MAURITIUS: ARCHAEOLOGICAL RESEARCH AND AGENDAS
THE 2009 SEASON: SURVEY, RESULTS AND RECOMMENDATIONS

Survey locations in red (Google Earth ©)

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REPORT SUMMARY

The subject of this report is the field survey undertaken between the 4th and 20th of December 2009. It builds on a project I initiated in 2008 titled ‘Environmental Imperialism: Colonial Activity in Mauritius’ that established a network of contacts, and witnessed a first exploratory season of test trenches on a privately owned site in Mont Choisy.

The 2009 season expanded this agenda considerably, adding the ‘human’ component to the environmental one that had been the inspiration for the 2008 season. The underlying purpose of this field campaign was to utilise state-of-the-art geophysical survey, in combination with traditional techniques, to maximise the recorded archaeology within the short timeframe available. The results presented herein are the product of an ambitious programme of research that had our team survey nine sites in seven locations situated predominantly along the western facet of the island.

The format of this report will be based, broadly, on chronology. The latest sites and topics will be discussed and evaluated first. For each subject area recommendations will be offered for future work; these have been consolidated in a summary at the end of the document, with longer-term recommendations also proposed.

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On a more personal note, I would like to express my sincere thanks to my colleagues. They took up the challenge of bringing new techniques and methods to Mauritian archaeology with tireless effort and continuous support for our underlying aims. They provided ideas and concepts that will ultimately form the foundation for our ongoing work.

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1. INTRODUCTION

The following report details the 2009 campaign of archaeological investigations undertaken across various locations on the island of Mauritius (Fig. 1).

Fig. 1: Map of Mauritius with site locations (capital starred).

Modern Mauritius has its birth in the early 18th century when a group of French colonists named it Île-de-France. Both prior to, and subsequently, the island evidenced waves of colonial intervention, resulting in a modern population that is diverse, and a past that is both highly turbulent and infinitely interesting.

The archaeological potential that Mauritius offers, both as a colonial enclave with Dutch, French and British influence, and a multicultural melting pot, has barely been explored. Furthermore, the volcanic nature of the island presents an exceptional opportunity to establish baseline data detailing specific environmental and landscape transitions as they relate to human agency. Finally, despite the fact that Mauritius is noted as having no indigenous population, this should not rule out the possibility that humans interacted with the Island prior
to the later medieval period. Its proximity to large landmasses to the east, and its strategic position in the Indian Ocean, should pique our interest at least to the potential for early exploration, if not outright colonisation.

The 2009 season built on preliminary works and collaborations carried out and established in 2008. The 2009 season was effectively a quantum leap by comparison, both in terms of sites studied and actual survey performed. Our international team, over a two-week period and with considerable assistance from local colleagues, were able to greatly broaden the spatial, chronological and theoretical remits of the preceding archaeological research. In total, nine sites over seven locations were surveyed (with numerous others noted for future work) using a variety of methods and techniques. For the non-invasive survey we relied on magnetometry and resistivity to provide a picture of the underground archaeology. This was complemented by both photogrammetry of standing archaeology on sites such as Aapravasi Ghat, field walking and finds collection at Trianon and archaeological reconnaissance at Le Morne, as well as a survey of environmental and intangible archaeology where appropriate.
2. AIMS AND OBJECTIVES

The archaeology of Mauritius can largely be divided by period and / or agenda. For the purposes of this season’s work, we choose to contextualise our research within a chronological framework that encapsulated different peoples. Therefore, our main objective was:

• To study the ‘coloniser and colonised’ (both slaves and indentured labourers) from an archaeological perspective. To achieve this, we investigated suitable sites for particular groups, as appropriate and available within the timeframe; thus, we established a solid foundation of archaeological survey that can be built on in subsequent seasons.

• In tandem with the above, a key component and underlying aim of this season was to broaden the remit of the type of archaeology that could be studied: in effect, this incorporated ‘potential’ early inhabitants / explorers of Mauritius; the ecological condition of Mauritius prior to colonisation and the environmental and landscape transitions subsequent to colonisation.

• Perhaps most importantly, there is a need to bring archaeological research to a wider audience and to encourage local participation in archaeology. The subject has the potential to be an unbiased storyteller of the past and it is important that this central facet of cultural heritage be recognised as a valuable commodity for all. With this key objective in mind, student involvement and training was, and will continue to be, an integral aspect of our work in Mauritius.

While the remit and aims are clearly broad, there is an important reason for this. There can be little doubt that what is needed from any preliminary works is an aspiration of continuance. Our underlying aim has been to show that there is wide scope for archaeological research, which must be grounded in appropriate techniques and established protocol. It is essential that appropriate non-invasive survey be carried out prior to destructive methods. This should set a firm foundation for future students of the subject to initiate their own investigations of the rich archaeological past of this fascinating island.
3. SITES STUDIED

3.1: Site 1 & 2: Aapravasi Ghat and Parc-a-Boule

This site fell within our broader contextualisation as a ‘colonised’ location, focussing on the indentured Diaspora that had huge implications for the modern population and indeed, the global paradigm of slavery and indenture. This has been rightly recognised through the dedication of Aapravasi Ghat as a UNESCO World Heritage Site in 2006. Much of the wider site was destroyed during the construction of the motorway in the 1980’s, although a variety of material has been preserved in the archives showing the location and type of buildings in the area. The embarkation area has been thoroughly investigated and is preserved as part of the World Heritage site. Other areas of the site have been excavated including the bathing area and latrines, temporary accommodation (‘sheds’), offices and medical quarters, and the immigrants’ kitchen.

Although considerable interest was expressed in the Warehouse area of the site, the two geophysical techniques used this season were not suitable for surveying an area covered with concrete, and surrounding by high walls and metallic elements. Instead, work concentrated on the courtyard where excavation of a kitchen area and sheds had recently been discovered, close to the quayside.

Fig. 2: Inset shows island location; main image show Aapravasi Ghat (Site 1), the Warehouse and Parc-a-Boule (Site 2) highlighted in red (Google Earth©).

In concert with the actual survey, work also concentrated on consolidating the extant maps and documents with the aim of situating these within a larger GIS model to investigate the spatial relationships between the antique maps, modern cartography and the archaeological study. Much is already known about these two sites, and it was seen as a useful exercise to collate this knowledge before planning a larger working programme.

3.1.1 Survey of Aapravasi Ghat and Parc-a-Boule

For the geophysical survey, grids of 10 x 10 meters were set out using a Leica 700 series Total Station. The grid was established along the longest possible baseline within the survey area and was oriented so that the survey would cut across archaeological features at an angle of approximately 30°. Cutting the archaeology at this angle ensures that more archaeological features can be identified, and fewer anomalies lost during data processing along traverses.
Magnetometer survey was immediately ruled out for these sites, due to the close proximity of a large metal fence, concrete bollards and a busy main road. The resistance survey was carried out using a Geoscan RM15, which was set up as a parallel twin array. Data was collected at one-meter intervals along traverses of one-meter intervals, in grids of 10 x 10 meters. Although this survey strategy does not allow for the highest possible resolution, it was designed to cover the area in a very limited period of time and to test the suitability / success of the methodology. A topographic survey was carried out in order to map features in the landscape, enabling the geophysical survey to be accurately georeferenced and used in combination with existing cartographic material.

Photogrammetry was also carried out on the existing structures, and the points tied into the wider survey. This technique gives a more detailed record of standing structures, and can be developed into 3D models of the standing archaeology, or reconstructions, which will be invaluable for developing public interest and understanding of this important site.

3.1.2 Survey Results for Aapravasi Ghat and Parc-a-Boule
The geophysical grid survey for Aapravasi Ghat proved unsuccessful due to the extremely dry, hard ground surface. It was virtually impossible to establish a current between all three probes. Resistance survey relies on optimum levels of moisture in the ground, excessively wet or dry conditions can make it very difficult to establish a current. There is also a risk that the data will be unrepresentative of archaeological features in the absence of optimal moisture content. It was therefore decided to devise a new strategy for investigation of these this site in subsequent seasons. One grid of resistance survey was also carried out in the area of Parc-a-Boule. Although the ground here was comprised of turf with a slightly softer surface, soil and adverse weather conditions (high temperatures with occasional heavy showers) caused an accumulation of water in the surface layers, affecting the current and therefore the results. Greater success was achieved through photogrammetric survey (Fig. 4) and will form an important starting point for future mapping and interpretation of the extant standing archaeology.
Fig. 4: Photogrammetry from Aapravi Ghat Courtyard Wall.
3.1.3 Recommendations & Future Work

1. As already discussed, this site is unsuitable for magnetometer survey due to the large quantities of modern ferrous material in the area. In this instance, resistance survey was unsuccessful due to ground conditions. An obvious route for future work would be a re-assessment of the sites using resistivity at a time of year with less adverse weather. Alternatively, a method that could potentially prove highly suitable for this area is Ground Penetrating Radar (GPR). This is another non-destructive method of geophysical prospection, which can detect sub-surface archaeological features. It uses electromagnetic radar waves to identify changes in soil composition and the location of structures, measuring the amount of time it takes for the wave to be sent and reflected. Unlike resistance or magnetometer survey, this survey method can be used in urban settings, on paved surfaces or within buildings.

2. It is therefore recommended that GPR be used in the area of Aapravasi Ghat, inside the Warehouse itself and on Parc-a-Boule. These areas are suitably open for a grid to be established; furthermore, this method has the added benefit of being unaffected by those features that made other methods impossible to employ on this site.

3. Given the large body of research detailing the historical context of this site, as well as the excavations already undertaken, at present excavation cannot be recommended without first carrying out more extensive geophysical prospecting. This is particularly relevant where the warehouse is concerned as GPR could greatly assist in focusing future research.

4. In tandem with the above, and again using GPR, a survey of the bus depot would be very beneficial as a means of integrating the current footprint of Aapravasi Ghat and Parc-a-Boule into the wider area.

3.2 Site 3: Trianon Barracks

As with Aapravasi Ghat and Parc-a-Boule, this site falls within investigations of indentured labourers. However, in contrast to the ‘monumental’ nature of Aapravasi Ghat, Trianon offers a more intimate and in depth window into the day-to-day lives of the indentured workers.

A visit was made to this site immediately upon our arrival in Mauritius. At this time, the site was very overgrown, and the possibility for survey appeared slim. However, AGTF personnel cleared the site, and we were able to carry out photogrammetry, magnetometer and field walking survey on the area around the standing barracks.

These standing barracks are the old labourers’ quarters, which were in use from the mid-nineteenth century right up to the 1970’s. At the time of their construction, most plantations provided workers and their families with living quarters, and these buildings stand as evidence to that trend. They are constructed from basalt blocks, and use sugarcane syrup and pebbles to form a vaulted roof. They are well built, with some fine details of design, especially visible around the front doors.

In 1974 the buildings was decreed a national monument on the basis of what they can tell us of the plight of indentured workers, and on their relative preservation. However, despite this, the buildings have been neglected, and the area around them has become overgrown. It was therefore of even greater significance to assess this site in order to make recommendations for future research and preservation.
3.2.1 Survey of Trianon

A series of grids were set out for geophysical survey in the area south of the standing structures. The area to the north was excluded since the ground was very disturbed, and seemed unlikely to yield clear results. Due to time constraints it was decided to focus on the area immediately adjacent to the standing structure to the south.

A base line for this site was set out north – south, which cut the known direction of archaeology by approximately 30°, to maximise the degree of archaeology recorded and minimise the amount lost through processing. This was carried out using a Leica TS 805 Total Station, using an arbitrary grid for speed. The stations, grid pegs and main topographic reference points were then recorded using GPS by Saša Čaval.

The grids measured 20 x 20 metres, and with traverses at one-metre intervals, taking points every 0.25 metres; the direction of traverse was orientated east. The geophysical survey method selected for this site was magnetometer survey, since large areas could be covered relatively swiftly. A Geoscan FM256 was used. The data was processed using Geoplot 3, after which it was georeferenced using Auto CAD and ArcGIS.
A basic topographic survey was carried out to record the location of standing archaeology and modern landscape features, such as tracks and field boundaries (Fig. 7 and 8). This would ensure that the geophysical survey could be accurately georeferenced into our own dataset, as well as other cartographic sources. The field walking resulted in a wide variety of material collected in a systematic survey on a grid that can be tied in with the geophysics (Fig. 9). The material will be cleaned, photographed and catalogued by Allan Charlot. Photogrammetry was carried out on the outside walls of the standing structures.
3.2.2 Survey results: Magnetometry

An important aspect to note when looking at the results of this geophysical study is that the site was bulldozed only two days prior to work being undertaken. Although this meant that the ground was clear for access and to collect surface material, it also resulted in surface disturbance. The bulldozing brought up large chunks of basalt, modern debris, and the soil itself became churned and disturbed. There were also large concentrations of rubbish, especially at the southern end of the field. All these factors resulted in conditions that were not ideal for the magnetometer survey, as the magnetic signals of the geology and modern debris would very likely be stronger than the ephemeral signals caused by any archaeological features.

Figures 10 & 11 show a large number of dipolar anomalies. These are mainly caused by modern disturbance on the site. The barracks were used up until the 1970’s, and even today they are occupied on an occasional ad hoc basis. The area around the site is also settled, so inevitably modern rubbish has ended up in the field. Some of the larger dipolar anomalies will be due to basalt on, or close to, the surface. Basalt has a very high magnetic signal; to further complicate the interpretation, it also forms the natural bedrock. Therefore, there is a risk of missing archaeological features amongst the general magnetic noise. Another problem in the magnetometer survey of this site is that there may have been soil dumped from the sugar plantations, altering not only the topography, but also disturbing the ground surface.

However, despite these caveats there are apparently linear features evident, which follow a similar alignment to the standing barracks. [M1] (Fig. 11) is a positive linear anomaly which runs parallel to the barracks building for a considerable length of some eight metres, and may in fact continue as [M2] and [M3]. The nature of this signal suggests that it could be another basalt wall that formed an adjacent feature to the barracks. It may be an enclosure wall, another aspect of settlement on the site or a feature linked to allotments. At this point it is difficult to date, although the common alignment with the barracks suggests it was contemporary to these buildings.
Fig. 10: Greyscale results of the magnetometer survey.

Fig. 11: Interpretation of magnetometer survey
*The results are seen in plan. However, the area covered by any anomaly relates more to the level of magnetic response than to the actual physical size of the feature.*
This feature is interrupted by [M3], cutting it at a 90° angle. This again looks like a basalt wall, the overall form of which suggests it may be a small room extending off the wall, very like the small kitchen areas built on the sides of the main barrack building in the 1960’s and 70’s. [M5] could be a similar feature, and the dipolar anomalies in this area could be caused by basalt blocks from the walls being caught on the surface. [M6] could be a continuation of this. It is mirrored by a similar feature [M7] running from [M4] on the same east-west orientation. It is probable that this set of features continue to the west [M8], [M9] and [M10] indicating possible walls. The extension of these features to the west may indicate a different set of buildings or features, related to the main barrack block.

Other features that could potentially support the hypothesis for the presence of buildings related to the barracks are a series of negative linear anomalies [M11], [M12] and [M13]. The negative signal could be caused by the use of a less magnetic building material than the natural basalt, or alternatively they could be ditches, with less magnetic fills. However, the strong right angles in these features suggest they are more likely to be walls. [M11] could be a feature directly associated with [M3] and [M6], as the anomalies almost abut one another. It seems convincing that they are directly associated with the barrack building since they retain the same orientation. One flaw in this theory is the proximity of some large dipolar anomalies close to [M11], which may be causing the negative response of that feature. [M13], a collection of three parallel positive linear features follows the same orientation, and may also represent related buildings. Another possible explanation is that those inhabiting the barracks were using this area for small-scale agriculture, and some of these walls may be divisions of plots.

There are a series of positive linear anomalies [M15], [M16], [M17] and [M18] which, unlike the rest of the features examined so far, do not follow the same orientation as the barrack building. If these are basalt walls, as the signal suggests, it may be that they were constructed at a time before the barracks were erected, or had no role related to these features. Some of them, such as [M17] and [M18], run down hill to the south and may be a drainage features. But their isolation means that making a firm hypothesis of function is impossible at this time.

3.2.3 Survey Results: Geo- and field-survey

The topographic and geopositioning data have been used to locate the barracks, and its immediate surrounding topography, within the wider environs. This serves to both integrate these structures within the modern landscape, and in the future, with sub-surface structures that can be detected through aerial methods (see also Sect. 3.2.5).

Clearly (Figs. 12 & 13 below), the barracks have little immediate relationship with contemporary structures; however, these figures (particularly Fig. 13) vividly illustrate the proximity these archaeological buildings have to modern constructions including, perhaps most significantly, the motorway. While this need not pose an immediate problem and may in fact have its benefits in terms of access to the structures for those interested in cultural heritage, there is the added pressure of development close to main thoroughfares. There is already a large shopping mall, and plans for another in the near future much closer to the barracks. This needs careful evaluation; the data provided herein will assist with this process.
3.2.4 Survey Results: Photogrammetry

The photogrammetric results allow us to have not only a visual representation of the structural archaeology on this site, but also a geometric referencing system for future extrapolation. This is particularly useful when attempting to understand the entire structure where parts of it have been destroyed. In this instance, the near-complete nature of these barracks makes them an ideal ‘corroborative’ model. These data can also be applied within comparative frameworks, for example, to have a rigorous method of dynamic comparison between similar barracks from other locations in Mauritius, or indeed, other British colonials contexts.

This type of modelling, when performed from all facets of the building, also allows for 3D reconstruction; this will be a remit in future seasons.
3.2.5 Interpretation of Results

Considering the modern disturbance and magnetic strength of the geology at this site, the results do reveal archaeological features that are very likely related to the barrack buildings at Trianon. There appear to be a series of walls on the south side of the building, the main one running north – south, parallel to the building, with smaller walls or possible rooms linked to it. This main wall ([M1], [M2] and [M3]) could be reflected in the topography of the site, where a ridge is visible running north – south.

On the basis of these results it could be suggested that there were additional built structures in this area, related to the sugar estate, and perhaps directly to the barrack building itself. The extant standing structures are highly unlikely to have been enough to accommodate the total number of indentured workers on the site. Other buildings (potentially identified by our survey) may have been demolished at some point, or were less substantial.

By corroborating and overlaying the results of magnetometry and geosurvey, we are able to provide a much more focused integration and appraisal of the barracks for future work. In the absence of the finds evidence (see Appen. III), at present we are unable to overlay spatial
patterning of artefacts. When complete, this integrated approach will provide useful data for tailoring future work on this site.

3.2.6 Recommendations & Future Work

1. This site has a great deal of potential in terms of landscape research, which is made even more important by the impending development work in the area. Although these developments would preserve the barracks as a monument, and the small area around it, they would destroy the archaeological landscape, and with that, our ability to understand the details of the estates history. It is therefore of extreme importance to initiate a sympathetic programme of research incorporating detailed archaeology.

2. Both field walking and magnetometer survey should be carried out on a much wider scale to investigate the relationship between the barracks and the landscape around them. This data needs to be tied into GIS where it can be compared with both cartography and evidence from oral histories.

3. This survey has shown that, using magnetometer survey, a great deal can be discovered from and about a large area within a short timeframe. This method is perfectly suited to large, open areas; especially where the known archaeology consists predominantly of solidly built structures. The integrated survey methods of geophysics, topography, field-walking and buildings survey can give a broader archaeological signature to this site and would be recommended for work in future years.

4. The area around the barracks needs to be explored more fully, to establish their full archaeological context, and to learn more about the Trianon estate as a whole. It is possible to see suggestions of building remains and a track-way (circled: top left) on satellite images (Fig. 15). This needs to be developed, with a more complete examination of aerial imagery. This would help focus survey work and excavation.

5. It is recommended that this site be viewed not as an isolated monument, but as part of a dynamic landscape that needs to be explored on a large scale, using integrated methodologies in order to be properly understood.

Fig. 15: Possible structures outlined in blue; barracks arrowed (Google Earth©).
3.3 Site 4, 5 & 6: Le Morne

Le Morne represents perhaps one of the most significant global commemorations to the memory of slave resistance. Not only does this site evidence a rich associated cultural and oral history within a local context, but it has recently been inscribed as a UNESCO World Heritage Site in 2008 precisely for its remarkable role within the maroon movement.

Within our scheme, this site complements the ‘colonised’ component, but attests to groups brought to Mauritius as slaves, predominantly from Africa. Within the wider region of Le Morne, three locations were investigated from a variety of perspectives. These were the Plateau itself, the ‘Malagasy’ Cemetery and Îlot Fourneau (Fig. 16 below). An initial site visit to Le Morne was made on the 9th of December, organised by the LMHTF, and led by Jean-Francois LeFleur. We were shown the general location of the region, as well as briefed on the history, both local and within the context the WHS inscription, of the area.

Fig. 16: Le Morne (Site 4), Cemetery (Site 5) and Îlot Fourneau (Site 6)(Google Earth©).

A brief exploration of one possible site on the visit of 9th December showed the existence of buildings at Trou Chenille (Fig. 17) and would be worth investigating in more detail in future years. Numerous other isolated sites are known of within the vicinity of the mountain, including the original ‘Le Morne’ village. The historic village is located approximately 80 metres north of the modern village, the only visible remains being a well. A kiln site also remains to the north of the mountain, although the exact dates of its use are unknown.

Following this initial visit, the overall team split into two, with Andrea Balbo and Krish Seetah working on an environmental as well as strategic assessment of the plateau. Diego Calaon, Saša Čaval and Rose Ferraby focused their efforts on the cemetery, located on a sand bank close to the present day village.
3.3.1 Survey of Le Morne Plateau and Îlot Fourneau
A more in depth reconnaissance of the plateau was undertaken on the 11th and 12th of December. Andrea Balbo and Krish Seetah, with the assistance of Anwar Janoo of UoM, Mr Ramjaun of the Forestry Commission and Jean Francois LeFleur of LMHTF, carried out a georeferencing survey along the perimeter of the plateau, as well as an appraisal of environmental clues and what can be considered ‘intangible’ archaeology. On the 13th of December the team reconvened and spent a day surveying Îlot Fourneau.

3.3.2 Survey Results from Le Morne Plateau and Îlot Fourneau
Approaching this from the perspective that little artefactual material evidence is ever likely to be forthcoming from a slave site, it falls upon us to look more creatively at how we might decipher the signs of human habitation, and, if they exist, what these data can tell us about the group we are interested in. These two sites are discussed in concert as they potentially represent regions that had similar functions, at least during certain periods of time. Îlot Fourneau has historically been considered as a site where French masters punished slaves; however, our appraisal also suggested that perhaps it had quite different uses within the paradigm of maroon resistance. The two clusters may be seen as parts of a communication network between villagers at the foot of Le Morne, and out-look posts on the top of Le Morne.
Fig. 18: Cultural landscape of Le Morne: overlaid on contemporary urban plan view.

Fig. 19: Cultural landscape of Le Morne: topographical view.
Circles represent LMHTF cultural artefacts; diamonds represent GPS points.
View ranges were provided for lookout spots at the perimeter of the plateau the greatest range of these coinciding with the main “hiding spot” at Le Morne, evidencing a view range of 310°-360°. It was noticed that some of these viewpoints were associated with piles of stones and a small (allowing one person to lie) flat area protected by a low wall along the mountain ridge. The top of Le Morne is irregular and characterized by a steep gradient, so that there are only a few flat areas where people could rest. The largest of these flat areas that we located during our brief survey would allow up to five people to lie down; it also incidentally coincides with the helipad.

More lookout points were recorded on Îlot Fourneau, which could be seen as a bridge between the top of Le Morne and the villages on the southwestern sector of the main island.

By plotting the GPS data and overlaying this onto both the contemporary urban (Fig. 18) and topographical plans (Fig. 19) we are able to show how the cultural landscape of Le Morne integrates into aspects of human agency and spatial environmental; and how these factors dictate the manner in which this region can be used. From these two figures it can be seen that the majority of current cultural artefacts (data provided by LMHTF) centre in specific regions, not surprisingly on the top of the plateau, to the north of its base and the margin where the peninsula meets the mainland. This is no doubt an artefact of sampling bias. It should also come as no surprise that the modern plan reflects this same pattern of land use, with contemporary structures focused within the same geographic areas.

The topographic overlay (Fig. 19) demonstrates how, particularly in a space like Le Morne, the constraints of the landscape dictate land use.

This is most effectively illustrated in figures 20 & 21, where both plan-view and 3D models of gradient reveal the restrictions on land-space on this inselberg. The lighter green concentric lines in the 3D model, Fig. 21, indicate a gradient of eight degrees. This is the minimum for habitation and it can be seen that the majority of cultural artefacts have been recovered at this gradient and below (olive green distribution). This is repeated on the plateau itself, as one might expect, indicating the utilisation of all usable available space as appropriate.

While this would seem self-evident from the generated models, the value of these representations lie in the fact that they provide a foundation upon which to base future work looking at both tangible and intangible aspects of human agency.
Fig. 20: Regional gradient: plan view.
Gradient: blue = low (effectively sea level) to orange = high. Circles = LMHTF cultural artefacts; diamonds = GPS points.

Fig. 21: 3D view of regional gradient of land surfaces.
Gradient: Olive green = low to maroon = high. Dots = LMHTF recovered cultural artefacts.
3.3.3 Survey of the ‘Malagasy’ Cemetery
The site was deemed particularly suitable for geophysical survey as the graves were constructed using basalt, a highly magnetic material, set in natural sand geology that is magnetically quiet. It was decided to set up a small survey area, which could be returned to in future seasons depending on results.

Grids of 10 x 10 metres were laid out using a Leica 700 series Total Station. The station and grid points were later recorded with GPS for subsequent georeferencing. Since the common line of archaeological features (the graves themselves) were aligned roughly north west – south east, the base line was oriented east-west and the direction of traverse was north. This meant the archaeology was cut at an angle of roughly 30°, ensuring that no archaeological features would be lost during processing. Magnetometer survey, using a Geoscan FM256 Fluxgate Gradiometer, was considered the more appropriate method of archaeological prospection on this site. The geological and archaeological conditions seemed perfectly contrasted. Also, the overgrown and littered nature of the site would pose severe difficulties for resistance survey, whereas the Geoscan FM256 is hand held, and therefore very manoeuvrable in confined conditions.

A topographic survey was also carried out to map dominant features in the landscape, enabling the geophysical survey to be accurately georeferenced and used in combination with existing cartographic material. Whilst we were establishing the geophysics grid, Diego Calaon led Allan Charlot and colleagues from the LMHTF in a campaign of clearance; a significant number of graves were uncovered following a thorough cleaning. The newly revealed graves within the geophysics grid were record, including location and spot level, thus enabling the topographic and geophysical surveys to be compared, in an integrated survey strategy.

3.3.4 Survey Results for the ‘Malagasy’ Cemetery
The magnetometer survey of this site was successful in identifying surface and sub-surface archaeological features. The quiet magnetic signal of the sand in this area contrasts sharply with the dipolar anomalies created by the highly magnetic basalt stones used to construct the graves. Since the graves on the surface have been located on the topographic survey, it is now possible to compare the results, and see where other graves may be located under the surface, or hidden in the long grass. The first interesting point to note about the results is that there appears to be a general orientation visible of northwest – southeast. The results show the main groups of graves, as well as isolated ones (Fig. 24 & App. IV).
Fig. 22: Greyscale results of the magnetometer survey.

Fig. 23: Interpretation of the magnetometer survey results.

The results are seen in plan. However, the area covered by any anomaly relates more to the level of magnetic response than to the actual physical size of the feature. Features relating to interpretation of the magnetometer survey (marked on figure 23) are shown in RED, whilst grave numbers (figure 24) relating to the topography survey are marked in BLUE.
Fig. 24: Numbered graves.
Graves are not shown to scale in relation to each other, ref. to Appen. IV for correct scale and positioning. ‘Grave 20’ not shown as this structure did not actually appear to be a grave – explained in text below.
The large dipolar anomaly [M1] in the centre of the survey, close to the two entrance trees, is situated in the area of graves [4], [5], [6], [13], [14], [15] and [16], shown here in figure 25. Much of the dipolar response will have been caused by the concentration of basalt stones used to construct the graves. However, as shown in figure 10, there were modern, metallic deposits in this area too, including an iron spike marking the location of a cross on grave [4], in the centre of the two trees. These metallic deposits will have increased the signal significantly.

Anomaly [M2] also appears to continue further west than where the grave has been recorded in the topographic survey. This may be because of scattered ferrous material. However, it may also reflect the presence of sub-surface archaeological features that were not visible on the surface. Some of the graves seem to have had additional graves built onto them, and this may be that part of what we are seeing. In contrast [M3] seems to reflect grave [3] without additional disturbance.


It is possible that there is a continuation in signal from the initial main concentration [M1], into [M6]. This anomaly correlates in part with grave [19], but much of the signal to the east of this is likely to be caused by the large amounts of modern ferrous debris from the voodoo offerings (such as sardine tins, bottle tops and coins). The survey in this area was difficult to carry out due to the piles of coconuts, and hidden debris in the long grass.

To the north of [M1] there also seems to be a continuation of signal [M7]. This is where the magnetometer survey is catching the magnetic response of graves [7] and [8]. The grass was particularly long here, so it may be that there are more graves located between graves [6] and [9], and graves [7] and [8]. Equally possible is that this response is due to modern ferrous material from the voodoo offerings. The magnetometer may have been affected to some extent by the large quantities of bottle tops hammered into the two entrance trees.
The dipolar anomaly [M8] is, in contrast, more defined, and correlates with the position of graves [17] and [18].

In the western edge of the survey area a series of dipolar anomalies [M9], [M10], [M11] and [M12] also seem to show defined features. [M10] is catching the edge of the high magnetic signal of grave [20] (a curious feature which looks less like a grave, and more like a distinct pile of stones). [M11] is the dipolar results of the basalt stones of grave [1]. [M9] and [M12] could be sub-surface graves (i.e. the basalt stones have been totally covered in earth, lessening the magnetic signal detected by the magnetometer). Alternatively they could be isolated deposits of modern waste accumulated during voodoo activities. The same possible explanations could also be applied to the isolated anomalies [M13], [M14], [M15] and [M16]. However, the area around [M14] – [M16] was very overgrown, and it is possible that these are individual graves. It should be noted that the graves that have been grown over for a long period of time have not been used for voodoo deposits, and therefore the concentration of modern ferrous material on them is less, resulting in a much lower signal.

3.3.5 Interpretation of Results

The successful outcomes on the cemetery site reinforce both the geophysical survey, and the integrated approach of mixed-survey methodologies. With the magnetometer survey results georeferenced into the topographic survey and drawings of graves, interpretation is made easier. Normally small areas are not advised for geophysical surveys, since the features shown cannot be properly understood or interpreted unless on a landscape scale. However, in this instance it has been possible to make a direct comparison, which can be used comparatively in subsequent surveys, or when similar sites are studied.

This work also highlights the advantages of geophysical survey for studying landscape archaeology, since areas can be covered quickly, even in difficult conditions such as woodland as shown here. The clarity of the results due to the relationship between the geology and archaeology will be an important factor for the consideration of sites for further survey work.

The survey has identified clear spatial patterns in the small area of the site studied. Clusters of graves are clearly evident, including some that have been extended or divided, providing an interesting introduction for further work on the site.

The survey of the plateau and Îlot Fourneau could effectively be seen as representative of knots of a possible observation-communication network built and used by run-away slaves on Le Morne and the surrounding region. The working hypothesis sees Le Morne and Îlot Fourneau as parts of a network of hiding and lookout locations that were of paramount importance for maroon resistance. What has been attempted and arguably should be continued is an appraisal of tangible alongside intangible. Our reconnaissance does not immediately support the notion of sustained habitation on the plateau; this then emphasises the need for continued research and appraisal of the region.

Geographical positioning and orientation is needed for those locations identified as potential lookouts. These data need to be studied in connection with archaeological and ethnographical evidence from settlements and cemeteries (a process commenced during our current research), as well as with palaeoenvironmental evidence from sediment records from the immediate region. This then allows us to draw a much more complete picture of a group that will no doubt have left very little material evidence.

3.3.6 Recommendations & Future Work

1. It is strongly advised that a continuation of the magnetometer survey over a large area of this sand bank be undertaken. It seems likely that the cemetery adopted the natural boundaries, and it would be interesting to ascertain the extents of the cemetery, as well as examining the overall spatial patterns.
2. Results as clear as these will be rare on an island dominated by volcanic geology, and therefore it offers a good opportunity to use magnetometer survey to achieve a large-scale view; this would be unviable through excavation. The results of this survey have an added value in that they would be essential for planning any excavation work, allowing for focused research in the future.

3. In terms of the Le Morne Cultural Landscape as a whole we would strongly recommend a large-scale survey of the area to the north and east of this site, to explore the lower slopes of the hills adjacent to the Le Morne Mountain. These would be accessible for geophysical survey, and may be able to reveal any settlement or archaeological features in the area, providing greater context to previous research on maroon activity in the area. To carry out survey in these areas a Bartington Grad-601 twin probe would be used, since a greater area can be surveyed at speed.

4. A programme needs to be initiate that records oral histories from local populations as well as other facets of cultural heritage, such as boat building traditions. This will inform not only on the paradigm of slaves and the activities of post-emancipation, but also provide tangible links to cultural heritage; aspects that are much needed in Mauritius.

3.4 Site 7: Flat Island
Flat Island was the only site we were able to study that gave insight into the ‘coloniser’ component of this project. Due to time constraints, only a short site visit was possible for one day on the 16th of December. The visit was designed mainly to assess the potential for future archaeological research, made more urgent by impending plans to develop the island. The most important aspect of this island is that it is a bounded space that has been left relatively untouched by the development in recent years. No modern roads or buildings have been constructed, so the archaeology remains relatively undamaged. It was very obvious that many buildings are still evident as earth works, as the area around the barracks in particularly shows.

3.4.1 Survey of Flat Island
The standing remains were visited and buildings recorded with photogrammetry. All the buildings and roads visited, as well as other points of interest, were recorded with GPS. The perimeter of standing structures were measured and recorded; building material used was also noted. The cemetery was visited; this too would benefit from clearing, and detailed recording, as well as a magnetometer survey to investigate the wider landscape and to position the cemetery in context of other activity on the island.
Fig. 26: Flat Island (effectively Site 7)(Google Earth©).

3.4.2 Survey Results for Flat Island: Photogrammetry

A number of detail features were noted on the standing archaeology from Flat Island that are worthy of further investigation. These include the use of coral block as internal wall division, and fine point basalt block rendering that seems indicative of individualistic artisanal style.

The most appropriate starting point for investigating these refined architectural details is through geometric photogrammetry; as with other sites investigated during this campaign, the preliminary survey results presented herein (Fig. 27) for photogrammetry will form the basis for future comparative and interpretive models. With the standing archaeology already indicative of specific, perhaps even unique practices, this study area holds considerable promise.
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Fig. 27: Photogrammetry of Building 1, Flat Island.
3.4.3 Recommendations & Future Work

1. A detailed micro-topographic survey of the area would be highly beneficial to plot any spatial patterns and buildings evident in the contour plan. Magnetometer survey would also work well here as the buildings are basalt and the background geology is sand. It is also possible that due to the particularly ‘quiet’ signal of the sand, postholes may be visible.

2. The standing archaeology on Flat Island was noted to have been of a particularly high standard with specific design features and decorative aspects that set it apart from that noted on the mainland. It would be beneficial to make a wider comparative appraisal of these technical aspects for better integration in the future.

3. Linked to the above, research on extraction sites for brick / block production would be very useful, especially as it was evident that at least in one location coral was used for internal room division. This once again links to the artistic and technical attitudes expressed in building construction that needs to be investigated. It also allows for crucial distinctions to be noted between each of the individual colonising groups.

4. The whole island would benefit from wide and varied survey methodologies, which could be brought together to create a detailed map of human activity on the island.

3.5 Site 8 & 9: Trou Aux Cerf and Trois Cavern

The final two locations surveyed formed part of the ‘early exploration’ aspect of our overall scheme. These were undertaken after earlier discussions in the UK with Profs. Atholl Anderson (ANU, Australia) and Keith Dobney (University of Aberdeen, Scotland). This aspect of the project aimed to contribute novel datasets for a much wider undertaking looking at early exploration and settlement in the southern Indian Ocean. This particular facet is thus well position to address interesting questions about the movement of peoples in this region of the world prior to the documented colonial interventions of the later medieval period.

Fig. 28: Trou Aux Cerf, with location of extracted core (Site 8) (Google Earth©).
3.5.1 Survey of Trou Aux Cerf

Andrea Balbo and Krish Seetah undertook the survey of Trou Aux Cerf on the 16th of December. Due to the limited time available, only one day could be devoted to this site; however, this provided much useful information both in terms of actual results and within the context of planning for subsequent seasons.

The area immediately around the crater edge has been substantially developed, with a road ringing the entire perimeter (Fig. 30). An initial circuit of this was made to note vegetation and other environmental conditions. The only route to access the base of the volcano, which contains a naturally occurring lake, was via a narrow track spiralling down the side of the crater.

On reaching the crater bottom, an initial reconnaissance of the visible crater slope was made with a minimum of six terrace levels evident from the perimeter to the basin. A 250 cm long bamboo stake was fashioned from readily available material. The entire length of this stake was hammered into the lake sediments from the top of the lowest terrace providing an estimate of the minimum sediment accumulation on the volcano lake margin. When trying to hammer in a PVC pipe we were stopped by angular basalt blocks (10s of cm) and could only recover the top 30 cm of the sequence. This will be used to test proxy presence/preservation.

3.5.2 Survey Results for Trou Aux Cerf

Analysis of the core has yet to be completed. Despite the relatively short chronological snapshot that this core will have captured, it will nonetheless provide important data for understanding the climate and environment of the recent past; it will also no doubt prove useful for refining future investigations of palaeoenvironmental and palaeoclimatic change.

Logistically, it is clear from our initial core experiments, that mechanical coring equipment is needed to recover a suitable sequence. However, during our decent into the crater it became apparent that heavy equipment couldn’t easily be transported down the slope. Thus, future coring will depend on machinery being airlifted into the crater and deposited in the basin.
3.5.3 Survey of Trois Cavern

Andrea Balbo and Krish Seetah, ably assisted by Anwar Janoo of UoM, undertook a daylong exploration of this underground cave system on the 10th of December.

Traces of human activity were recorded within some of those tunnels that may be connected to run-away slaves and / or later periods. Evidence of earlier human presence has not noted within these tunnels. A range of features were described and samples collected from the lava tunnel including: various animal bone remains (pig, dog) including a human tooth, landsnails, possible temporary sleeping places along the tunnel walls (higher than the centre of the tunnel), fireplaces along the tunnel walls. A test pit, dug in the tunnel in the 1990s, was also noted and served as a serendipitous occasion for stratigraphic recording.

3.5.4 Survey Results for Trois Cavern

The pit sequence included:
(a) 0-20 cm below surface is very dark brown clayey silt sheet flows with magnesium staining indicating sheet flow accumulation (possibly indicating more intense rain and erosion); (b) 20-35 cm dark brown (7.5YR3/4) blocky silty clay, 35 cm band of magnesium staining, 35-85 (c, d, e) cm dark brown (7.5YR3/4) clayey silt including clasts from a rockfall (35-65 cm), magnesium stains (d - 65 cm) and reduced yellowish green peds (e - 85 cm).

The transition from (b) to (a) could coincide with clearing for sugar cane plantation or with a transition to higher precipitations. The tunnel pavement is mostly made of angular basaltic clasts fallen from the tunnel roof (average 20 cm). Larger blocks (up to 150 cm) were present. Finer dark reddish brown (5YR3/2) sediment (silt and fine sand) was accumulated in the central part of the tunnel floor, along the tunnel axis, and includes animal footprints and charcoal. Channelling was observed on the finer sediment parallel to the tunnel axis indicating the occasional presence running water. Water and finer sediment are coming to the cave through the tunnel entrances as well as by percolation from the roof, as indicated by a clay film covering walls and blocks in the tunnel. Above the roof, land is cultivated with sugar cane. White spores were observed on the surface of the fine sediment. Occasional accumulation of finer sediment (clay) was observed within circular depressions along the tunnel axis.

3.5.5 Recommendations for Trou Aux Cerf and Trois Cavern

Recommendations for these two sites are intimately tied into the wider remits of our investigations of early exploration. However, we would recommend that future work on these specific regions:
1. Mechanical coring of Trou Aux Cerf is imperative as a prime location for initial sediment and palaeosoil study.
2. Continuation of survey, and subsequent excavation, of Trios Cavern as this site may well serve as a useful catchment area for data relating to historic environmental changes (influx of agriculture, changing land uses etc) as well as well as prehistoric.
4. RECOMMENDATIONS

4.1 Summary of Recommendations

4.1.1 Aapravasi Ghat and Parc-a-Boule
1. Perform GPR inside the Warehouse and on Parc-a-Boule.
2. Consolidate extant textual sources and consolidate these with the growing archaeological evidence.
3. Using GPR, survey the bus depot as a means of integrating Aapravasi Ghat into the wider area.

4.1.2 Trianon
1. Field walking and magnetometry should be carried out on a much wider scale.
2. Tie in this data with GIS where it can be compared with both cartography and evidence from oral histories.
3. Examine aerial imagery to identify potential sites in the vicinity.
4. Finds evidence needs to be catalogued and overlaid with current data to investigate spatial patterning of artefacts.
5. View site as an integral part of the wider.

4.1.3 Le Morne
1. Magnetometer survey over a large area of this sand bank is needed.
2. Initiate an investigation of oral histories and cultural facets from the region.
3. A large-scale survey of the area to the north and east of this site is needed to explore the lower slopes of the hills adjacent to the Le Morne Mountain to provide greater context to previous research on maroon activity in the area.

4.1.4 Flat Island
1. A detailed micro-topographic survey of the area is needed to plot any spatial patterns and buildings evident in the contour plan.
2. Magnetometer survey would also work well as the buildings are basalt and the background geology is sand.
3. It is also possible that due to the particularly ‘quiet’ signal of the sand, postholes may be visible.
4. These methods would create a detailed map of human activity on the island.

4.1.5 Trou Aux Cerf and Trois Cavern
Refer to 4.2.1 below.
1. Mechanical coring of Trou Aux Cerf is imperative as a prime location for initial sediment and palaeosoil study.
2. Continuation of survey, and subsequent excavation, of Trios Cavern as this site may well serve as a useful catchment area for data relating to historic environmental changes (influx of agriculture, changing land uses etc) as well as well as prehistoric.

4.2 Longer-Term Study Agendas

4.2.1 Colonised – Coloniser Paradigm
1. An obvious plan for future research would be to broaden the remit in subsequent seasons to include Dutch and British occupation sites, thus evidencing the changes in material, culture landscape use and human component between these groups.
2. Finds evidence, particularly from sites such as Trianon, provide crucial baseline date. These need to be carefully recorded for creation of ceramic, glass, metal and other material culture catalogues. These will form the backbone of future research using specifically Mauritian finds to create archival databases.

3. Photogrammetry provides a useful avenue for understanding the specifics of building technology and transitions in architecture, stylistic detail and materials. This method will allow us to refine our understanding of the techniques used with more detailed data, to compare functionally different buildings, and finally to link the relative chronology to an absolute chronology through data from historical sources and sample excavations.

4. An ethnographic survey of traditional boat types and seafaring practices around the island may indicate the influence of boat building traditions from a variety of cultural groups. As tourism increases and traditional boats and fishing practices are replaced with modern technology it would be interesting to record these traditions before they are replaced. Can we see evidence of East African, Madagascan, Austronesian or Indian traditions within the boat technology? Did European technology and ship design influence local boat building traditions?

5. It would be interesting to investigate whether slaves and indentured labourers gained or maintained a sense of the islands’ position in relation to their homeland. For example, were slave cemeteries orientated towards Madagascar? If knowledge of seascape and geography were important, was knowledge about navigation and seafaring transmitted through oral traditions in order that it was maintained?

6. The coastal development of the island could be mapped using a combination of historic maps, records and coastal survey. Areas of potential interest and preservation may be highlighted and surveyed with geophysical equipment such as side scan survey or sub-bottom profilers. In this way coastal installations (break waters, harbours etc) and wrecks could be identified and studied. More general coastal survey could include studying access and visibility of sites from the sea.

7. It may be interesting to investigate whether ports and maritime installations on the island were specifically designed for trade in sugar and slaves and whether the material culture reflects this. Can similarities be seen between the archaeology of Mauritius and other islands that were within this trade network?

8. The coastal archaeology could be studied alongside the environmental and geomorphic development of the coastal zone. Slope analysis, local currents and tides could be used to indicate areas of erosion and deposition of sediment and sediment transportation could be tracked. Any coastal sea-level indicators, wave cut notches, raised beaches and reef deposits could be mapped and, where possible, dated. Auger survey could be used to provide a record of changes within the coastal environment.

9. Sourcing coral and other raw materials as a mechanism to corroborate and expand historical research on labour practices of slaves and indentured workers.

10. Dendrochronology (see 4.2.2. point 3, below) could be an invaluable route for appraising the movement of goods and raw materials out of Mauritius. The proposed development of an ebony dedrochronological ‘tracking system’ would have major implications for understanding the economic role of Mauritius in the later medieval period.
4.2.2 Early Exploration of Mauritius and its Environmental Potential

1. One of the first steps for investigating possible early human settlement / exploration of Mauritius (previous to 1500 AD) is the building of a preliminary model for sea-level change and emerged land in the Mascarene Plateau, back to the (Last Glacial Maximum, c. 18 ka BP) LGM period, when sea level was as much as 130 meters below present-day levels. Also changes in palaeo-currents in the Indian Ocean and historical navigation tracks need to be taken into account to define potential sea-routes and investigate the possibility for Palaeolithic people to reach the island.

2. Dependent on funding, a laser scan and aerial reconnaissance of the island, its coast and surrounding island would provide very useful based line data for exploration of all facets of Mauritian archaeology. Discussions have been entered into with local (Mr Uckiah) and overseas (Dr Kristof Ostir, ZRC, Slovenia) colleagues and it is anticipated that this ambitious programme of reconnaissance will be achieved by 2012.

3. An ebony tree dendrochronology program could be developed in parallel with sediment studies already underway for the Island. Mauritius presents a number of preserved wildlife areas where ebony trees as old as 500 years can still be found (Le Petrain). Starting from the study of these particular trees, a new dendrochronological reference curve could be produced, which can be used for palaeoclimatic purposes, as well as for tracking historical ebony wood trade routes.

4. Satellite images may be used to detect land clearing, land-use, and agriculture-triggered landscape change. Such information may be integrated to investigate human impact, in relation to the introduction and extinction of plants and animal species.

5. In order to understand if prehistoric seafarers could have reached the island and what technology, skill and knowledge they would have had to possess it is first necessary to study the palaeo-geography and maritime environmental context of Mauritius. A reconstruction of the island’s place within the wider Indian Ocean and seascape would include a desk-based assessment of regional bathymetry (preliminary research indicates the availability of existent Swath survey data), relative sea-level and geological development of the island.

6. In addition, the prevailing winds, currents and inter-island visibility could be mapped (using GIS) to enable us to consider the distances people would have had to travel, the conditions they would have had to negotiate and what skill and technology would have been needed. This would enable possible maritime routes to be modelled. Alongside this, the mapping and compilation of known human activity within the wider Indian Ocean region and the existent evidence for early seafaring and boat technologies could be combined to discuss the possibility of early colonization. This may also provide a framework for potential dates of early colonization or visitation, site type and potential activity on the island prior to its colonial history.

7. In terms of seafaring technology, it is interesting to consider whether the island’s colonization and insular connectivity are linked to a specific maritime technological, social or economic development. For example, boat size or type, increased navigational skill, or understanding of the world.

8. If there is no evidence for an early colonization of Mauritius, what can this tell us about the island’s location, wind, weather and tide, travel and risk? Would seasonal visitations have left a permanent trace in the archaeological record?
9. For later periods, there are many sources of seafaring evidence that can be investigated including iconographic and historic. However a coastal survey of the island would help to identify potential areas of coastal importance (for example natural harbours and anchorages, gaps in the barrier reef, shelter from prevailing weather and cyclones etc). Coastal installations and harbour works can shed light on ship technology.
5. CONCLUDING COMMENTS

This report has provided a snap shot of the huge potential that Mauritian archaeology has to offer. Clearly, whilst much was certainly achieved during the two weeks spent on the Island, equally clear is the fact that we are only now scratching the surface of much globally significant cultural heritage that demands further investigation.

As shown in this document, the unique interplay of indenture and slavery are but two facets of these investigations: albeit two extremely relevant ones. With sites such as Trianon, we are afforded an opportunity to add much more intimate details of daily life, corroborating the historical (from archives) and complementing the monumental (from sites such as Aapravasi Ghat). While the plan of research for investigating indenture unfurls itself readily, the equally rewarding (academically speaking) study of slavery is arguably more challenging.

The whole process of studying slavery requires a greater breadth of methods. A good example of this is the complexity we faced in trying to better understand Le Morne itself. Our preliminary appraisal of the plateau does not support mid-to-long term habitation. On the surface this would seem to deemphasise the importance of this site. In fact, by looking at Le Morne from the outside in, and inside out, we start to appreciate its true significance: by its geological monumentality the plateau actually allowed for a much greater zonal space of the rugged coast to become a refuge.

Although we are at the beginning of our investigations, it is clear that archaeology has much to offer. What has also been shown is the need for a multidisciplinary approach, and this model is one that will be continued and expanded in future campaigns. In much the same way that we cannot depend on one method of archaeology, nor can we depend on one subject area to illustrate the complete picture of Mauritius’ past. If we are to improve our understanding of all aspects of the Islands’ archaeo-history, it will require the integration of a range of methods, and a widening of our catchment area. For example, drawing the genetic map of present day human population could help in characterising cores of early emancipation, particularly as present-day population distribution seems to reflect past ethnic distribution. Oral histories and literature can be used to locate new sites and better understand human agency, while maritime research will allow us to integrate a sea-facing-land view of past human movement and trade, as well as investigate culture, as it can be understood from maritime technology.

We have been able to meet both our academic and wider aims, the latter being as important and rewarding as the former. Mauritius has much to do with regard to legislative protection and management of its unique and largely unexplored archaeology. This crucial component of its cultural heritage deserves to be investigated and safeguarded: we hope that this report will play a role in this worthy dual process.
APPENDIX I: GEOPHYSICAL SURVEY SUMMARY

Aapravasai Ghat and Parc-a-Boule
Dates of survey: 6 – 21st December 2009
Site: Aapravasi Ghat World Heritage Site
Location: Port Louis, Mauritius
Surveyor: Cambridge University
Personnel: Rose Ferraby with Saša Čaval and Vaneeesa Girdhari
Geology: Basalt
Soil condition: Very dry and poorly drained
Land use: Conservation area and public park
Survey Type: Resistance survey
Instrumentation: Geoscan RM15 parallel twin array
Area size: 2253m²
Grid size: 10 x 10 metres
Traverse interval: 1 metre
Reading interval: 1 metre

Trianon
Dates of survey: 16 - 17th December 2009
Site: Trianon barracks, Mauritius
Surveyor: Cambridge University
Personnel: Rose Ferraby and Saša Čaval
Geology: Basalt bedrock with alluvium
Soil condition: Disturbed
Land use: Cleared scrub
Survey type: Magnetometer survey
Instrumentation: Geoscan FM256
Area size: 65 x 43m
Grid size: 20 x 20m
Traverse interval: 1m
Reading interval: 0.25m

Le Morne
Dates of survey: 11-12th December 2009
Site: Le Morne cemetery site, Le Morne, Mauritius
Surveyor: Cambridge University
Personnel: Rose Ferraby, Saša Čaval and Allan Charlot
Geology: Sand
Soil condition: Dry on surface but tidal
Land use: Wooded
Survey type: Magnetometer survey
Instrumentation: Geoscan FM256
Area size: 30 x 20m
Grid size: 10 x 10m
Traverse interval: 1m
Reading interval: 0.25m
APPENDIX II: ARCHAEOLOGICAL PROSPECTION TECHNIQUES

Archaeologists use geophysical survey to record sub-surface archaeological remains. It is non-destructive, and best used on a landscape scale so that spatial relationships within the data can be fully understood.

Statement of Indemnity

Geophysical survey allows the collection of data in reference to the local geological features of the site. It may only reveal certain types of archaeological feature or material. Small areas pose problems for interpretation of results and are not advised.

Magnetometer survey

This is based on the measurement of differences in the earth’s magnetic field at points within a specific area. The iron content of the soil provides the soil’s basic magnetic properties. The earth’s magnetic field is 48,00nT (nano Tesla) but certain instruments can detect the weak differences associated with archaeological features in the ground.

The fluxgate gradiometer used in this survey works using a permeable nickel core magnetised to the earth’s magnetic field. Since the fluxgate has a directional method of functioning, two fluxgates must be used together, positioned vertically to one another on a staff. This reduces the impact of orientation of the instrument on the readings.

Fluxgate gradiometers can detect archaeological features such as brick walls, hearths, kilns and building material. They can also detect changes in soil type such as might be found in ditches, pits or trenches. The success of a survey will rely on the contrasting magnetic readings of the natural geology and archaeological features.

Resistance Survey

Resistance survey uses an electrical current to determine the conductivity of materials in the ground. Different materials allow a current to pass through them to greater or lesser extents. Within a survey area, this data can be compared relatively to assess the kinds of geological and archaeological features that may be present.

Several factors can affect the success and interpretation of resistance survey results, including soil type, terrain and climate, as well as the nature and depth of archaeological features. Moisture content and variations in temperature can affect the results of resistance surveys. However, in general those features that register higher resistance are those that retain less water, such as walls, rubble and surfaces. Features with lower resistance tend to be ditches, trenches, pits and gullies.
APPENDIX III: EXAMPLES OF FINDS FROM TRIANON FIELD WALKING SURVEY

A & B: Examples of ceramic artefacts, most likely parts of porcelain plates;

C: Porcelain figurine head;

D: Inscribed clay tile;

E: Worked basalt artefact.

Images gratefully received from Natasha Kheddoo; amended by Krish Seetah.
APPENDIX IV: COMPLETE GRAVE LAYOUT FROM LE MORNE