surface, and, in parts, (as seen in Plate 9.7.27) this resulted in large holes in the bronze layer.

Plate 9.7.27 Fragmented and thin bronze section and area where runner has been removed (detail)

Before repair work could begin on the damaged sections, the plaster/sand cores (Plate 9.7.28) needed to be removed via the holes. This proved quite challenging as the fired plaster was extremely hard to break down into small enough sections to remove and eventually some purpose built tools attached to an electric drill were devised and proved to be successful. These could be used in a fashion similar to paint mixers and could be bent to an angle suit the internal dimensions of the individual works.

Plate 9.7.28 Bronze section showing inner core (runners still attached)

Once the internal core was removed, wire brushes were used to remove the external shell which had become embedded in much of the textured and carved surface as can be seen in Plate 9.7.29.

Plate 9.7.29 Detail showing shell imbedded in the carved bronze surface

As soon as this was accomplished, repair work on the actual bronze could commence. This comprised welding bronze rod over the multitude of holes in each piece, grinding the welds back and then retexturing the surface. This was extremely time consuming and, frequently, the bronze on the cast was so thin that, as soon as an attempt was made to weld, it just melted. Each piece took many weeks of sustained work before it began even to look as planned. One of the more complex pieces was lost completely as the initial coating of zircon flour had not been sufficient resulting in a coarse coating over the entire design which was irretrievable.

9.7.2 Casting the glass

Once the final wax cast had been made, the technique for casting the glass sections deviated from the methods used for the bronze in that no pouring cup or runners were required. Instead air vents and a sprue through which the glass would enter the mould

had to be incorporated prior to the final mould being cast in a silica/plaster mix. The mould itself was a waste mould, that is, one that can only be used once, as the only way to remove the cast glass is to destroy the mould. In Plate 9.7.30 the wax cast is joined (at what will be its highest point once in the mould) to a slightly conical clay section, which forms the sprue.

Plate 9.7.30 Clay Sprue

Plate 9.7.31 Pouring the plaster/silica/fibreglass waste mould

Plate 9.7.31 shows the first coat of the mould mix being applied to the wax cast. Not visible in the image are the wooden skewers which were attached to the ends of the arms/appendages and to the base of the mould (which, when poured, would be turned over to become the top of the mould); these were to act as air vents, encouraging the molten glass to flow to the extremities of the mould unhindered by air pockets. Subsequent coats of the plaster/ silica mix were reinforced with fibreglass to enable it to withstand the long firing and annealing process. Plate 9.7.32 shows the completed mould with a carefully levelled top which, when turned over, will form the base which needs to be perfectly level to allow the molten glass to fill the mould evenly.

Plate 9.7.32 Completed mould left to dry

When the mould was completely dry, the clay sprue was removed leaving an opening down into the mould and the cast wax contained within. The mould was then placed over a specially constructed steamer and the wax melted out with heat from the steam. Once the wax was completely removed, the mould was left until completely dry and then the amount of crystal needed to fill the cast calculated by using a volume displacement method. This is a simple method starting with a container of water with the water level clearly marked, and then enough water is removed from the container to fill the hollow area in the plaster. This water is then discarded, and pieces of the crystal to be cast are placed in the container until the water reaches its initial level. The pieces of crystal are then carefully removed from the container of water, dried and placed in a crucible which has a hole in the bottom. The crucible is then placed over the opening of the mould (sprue hole) (which has been allowed to dry again) and the mould placed in the kiln for firing with great care being taken to ensure that it is sitting level. Figure 9.7.13 shows a cross section of what happens as the kiln temperature rises and the glass begins to melt and flow into the hollow mould.

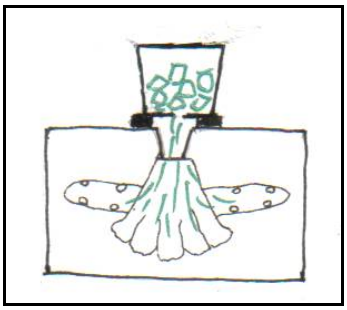

Figure 9.7.13 Cross section illustrating what happens as the glass begins to melt

The firing and annealing process for this work took a week in the kiln and then the moulds needed to be left at room temperature for a further three days to finish the annealing process. After the three days, the moulds were removed, at which point they were fragile and basically just crumbled apart. The cast glass was then thoroughly washed and examined for faults.

All of the cast glass pieces had excess glass where the sprue had been located (as seen in Figure 9.7.14); these had to be sawn and then ground off so the work would sit flat as per design.

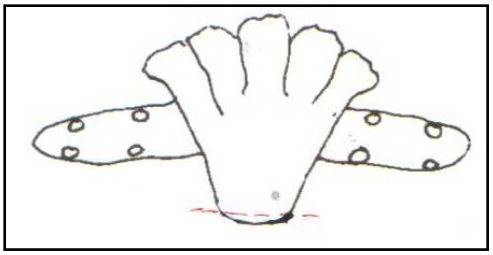

Figure 9.7.14 Showing excess glass where sprue had been

Some areas on each piece also required major work where the moulds had degenerated allowing the molten glass to penetrate areas it should not have done. This took literally hundreds of hours of work to correct as the glass was very hard as well as being fragile. In addition, as all of the bronze sections had required large amounts of welding, grinding and retexturing, the heat necessary to carry out these procedures had caused the original shape of the bronze to alter which had a huge impact on the glassworks which had been cast to fit tightly into precise areas.

However, once alterations and repairs had been almost completed on both bronze and glass sections, it became possible to join the sections together roughly as seen in Plate

9.7.33, thus making it easier to check the fit of the respective parts, plus ensure that the holes that were going to house the support rod were aligned. Work on both glass and bronze sections continued until the best possible fit was achieved.

Plate 9.7.33 **Initial assemblage of bronze and glass components**

Final finishing involved the patination of the bronze surface and the bathing of the glass in an acid bath as no amount of manual polishing was able to achieve the translucency of the surface sought. The bronze sections were sandblasted and then patinated using a variety of colours to arrive at the desired tone prior to being sealed with wax and polished before being assembled. Threads were then tapped into both layers of the bronze (internal *sleeve* and external shell) wide enough to take 3/8th inch threaded brass rod positioned as illustrated in Plate 9.7.34 which extended down into the glass securing it in place.

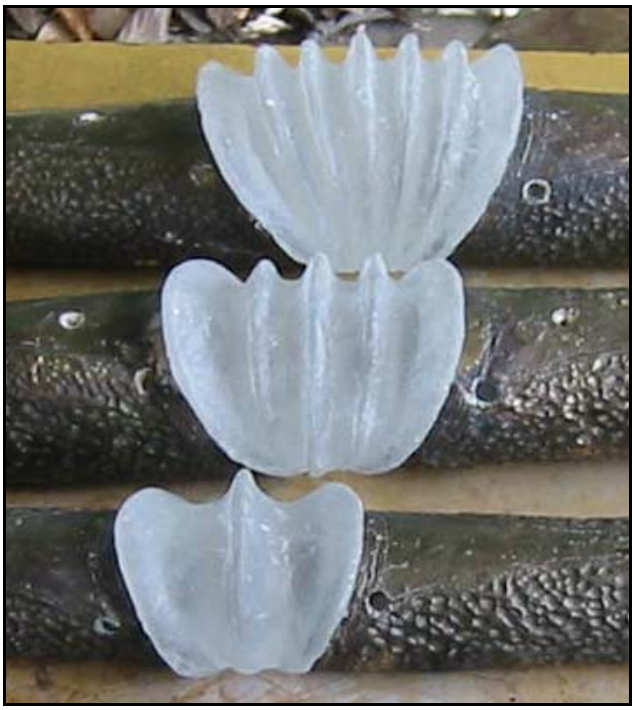

Plate 9.7.34 Showing holes for threaded rod and glass (ground but not polished)

This was achieved with great difficulty as, in some instances, the bronze was very thin making the tapping of a thread difficult. In order to ensure that the rod was as secure as possible, Araldite was placed in the holes as a back-up support. Unfortunately at this stage the cast glass in the largest of the works fractured during the process of tightening of the threaded rod. As the initial seven works were now reduced to five, extra special care was taken with those remaining. Once the sections were joined together it became necessary to conceal the holes. To achieve this, sprigs, made to the correct dimensions to ensure the holes and rod would be completely covered were individually made from clay, bisque fired and then used to make impressions in the cuttle fish bone to which air vents and a pouring sprue were carved (Plate 9.7.35). The two halves of the moulds were then wired tightly together as seen in Plate 9.7.36 and placed upright in a bucket of sand.

Plate 9.7.35 Cuttle fish shell mould

Plate 9.7.36 Mould secured for pouring bronze

Bronze scraps were melted in a hand held crucible (Figure 9.7.15) using an oxy acetylene torch and the molten bronze poured into the moulds.

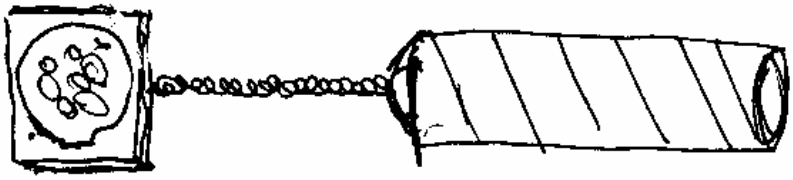

Figure 9.7.15 Hand held crucible for melting bronze

After the bronze had cooled, the cast sprigs were removed from their cuttle fish moulds (Plate 9.7.37) and the sprues ground off (Plate 9.7.38). They were then cleaned up, patinated, waxed and placed in position over the holes becoming an integral part of the design as can be seen in Plate 9.7.39.

Plate 9.7.37 Cast sprigs with sprues still attached

Plate 9.7.38 Sprig ready to be cleaned, patinated, waxed and joined to main work

Although the glass sections appeared to be quite securely in place, an additional support in the form of an appropriately curved and patinated bronze backing plate was joined to the underside of the works. The threaded rod was placed through the layers of bronze down into the previously made holes in the glass in the same manner as used previously. This backing plate, which can be just seen on the underside of the top work featured in Plate 9.7.39, provided a solid support for the glass by further linking the two bronze sections together.

Plate 9.7.39 Showing sprigs in position and underneath support sections

As with the top side of the work, individual sprigs were placed over the drill holes which had been made to accommodate the rod and formed part of the overall design.

Of the works in this series that were cast in one piece, the two smallest had no glass added and were thus made entirely of bronze. Another, however, had a delicate piece of glass inserted into a space in the centre of the work after the bronze had been fully finished. Initially constructed at the same time (Plate 9.7.40), and in the original clay and even wax state fitting together exactly, the work suffered the same problem as the others in that, while undergoing repairs which required lots of welding and grinding, the bronze distorted ever so slightly ruining the once perfect fit between glass and bronze.

Plate 9.7.40 Original model for bronze and first glass section made

Numerous ways of correcting this were tried, which included grinding the glass, and the grinding and deepening of the space which was to house the glass. As none proved successful another wax cast was taken and another glass section cast. While this proved more successful, it was not possible to achieve the perfect fit of the original due to the slight shrinkage of the glass during the firing process. As this had been anticipated, the new cast work had been made a little larger around the edges so they would overlap and just sit lightly on the edge of the bronze as can be seen in Plate 9.7.41

Plate 9.7.41 J. Mulcahy Glass insert overlapping the edge of the bronze *Message Stick* 2006

The five works in the Message Stick series that ultimately made it to completion worked well together and also carried the narrative aesthetic/aspect forward in a way that was able to be linked to the final series of works that has, as its story, our possible futures.