

# ARCHAEOLOGICAL STORAGE ORGANIZATION AND MANAGEMENT.

A CASE STUDY OF FORT JESUS MUSEUM, MOMBASA-  
KENYA //

CAESAR|BITA

UNIVERSITY OF NAIROBI  
INSTITUTE OF AFRICAN STUDIES  
LIBRARY

PROJECT REPORT SUBMITTED TO THE INSTITUTE OF  
AFRICAN STUDIES, UNIVERSITY OF NAIROBI,  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR A  
POSTGRADUATE DIPLOMA IN THE CARE AND MANAGEMENT  
OF HERITAGE AND MUSEUM COLLECTIONS.

UNIVERSITY OF NAIROBI  
INST. OF AFRICAN STUDIES  
LIBRARY

JUNE, 2003

University of NAIROBI Library



0444438 6


## *COPY RIGHTS*

© Caesar Bitu 2003

No part of this research project may be reproduced in full or in part, or transmitted in any form or by any means: photocopying, recording or otherwise without prior written permission from the author or the University of Nairobi on that behalf.

**DECLARATION**

I, CAESAR BITA, do hereby declare that, this research project report is a result of my own study and findings except where acknowledged, and that, it has not been submitted for a Postgraduate Diploma in any other University.

Candidate signature .....   
Date. .... 26<sup>th</sup> JUNE 2003

Supervisors signature.....  
Date.....

# TABLE OF CONTENTS

	PAGE
LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
LIST OF PHOTOGRAPHS.....	v
LIST OF ABBREVIATIONS.....	vi
ACKNOWLEDGEMENT.....	vii
DEDICATION.....	viii
ABSTRACT.....	ix
<b>CHAPTER 1. INTRODUCTION.</b>	
1.0: Introduction.....	1
1.1. Background information.....	2
1.2. Statement of the problem.....	4
1.3. Objectives.....	6
1.4. Justification.....	7
1.5. Scope and limitations.....	8
<b>CHAPTER 2: LITERATURE REVIEW.....</b>	<b>10</b>
2.0: Introduction.....	10
2.1: General overview.....	10
2.2: literature review on study area.....	12
2.2.1: Role of archaeological collections.....	12
2.2.2: Storage systems.....	13
2.2.3: Packaging.....	14
2.2.4: Space utilization.....	14
2.2.5: Storage environment.....	15
2.2.6: Pest infestation.....	17
2.2.7: Security.....	18
2.2.8: Preventive conservation.....	19
2.2.9: Documentation.....	21
2.3: Conceptual Framework.....	21
2.4: Hypotheses.....	23
2.5: Definition of terms.....	23
<b>CHAPTER 3: METHODOLOGY.....</b>	<b>25</b>
3.0: Introduction.....	25
3.1: Research site.....	25
3.2: Population.....	26
3.3: Sampling/elements of study.....	26
3.4: Methods of data collection.....	27
3.5: Method of data analysis.....	27
3.6: Problems encountered.....	28
3.8: Expected / anticipated results.....	28
3.9 Ethical Issues.....	

<b>CHAPTER 4: STORAGE ORGANIZATION AND MANAGEMENT.....</b>	<b>30</b>
<b>4.0: Introduction.....</b>	<b>30</b>
<b>4.1: The collections.....</b>	<b>30</b>
<b>4.2: The storage conditions.....</b>	<b>31</b>
4.2.1: Storage units.....	37
4.2.2: Packaging.....	37
4.2.3: The storage building.....	38
4.2.4 The surroundings.....	39
4.2.5: Security.....	40
4.2.6: Collection Organization and space use.....	42
4.2.7: Accessibility.....	42
4.2.8: Infestation.....	43
4.2.9: Preventive conservation & maintenance.....	44
4.2.10: The climate.....	45
4.2.11: Documentation.....	46
<b>4.3: Executive summary.....</b>	<b>48</b>
<b>CHAPTER 5: FORT JESUS MUSEUM STORAGE QUALITY.....</b>	<b>48</b>
<b>5.0: Introduction.....</b>	<b>48</b>
<b>5.1: Comparative Evaluation.....</b>	<b>49</b>
5.2.1: Preventive conservation.....	50
5.2.2: Storage units.....	51
5.2.3: Storage building, security and location.....	52
5.2.4: Use of space.....	53
5.2.5: Storage climate.....	54
5.2.6: Infestation.....	54
5.2.7: Documentation.....	54
<b>CHAPTER 6: CONCLSION AND RECOMMENDATION.....</b>	<b>56</b>
<b>6.1: Conclusion.....</b>	<b>58</b>
<b>6.2: Recommendations.....</b>	<b>59</b>
<b>6.3: Proposals for further action.....</b>	<b>61</b>
<b>REFERENCE.....</b>	<b>65</b>
<b>APPENDIX.....</b>	
Appendix 1: Fort Jesus museum archaeological store and its surrounding.	
Appendix 2: Fort Jesus Museum Archaeological Storage Floor Plan	
Appendix 3: Storage Units in Use at Fort Jesus Museum.	
Appendix 4: Documentation card used at Fort Jesus museum.	
Appendix 5: List of interviews	
Appendix 6 4 Weeks RH and Temperature recordings.	

## LIST OF TABLES

Table 4.1: Weekly RH and temperatures ranges.....	44
Table 4.2: Fort Jesus museum storage quality assessment.....	47

## LIST OF FIGURES.

- Figure 2.1: Conceptual model for deterioration of archaeological collections... 22
- Figure 5.1: Percentage representation of Fort Jesus storage quality..... 49

## LIST OF PHOTOGRAPHS.

Plate: 1.1: Fort Jesus national Monument from the sea.....	3
Plate: 1.2: The New Fort Jesus Museum Archaeological store.....	4
Plate: 4.1: Objects poorly organized in shelves.....	32
Plate: 4.2: Wooden cabinets, drawers and cupboards.....	33
Plate: 4.3: Metals shelves poorly organized and overcrowded.....	34
Plate: 4.4: Wooden trays.....	35
Plate: 4.5: Paper boxes.....	36
Plate 4.6: Tables.....	36
Plate: 4.7: Leaking roof.....	38
Plate: 4.8: Empty cabinets.....	40
Plate: 4.9: Ethnographic objects.....	41
Plate: 4.10: Objects placed on the ground without padding.....	43



## LIST OF ABBREVIATIONS

PMDA	Programme for Museum Development in Africa
RH	Relative Humidity
FJM	Fort Jesus Museum
NMK	National Museums of Kenya.

## *ACKNOWLEDGEMENT*

This research report is a result of a study that was carried out in March to June 2003. In a work of this nature one ends up with very many debts, which have to be acknowledged. For practical purposes it is impossible to mention all of them here. However special mention must be made to some of them. I would like to express my thanks to Dr Ephraim Wahome, my supervisor, who devotedly supervised the entire research work and provided me with the needed guidance, advice and criticism throughout all stages in the production of this research work. To him I say, "Thanks very much."

I am also grateful to PMDA, the National Museum of Kenya, Kenya Museum Society and the Friends of Fort Jesus for their financial and material support, which in deed made it possible for me to attend the course and undertake this research. Further, much thanks to my PMDA colleagues and tutors for their invaluable comments and company during the course.

I am also indebted to members of the department of Coastal Archaeology at Fort Jesus Museum: Dr. Herman Kiriama, Mr. George Ghandi, Mohamed Mchulla and Steve Mutava, Fatuma Mansoor, Said Kaonge and on a greater extension to all NMK staff members at all levels for their support.

I reserve my greatest gratitude to my immediate family for their support and encouragement throughout the study.

**I Dedicate this work to my  
Wife, Dorcas,  
And my  
Loving Daughter, Juliannne.**

## *ABSTRACT*

This report presents a study done in the Fort Jesus museum on the archaeological storage organization and management and how this is likely to lead to deterioration of collections. The research sought to answer the question whether poor storage organization is likely to lead to the deterioration of archaeological objects at the museum. Its main objective was to study the store and come up with qualitative information concerning the facility and also information on what should be done to mitigate damage to the objects. The study was based on published data as well as observations made by the author himself. Relevant data was collected in photographs and tables. Instruments used for the data collections and throughout the study included among others thermohygrographs, cameras, scanners and the like. Collected data has been descriptively analyzed by comparatively looking at the standard practice in published literature and the level at which Fort Jesus museum is operating then asking whether it is at the standard practice or below. From this basis, guidelines and recommendations have been drawn. Nevertheless, results gathered revealed that stored objects are likely to deteriorate at Fort Jesus Museum due to both poor storage organization and management. To project these collections to the future, the study has recommended that sustained effort should be made to improve conditions in the storage facilities. On the same level, a number of proposals for further action have been offered among these being the need to draft collection care and management policies for Fort Jesus museum and training of staff in basic collection management and care. All in all to achieve optimum preservation of collections, the study observed that there is need for renewal of the commitment by the museum itself to the care of its collections because this is the first step if these collections are to preserve for the present and future generations.

## Chapter 1.

---

### 1.0: INTRODUCTION.

It is a fact of museum life that most collections end up in the storage facility. This does not mean that their significance is any less than those that have been exhibited. These collections not only represent the inheritance of future generations, but they are also the raw materials for scholarship, learning and discovery for the people of today. In many ways they are the three-dimensional equivalent of archives held by record offices. To realize their potential, these collections must be in good condition and accessible. Their usefulness is limited however when their care and maintenance are of a standard lower than that expected for their long-term preservation. Therefore archaeological collections have a vital role to play and indeed one justification of their collecting for museums is that they form a permanent body of research material for future generations. Managing them effectively and efficiently, and making the necessary investment in them over time ensures that these collections are maintained for research purposes in the future. The subject of this research was to study the storage systems used at the Fort Jesus museum archaeological store and their role in collections preservation. How this is likely to impact on the collections and whether it prevents collections against agents of deterioration. The study therefore sought to look at the general storage and how this is likely to lead to the deterioration of collections. It covered space utilization and storage fixtures and their effects on objects preservation. The study also looked at the preventive conservation and collection management programmes in place, and their impact on collections. The project's overall goals however, were to provide qualitative information concerning the archaeological

storage at Fort Jesus museum on its organization and management and provide recommendations for the future of this store.

## **1.1: Background information.**

### **1.1.1: History of National Museums of Kenya.**

The present day National Museums of Kenya (henceforth NMK) started as a private venture of the East Africa and Uganda Natural History Society (Now the East Africa Natural History Society) in the 1910's. With gradual developments over the years, by late the 1960's historic sites and monuments came to be placed under its charge. Later on, other than Nairobi, other museums were established. Among these were Kisumu, Meru, Kitale and Lamu. At about the same time Olorgesailie, Kariandusi and Fort Jesus museums, which were under the National Parks Department, were handed over to the National Museums of Kenya. Over the years NMK has witnessed growth and establishment of other museums like Kabarnet, Narok, Krapf Memorial museum and many more are being established.

### **1.1.2: Fort Jesus Museum.**

Fort Jesus Museum is one of the regional museums in Kenya under the national umbrella body, the National Museums of Kenya. It is situated in Mombasa city right inside the famous historical Fort Jesus national monument. The Museum, established and opened to the public in the 1960's not only serves the Kenyan coastal communities but is also in the service of the entire nation, the larger East Africa and the world at large. It is headed by a chief curator and has six sections excluding administration, which combine in the effort to make the museum meet its obligations. These include: archaeology, conservation, education, macology, Mombasa Old Town Conservation office, and Swahili cultural center. In seeking to classify the museum in the known categories, Fort Jesus can be said to be a

general museum for its functions entail interests in archaeology, history and arts in general. It also exhibits collections of scientific nature. Fort Jesus also houses collections from the local communities sometimes on a temporary basis. The role of Fort Jesus Museum, as with all bona fide museums, revolve around collections acquisition, recording, storage and preservation, research, exhibition and education. It accomplishes these in the pursuit of education and enjoyment for the benefit of the society.

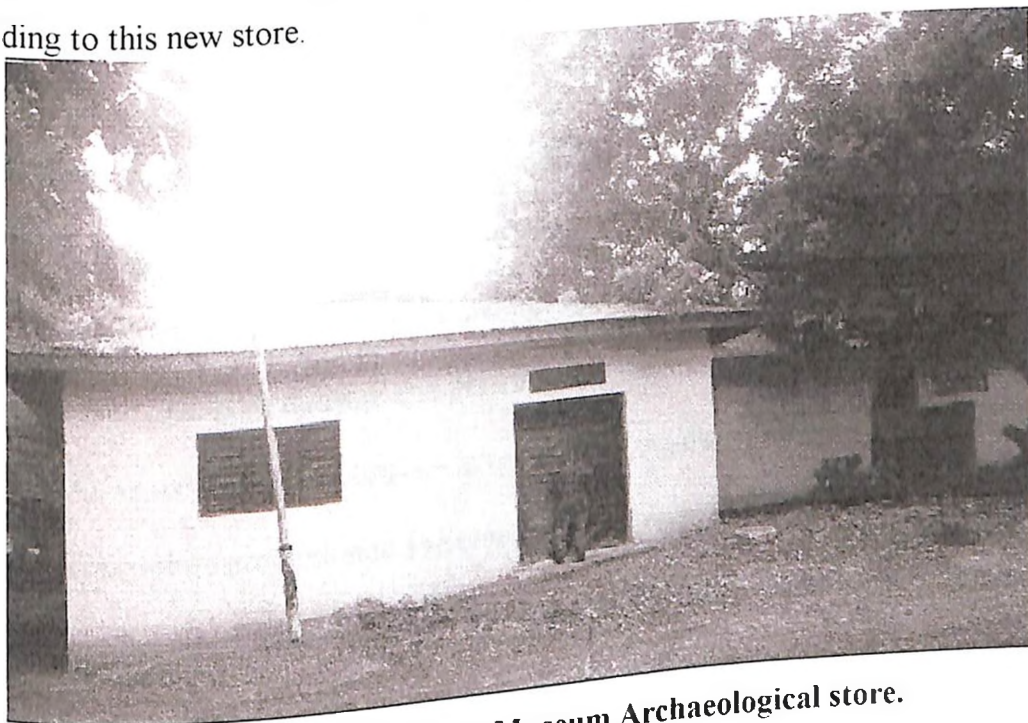


**Plate 1.1: Fort Jesus national monument from the sea. Photo: Author.**

### **1.1.3: Fort Jesus archaeological storage.**

The new archaeological storage at Fort Jesus museum was built in 1999/2000. Initially objects were housed inside Fort Jesus museum and it was after the establishment of the department of coastal archaeology in the old law court building, that they were relocated. When Programme for Museum Development in Africa (henceforth PMDA) came up, a temporary shelter had to be sought and this led to the construction of a building, outside Fort Jesus monument, at the Swahili cultural center southwest of Fort Jesus monument. Objects were then moved from the old law court building to this new facility paving room

for PMDA. This translocation of objects involved two phases. Phase one consisted of preparation of collections in readiness for shifting involving labeling, packaging and cleaning. Bone artifacts were wrapped in plastic sheets and ceramics put in plastic bags in readiness for translocation. This phase also included the provision of storage fixtures or furniture such as racks, trays and wooden cabinets for the new storage facility. The second phase involved cleaning of the store and actual movement of objects from the old law court building to this new store.



**Plate 1.2. The New Fort Jesus Museum Archaeological store.**

**Source: Author.**

### **1.2: Statement of the research problem.**

During the past decades, there has been an increase in archaeological research and many museums have been given responsibilities, which impose a considerable strain on their staff and resources. Storage is one of these difficult responsibilities of a museum in the care of its collections. It becomes more difficult to manage archaeological collections especially due to lack of funds, trained staff and the large space needed. This storage problem has forced many museums in the developing countries to use unstable areas to store their



archaeological collections. Poor storage can lead to the loss of valuable archaeological evidence through deterioration. Museum storage is a permanent home for collections, which must provide conditions that ensure adequate protection to the artifacts. Most problems relating to archaeological storage revolve around provision of space and its utilization. However, the use of poor storage fixtures and lack of appropriate preventive methods and maintenance programs in storage areas poses a major problem in the preservation of collections.

Archaeological storerooms come in many designs, however, when planning the storage facility, it is important to take future expansion into consideration. Careful planning of the storage units, buildings and the surroundings should be considered. The surroundings must guard against agents of damage and deterioration such as theft, infestation, pollution and the like. Of equally great importance is to consider the designs of the store to ensure that it provides maximum protection to the objects. There must be a comprehensive policy on how to maintain the store. This means that there must be policies for the management of these facilities with trained persons being responsible for their regular cleaning, inspection and maintenance. Appropriate strategies for preventive conservation of the collections within the storage must also be put in place. Such strategies should include cleaning, temperature and relative humidity monitoring, survey programmes to assess the needs of the collections, fire prevention measures, collections accessibility, security, pest control programmes, and emergency programmes for disasters among others. It should also include training programmes for staff working in the store on matters like handling of collections, pest detection, hygiene and security.

A museum archaeological storage should also be organized to ensure maximum space utilization. This is only achievable by ensuring that objects are stored correctly and in the right fixtures like trays for small objects and pellets for large ones. This, apart from maximizing space does help especially when planning for the future expansion of the collection. Selection of storage fixtures and materials for their construction should also be done wisely. If anything, the materials used should guard objects against atmospheric pollutants. Storage fixtures should be selected well to protect objects against pest, unsuitable relative humidity, pollution, light, dust, fire and the like. They should also facilitate easy access to collections for examination and inspection during stocktaking. The store must also have a good documentation system, which allows easy location of the objects.

The research questions that this study sought to answer are:

1. How are the storage systems in use at Fort Jesus museum archaeological storage likely to lead to damage and deterioration of collections?
2. Are there strategies for preventive conservation and maintenance of collections at the storage facility?

### **1.3: The study objectives.**

If an object or a collection is in good condition, all that is required is adequate maintenance. Objects properly stored with due precautions against damage can be preserved for many years. This means that when an object becomes the property of a museum the conditions under which it is handled, displayed or stored should obviously be aimed at extending its longevity. The primary aim of this study was to look into the needs of archaeological

objects at the Fort Jesus Museum with a view to finding out what needs to be done to improve storage conditions for long-term preservation of objects.

The following were the main objectives of the study:

1. To provide qualitative information concerning the organization and management of the Fort Jesus Museum archaeological storage.
2. To provide recommendations for suitable storage management for the overall welfare of the collections.

#### **1.4: Justification of the study.**

Archaeological storage management and maintenance are among the most demanding functions for all museums. They are also the least visible to those outside the museum establishment. The activities of collections storage, maintenance and management have, in many museums, taken a back seat in comparison to other more visible activities. Without strong commitment to collection care and management, museums will be increasingly unable to provide programmes of value to those who seek to see and learn from these objects. While some collections are adequately catalogued and organized at Fort Jesus, most are in need of massive reorganization. The adequate organization of collections and the full documentation of the associated information are key to gaining intellectual control of these resources. Lack of information on archaeological objects reduces their usefulness dramatically and makes the museum irrelevant.

This research seeks to address storage problems that have been bedeviling Fort Jesus museum archaeological storage. The department of archaeology at Fort Jesus museum is responsible for archaeological researches covering a stretch of over 500 kilometers and over 250 archaeological sites. Finds from all these sites are brought for safe-keeping at the

museum. In view of this, unless a good storage system is put in place, a lot of research material in form of collections is likely to deteriorate or be damaged due to poor management. In addition the study also looks at the storage organization with the aim to help solve the problem of overcrowding brought about by poor space. The effective use of space and good storage fixtures as well as good collections organization are other important areas to be addressed.

One important aspect of this study is that the results are applicable not only at the Fort Jesus museum but also in many other museums with similar problems. Lamu museum north of Mombasa along the Indian Ocean is likely to share a similar problem and can enormously benefit from this project as are other museums within the country. The results can also be used outside the country where similar problems exist.

### **1.5: Scope and limitations.**

Management of museum collections takes many forms including conservation and treatment, maintaining buildings, storage, documentation, correct handling, suitable packaging, disaster management and preparedness, and control and management of pests among others. All these aspects form the basis of collections management policies and procedures, which all museums should have. In the pursuit of the aforementioned objectives, and as is the case in all similar studies, this study had its scope and limitations.

Since the management of archaeological collections is diverse, covering all of the above aspects, this study limited itself only to museum storage organization and management. In storage organization, the study focused on the storage systems in use, the building shell, the surrounding, the internal climate, collection organization and use of space and how these

are likely to affect collections. As far as storage management is concerned, the project looked at collections preventive conservation strategies at Fort Jesus in terms of effectiveness. This limitation has been necessitated by the diversity of the subject itself and the lack of adequate resources such as time and funds. Time limitation for instance had an impact on the collection of data on the internal climate of the Fort Jesus Museum store. It is agreeable that the climate of a place cannot be ascertained by using the records of one month. A climatic study must be done for at least one year (to encompass all seasons of the year) i.e. a complete cycle of all the seasons of the year so as to be able to determine the true conditions. This however was not possible in this project due to the limited time available. It is no surprise, therefore, that the internal climate (temperatures and relative humidity) of the store was measured for a period of only four weeks. Another reason for this is the relative age of the store. This store is very new, only two years old, having been put up in the year 2000. This period is not long enough for one to be able to detect any change in the objects or to ascertain that deterioration is a direct result of this particular storage. In addition before objects were removed to the store, they were kept in the old law court building and no data is available on their condition before translocation; not even information on their condition during acquisition.

## Chapter 2

---

# LITERATURE REVIEW

### 2.0: Introduction

Management and care of museum collections is one of the most difficult problems facing the majority of museums in the vast developing countries of Africa. Most collections from yester decades are lying crowded and neglected in storerooms with most of the archaeological collections unpublished. It is important therefore, regardless of type, for all museums to have a collections management program. Such a program involves care for the physical well-being and safety of all the collections, covering appropriate storage, organization of collections (including archival arrangement and description of documents), their accessibility for various uses, and their overall management. This chapter attempts to explore the published standard practice in archaeological storage provision. It covers such aspects as storage systems, preventive conservation, use of space, climate, infestation, security and documentation.

### 2.1: General preview.

Once a museum accepts a collection of archaeological materials, provision must be made for their controlled storage and long-term preservation. In whatever form they arrive, the materials should be received, assessed, and monitored by a qualified conservator to advise on conservation and storage. Since collections in the care of a museum form the primary resource from which all other activities flow, the museums responsibility to its collections should be paramount, above all others. The duty of care thus becomes central to the

museums functions and its stated mission objectives. A key component plan to form part of the museums overall forward plan should be the conservation plan forming part of the museums collections management strategy. This should cover things like conservation guidelines, policies on collection assessment, environmental monitoring programmes, and strategies for dealing with emergencies such as fires, floods among others. Good storage is therefore crucial to the life of the object for it is in the store that the object spends all of its life and storage conditions can destroy it or extend its life expectancy. The conditions should be such that the objects risk of deterioration is minimized. A museum store is also the basis of other museum functions such as research, exhibition and education. The storage methods used should be able to facilitate the carrying out of these core functions. Suitable storage covers things like good storage units, suitable buildings (shell) and the surroundings, good packaging, effective documentation, security, maximum space utilization, control of pests and effective preventive conservation and maintenance measures.

From a general point of view, whether an object will be preserved for the future is most dependent on the kind of storage provided. As Buchamann (1992:3) observed, providing the best storage possible is by far taking the first and most important step towards preserving collections. He also contends that an ideal storage has climate, temperature and relative humidity control, theft and fire protection, maximum space use and collection accessibility to only a limited number of persons. In addition objects should be organized according to a system for example by material size or provenience. It is these ideas that have formed the basis on which recommendations have been made.

## **2.2: literature review on study area.**

A lot has been written on the storage and management of archaeological storage facilities in museums and this study has drawn on diverse approaches to the effective storage and management of archaeological collections at the Fort Jesus museum. At the Fort Jesus museum, stored archaeological collections are likely to deteriorate due to a combination of factors. Included among these are organization and management. Poor buildings endanger collections housed in them leading to deterioration. Maintaining the building to a high standard is a critical step towards obtaining good preservation of collections.

### **2.2.1: Role of archaeological collections.**

Museum collections come in many categories and one of these categories is the archaeological collection. When these are transferred from the site to the museum, they acquire a uniqueness that exceeds their previous existence and deserve good care. This is because archaeological objects represent the most sacred and profound of a society's cultural heritage and embody the common elements of everyday life. Archaeology, according to the observations of Hyden (1993), has a very special perspective on the world; it is a way of looking at the world and a way of interpreting the relationship between material items and the economic or social aspects of culture. Archaeological collections therefore have a vital role to play and indeed one of the justifications advanced by Longworth (1994:522) for their collection is that they form a permanent body of research material for future generations. Managing them effectively and efficiently, and making the necessary investment in them over time ensures that these collections are maintained for research purposes in the future. It would nevertheless be unwise to think of archaeological collections as being divisible by two: those capable of sustaining research and those that are not. Archaeological objects are very important for they convey a good amount of



information. In some, the information yield may be small while in others the yield can be proportional to the amount of time invested in their study. The bulk falls between the two extremes (Longworth, 1994:522). Archaeological collections in museums should not therefore be thought of in isolation from other collections and it is essential that the museum itself be able to compare and contrast its own collections with those of other museums.

### 2.2.2: Storage systems.

Many objects arrive in museums already damaged only to be placed in storage areas that are overcrowded. Cramped conditions hasten destruction and encourage pest infestation.

One aspect of good storage is the use of good storage units. These should be constructed and designed with care if they are to prolong the life of the objects they contain. Use of collections and space utilization should be incorporated in their design. The designing storage facilities should take the following into consideration among others:

1. Objects shape, size and materials from which they are constructed
2. The materials used for the support of the objects in the storage units
3. The conditions and situations that encourage the deterioration of the materials used in the construction of the objects
4. Policy and practice on the access, recording and retrieval of collections.
5. Space utilization

Tate and Skinner (1994:459) observed that storage of archaeological objects could greatly be improved by the use of suitable storage systems. From their argument, by taking into account the type of storage system used, storage units can be used to play a great part in the conservation and hence continued preservation of objects. This therefore means that collections may not last long if storage systems used are not good. Storage systems should

be designed such that they are able to accommodate all the objects. According to Bradley (1994:468), storage facilities should be built to house as large a number of objects and as efficiently as possible. It is therefore necessary, when making storage fixtures, to identify and design the correct style of storage units and systems appropriate to the particular type of objects. In the units, objects can be placed on shelves, in trays, cupboards, and boxes. Objects should be separated so that they are not touching or piled on top of one other and should be protected from dust, pests, mould growth, corrosive gases and unstable temperature and relative humidity. They should also be ordered so that they can be readily located and easily observed. The use of good storage systems therefore becomes one of the most important steps towards the conservation of collections.

### **2.2.3: Packaging**

This should provide physical and biological protection, allow easy examination of objects, and ensure durability. Joukowsky (1980:274) observes that packing materials should be strong, durable and directly related to the size, condition and weight of the object while Sease (1994:33) asserts that the material should be selected with care and only inert materials such as acid free tissue or polythene should be used.

### **2.2.4: Space utilization.**

One of the storage difficulties for archaeological collections in most museums is the large space needed. This forces many museums to use unstable areas to store their archaeological collections. Space for storage is critical in almost all museums. It is expected, however, that storage units be able to solve the problem of space by being able to hold as many objects as is considered safe for conservation. By all means objects should not be placed on top of

each other or allowed to rub against one another. It is important that thorough planning of the storage facility is made before putting up the building. A primary consideration in this planning, as noted by Buchamann and Rushfied (1992:5) is the nature of the collection. This is important because artifacts in various media and sizes need a variety of units and spaces. In addition to this a complete record of the types and sizes of the objects in the store is also of importance for it helps in the calculation of spatial requirements. In ensuring that there is maximum space utilization it is important to consider the following:

1. The store should only house objects that it is meant for. For example an archaeological storage facility should only store archaeological objects.
2. In organizing the store, the floor space should leave aisles in all spaces used by shelves.
3. The shelves and cabinets should go up to the ceiling for maximum use of storage space.
4. All shelves should be fully occupied.

Inappropriate use of storage space can cause valuable archaeological evidence to be lost and/ or lead to poor storage of objects thus accelerating their deterioration. In this respect, a key responsibility of museums, according to Ambrose and Paine (1993:178), should be to ensure that adequate storage facilities and conservation methods are provided for the collections. Space should be provided for movement of people and expansion of collections while regular procedures for logging staff in and out should be established. In addition, storage facilities should maximize space utilization without overcrowding or creating hazards for the movement of objects or people.

### 2.2.5: Storage environment.

Climate is the consequence of many elements and factors of varying nature. The main elements that are of importance are temperature and relative humidity. According to UNESCO (1968:27), these factors are influenced by latitude, altitude, land and water, mountains, ocean currents and winds. This is the reason why tropical climates normally have high temperatures and relative humidity. Archaeological objects can be in an excellent state when extracted from the soil but they may be distorted and ruined after a few minutes of contact with unsuitable RH or temperatures. It is these two that impact negatively on archaeological objects. This stresses the importance of climate as major factor affecting the decay/preservation of objects.

Any artifact that has survived burial for hundreds of thousands of years can be assumed to have reached chemical and physical equilibrium with its environment. Excavation immediately places the object in a different environment where a new equilibrium must be attained. This may lead to deterioration. Archaeological collections should therefore be carefully stored under controlled conditions to ensure they do not deteriorate. Archaeological collections are of two types (Longworth 1994:522-524), organic and inorganic and both need varying environments, which should be considered in their storage. For instance, all organic materials by virtue of being sensitive to moisture will react physically to fluctuation in relative humidity, which sets up stresses in the material leading to their cracking and or warping. RH also reacts with some inorganic materials such as metals leading to their corrosion (Newey, 1994:369). Similarly high relative humidity also affects any porous material that is saturated with water-soluble salts including pottery, stone, wall plaster and organic materials. This means that RH should be monitored and maintained at suitable levels. According to Pye (1994:400), fluctuation and extremes in

R.H. is damaging, and should not rise above 70%. A stable relative humidity of 65% or a variation of 50% - 60% is preferable. While too low R.H. will lead to desiccation of objects and too high to mould and fungal growth on organic materials a generous amount of acid free paper padding helps buffer most objects against rapid fluctuations. Though temperature by itself has no immediate observable damage, extremes and rapid fluctuations are damaging. A stable rate of 15 – 25 degrees Celsius, is however, preferable with no more than a daily movement of plus or minus 5 degrees Celsius.

Although appropriate environment in storages is complicated meaning there is no such thing as stable environment (Skempton, 1994:247), there is a need to study the climate at Fort Jesus museum to establish how best collections can be suitably stored without due threat to their survival. With this reflection, this study acknowledges the observations made by Gary (1978:89) that we have to interfere with the interior climate in some ways so as to ensure safety of collections. It follows therefore that storing objects in the correct environment can halt or retard the process of deterioration (Daintish, 1994: 355). This is observed by Pleinderleith and Werner (1956:1) that with the atmosphere conditioned it is possible to hold in check the major causes of deterioration in collections. Objects will always deteriorate, and although this will be accelerated by poor environmental conditions, good storage systems are a key to their safe-keeping.

#### **2.2.6: Pest infestation.**

One of the major problems facing archaeological collections in stores is insect infestation. Insects become adapted to exploit a wide range of environmental factors often in ways that bring them into direct conflict with man. For instance, as Dennis (1994:474) noted, when we seek to preserve certain artifacts for cultural or research reasons, insects seek to utilize

them as alternatives to their natural habitats to which they are adapted. Controlling pests in museum stores therefore becomes a very important aspect in the care of museum collections. Pest infestations in museums can be started when, objects, which harbor pests, are added into the collection in the storage or foodstuffs are taken into the store areas (Dennis, 1994:474). Foodstuffs can be a cause of an infestation because food debris attracts insects and other pests. Not all insects are pests, however most pests can be disposed into museum store areas through a number of methods, flying or walking in through open doorways or windows, or when artifacts harboring pests are brought into the store. In the choice of construction materials for storage facilities and areas, it is important to know that wood is vulnerable to attack by insects and that metal is not.

### **2.2.7: Security.**

Archaeological collections are of great historical value, if lost or misplaced or destroyed, they cannot be replaced. Therefore security against all threats to collections (Buchamann and Rushfield 1992:8) is an essential part of a comprehensive storage program, which every museum should have. For example, fire is very important because one fire incident can destroy an entire collection in a very short time. Precautions should be taken to avoid fire accidents and to safeguard the collection in case of fire. In this, the design of storage units plays a great role in safeguarding collections for it is well known that wood burns and metal does not. A storage unit made of metal would therefore provide better security against fire especially if the objects are completely enclosed in the units.

Provision and maintenance of fire extinguishers in visible places in the store accompanied with training of staff in their use in fire prevention is recommended. There should be fire exits clearly labeled and instructions for staff and visitors prohibiting smoking and

monitoring program for collections to check occurrences like disasters and pest infestation as well as mould and fungal growth. It also entails a detailed assessment of environmental risks e.g. roots due to nearby trees, municipal infrastructures such as sewage and water conduits. It should also cover an assessment of storage within a building like the placement of shelves several inches above the floor to avoid damage to the objects in the event of flooding. A preventive conservation and maintenance program should also entail an assessment of collection priority in regard to their vulnerability. Ballard (1992:12) gives a good example of collection vulnerability assessment. She argues that some stored objects may be vulnerable but have low priority, while others may have a high curatorial priority, but may not be easily damaged (Ballard, 1992:12). In the event of a particular disaster such as floods, objects priority becomes of importance and should be considered. Because many museums house mixed collections (Pye, 1994:400-4001), preventive conservation strategies have to take note of the fact that different materials react differently to different environments. All in all, preventive conservation emphasizes non-interventive actions to prevent damage and minimize deterioration to objects. Such actions include inspecting and recording condition of objects, monitoring and recording levels of environmental agents (light, temperature, air pollution and relative humidity), controlling environmental agents, establishing a pest management program, practicing proper storage, packing and so on. Preventive conservation measures are also important when considering the effects of disasters. The amount of damage to collections can be substantially reduced if preventive measures are taken beforehand and the right procedures put in place. All the same, stored objects should be examined regularly to note changes in storage arrangements. Regular inspection, monitoring and cleaning is essential.

carelessness in general. Such precautions if properly followed, can indeed prevent fire. On theft, periodic inspection of collections affords security protection that may not be readily available for objects in store. Enclosed units made of 'hard to break' materials like hardwoods or steel with a lockable mechanism can prevent theft. Similarly, a staff member should always accompany visitors to the storage. General security of the collections, storage facilities and rigidly enforced policy on access to the storage are therefore necessary. Storage security however goes hand in hand with good storage organization. This is mainly because a poorly organized collection will compromise the effectiveness of visual inspection for it could be hard to detect a missing item.

#### **2.2.8: Preventive conservation.**

Archaeological collections will be meaningless if put in the store without an effective preventive conservation strategy. A collection maintenance program in the storage is an important feature in the care and management of archaeological collections for this ensures their survival and enhances their value. Without such a program collections can undergo tremendous deterioration occasioned by their lack of inspection thus the investment in time and money put into museums becomes wasted. Preventive conservation is therefore one major aspect of a museum and should be covered in the museums collections management policies (Malaro 1995:11-12).

Preventive conservation refers to measures or actions that are taken to prevent or avoid damage occurring to collections. It is about preventing and or controlling all the known and unknown risks to museum collections and should, among other things, involve conceiving, developing and organizing strategies in time and space to preserve objects. Such programmes should cover issues such as the implementation of a maintenance and



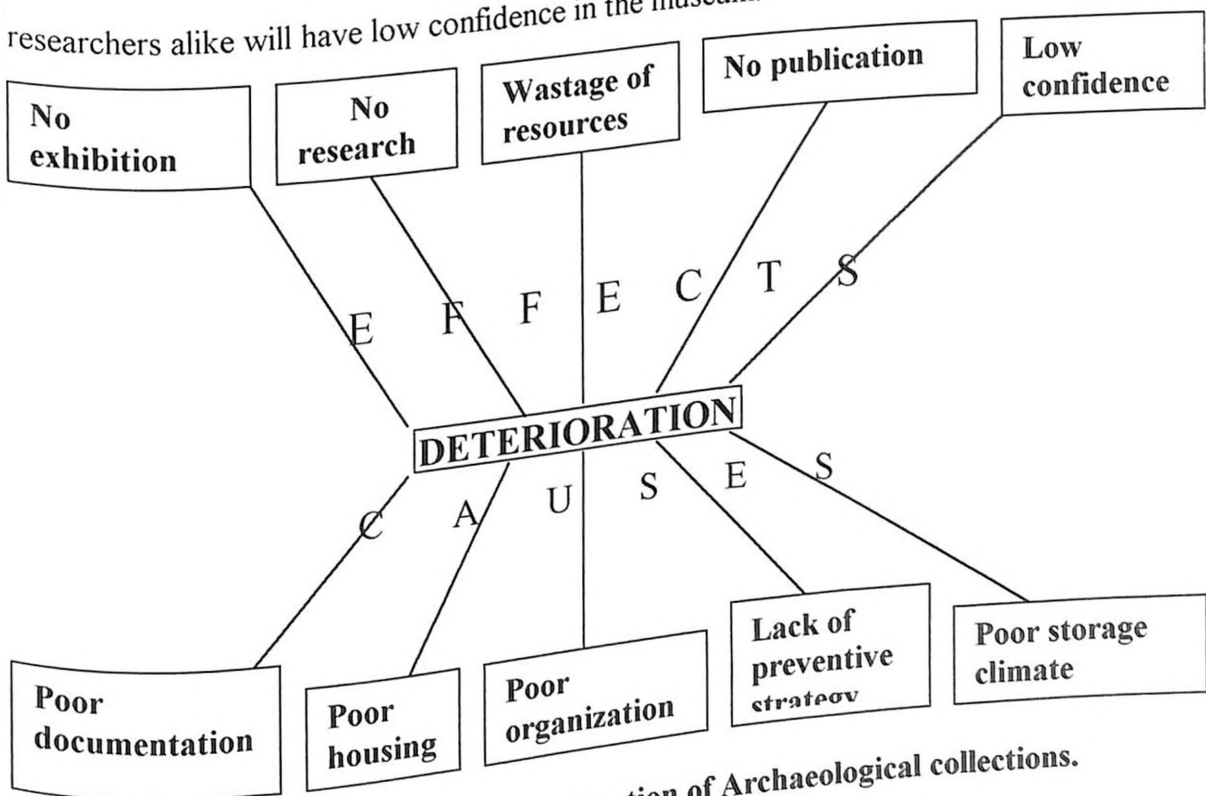
### **2.2.9: Documentation.**

A collection maintenance and preventive program goes hand in hand with good documentation. Documentation is important because with proper documentation and indexing, (Ambrose, 1993:46-47) the security of artifacts is assured and the museum will be able to use the collections for display and/ or research purposes effectively. It is essential, therefore, to ensure that objects are properly documented and recorded for security and identification (Stone, 1994:213). Documentation is also fundamental to the curatorial work as a basic source of information on the collections. It enables the effective management of the collections encompassing storage and auditing among others (Stone, 1994:213). Incomplete records would mean that the museum neither knows what it owns nor what it has lost. Another justification for effective documentation relates to disasters. This is because events and activities outside the museum can have noticeable effects on the collections within. A thorough documentation ensures that even if objects are accidentally lost, or damaged by disasters, knowledge about them and their relevance is preserved. This information can be used to regroup objects that have been dispersed or reconstruct those that have been damaged. Documentation is therefore a vital part of collections management without which the value of collections is substantially reduced.

### **2.3: Conceptual Model.**

No particular and clear-cut theory was used in this research. The project however conceptualized that poor storage organization, poor storage fixtures, poor documentation, and lack of a collection preventive conservation program leads to deterioration of objects. Included also is poor housing and storage surroundings. This conceptualization assumes that poor storage has serious adverse effects on collections and the museum as a whole. Such effects include, among others wastage of resources, lack of publication, low

confidence levels, low research priority and lack of exhibition. The assumption here is that the causes of deterioration do have the mentioned diverse effects, thus establishing a cause-effect relationship (Figure 2.1). In this respect wastage of resources means that the museum will be spending resources in keeping objects that it does not use; lack of publication means that objects, because they are not being used will only rot away and will not be published thus no information dissemination. A collection not cared for will result in deterioration and damage, which, in most cases, can be identified through research. Related to low research priority is the lack of exhibition in that damaged objects cannot be used for exhibition. Because the store is the reservoir for objects to be exhibited, when deterioration occurs it means they cannot serve this purpose. Owing to deterioration of objects, lack of publication and exhibition, no information will be disseminated thus the public and researchers alike will have low confidence in the museum.



**Figure 2.1: Conceptual Model for deterioration of Archaeological collections.**

(Source: Author)

## 2.4: Hypotheses.

The study seeks to understand how storage systems facilitate deterioration of objects. In this respect the study investigates the contribution of storage units, packaging, surroundings, storage space and organization, security, preventive conservation and general condition of objects in facilitating deterioration. The hypotheses that were generated from this and which will be tested in this respect are:

**1. Poor storage organization and management leads to deterioration of archaeological collections at Fort Jesus Storage facility.**

**2. Poor storage organization and management does not lead to deterioration of Archaeological collections at Fort Jesus Storage facility.**

## 2.5: Definition of terms.

In the above hypothesis, storage management and organization covered collection preventive conservation programmes and storage systems. The variables were **deterioration** and **poor storage management**. The following terms have been used in the study and their definitions as per this study are given as:

1. **Storage:** There are some museum activities, which could technically be considered as storage. The keeping of objects in an exhibition case or generally on display is in some way a kind of storage. The transportation of objects in packages especially over long distances as loans to other museums can also be considered to be some form of storage. These are forms of storage, which deserve consideration. This study however, was centered on the well-known safe-keeping of objects in

museums, in rooms and spaces called storage areas, on a more or less permanent basis.

2. **Storage units:** In this text, this refers to physical structures including drawers, boxes, racks, cabinets, shelves and the like located in the storage area and in which objects are stored.
3. **Organic materials:** In this study, this refers to collections created through the process of life (the carbon chain) like plant and animal material remains.
4. **Inorganic materials:** These are materials that are not created through the carbon cycle (not through the process of life), such as stone, ceramics, metals and glass.
5. **Preventive conservation:** This refers to measures or actions taken to prevent or avoid damage occurring to collections such as good packaging, security, integrated pest management, and good storage.
6. **Storage Maintenance:** This term is used to mean provision of means for the preservation of the store and its contents.

From the literature review of the Fort Jesus museum storage facility, it can be determined that much is to be done if suitable storage for and effective preservation of collections is to be achieved. In this regard, the following outlines the methods that were employed to study the actual state of affairs in the store.

.....

## METHODOLOGY

### 3.0: Introduction.

This chapter outlines how different kinds of data were collected and how they were subjected to analysis. It also touches on the sampling methods employed, problems encountered and the anticipated results of the study.

### 3.1: Research Site.

This research covered the archaeological storage facility at the Fort Jesus museum in Mombasa, Kenya. The actual research, though involved drawing on diverse approaches in published literature for the storage of archaeological objects. While the research concentrated on materials from the Fort Jesus museum, some data was also gathered from a number of different areas including the Nairobi National museum.

### 3.2: Population / Universe.

When a museum has a broad range of collections, it needs to have policies, procedures, and plans that adequately cover the long-term preservation needs of all the different collections. Archaeological collections are of two types organic and inorganic and Fort Jesus museum archaeological storage houses both types with ceramics taking a sizable amount of the storage space. This study focuses not only on single objects but rather at the organization of the entire store. It also investigated how objects are organized, the problems of inadequate housing, poor storage systems and shortage of appropriate storage fixtures. In as far as the

management of collections is concerned the project made attempts to explore the maintenance and management problems that are enormous and believed to steadily increase as more objects are added to the already existing collections.

### **3.3: Sampling.**

Since the study covered the entire storage and not individual objects, there was no sampling. This is so because there was no sampling frame or rather list of things from where sampling could have been done due to the fact that the storage building was used as the unit of study. However, the elements that the project studied in the store include the store surroundings, storage fixtures (shelves, cabinets), the building shell (windows, doors, ventilations) and the storage maintenance and conservation programmes. These were taken as individual units of study and did not require any sampling.

### **3.4: Methods of data collection.**

#### **3.4.1: Primary data.**

This study used observation and semi structured interviews as one of its main data gathering methods. Primary data was collected through observation of the objects, the storage building, fixtures, and the surroundings with associated data collected in photographs. A study of the organization of the objects in the store was also done by directly observing and photographing them. Observations were also made of the building (location, security and building shell), packaging and storage documentation. Direct personal interviews with staff responsible for the storage were also conducted as a method of collecting primary data.

### **3.4.2: Secondary data collection.**

Secondary data was collected through review of published literature on archaeological storage. A lot has been published on archaeological storage, management and organization, which this study capitalizes on.

### **3.5: Data analysis.**

Data has been descriptively analyzed and interpreted for it to be useful by comparatively looking at the secondary data (standard practice via published literature) and the primary data (conditions observed). It was then possible to ask at what level Fort Jesus museum is operating. Is it operating at the standard practice or below? On this basis recommendations for the storage management were made with the expectation of enhancing the future management and storage policies. It is from this that it has been possible to deduce that poor storage at Fort Jesus is likely to lead to collections damage and deterioration of collections. Several instruments were employed in the data collection and these include cameras, scanners, thermohygrographs, rulers, tape measures, pens and pencils and many others.

### **3.6: Problems encountered.**

The main problem emanates from equipment availability. Only one thermohygrograph was available for the measurement of RH and temperatures in the store whilst two would have been appropriate. It is true that many museums are hard pressed financially, but arrangements can always be made in advance to ensure such problems do not occur.

Another problem was the unavailability of reference material. The library at the Fort Jesus museum does contain very little relevant literature. Since the project ran concurrently with other class work, this was a serious drawback because the researcher could not afford to

visit other libraries in Nairobi. This would not have been a problem if only there was enough time allocation to enable researchers access libraries in Nairobi. The other problem was the element of time. Only three weeks were allocated for data collection out of which one, due to logistics, was spent writing up proposals and another in consulting with the project supervisor. This sucked up the time that could have been used to visit libraries in Nairobi. It is important that in future such projects be allocated plenty of time to enable researchers collect substantial data.

### **3.7: Expected results.**

There is no museum that can pride in having perfectly preserved its collections. Preservation is costly and complicated and deterioration will always occur no matter the investment put in its control. In this regard it was anticipated at the onset of the research that storage conditions at the museum are not excellent but of average standard for the preservation of archaeological collections. Storage units were expected to be meeting at least half if not all the basic standards for good storage. Similarly it was expected that there are regular plans for collections inspection and maintenance and to a larger extent the required preventive conservation mechanisms.

### **3.8: Ethical issues.**

During the study of the storage, all professional codes of ethics were adhered to strictly. No attempts were made to tamper with the conditions of the collections. Where a need to examine objects arose during the course of the study, all guidelines for handling were followed strictly and with due respect of the physical, historic and aesthetic integrity of objects. It was observed that Fort Jesus archaeological storage also houses collections from individual researchers and scholars doing their Ph.D. or Masters programs who, upon



completing their archaeological researches, deposit their objects with the museum. Such objects were not in any way interfered with.

Despite the mentioned problems encountered and, with the anticipated outcome of the research, the methods outlined in this chapter were employed in studying the Fort Jesus store. The following chapter is a report of this investigative storage quality assessment.

.....

## FORT JESUS MUSEUM STORAGE CONDITION ASSESSMENT.

### 4.0: INTRODUCTION.

Storage conditions can adversely affect the life of collections and their usefulness thus an awareness of problems associated with collections storage is necessary for the competent management of collections. This chapter covers what was discovered of the Fort Jesus Museum store and includes such issues as packaging, storage units, climate, preventive conservation, space utilization, surroundings, and collection maintenance programs.

### 4.1: THE COLLECTIONS

Currently the collections held at the new archaeological storage building at the Swahili cultural center were initially at the old law building (see chapter 1). The Store houses materials from terrestrial sites within the coastal region from the border with Tanzania to the border with Somalia covering over 250 sites. It holds less sensitive materials that include pottery (both local and imported), metal, glass, beads, and non-archaeological bones. More sensitive materials such as marine artefacts are housed at the conservation laboratory store inside Fort Jesus where environmental conditions are regularly monitored. The total number of objects housed in this store is not exactly known. However records availed to this study indicates that about 52,606 specimens have already been entered in the master inventory register (from accession No 01 to 1897). This number, according to Mr.

George Ghandi, (one of the store caretakers), is only  $\frac{3}{4}$  (three quarters) of the total finds documented and represents  $\frac{1}{4}$  (quarter) of all the materials in the storage. Going by this record, it can be estimated that the store houses over 200, 000 objects and more are being added as was witnessed.

## 4.2: THE STORAGE CONDITION.

### 4.2.1: Storage units

The type of storage units used at the Fort Jesus Museum include wooden shelves, wooden cabinets (some with drawers and others with trays), wooden and metallic boxes, wooden trays, tables, paper (manila) boxes, plastic bags and baskets. Each of these was observed keenly with accompanying photograph to note strengths and weaknesses and how they are likely to contribute to damage to collections.

- a) **Wooden Shelves.** These, it was observed, are poorly constructed, most of them with weak partitions, and leaning from weight. Most of them seem to be near collapse (Plate 4.1). According to one of the store caretakers, a Mr. Mohamed Mchulla, these were not designed specifically for the storage of archaeological finds. A majority of these shelves are badly overcrowded with some showing signs of attack from termites by where evidence was found in form of fecal pellets and frass. The units are also covered with a layer of dust.



**Plate 4.1: Objects poorly organized in shelves.**

**b) Wooden cabinets.** For those cabinets with drawers, the doors do not close easily thus enabling dust and insects to reach objects. Inside, some drawers have mixed finds, some congested and others empty. The cabinets are made of different kinds of wood and were designed for study collections (special finds) but not for storing heavy objects. Currently they house a mixture of objects, ceramics, glass and porcelains. As for those cabinets with trays they too have doors that do not close properly, are made of different type of wood (some strong others weak) and are irregularly constructed (differing heights) leading to poor space utilization.



**Plate 4.2: Wooden cabinets, drawers and cupboards.** Photo. Author

- c) **Metal Shelves:** Metal shelves in use at the store it was learned, were borrowed from the museum library, thus not adapted for storage of archaeological objects but could be used best for display. They are rusted and are coated with dust. Objects on these shelves are not covered (Appendix 3) thus vulnerable to dust, theft and also at risk of falling once the shelves are shaken. The long metal shelves (Plate 4.3) are dangerously overcrowded with objects packed in plastic bags.



**Plate 4.3. Metal shelves poorly organized and overcrowded. Photo: Author**

- d) Wooden boxes:** These are used to store private collections (collections from individual researchers). They are heavy and are piled atop each other with dust on their surfaces; they are congested and randomly placed in the store without orderliness. Some of the boxes are sealed completely (see Plate 4.3) and have no information on the outside as what the contents are.
- e) Metallic Boxes:** These contain private collections and, just like the wooden boxes, bear no information on the outside, the objects inside the boxes are mixed up with other materials that are not archaeological. They are congested and exposing objects to dangers of abrasion.
- f) Wooden Trays:** These are the majority in the store and most are placed on the floor piled on each other making retrieval of materials difficult. Some trays are uncovered exposing objects to dust and pests (Plate 4.4). According to information from a Mr. Mohamed Mchulla (one of the store caretakers), these trays were designed for

keeping in the wooden cupboards but now are haphazardly placed, some on the shelves, on bones and virtually all around the store. A majority of them hold mixed materials; organic and inorganic thus placing objects at risk. The trays bear no information and are dusty. Many of the trays are placed on the floor between shelves leaving little space between the trays and shelves which makes inspections almost impossible (Plate 4.4). Similarly, the trays are stacked more than ten pieces high, some covered others not.



**Plate 4.4: Wooden trays** Photo. Author

**g) Paper boxes:** These are being used to store both organic and inorganic objects. The boxes are dusty and the objects in them are placed in plastic bags. Inside the boxes the objects are congested. The boxes are haphazardly placed (in both metallic and wooden shelves) without any order, or label and thus not easy to retrieve or inspect. Whereas objects inside the boxes are poorly packaged and not padded, the boxes themselves are placed on the floor atop each other and stacked several layers high.

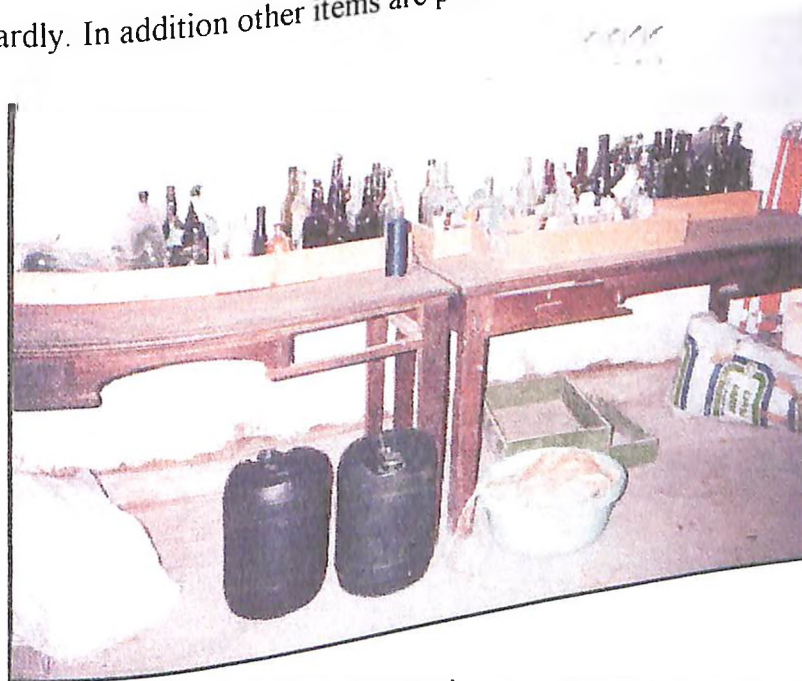
UNIVERSITY OF NAIROBI  
INST. OF AFRICAN STUDIES  
1982

(Plate 4.5). Though the greatest problem on the objects is dust, a few boxes were found to have insect infestation.



**Plate 4.5: Paper boxes.** (Note the air vents with no dust filters). **Photo: Author.**

**Tables:** These are being used to store glass bottles and are located near the door. They are dusty and bottles that are first put in wooden trays are placed on the tables haphazardly. In addition other items are placed poorly below the tables (Plate 4.6).



**Plate 4.6: Tables.** **Photo: Author**

**h) Plastic bags:** Plastic bags are also in use in the archaeological store. Objects in these bags are not labeled, are dangerously overcrowded (Plate 4.3) and difficult to



inspect. The bags are dirty and dusty. Apart from being over packed, the bags are also dangerously placed on the shelves.

#### 4.2.2: Packaging

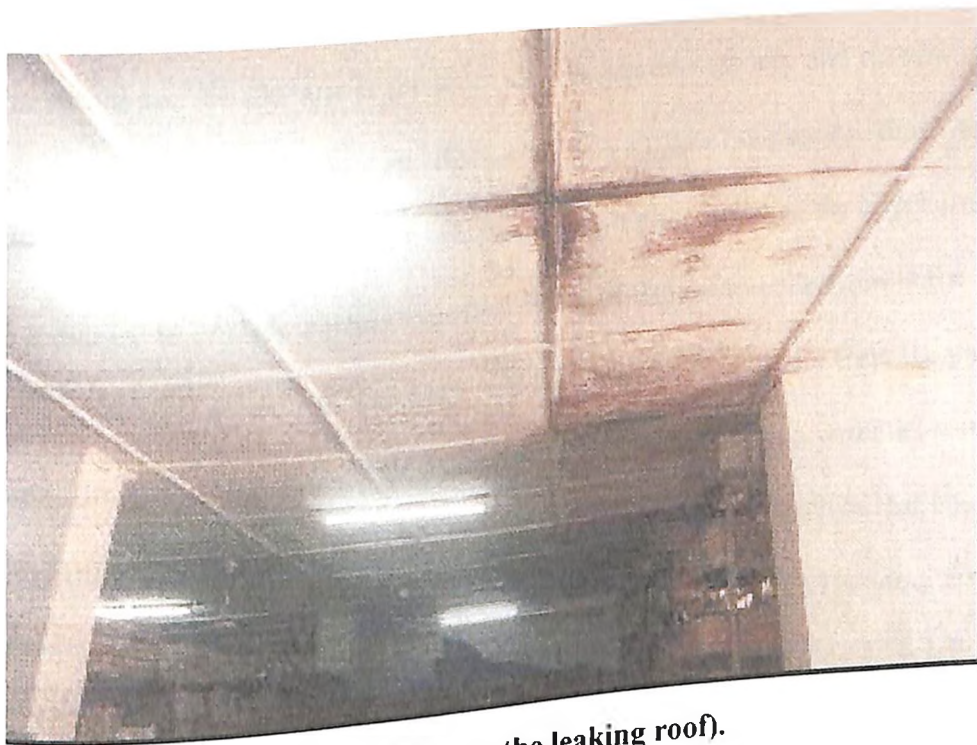
The type of packaging used for the objects is very poor in that most of the objects are wrapped in polythene bags and crammed together in the metal shelves. Though packaging is in acid free paper boxes overcrowding in the shelves is a problem. Most of the polythene bags and paper boxes are not labeled.

#### 4.2.3: The storage building.

**a). Location:** Fort Jesus archaeological store is located behind Fort Jesus monument on the southwest corner within the Swahili Cultural center, a project of Fort Jesus museum. To the East of the building is the center training workshop (Appendix 1) and further, about 100 metres, the Indian Ocean. To the west, separated by a wire fence is the Mombasa municipal council law courts and offices.

**b). Inside:** The inside of the storage, several factors that are likely to lead to collection deterioration were noted. These include a leaking roof that has severely damaged a section of the ceiling (Plate 4.6). Interesting though, just below the leaking section on the floor is a large whale skull (Appendix 3). Lighting is also not enough inside. Some areas especially the corners where big bones are placed on racks are not well lit and this is likely to encourage mould to grow on the bones. The building has only one wooden door, which has spaces below and above it, allowing dust, dirt, leaves and insects to enter the building. In addition there is only one wooden window in this building on the southern wall that has no dust filter. Although the store is well ventilated with nine air vents these have no dust filters

and are large enough (Plate 4.5) to allow not only dust and dirt but also insects, pests, and leaves from surrounding trees.



**Plate 4.7: Damaged ceiling (Due to the leaking roof).**

**Photo.** Steve Mutava, Fort Jesus Museum.

**f). Walls and Floor:** On the walls and floor is a lot of dust from outside. The walls and floor are however properly made, they are strong and no indication of raising damp was noted nor were signs of raising dust except dust through openings (window, door and vents). Lack of regular cleaning nevertheless has led to insects building nests on the wall and a lot of dust settling on the floor. Insects seen include moths, ants and spiders.

#### **4.2.4: The surroundings.**

The vicinity of the storage was scanned for any potential sources of danger to collections and several were discovered. Though the location of the store is far from industrial zones (factories), large trees dropping leaves and dirt, which finds its way into the store, surround

it. In addition, there are large branches overhanging the storage roof that could be a contributing factor to the leaking roof when leaves fall on the roof and are not cleaned hence blocking the drainage. These branches also pose a threat to the building as a whole should they collapse. To the east of the store are the centers masonry and woodworks workshops that are sources of dust and dirt (Appendix 1). The building proximity to the sea (about 100m) is also a danger as this could be a contributing factor to the high humidity of the area, a danger to organic objects. Another factor of danger to collections is the untarmacked car passage outside the door, which is used by cars to and from the packing yard about 20m east of the store. This apart from raising dust is also a potential source of pollution from the vehicle exhaust. All round the building are stone rubbles that could be hideouts for pests and insects. More so a trench that was dug round the building during a fumigation exercise and was not backfilled could also be a home for pests especially termites.

#### 4.2.5: Security

The area around the building (the store) is fenced and access to the building is through two gates: one for cars and another small for people on foot to Fort Jesus. Although there are two museum security guards around the premises, not one is assigned specifically for this store. There are also electricity cables running directly over the building (appendix 1) that are a potential danger to the collections in the vent of their falling on the building. In addition no provision of fire extinguishers in the store has been made, there is only one entry which doubles as the exit, no smoke detectors, no periodic inspection of collections, no complete documentation of collection thus it is hard to know what is missing. Similarly collections are poorly organized, storage units are not made of 'hard to break' hardwood, have no locks and some cabinets do not close altogether (Plate 4.2). It was also learned

from Mr. George Ghandi that there is no monitoring of students or researchers entering the store, although there is a well-controlled key discipline.

#### 4.2.6: Collection organization and space utilization.

In seeking to answer the question of space and storage organization, the following questions were used as guidelines:

- a. Does the store have materials that should not be in the storage?
- b. Is the organization done leaving aisle space and do shelves use up all floor space? Are all shelves, drawers and racks fully used?

At Fort Jesus Museum archaeological store it was noted that:

- ❖ Space is not properly utilized in that some areas have narrow passages and others wide (Plate 4.1). Some areas are congested and others have virtually empty spaces. In addition, some units are overcrowded leaving no space between objects, and some cabinets are virtually empty (Plate 4.7).



**Plate 4.8: Empty cabinets.**

**Photo: Caesar Bitá**

- ❖ Objects are not properly organized according to the designed floor plan (Appendix 2). There are no designated area for collections of same materials such as bones on

their side, ceramics one side, boxes on one side, complete vessels on one area and so on.

- ❖ Collections are not organized properly on the shelves e.g. bones are not placed well on the racks, while bones and big and complete pots are placed on the floor (see Plate 4.9). Similarly bones are mixed with ceramics, others placed on top of shelves (Plate 4.1) as opposed to being on pallets, some racks are overcrowded others are empty.



**Plate 4.9: Ethnographic collections.** (Objects not supposed to be in the store).

**Photo.** Author

The store has a collection of ethnographic objects (Swahili chairs and beds) that are not supposed to be in the store. These objects are poorly arranged (lumped together) thus taking up a lot of storage space (Plate 4.8). They could also be an encouragement for pests since the wood used was not treated and the bones are not covered. Similarly all the big bones

(whale bones and elephant and buffalo skeletons) in the store are not archaeological though they take up a sizable amount of storage space.

#### **4.2.7: Accessibility**

Despite the objects having been accepted into the storage, most are not fully documented and this makes their accessibility, retrieval and inspections nearly impossible. Objects in the manila boxes, plastic bags and even in trays cannot be inspected easily. Worse, majority of the objects are mixed up and have no information. This makes physical access to some objects difficult, although their location and distance in the units is reachable. In terms of academic access, this is only possible for a limited number of the already documented finds. Since the storage documentation is not complete (having been done halfway), it is only those objects in the cabinets that are accessible for research. In addition, many of the objects are not published, and for those that are, that information is lacking in the catalogue cards.

#### **4.2.8: Infestation**

Insects are destructive to organic materials and in Fort Jesus, wood and bones are the most susceptible. Some wooden fixtures are already infested and signs are clearly visible, they are weakened and are about to collapse. The storage has a history of insect infestation and it was during one encounter that objects got mixed after cabinets were eaten away by termites. Another evidence is the trench dug round the building foundation on the outside, which according to Mr. George Ghandi (one of the store caretakers) was done during a fumigation exercise.

#### 4.2.9: Preventive conservation and maintenance

It was noted that all objects entering the FJM store do not undergo any treatment but remain in the condition in which they are received. On the same level it was learned that there is a maintenance program, which is on paper, but according to the store assistants, is not practiced. This lack of a preventive conservation strategy is seen for instance where some boxes are placed directly on the floor (no pedestals), some big bones are also on the floor (no pellets) and wooden cabinets and drawers too close to the ground level such that in the event of floods objects will obviously get damaged.



**Plate 4.10** Objects placed on the ground without padding.

**Photo.** Caesar Bitá.

It was also noted that in the store there was no:

1. Active program for the inspection of collections.
2. Program for the assessment of collection priority
3. Assessment for environmental risk to collections
4. Active storage-monitoring program.
5. Regular plan of cleaning the storage, which has led to a build up of dust on the objects.

In a report from Nairobi museum, it was learned that a conservation team was formed between 1997 - 2000 and charged with the responsibility of visiting regional museums in Kenya at least twice a year to conduct conservation related activities including training workshops for staff. From this report, it was found that this team did not do any work at the Fort Jesus museum. In addition no intensive lectures were given for preventive conservation, focusing on areas like pest control activities, disaster management, condition reporting on objects and detailed conservation procedures (Museum Conservation Team Report, 1997 – 2000).

#### 4.2.10: The climate

Since the store was constructed measurement of the relative humidity and temperatures of the building interior have not been taken to ascertain how safe the storage is for the preservation of archaeological collections. Therefore, no data on the internal climate of the store was available. However, temperatures and relative humidity of the storage were measured during this study for a period of four weeks (Table 4.1)

Relative humidity in percentage				Temperature in degrees Celsius		
Week	High	Low	Variation	High	Low	Variation
1	85.0	62.5	22.5	32.0	27.5	4.5
2	80.0	60.0	20.0	32.0	26.5	5.5
3	90.0	70.0	20.0	30.0	25.5	4.5
4	92.0	70.0	22.0	31.0	25.5	5.5

Table 4.1. Weekly RH and Temperature ranges.



#### 4.2.11: Documentation.

None of the museum staff know the number of objects in the store. Although there is a system of documentation in place, a majority of the objects in the storage are not fully documented. Formally, the documentation method used involves materials brought from the sites first being entered in the sites inventory books. These sites inventory books are not traceable in the store as they are kept in a different building and the field notes are deposited in the library. There is also a register, which is not complete, and cards that are not filled up. The documentation is incomplete done; some objects have full information while others don't. Objects in the manila boxes, plastic bags and even in some trays are not labeled.

It was learned that in 1999 a new method of documentation was introduced to replace this old one. It is this new method that saw the introduction of the following documents in the store.

- a) **Master inventory book:** This is where all archeological objects entering the department of archaeology are registered. The registration involves assigning each object a registration number that is recorded in the master register and filling all the register requirements. This number is also marked on the object using black and or white ink depending on the color of the object. This book also records all the information about an object; describing the acquisition process, entering objects as they come in serial numbers, accession, site, locality, map reference, object name.
- b) **Accession catalogue cards:** These are for the documented objects only. They contain the accession number and name of object (object identification), object description (dimensions, material, technique and historical comments), and place of

permanent storage. The cards are stored in a metal cabinet and arranged according to site (origin), and material. The accessioning is done in two-part numbering which shows the number of the object and year of accessioning. For example 1999:786 where is 1999 standing for the year and 786 being serial number given of the object.

c) **Location and retrieval system.** The catalogue cards are arranged according to site and material. This system makes it easy for the staff and researchers to locate and retrieve objects in the store.

d) **Loan and movement forms.** This form records those who borrow objects from the store and the movement of the same.

e) **Site inventory books:** These are the books where finds are entered into once brought to the museum. Each site has its own inventory book. These are however stored elsewhere, not in the main store.

#### **4.3: EXECUTIVE SUMMARY**

From the above data, studied items were assessed and scored into excellent, good, fair and poor. Excellent meaning that the concerned item meets all standards for effective preservation of collections and is totally acceptable. Good means that the item meets some qualities but is not entirely acceptable. Fair means that the item is in the right order but is not implemented and is fairly acceptable. Poor means that the item is either lacking in the store or its standards are totally unacceptable and will surely lead to deterioration of objects. From this assessment 15 items were found to be of poor state, 3 of good state and 3 in fair condition. None was found to be of excellent standard (Table 4.2).

It was expected at the start of this research (Chapter 3(8)) that storage conditions at Fort Jesus are not excellent. Table 4.2 is a summary of the quality of the store. It indicates that although some items are in acceptable state, others such as security are poor. For instance, storage units used, out of the 8 types used, only one, the metal shelves, is of good quality. The rest are either fair or unacceptable. It is these that make the storage poor. Of the building, only its location, walls and floor are of suitable conditions, the rest poor; there is also lack of preventive conservation and maintenance programs, which too contribute to the low storage standards. It is these among others that are compressed in the table below in the order of their quality.

		Excellent	Good	Fair	Poor
<b>STORAGE UNITS</b>	Wooden Shelves			*	*
	Wooden cabinets				*
	Wooden Boxes				*
	Wooden Trays		*		
	Metal Shelves			*	
	Metal Boxes				*
	Paper boxes		*		
	Tables				*
<b>BUILDING</b>	Location				*
	Roof / Ceiling		*		
	Door / Windows				*
	Floor / Walls				*
<b>SURROUNDING</b>	Air Vents				*
					*
<b>SECURITY</b>					*
<b>PACKAGING</b>					*
<b>COLLECTION ORGANIZATION</b>					*
<b>PREVENTIVE CONSERVATION</b>					*
<b>COLLECTION MAINTENANCE</b>					*
<b>CLIMATE</b>					*
<b>DOCUMENTATION</b>					*

**Table 4.2: Fort Jesus museum storage quality assessment.** (Assessed by. Caesar Bitia)  
 NB The star denotes the quality of the item

.....

## **FORT JESUS MUSEUM STORAGE QUALITY.**

### **A COMPARATIVE OVERVIEW.**

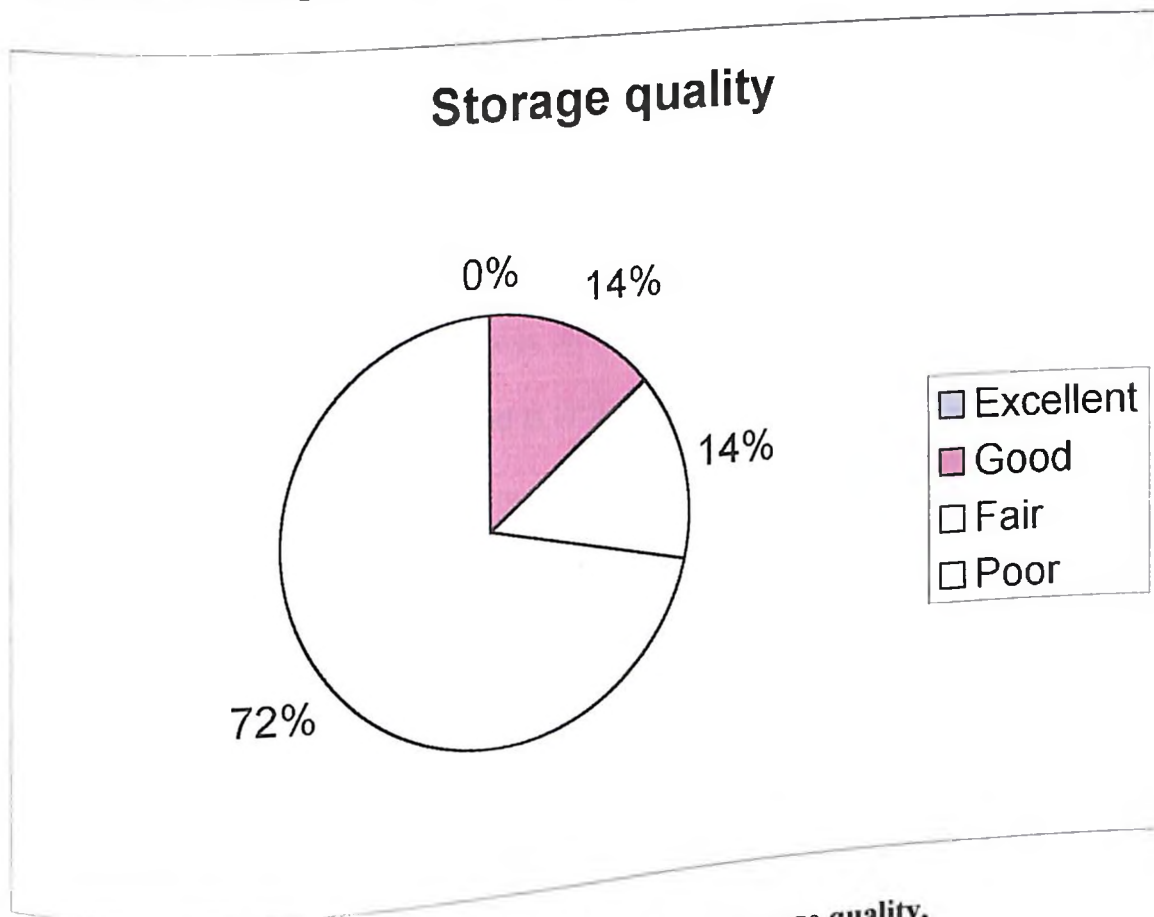
#### **5.0: INTRODUCTION.**

The continued survival of archaeological collections depends to a greater degree on the willingness of the collector, scientist and the conservator to support preventive conservation. Their preservation is however not the responsibility of a single profession, but is the obligation of all in charge of the collection. This chapter is a comparative study of the storage assessment of the Fort Jesus' museum store against the published standards. It attempts to underscore the assessed conditions in the storage and how these are likely to lead to deterioration of objects in relation to the published standards of storage of archaeological collections.

#### **5.1: COMPARATIVE EVALUATION / STUDY.**

Critically drawing from the data collected, the archaeological storage facility at Fort Jesus museum does not adequately meet standards for long-term preservation of archaeological objects. By comparatively looking at the standard practice in published literature and what was observed of the storage, it could be determined that Fort Jesus museum is operating below the standard practice. This is because out of the 21 items studied 15 were found to be of poor quality, 3 of good quality, 3 fair and nil of excellent quality. A percentage representation (Figure 5.1) of the storage assessment shows that 72% of the storage is of

poor standard meaning that objects are obviously at risk of deterioration.



**Figure 5.1: Percentage representation of Fort Jesus storage quality.**

#### **5.1.1: Preventive conservation.**

A comprehensive conservation program for archaeological collections is a critical feature, lack of which is likely to lead to deterioration of objects. A preventive conservation and maintenance program covers issues such as the assessment of storage within a building; implementation of a maintenance and monitoring program for collections to check things like disasters, regular cleaning, assessment of environmental risks that may lead to mold and fungal growth among others. Regular inspection to detect insects, rodents or other biological problems as well as assessment of structural defects and monitoring of the condition of collections is essential. Preventive conservation therefore is a process that seeks to prevent or reduce or mitigate the effect of all the factors that threaten an objects

continued survival. Failure to have in place and implement such programs means that objects are surely going to be destroyed.

### 5.1.2: Storage Units.

Another aspect of good storage is the use of storage units. These need to be constructed and designed with care if they are to prolong the life of the objects they contain. Space utilization should also be incorporated in their design and they should guard objects against dust and pest. Though some storage units in Fort Jesus store such as the wooden cabinets and cupboards are of good quality, objects have been badly stored inside them often being overcrowded and improperly organized in units that do not lock properly. It is these that make the state of units poor. However, except the wooden shelves and boxes, the other storage units are of good quality and can hold a lot of objects if properly organized. Nevertheless with the current situation where some cabinets are overcrowded and others empty or half filled, objects are likely to deteriorate. It is important to realize that cabinets with tight fitting doors, curtains for open units, sealed windows and vents would reduce the level of dust and other airborne particles and pests reaching the objects.

Packaging should be aimed at protecting objects from damage resulting from abrasion, dust and pests. In the store, objects are placed on shelves without cover, on the floor and in boxes with no packaging, which is dangerous to collections. Objects can be wrapped in tissue or other inert material to prevent dust particles from settling on them. This is because dust is abrasive and contains other particles such as mould spores.

### 5.1.3: Storage building, location and security.

Storage building for the permanent storage of archaeological collections must provide at minimum, some form of physical security, climate control, fire suppression, collection monitoring, and access by qualified researchers (intellectual access). However, maintaining the building to a high standard is a critical step towards obtaining good preservation of the collections. These requirements demand adequate space and resources dedicated to the purpose of the storage. Despite Fort Jesus store building having properly constructed walls and floor, the windows, door and vents have large spaces, which allow free entry for pests and dust. In addition the leaking roof will mean that RH levels are raised and this affects objects. Critically looking at the building surroundings, the proximity of the store to the sea is also likely to contribute to high RH levels. Similarly, the wood workshop and masonry are a source of pests and dust while the large trees overhanging the roof, apart from being a danger should they fall, are also a source of dust and an abode for pests as are the mounds of dirt and soil all round the building. Looking at storage security, the condition is poor. This is because although the area is fenced and a restricted access is enforced, collections are at great risk of destruction by fire likely to result from the electricity cables running directly above the building. The situation is worsened by the realization that no fire extinguishers are provided in the store, no plan for regular storage inspection and, more so, there is only one door which doubles as the exit. It is important to understand that archaeological collections are of great historical value and if lost, misplaced or destroyed, they cannot be replaced. This calls for their security against fire, deterioration and theft. General security of the collections, storage facilities and rigidly enforced policy on access to the storage and regular inspections should be necessary. It is important that suitable fire extinguishing systems be installed and be constantly maintained. The store should however be well organized since a poorly organized collection will compromise the effectiveness of

any inspection. Its location away from industrial areas (sources of pollution) makes the store fair for archaeological objects however lack of fire extinguishers, the large trees, the overhanging electricity cables, the open spaces in the door, windows and ventilations and lack of preventive and maintenance makes the storage poor.

#### **5.1.4: Use of space.**

The greatest problem noted with FJM store is poor utilization of space. Storage space must be organized to allow controlled access, efficient collection retrieval and above all optimum preservation. Storage space is critical in almost all museums and it is expected that storage units are able to solve this problem by being able to hold as many objects as is considered safe for conservation. Within the store some areas are empty and others overcrowded with no space left between objects. Some cabinets for instance are empty and a lot of space is left in the foreground inside the store. This space could be used to create an office for the store caretaker (Appendix 3). It is hard to comprehend how objects can be congested in some units while others are totally empty. This portrays lack of commitment on the part of the museum in space management. It is important to realize that objects need to be properly organized in order to ensure maximum utilization of available storage space and avoid overcrowding and stacking which causes objects to get scrapped, banged up, and squashed.

It is also of great importance that what is held in the store is of archaeological interest to avoid wastage of space and/ or management problems. Fort Jesus museum archaeological store does house objects that are not archaeological. The big bones and the ethnographic collection for instance are not archaeological, and apart from taking up a lot of space, can be a source of infestation. While we may sympathize with the hard pressed curators who have to find storage for the ever-increasing museum collections, it is imperative that an



alternative store for these bones and the ethnographic objects be sought if this storage is to be upgraded. Alternatively if the bones are to remain in the store, conditions should be improved for their preservation for instance to have them placed on padded pellets

### 5.1.5: Storage climate.

For many historic artifacts, climate control is crucial to reduce their rate of deterioration. RH and temperatures must be continually monitored and controlled to minimize harmful fluctuations. An archaeological storage building should therefore be designed to exclude the obvious ambient climate. It is generally accepted that rapid fluctuations in temperatures and relative humidity are harmful to objects and especially organic ones. Most objects will obviously be destroyed if RH is too high although different levels of RH have different effects on different materials. For instance while organic materials survive best between 40% and 65% RH, most materials both organic and inorganic will be destroyed when RH is above 65%. From the 4-week thermohygrograph recording, RH in the store fluctuates between 80% and 70% although at one time it rose to 90% (which was attributed to the rains experienced during the week recording was done). Although inorganic objects may acclimatize to this level of RH, it is far too dangerous for organic materials. This is because humidity can exacerbate oxidation caused by acidic atmosphere and produce conditions ideal for the growth of bacteria and mould, evidence of which is mould growing on the big bones.

Though temperature by itself has very little damages, much of the damage being caused by RH, temperature fluctuated between 25 degrees Celsius and 32 degrees Celsius which if allowed to continue for a long time can lead to damage to objects. Although temperature by itself has no serious effects, its relationship with RH makes it important because high

temperatures lead to low RH and vice versa. Although these measurements were taken for four weeks only, which may not be a true representation of the climate, these readings are informative. A climatic study must be done for at least one year and it is important therefore that a complete year climatic survey of the store be done to ascertain the real conditions and in order for the right actions to be taken accordingly.

#### **5.1.6: Infestation.**

Another yet serious problem facing archaeological collections in many museums is insect infestation. In FJM, pests are likely to be introduced into the store through flying or walking in through the open spaces in the door, the windows and the open ventilations or when infested artifacts are brought in. Signs of infestation having been found in the store and information on termite infestation available, ways should be found to keep them out. Since the store has no air conditioning, insects can be kept out of the building by covering the windows and air vents with fine mesh wire screening.

While many pests can be controlled by chemicals, much unnecessary work can be avoided by the adoption of proper preventive methods. Such include use of insect proof materials such as steel and concrete blocks, careful architectural planning to precede the construction of storages and use of termite resistant timber species or its proper treatment to render it against attack.

#### **5.1.7: Documentation.**

On documentation, it should be a standard rule, from the administrative and scientific point of view, that careful documentation is kept of all objects. This should include both written and photographic documentation. Although there is a good documentation in use at Fort Jesus Museum all the same its being incomplete, slow and not computerized makes it poor.

This translates into incomplete records which will lead the museum into not knowing what it owns or what it may have lost which is ideal for objects to deteriorate since their accessibility, and inspections will be nearly impossible. Documentation is thus a vital part of collections management for without high-quality records the value of collections becomes substantially reduced. Since the Fort Jesus museum has not computerized its collection records and still uses the manual cataloguing, this further worsens the situation since more objects are being added into the store where documentation is manual and slow. This leads to a build up of objects awaiting documentation and this is likely to lead to their deterioration. Computerization of records can improve collection management especially by facilitating collection organization and audit thereby improving security and accountability.

This chapter realizes that Fort Jesus does not meet standards for suitable storage of archaeological collections. Some items of storage observed such as metal shelves, the building location, floors and walls are preferably good for objects. However, the rest, and which comprise the greater proportion of the store are either fair or poor which is risky for archaeological materials. Based on this discovery, the following chapter recommends what should be done at Fort Jesus museum in order to improve storage conditions.

.....  
**RECOMMENDATIONS AND CONCLUSION.**

**6.1: Conclusion**

Reflecting on the hypothesis it has been demonstrated that poor storage at FJM is likely to lead to deterioration of stored archaeological objects. This study has established that the poor storage organization and management at FJM in addition to the other factors is also attributable to following reasons:

**A. Poor use of space.**

One feature of the FJM archaeological store that this study was able to ascertain is that the storage space provided is adequate to handle all the archaeological collections (Appendix 2) However due to the poor use of available space occasioned by poor object organization, a majority of the finds are lying crowded and neglected in the store. Although this problem may be well known to the museum directors lack of funds and trained staff makes the prospect of an early solution improbable. Similarly there has been an increase in the amount of collections entering Fort Jesus museum since the birth of National Museums Kenya (NMK) in the early years of the century, giving the museum responsibilities that impose a considerable strain on its staff and resources. It is however, the responsibility of Fort Jesus and NMK, for that matter, to increase its budget and staff priority towards preservation of these objects. Together with this there is need for a massive reorganization of the store in order to effectively handle the collections.

## 2. Little interest and uncontrolled addition of new material.

This is a very serious drawback in archaeological provisions. The days are gone when excavations could lightly be undertaken without a great deal of thought about where the finds are to be stabilized and or stored. Artifacts remain indeed the *raison d'être* of many museums and such institutions must have control of the collections at their disposal. The uncontrolled depositing of objects in the museum store without prior planning on post-excavation storage can severely jeopardize the preservation of collections. In Fort Jesus Museum there are collections tightly sealed in boxes and bearing no information, which shows laxity on the part of museum management. This is a pointer on how collectors lack interest in their finds after having secured and photographed the more important ones. This has seen uncontrolled addition of objects in the store, which end up deteriorating and rotting away. It is important to have prior planning before collecting and this should include arrangements for storage before objects are brought into the museum.

Conclusively the research hypothesis that Poor storage organization and management leads to deterioration of archaeological collections at Fort Jesus Storage facility and all the research questions has been answered. This is from the storage quality assessment results, which show a good proportion of the store (72%) as being in poor state. From the study it can be deduced that it is not the storage systems in use only, that are of poor standard and likely to lead to collection degradation, but also the lack of an effective preventive conservation and maintenance programme for the store. There is therefore a constant need for guidance as to how best to care for these archaeological objects which Fort Jesus museum is responsible for. Nevertheless, this store requires remedial action and this is possible through application of simple and well-known techniques. It is my conviction that this study has come up with substantial data to this effect and it is the assumption of this

research that a sustained effort will be made to improve conditions in this store. There is, however, the need for renewal of commitment by the museum to the care of its collections.

## 6.2: Recommendations.

In the past and unfortunately today as well, efforts to preserve archaeological material sometimes ends up in disaster. In other cases the results while not entirely unsatisfactory could be improved by use of up-to-date techniques and materials. It has been proven in this research that storage conditions for archaeological collections at the museum are not very suitable for the long-term preservation of objects and that collections are at risk of deteriorating due to both poor storage organization and management. In respect to this discovery, no meaningful change can be achieved unless effective policies are put in place. For the interest of this store therefore, and if any attempts are to be made for its upgrading, the following recommendations may need to be considered:

1. All the undiagnostic finds (potsherds) and undisplayable pottery taking up the largest part of the storage space with the permission of the concerned collectors and the museum director should be reburied with complete documentation of the same. This would otherwise ease the present overcrowding in the store and create space for new objects. It should, however, be done carefully considering the objects' research value and asking whether museums should take little and leave the rest. The museum should also consider whether it is a solution to keep only selected objects and get rid of the rest for this may lead the museum not to know what question they may be asking of the material culture in the future.
2. Researchers should select analyze and photograph important finds right at the excavation site and bring to the museum only a representative sample. This would ensure that only few manageable finds are brought to the museum.

3. There is need to select appropriate storage fixtures, supports and packaging materials for collections.

In terms of priority therefore it is important that immediate action is taken to deal with the following prevailing storage problems:

1. Get control of the RH and temperature through the use of RH controls such as air conditioners.
2. Use metal shelving that have an enamel finish. If wooden ones must be used, it is important to make sure several layers of an appropriate sealant have been applied and allowed to cure for at least two weeks.
3. Improve housekeeping in the store. Schedule regular thorough cleaning which includes removing the dust build up on objects, floor and on and behind storage units. Consider sealing windows and vents with fine mesh wire, and spaces below and above the door to control entry of dust and dirt.
4. It is also important that open shelves are padded or foamed polyethylene placed on them to cushion objects and prevent them from moving in response to vibration.
5. Undertake a fresh reorganization of the storage.

### **6.3: Proposals for further action.**

In view of the above the following proposals have been suggested for further action if this store is to achieve the required standards for the long-term preservation of collections.

- Need to draft collection care and management policies for the store.
- Training of staff in basic collection management, conservation and care.
- Need for a wholesale reorganization of objects in the store.

- Appointment of a key museum staff responsible for the archaeological store and creation of an office within the building for him/her. A section inside the store can be partitioned to create an office for the staff member. It is here that records and documentation cards can be stored in metal cabinets for easy retrieval.
- Acquisition of computers for computerization of the documents is essential. Currently the system is manual and slow with lots of objects from several decades ago lying undocumented.



## Reference:

- Ambrose, T. 1993:** Managing new museums: A practical guide. Scottish Museum council: County House, Edinburgh. Pp 46-47.
- Ambrose T. and Paine C. 1993:** Museum basics. Routledge: London. Pp 178
- Ballard, M. 1992:** Emergency planning. In conservation concerns. A guide for collectors and curators. Smithsonian Institution press. London: Washington. Pp 12
- Bradley S. M. 1994:** Conservation Aspects of Storage and Display. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 468
- Buchamann, K. 1992:** Conservation concerns. A guide for collectors and curators. Smithsonian Institution press. London: Washington. Pp 3
- Buchamann, K. and Rushfied A. R, 1992:** Principles of Storage. In conservation concerns. A guide for collectors and curators. Smithsonian Institution press. London: Washington. Pp 5
- Conservation Team Work: 1997 – 2000: Evaluation and Future Plans.** Report by Museum Conservation Team members. NMK. Nairobi
- Daintish C. 1994:** Conservation and storage ceramics. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (Eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 355

**Dennis, R. 1994:** Pest Control In Museums. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition 1994 (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 474

**Gary T. 1978:** The museum Environment. Conservation in the Arts, Archaeology and Architecture. Butterworth. London. Boston. Pp 85

**Hyden, B. 1993:** Archaeology: The science of once and future things. W.H. Freeman and company. New York.

**Joukowsky M. 1980:** A complete manual of Field archaeology. Tools and Techniques of fieldwork for archaeologists. Prentichall Englewood cliff, New Jersey. Pp 274

**Longworth I. H. 1994:** Archaeological research collections. Pre-Historic and Roman. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition 1994 (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 522

**Malaro, M. 1995:** Collection Management Policies. In Collections management. Anne Fahy (Ed) 1995. Routledge: London. New York. Pp 11-12

**Newey H. 1994:** Conservation and Storage: Metals: In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 369

**Pleinderleith, H. J. and Werner, A.E.A. 1956:** The conservation of antiquities and works of art: Treatment, repair and restoration. Oxford university press. London: New York. Canada. Pp 1

**Pye, E. 1994:** Conservation and Storage. Archaeological Material. In manual of Curatorship: A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 400-401

**Sease C, 1994:** A conservation Manual for the field archaeologist. 3<sup>rd</sup> Edition. Archaeological research tools 4. Institute of archaeology, University of California, Los Angeles. Pp 33

**Skempton T.1994:** Building, Environment and Artifacts. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 247

**Stone S. M. 1994:** Documenting Collections: In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 213

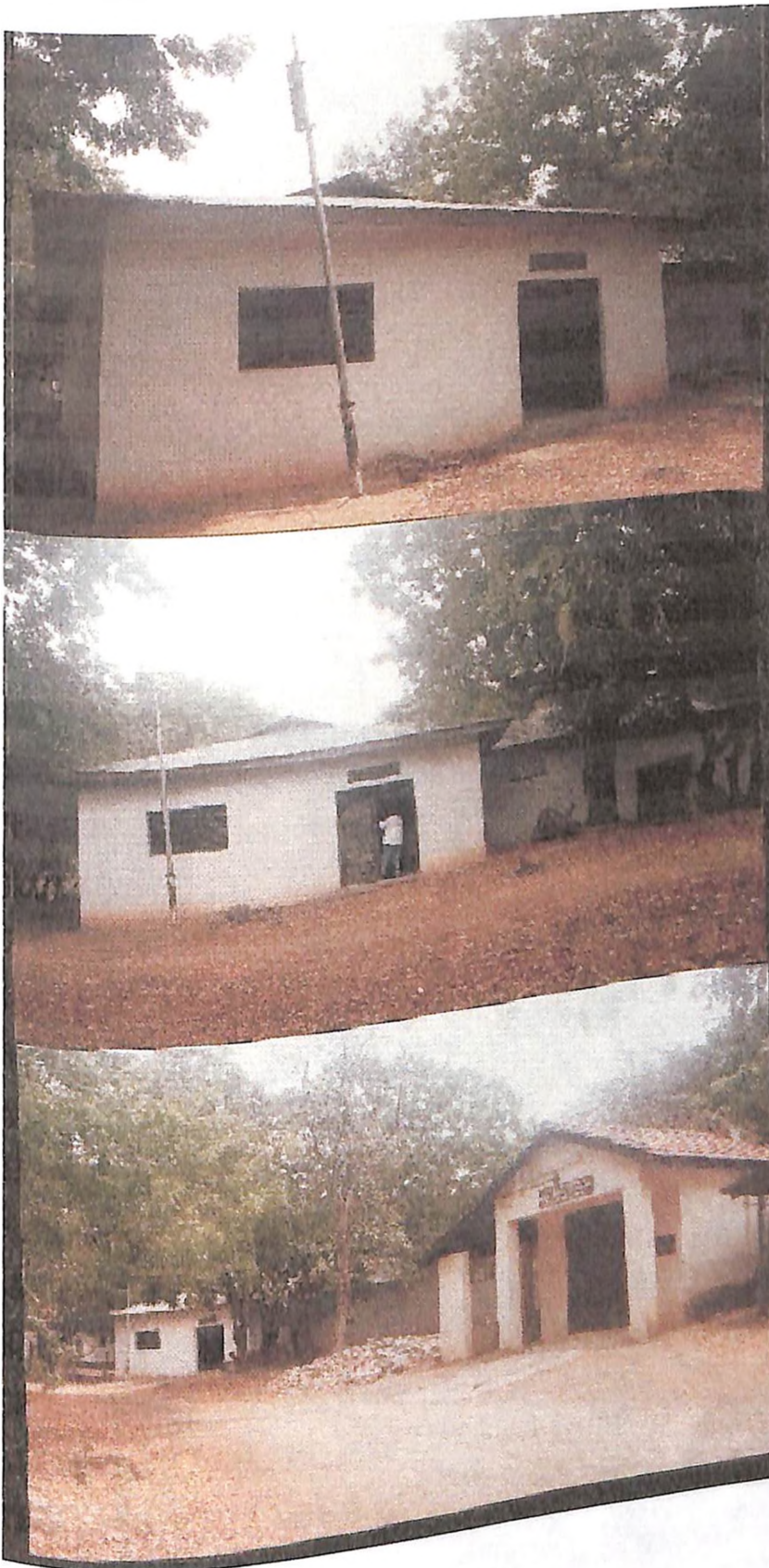
**Tate J. and Skinner T. 1994:** Storage systems. In manual of Curatorship. A guide to museum practice. 2<sup>nd</sup> Edition (eds) John M.A. Thompson. Butterworth Heinemann Ltd. Pp 459

**The conservation of cultural property.** In museums and monuments XI. UNESCO 1968:Pp 27

# APPENDIX

**Appendix 1.**

**Fort Jesus museum archaeological storage and its surrounding.**



**Photo: Caesar Bitia**



### Appendix 3.

Storage units in use in the Fort Jesus Museum archaeological store



Photo. Steve Mutava, Fort Jesus Museum.

# Appendix 4.

Documentation card in use at FJM.

**KENYA COASTAL ARCHAEOLOGY DOCUMENTATION CARD NO: \_\_\_\_\_**

ACC. NO.	Previous No.	Object Name;	No. of Objects
Material:		Shape	Date of Collection
Acquisition Method		Season;	Map ref.
Trench:	Level	Site:	Field No:
		Feature:	Donor/Collector/Researcher:
		Physical Description:	
		Decoration & Finishing:	Color:
		Rim Dia	Base Dia
		Weight	Height
		Width	Length
		Photo No.	Slide No.
		Negative No.	
		Permanent location of the object:	
		Building:	Shelf:
		Published Ref. Date, Author, Title, Journal or Publisher.	
Recorder	Date:	Comments	



## Appendix 5

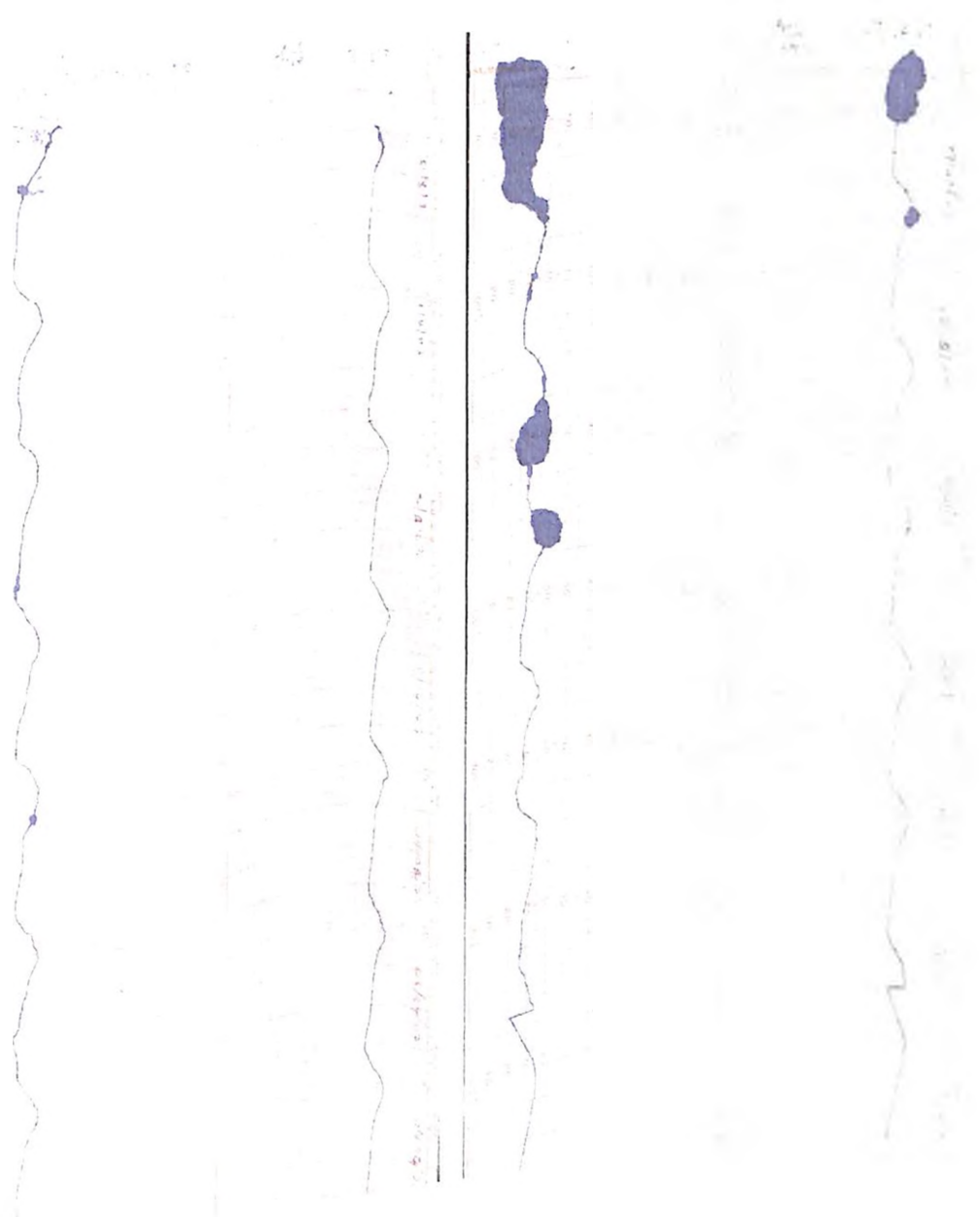
### List of Interviews.

1. Mr. Mohamed Mchulla. Dept. Archaeology Fort Jesus Museum Mombasa Kenya.
2. Mr. George Ghandi: Dept. Archaeology Fort Jesus Museum Mombasa Kenya.
3. Ms Aisha Fadhil, Conservation Dept, Fort Jesus Museum, Mombasa Kenya.
4. Mr. Athman Lali Head Coastal Archaeology, Fort Jesus Museum
5. Dr. Herman Kiriama, Coastal Archaeologist, Fort Jesus Museum.
6. Mr. Harumii Loo Bobo, Security guard.

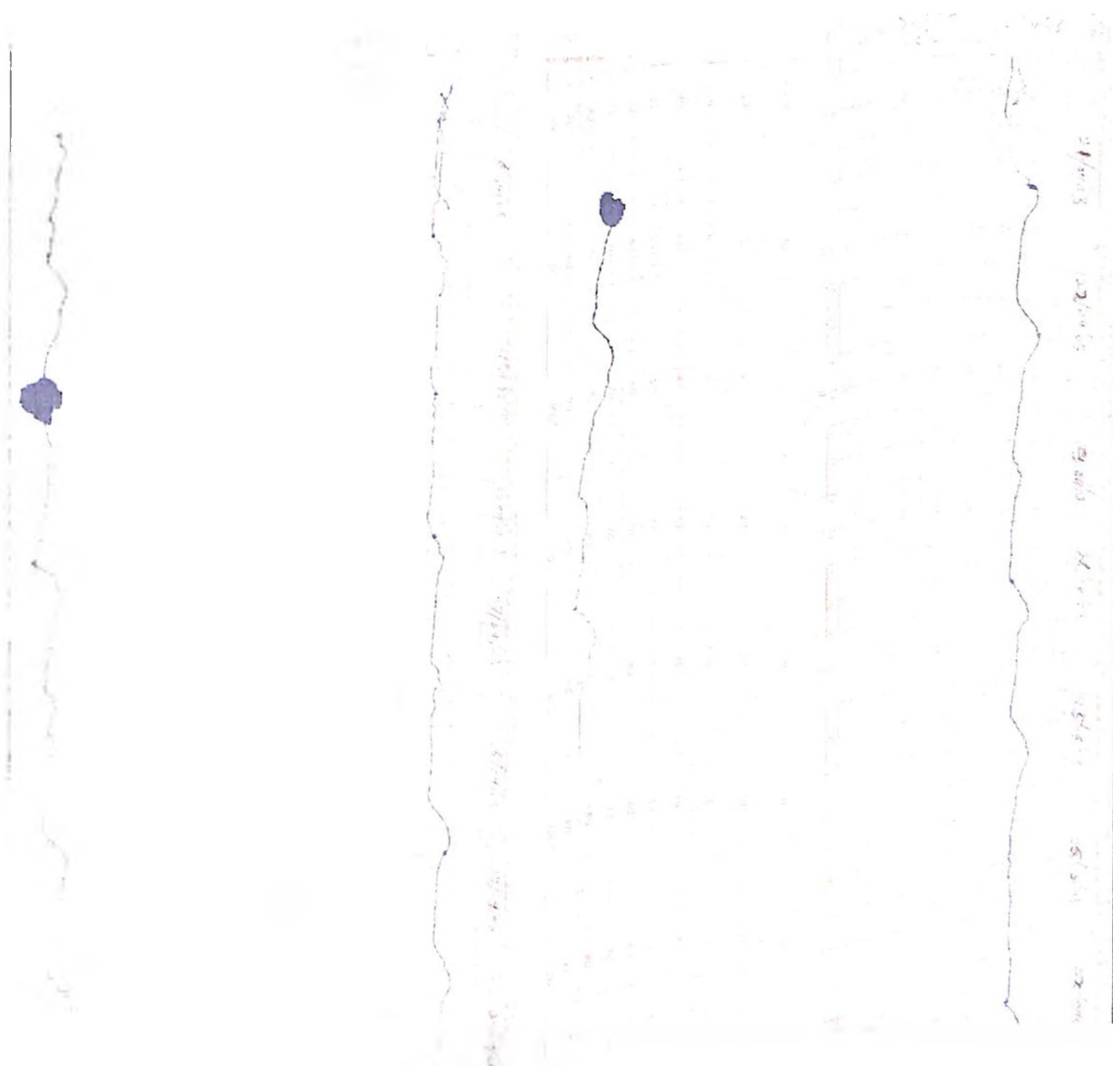
# Appendix 6.

## 4 Weeks RH and Temperature recording of the FJM store

Week 1 and 2; 31/3/03 to 13/04/03



Week 3 and 4. 14/04/03 to 27/04/03



UNIVERSITY OF NAIROBI  
INST. OF AFRICAN STUDIES  
LIBRARY