

Identifying challenges in the conservation of South African photography based on three case studies



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

by Jabulile Ntuli
u13041470

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Supervisor: Dr Isabelle McGinn
Co-supervisor: Prof. Rory Bester

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PLAGIARISM DECLARATION

I, Jabulile Ntuli, acknowledge that I understand what plagiarism is and that the following work is my own and where the work of other people was used it has been properly referenced.

A handwritten signature in black ink, appearing to read 'Jabulile Ntuli', written in a cursive style.

ABSTRACT

Photographs have a visual tie to human memory in that they are used to capture moments of significance, and give a visual illustration of how something looks at that moment and time. Visual representation, in the way it is connected to human memory, has become an important tool in historical and heritage studies. Photographs allow for senses of the past to be seen and experienced, which is one of the primary reasons why pictures are safeguarded. This dissertation focuses on the ways in which photographic conservation gives special attention to the preservation of photographs. I will review the conservation and archival practices that the following three collections use to care for their photographs: the Duggan-Cronin collection at the McGregor Museum in Kimberley, the Bensusan Museum collection at Museum Africa in Johannesburg, and the Rashid Lombard collection, which is being donated to the University of the Western Cape. Each of these three collections tell a South African heritage story as seen through photography from 1866 to present. They cover different aspects that form an integral part of the history of South Africa, including the colonial era, the era of The Union of South Africa, apartheid and the post-apartheid era. It is important to understand the technological and social evolution of photography because how an object is made, the materials it is made of, and how it is used in research and exhibition, all influence its longevity, preservation, and deterioration. To complement observations in the three case studies, a survey was circulated through the South African Museums Association requesting participation. The survey allowed for a broader view to be formulated as to how different Museums in South Africa care for their photographs and to guide the formulation of context appropriate guidelines for handling, storage, exhibition and albeit briefly, digitization.

Keywords:

- South African photographic collections
- Preventative conservation
- Photographic conservation
- Collections care and management

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1. INTRODUCTION

1.1. Introduction, background, and context

Despite experimentation in the 18th century by Johann Heinrich Schultz, Thomas Wedgewood and Humphry Davy in capturing an image, the issue of making the image permanent by fixating it was only resolved in the early 19th century. William Henry Fox Talbot (1800-1877), the British inventor of photography is credited with the invention of photogenic drawings. In 1835, Talbot then created the earliest surviving photographic negative, and from this negative a positive image could be subsequently printed. The photograph in question is of a small window in the London abbey South Gallery. In 1840 Talbot discovered the Calotype using gallic acid and hyposulfite of soda to fix a black and white image on paper (Daniel, 2004). Three of Talbot's negatives currently survive in different locations. The one surviving negative is at the British Museum in London, the other at the Metropolitan Museum in New York, and the last at Museum Africa in Johannesburg (Anon, 2020). This places South Africa on the map for photographic history and highlights the importance of its conservation.

The National Heritage Resources Act (No. 25 of 1999) established the South African Heritage Resources Agency (SAHRA), and a framework for the preservation of the nation's heritage sites, structures, including artefacts and photographs. This piece of legislation acknowledges the importance and value of protecting and preserving cultural heritage for future generations. Apart from the aforementioned legislation, there are a number of other domestic and international legislation relevant to the preservation of photography in South Africa.

Locally, the Copyright Act (No. 98 of 1978) governs the copyright of creative artistic works, including photographs. It provides for the rights of photographers to control the use of their works, among other things. The Protection of Personal Information Act (No. 4 of 2013) regulates the protection of personal information, including photographs of individuals. It

enjoins organisations to protect the privacy of individuals, including their right to control the use of their images, and the Electronic Communications and Transactions Act (No. 25 of 2002) seeks to protect electronic information, including photographs stored electronically.

Internationally, the UNESCO Convention for the Protection of the World Cultural and Natural Heritage provides instructive guidelines for the protection of cultural and natural heritage sites and objects, including photographs of outstanding value. The Universal Copyright Convention and the Berne Convention also provides for the protection of artistic works, including photographs for member states. Creating awareness regarding the rights, best practices and principles on preservation and conservation of photographs will thus be an important part of this research paper.

In order to preserve the nation's photographic heritage, there are several notable photography archives and collections that were established in South Africa. I am examining collections housed by three different institutions for the purposes of my research: Museum Africa, the Duggan-Cronin collection, and the Rashid Lombard collection which will be housed at the University of the Western Cape. Each of these three collections tell a South African heritage story as seen through photography and they cover different aspects that form an integral part of the history of South Africa.

Museum Africa is currently home to more than 5000 photographs, has the largest photo archive in Johannesburg and houses the Bensusan Museum of Photography, which comprises a collection of cameras, interactive toys, and a darkroom to demonstrate basic photography lessons. The museum also collects equipment ranging from wet-plate prints to the current experiments in 3-dimensional printing. (Anon, 2020).

The Duggan-Cronin collection managed under the flagship of the McGregor Museum is based in Kimberley and houses a collection of ethnographic photographs by Duggan-Cronin, Aubrey Elliot, Jean Morris and Alice Mertens which cover the same scope as Cronin (The McGregor Museum, 2019).

Rashid Lombard' collection focuses on photo-journalism and specifically the anti-apartheid movement, as well as the post-apartheid era and the Cape Town International Jazz Festival (Abarder, 2022).

To have a better understanding of South Africa's photographic assets in general, I have selected the above three case studies as they cover different time periods, as well as different materials. They also have vastly different resources, including funding and staff, among other things. These three case studies can thus be seen to give insight into the types of photographic heritage present in South Africa, and how these collections are cared for, and their longevity promoted.

1.2 What is conservation?

Conservation deals with protecting, maintaining, preserving, and restoring materials. Cultural conservation has to do with the protection of tangible and intangible heritage objects. Photographic conservation is a specialised field of conservation which gives special attention to the preservation and restoration of photographs. Not only do the methods used to preserve photographs differ depending on the type of camera being used, but they also differ depending on the type of method being used to develop the photographs. Conservation can be preventive, or interventive/remedial in nature. The former is defined by Dardes and Staniforth (2015:19-21), as including all the policies and processes that prevent or reduce potential damage and includes handling, environmental control for storage and exhibition. This also includes emergency planning that focuses on the entirety of the collection and non-treatment. Remedial conservation focuses on treatment and individual objects to halt or remedy the effects of damage and deterioration. According to Purdue University a technical conservator is someone who should have the technical skills to manage, preserve, treat and conserve works according to their requirements. A conservator should also be able to aid or minimize deterioration to have objects in their original state or in a state where they are stable enough to use (Purdue University, 2021). There are only a few trained preventative and interventive conservators in South Africa (McGinn, 2021:76). In South Africa there are only two institutions which offer a degree in Conservation, the University of Pretoria and The South African Institute for Heritage Science and Conservation, and neither of which has a focus on the conservation of photographic materials. As in many parts of the world, the title of

conservator is not protected in South Africa (McGinn, 2021:74-75), which generally means that anyone who carries out collections care or remedial treatment usually calls themselves a conservator with or without having any training in heritage conservation. Because photographs are such sensitive materials in collections, they have particular storage requirements, handling and use guidelines in order to promote longevity. These are discussed more in-depth in chapter two.

With recent technological advances preservation strategies have also included the digitisation of collections as a form of preservation which promotes access while minimising unnecessary handling, movement, and exposure of the original. Although much has been done to digitise South Africa's archival records including photographs, digitisation provides a digital avatar of the artefact which can itself be preserved under the correct conditions. However, digitisation in and of itself does not promote the longevity of the tangible object itself and appropriate preventive conservation measures including handling, storage conditions, and exhibition guidelines are essential to preserving South Africa's photographic heritage.

1.3 Research aim and question

The research sought to identify the main challenges that exist in the conservation of South African photography, as well as the causes and solutions to these challenges.

In order to best answer the main research question, the following sub-questions were explored by focusing on the three case study collections::

- What does photographic conservation entail in the context of South Africa?
- Can the digitisation of photographs be considered as conservation?
- What happens to the original images after they have been digitised? Are they restored or simply put away in storage?
- What disaster management plans should be put in place for a photographic collection?

Based on the data collected from the case studies, the goal of the research is to provide targeted guidelines to collection caretakers, managers, and curators for optimum care of photographic collections, the main research question focuses on identifying where South

Africa's photographic collections are, what conditions they are in, and how these photo collections are currently cared for, to promote longevity.

According to Grant B. Romer (2010) the definition of a photograph has evolved since the introduction of the camera in 1839. For an image to qualify as a photograph the chemicals in it had to react with light. Consequently, the definition of photography is "writing with light". Ink on the paper is the result of a chemical reaction. And the photographic process of a darkroom will soon be history. The new age pictures are hardly printed out. They are saved on drives and clouds.

Peter Galassi (1999) argues that the ability to reprint a photograph has been a game changer for conservation. His statement is supported by the fact that a replica of a photograph can be reprinted, showcased and take the place of the original in museums and art galleries. When displaying the replica, the original can be placed in storage with low temperatures and away from light. It allows for less damage to occur on the original allowing for preservation. He believes that the state of an original photograph should carry more value than whether it is an original or replica. What Galassi (1999) does not address is the question of whether it should be stated to the public that they are viewing a reprint rather than an original. Bertrand Lavédrine (2003) states that mentioning that a replica is on display will drive more traffic to the original defeating the purpose of storage as preservation. He also argues that since other art forms are not stored in clouds and replicated for the public to view, photographs should not be treated differently, originals should take precedence.

The most researched topics concerning photographic conservation are: The history of photography, preventative conservation, and conservation treatment (Norris, 2014). In this paper, I will discuss all three of these topics, as well as consider viable solutions from a South African perspective. A closer analysis of the aforementioned points will shed light on how to care for photographic collections in the South African context.

1.4 Research methodology

The study, involves qualitative research which allows for concepts to be explored and analysed as opposed to quantitative which deals with numerical analysis (Streefkerk, 2022).

Even though a quantitative research method through use of surveys and questionnaires were utilised, this study is qualitative and explorative rather than quantitative. The goal was to investigate the challenges to photographic conservation in South Africa to gather feedback from various role players which would be instrumental in developing appropriate recommendations on a subject that has been less traversed. A survey and questionnaire distributed to Museum Africa in Johannesburg, The Duggan-Cronin gallery, the University of the Western Cape Archives and the South African Museums association will be used to better understand the diversity of photographic materials and processes.

These institutions will be targeted directly for data collection through a questionnaire with the collections' curators. A letter of introduction was sent out for permission and only once consent had been obtained was the questionnaire circulated.. The questionnaire gave insight into the holdings of various collections and assisted in providing conservation-related questions. Answers from the questionnaire were used to identify shared problematic areas and causes.

The data collected in both the survey and supplemented by interviews with custodians will aid in developing various archival techniques which are locally appropriate. Data will be analysed and interpreted through datagrams.

1.5 Significance, feasibility, and limitations of the study

Studies have been done on the history of South African photography, such as "Power, secrecy, proximity: A short history of South African photography" by (Hayes, 2007) as well as on the political aspects of photography in South Africa based on the lives of South African photographers "Representing the Body Archivaly in South African Photography" (Firstenberg, 2002). However, no studies have been done to determine and assess the state of South African photography.

The research being for the purpose of a mini-dissertation needs to be limited in scope, as such three institutions in the public domain were approached for the research, namely the Bensusan Museum of Photography at Museum Africa in Johannesburg, The Duggan Cronin Gallery in Kimberley, and the Rashid Lombard Collection which is being archived by the

University of the Western Cape. Together these three institutions were selected as they cover a wide gamut of South African photographic history. Although site visits were initially planned, these did not materialise and the information from the three case studies is based on a 30-question survey form.

Institutions in South Africa are of an unequal nature and thus more prestigious institutions such as the ones above might be better supported financially, placing them in a better position to support their collection. As a result, it was deemed important to also contact smaller institutions that are less likely to have the same degree of resources. This is where the survey comes into play. However, as the questionnaire is lengthy and will be completed on a voluntary basis, this may influence representability.

1.6 Chapter outline

The research is laid out in five chapters. Chapter 1 introduces the topic and research questions that guided this research and attempted to highlight the importance of photography in the context of South Africa.

In order to better understand what classifies an image as a photograph, Chapter 2 looks at the characteristics of a photograph, how it is made, and the chemical processes that qualify an image into a photograph. South Africa was behind with the development of photography in comparison to Europe and the West. Understanding the heritage of South African photography will start from the introduction of photography in South Africa to what the three selected collections primarily consist of.

In Chapter 3, I delve deeper into how photographic processes affect stability and longevity of photographs as they respond to different sources of deterioration and decay in collection environments. Once the sensitivities of photographs as collection objects are examined, a discussion on mitigating these risks through an appropriate preventive conservation framework is outlined.

Chapter 4, explores South Africa's photographic heritage through three case studies. A questionnaire was compiled and sent to the three case study institutions. The questionnaire

was distributed as a survey to supplement this data and ensure that recommendations could be applied outside of the three case studies. The methodology, dissemination and results are captured and discussed in chapter 4.

Based on the questionnaire responses, recommended international guidelines for the preservation of photographic collections are reviewed and local solutions applicable to our South African context are offered in chapter 5.

In chapter 6, I offer some concluding remarks and suggestions for future research.

2. HISTORY THROUGH THE LENS

2.1 Introduction

Chapter two reviews the components that qualify an image as a photograph and discusses its chemical characteristics. Photography developed in stages and the invention was driven by first capturing an image of the world, and then developing ways to try and retain or fixate this image on a solid base structure whether it be rock, paper, metal, or glass. Throughout time various techniques and materials have been used to achieve this. The chapter briefly reviews the technological development of photography before focusing on its social development in the South African context. Moreover, the chapter examines, using a thematic approach, the types of photographic subjects we can find when browsing photographic collections in South Africa.

2.2 A brief history of the technological development of photography

Photography is a process that captures light to create an image. This is made possible by manipulating the light-sensitive properties of silver halide crystals. Most traditional film photograph essentially use a surface coated with silver atoms, exposes it to light and through a photochemical reaction, the impression of this light is recorded onto the surface. The major development came with the ability to permanently fixate this image. A photograph is structured into different layers each layer performing a different function. The first layer is the base which is the physical support for the photographic image. The base can be made from different materials such as glass or paper. The base is then layered with a binder. The image-forming chemical will then be placed on a material that is able to manipulate light (Lavédrine, 2003:3).

Although chapter 1 started with Talbot, the first developments of photography can be traced back to Joseph Nicéphore Niépce in 1817. Niépce first tried developing the drawing image reflected through a camera obscura by placing paper sheets coated with silver salts behind the eye of the Obscura. The problem with silver salts is that it darkens when exposed to light, which meant that the images that were created by Niépce on his sheet of paper would darken when exposed to light.

Niépce then started using chemicals that would brighten/bleach rather than darken in light such as iron oxide and manganese black. Niépce continued developing his idea until in 1828 when he started using polished silver as the base on which he built the image, iodine vapours then interacted with the bitumen image. That process created a black and white photograph on a metal plate developing the possibility of permanently fixing an image onto a surface (Niépce's house Museum) as up until then, photographic images were fleeting and unfixable and could even be referred to as ephemeral.

2.2.1 The earliest photographs and first lasting captured images

Daguerre further developed Joseph Nicéphore Niépce's idea. Niépce developed the first heliographic photograph in 1826. Daguerre discovered that an image can be fixed by exposing an iodized silver plate in a camera, and the image was fixed by exposing it to fumes of mercury and fixing was done through salt. Not only were these photographs toxic, but they did also not last. Oxidation caused them to deteriorate, and they could not be reproduced.



Figure 1 -An open-cased Daguerreotype photograph. Case parts include a brass mat, a plate and a glass cover stuck to paper tape. Paper tape is then followed by a decorated brass frame. Back of the casing is a wooden plate covered with leather. Photo courtesy of Isabelle McGinn, 2021. (UCT, Jagger reading room fire salvage operation 2021)

The developments of Daguerre were followed by those of Frederick Scott Archer who developed the collodion wet-plate. A glass plate was coated with gun cotton dissolved in ether and alcohol, after which the image then went through salt. The plate was then placed in the camera whilst still wet to fix the image. Collodion was later replaced with gelatine as a binding medium and glass with plastic. Gelatine was a perfect binder as it is chemically stable and does not have any effect on the image silver. Gelatine prints consist of a white opaque layer also referred to as a baryta layer. Baryta is often applied on both sides of the paper. It seals off the fibres of the paper so that they do not interfere with the chemical process, and they lay flat. The baryta layer is then followed by a coat of image-forming silver-coated gelatine. Different coatings were used as photography developed. The same layer structure was later used in the 1970s when colour photography was introduced. The only difference was that the silver gelatine emulsion was replaced with colour-forming dyes (CCI, 2017).

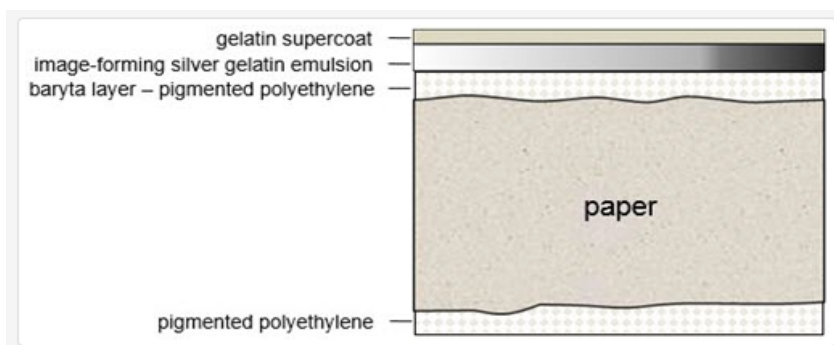


Figure 2 - Layering structure of an image fixed on paper that has used baryta/ pigmented polyethylene to flatten the paper fibres. Baryta/ pigmented polyethylene has been applied on both sides. The image-forming silver forms the second layer. The top gelatin supercoat acts as the binding medium (Government of Canada, Canadian Conservation Institute. CCI 129982-0011)

Being able to identify a daguerreotype will help cause less confusion with the ambrotype that was cased in a similar manner as the daguerreotype. Ambrotype use silver halides as their image-forming light sensitive chemical, the binder is supported by a glass support. Ambrotypes are considered as positives because the dark backing behind the image made the negative to appear as a positive. An under-exposed collodion negative is treated with a solution that makes the silver image give off a white tone. Once processed and varnished the photograph is placed on a dark background material and cased (Lavédrine, 2009:52).



Figure 3 - Cased Ambryotypes very similar to the casing used by daguerreotypes (IPI,2022).

In 1835 William Henry Fox Talbot created the salted paper and calotype processes, the earliest surviving photographic negatives. The photograph is of a small window in the London Abbey South Gallery. Talbot's salted paper is what is referred to as a "printing out" process, meaning that the exposure continues until the desired degree of darkening is achieved. Exposure could thus take several hours to complete and as such these images were limited to subjects that didn't move, including natural specimens, buildings and landscapes. In 1840, Talbot discovered the Calotype using gallic acid and hyposulfite of soda to fix a black and white image on paper (Daniel, 2004). In 1841, Talbot's patent of the calotype explained the process of soaking paper in silver nitrate so that it may reflect light and the image may become fixed by chemical treatment. An image forming substance had to be embedded on the paper. In this instance, it was metallic silver. It had to be layered into the top fibres of the paper and became the prototype for 19th and 20th-century photography. Photographs produced in this way were not as clear because its clarity was affected by the texture of the paper (CCI, 2017). The image forming substance was basic and consisted of only two layers: paper and the silver coated paper fibres.

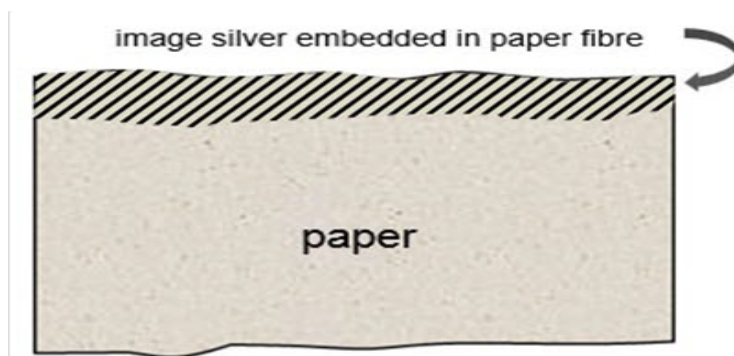


Figure 4 - Figure 4: Salted paper print, the image-forming silver salts have been coated directly onto the paper (Government of Canada, Canadian Conservation Institute. CCI 129982-0001).

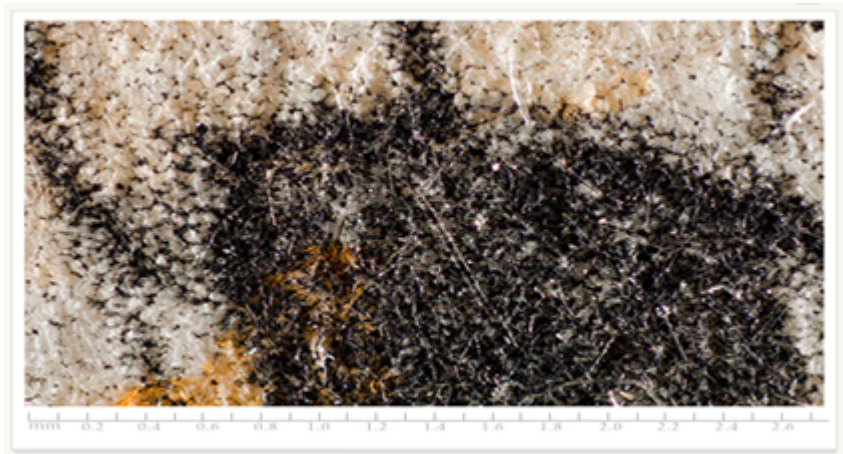


Figure 5 - An example of a microscopic view of a Collotype photograph fixed on uncoated paper (Image Permanence Institute IPI, 2022).

2.2.2 Collotype

Collotype is easily described as a photomechanical process that is a combination of both planographic and photographic technologies. A glass plate gets cleaned then first layered with sodium silicate before it gets coated with gelatine that is mixed with chromium salts. This is also referred to as a dichromated gelatine layer (IPI, 2022). The dichromated gelatine is then evenly laid over the base surface. The drying process has to be controlled and kept at the same level. It has a drying temperature of 55. The dried gelatin is the reticulation for the top gelatin layer. Reticulation also served as a screenless matrix that could tell how much ink would be absorbed or not by the gelatine layer during the printing process. The dry gelatine creates a bottom surface filled with rectangular patterns formed by the dry gelatine that is separating. Under microscopy this makes the identification of a collotype visible. The dry gelatine also serves as the image-forming substance for the ink image that will be transferred onto the plate (Lavédrine, 2009:184). To get an image, the dry gelatine plate is placed in a copy frame in contact with a reversed negative. It is then placed in light where the dichromated gelatine will harden in accordance with the amount of light it receives – the area with shadows will become hard and the highlights will be soft. The plate is then washed with water at a temperature of between 10-16OC, to wash off the dichromate residue. To ink the plate, it is placed in a damping solution of glycerine and water, which will moisten the soft regions. The hardened gelatine clusters absorb water only sparingly. Lithographic ink is then spread evenly over the gelatine the hardened areas/shadows will absorb the ink whilst the soft areas will repel it (Lavédrine, 2009:184). Collotype made it possible to duplicate images and

artworks. This printing-out system became used to print out postcards, catalogues, and book images (IPI, 2022).

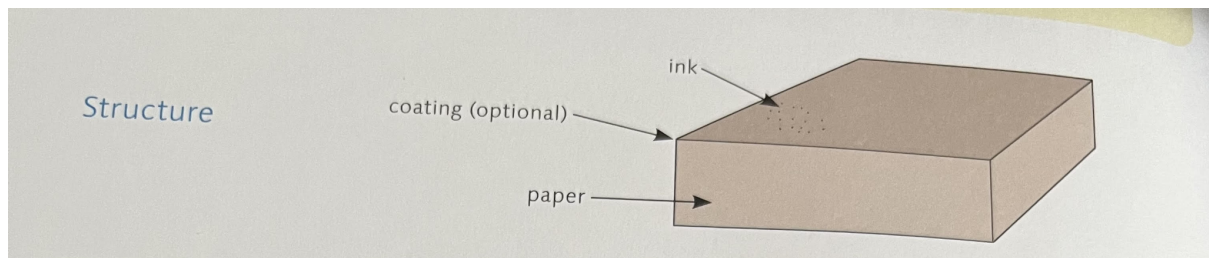


Figure 6 - Layering structure of the Collotype (Lavédrine,2009:186)



Figure 7 - A photograph created through the Collotype printing process. Shows no signs of image deterioration and is stable (IPI, 2022).

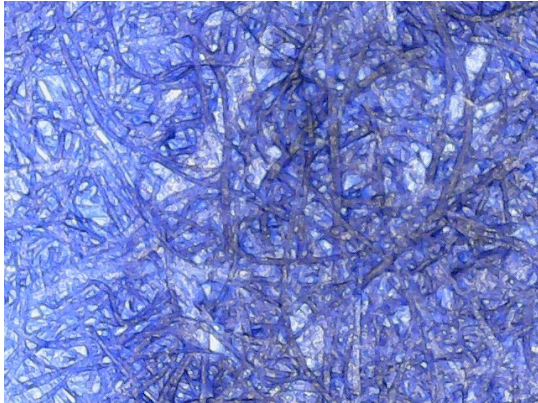


Figure 8 - Microscopic view showing the reticulation pattern of the dichromated gelatine layer (IPI, 2022).

2.2.3 Cyanotypes

Unlike most photographic processes, the cyanotype uses iron salts and potassium ferricyanide as its photosensitive material instead of silver salts. The ferric ferrocyanide is responsible for

the Prussian blue colour of the cyanotypes. Cyan means blue (IPI, 2022). A mixture of ammonium ferric citrate and potassium ferricyanide is made and paper is coated with it. The paper is then left to dry after drying a negative is placed on it and exposed to sunlight (ultraviolet radiation) for about 20-30 minutes. The image is fixed by rinsing it in running water. It is important to know how to identify a cyanotype, otherwise it might be considered as a photograph that has been damaged by light.



*Figure 9 - Magnified view of a cyanotype,
Photo by Jabulile Ntuli (THC Collection, Print by
Janus Boshoff, 2020).*



*Figure 10 - Cyanotype photographic print, Photo by Jabulile
Ntuli (THC Collection, Print by Janus Boshoff, 2020).*

2.2.4 Gelatine silver negative on glass

Silver nitrate gets added to a solution of warm gelatine that has been premixed with potassium bromide, the mixture will turn into white silver bromide particles. The bromide mixture is then heated to promote its photosensitivity once it is taken of the heat it will harden. The hardened gelatine mixture is cut into strands, the strands are washed to remove any residue of the silver halide. Once clean and dry the shreds are melted to enable flexibility, melted shreds are then spread evenly on glass plates and stored away from light. The plates needed to be exposed to UV light through the camera to form a photographic image. Once exposure has taken place hydroquinone is used to develop the photography and sodium thiosulfate was used for fixing (Lavédrine, 2009:246).

2.2.5 Gelatine silver developing

Two different mixtures of bromide/chloride and the other a mixture of silver nitrate are mixed to create a white mixture of photosensitive silver salt particles that form liquid gelatine. The

mixture is then evenly applied onto a baryta paper using a coating machine. The dry-coated paper is then cut into different sizes, finishes and textures. The exposure of the paper was done either by contact printing or by projection. In the nineteenth-century solar camera's that depended on sunlight to project through the optical device to hit onto the negative plate (Lavédrine, 2009:141-143). After light exposure the paper is taken through a developer bath which makes the silver image visible. The fixing is done through a thiosulfate solution before being washed to remove all residues. The photograph would come out in neutral grey tones but toning treatments could be applied onto the developing paper to make warmer tones (Lavédrine, 2009;143).

2.2.6 Screen plate/ Autochromes

Screen plates are considered to be the first successful colour photograph. On the 30th of May 1904 Lumière wrote a letter to the French Academy of Science detailing the production and manufacture of the autochrome plate. The following method is detailed in the letter for making the plate. Potato starch granules are divided into three portions. Each portion is dyed with a different colour, either orange, green or violet. The colours were then left to dry before being mixed until they were evenly distributed. The glass support was then coated with a sticky varnish. The varnish could be dammar gum, which is a triterpenoid resin or a natural rubber that has been dissolved in toluene (Lavédrine, 2009:78). Toluene is a substituted aromatic hydrocarbon, it is insoluble in water and is colourless (Anon, 2022). The starch grains were then pressed onto the glass plate using a laminating machine, which allowed for the granules to be thinner and be in touch with each other without imposing on each other. Where the granules left spaces between each other the spaces were filled with a black powder to stop the transmission of white light. The final step was coating the screen plate with a water-proof varnish (IPI, 2022). A very fine layer of gelatine silver bromide was then poured onto the varnish. The plate is inserted inside the camera in a way that will make sure that the incident light passes through the granules before hitting the photosensitive layer (Lavédrine, 2009:78). Once exposure has taken place the photograph is taken through a reversal process to obtain a positive transparency. The plates get bleached then exposed to daylight plates require long term exposure before getting bleached again in the same developer. There was no need for fixing the silver bromide that was exposed to the light. The photograph was varnished and placed in a protective glass cover (Lavédrine, 2009:78).



Figure 11 - Autochrome photograph that has been damaged by water, colour fading is visible on the areas affected by the water (Lavédrine, 2009:79)

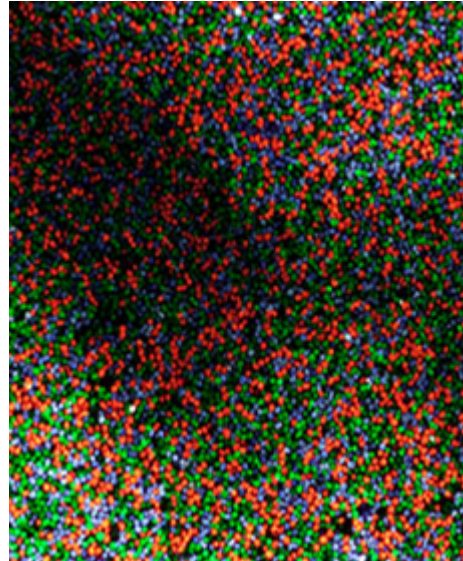


Figure 12 - Screen plate with the coloured potato starch granules (IPI, 2022).

2.2.7 Chromogenic transparencies

The autochrome screen plate created the opportunity for the development of a more flexible support that replaced glass. Plastic replaced glass as a support, the plastic support went through three silver bromide application processes. Each layer was sensitised with a different colour. The first being sensitive to red light, second green and the top layer to blue light. This being called the tripack (IPI, 2022). Between each layer of the tripack a different colour coupler is incorporated. Each coupler is seemingly colourless in the beginning but will be transformed into the three dyes. When the exposure gets done, each layer of the tripack changes based on the colours of the scene. During the development process oxidation of the developing agent takes place. The couplers react to the oxidation forming different colours such as cyan from the red sensitive light, magenta from the green sensitive light and yellow from the blue sensitive light. The final bleaching step is to remove the remaining silver to leave behind a positive image (Lavédrine, 2009:88).

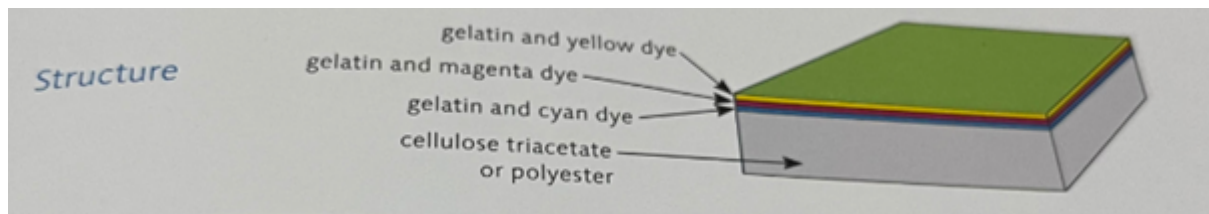


Figure 13 -Different layering of the tripack and how the different colour couplers are stacked unto each other (Lavédrine, 2009:89)

Cellulose nitrate was first used as a photographic base in 1889 by George Eastman who is the founder of Kodak. Eastman produced a strip of cellulose nitrate which made it possible to replace glass as a base. Its flexible and lightweight nature made the development of motion picture possible in 1895. However, in 1950's the use of cellulose nitrate was stopped. Cellulose nitrate is unstable – not only is it flammable when it decomposes, but it also releases a toxic acid called nitric acid (Lavédrine, 2003:17). It turns a photograph into an acid releasing material, which is especially dangerous if stored incorrectly. The prohibitions placed on the usage of cellulose nitrate lead to the search of finding usable replacements such as cellulose diacetate to cellulose triacetate to polyester. Cellulose triacetate is still being used in the film industry, and cellulose triacetate also releases acetic acid when it has been stored for a long period. The release of acetic acid can be followed by peroxide-included oxidation, which will spread the acid release into the air, causing it to affect other films stored in proximity. When acetic acid gets released, it is the first sign of deterioration, embrittlement and deformation of the polymer will soon follow (Lavédrine, 2003:19).

Photographs are made of composite materials and chemicals. To properly care for a photographic collection, it is important to understand the different components that make up the structure of a photograph as it is the interaction between these components and their influence on each other, as well as their response to the environment which will determine the longevity of the image. Typically photographs consist of an image material (silver, platinum, organic dyes or pigments) which creates the image we see, a binder layer (collodion or gelatine, which is a transparent layer in which the final image material is suspended), and primary support (paper, glass, metal or plastic) which carries the binder and image (IPI, 2022). In addition to this three-part structure, individual images may also include additions such as hand colouring post processing, various coatings, frames and cases which are all considered a part of the original photographic object (IPI, 2022).

2.3 Social development and spread of photography in South Africa

It is believed that the words “Use a picture. It’s worth a thousand words” was first used by Arthur Brisbane in March of 1911, in a newspaper article in *The Post-Standard* (Anon, 2022). The quote has since been used as a figure of speech to highlight how many different stories a single photograph or picture can contain. A photograph remains forever the same (O’Connell, 2018:10) – stuck in time, however, it is the philosophical lenses through which we view and interpret these images which changes.. The photographic history in South Africa is as rich as its historical narratives and can tell stories of colonialism, dispensation, apartheid and transformation. Much has been written about the history of photography in South Africa, either generally or focusing on a particular theme. Chapter 2 briefly outlines the history of photography in South Africa based on some exemplary case studies. This exploration allows me to situate the different photographic materials discussed in chapter two in relation to the South African context, as these are the types of materials expected to be in our collections, which will be explored further during the survey of collections in chapter four. This brief historical survey further allows me to argue for the significance of our South African photographic heritage and why it is important to preserve it.

The style of photography in the Cape changed as Europe got more interested in discovering the unknown making way for ethnographic photography. Ethnographic photography has to do with capturing that which is different to what the photographer knows or is familiar with (Hadijzer, 2018). This photographic period captured a lot of South Africa’s indigenous people. Here we see chiefs and the normal citizen captured in their traditional attire. The influence of the West became much more visible as you see the change in clothing and dress styles. Most of the photographs taken were picture postcard-card photos. The postcarding style became more dominant as photographs were sent to Europe for printing. Alfred Martin Duggan-Cronin started taking ethnographic pictures of South Africa from 1906 to 1914. In 1930 Cronin opened *The Bantu Gallery*, which consisted of photographs of ‘tribes’ arranged in different rooms of “The Lodge” building, now known as The McGregor Museum (The McGregor Museum, 2019).

South Africa, like most African countries, was no stranger to Western rule. The aim is to examine the photographs captured during the colonial area. A film and article called *Movie Snaps*, written, and directed by Siona O’Connell shows life lived during the apartheid area on

a happier note (O'Connell, 2018), and the work of Santu Mofokeng will also be looked at in this light contrasting it to that of Duggan Cronin.

2.3.1 Pre-colonialism and photography

When considering that the first European settlers settled in the Cape, with the arrival of Jan van Riebeeck in 1652, it is no coincidence that the first camera that came to South Africa landed in the Cape. In 1846, the first camera landed in South Africa and shortly thereafter commercial photographers became active in the Cape, first establishing themselves in the larger towns before spreading into the inner parts of the Cape and moving into other provinces (Hardijzer, 2017). The first owner of a camera in South Africa was Frederic York, who received the camera as a gift from Prince Alfred (Hardijzer, 2017). The camera was able to capture between four to eight photographs on a single plate, namely the Carte-de-visite (visiting card), abbreviated CdV, which was the popular photographic style at this stage. The large print made from that plate was cut up into small portraits of approximately 11.4 by 6.4 cm and were separately mounted on cards. Most of the photographic CdVs were used as visiting card portraits, or calling cards and it was customary to leave these behind after a visit (Hardijzer, 2017). These became very popular in the mid-nineteenth century as it was the most economic form of portraiture at the time. The CdV was usually printed in black and white, exchanged on birthdays and holidays, and collected in a Victorian photo album (National Portrait Gallery, 2020). The earliest forms of photographs taken during this time were of single individuals and a simple background. As the photographic process gained popularity photographic studios were introduced and props added to give the picture more life. These photographs increased in popularity with increases in mobility as it allowed friends, families, and loved ones an inexpensive means of sending small mementos by post, or carrying them with during military mobilisation, travel, and relocation (Hoagland, 2022).



Figure 15 - A carte-de-visite photograph of an unknown farm in Cape Town taken in 1870. The photographer is unknown (Hardijzer, 2017)

The Carte-de-visite photography shows South Africa as it was developing as a capitalist society driven by the mining sector (SAHO, 2019).

In South Africa, the introduction of the Carte-de-visite made for a huge following. It resulted in an impetus creating the beginning period of the history of photography in South Africa. Furthermore, it resulted in South African photographers being commercially known from 1846. The photographers were mostly found in the larger towns of Cape Town but soon moved into other provinces and towns. The market became flooded and as a result, there were more than 230 photographers in the Cape between the years 1846 and 1870 (Hardijzer, 2017). As Carte-de-visite were so popular and are readily available to collectors on various auctions and e-commerce platforms today, I fully expect that they will be readily available in collections in South Africa.

2.3.2 Ethnographic photography

The camera came at a time when colonialism was growing and Europe and the West wanted to know more about Africa. The discipline of anthropology and ethnology accelerated because the camera allowed for easier information and data collection. Because of the photographs collected people could easily be classified, different societies could be explored, and people and things were easier to identify and place within a colonial context. The ability

to reproduce photographs at a large scale made it possible to circulate them easier around the world, the photographs that were circulated shaped the perspective that the world would have of Africa (Whittle, 2013).

As the camera became mobile and was taken to document explorations and fieldwork, ethno-photography developed and with this there was a decline in the number of photographic studios (Shepherd, 2015). In the year 1903 Kodak developed a new camera that allowed for photographs to be printed on a postcard. In 1907 Kodak furthered their development by a new camera that turned all photographs into a postcard. These were called “real photo postcards”, and in the same year it became legal to write on the back of a postcard (Anon, 2022).

Ethnographic photography unlike CdVs focused a lot on capturing the indigenous people or that which was perceived as different from the West/Europe. Ethno-photography allowed for visual information to be gathered and offered a visual interpretation rather than depend on narrations and drawings about adventures to Africa. People in far-away Europe could now see what the adventurer was seeing, however subjective (Wright, 2017). To better understand the works of the colonial period as well as the union of South Africa period. I will be looking at the life and work of Alfred Martin Duggan-Cronin. Duggan-Cronin was born in Ireland in 1874 he was educated in England and moved to South Africa in 1897. He found employment in Kimberly at the De Beers mine as a compound guard. He later started working at the prison dispensary. In 1904 Duggan-Cronin brought back a camera from his visit home. He started capturing photographs of migrant mine workers (Godby, 2010). The photographs he took during this period can be used to study how life in the mine compounds looked. Cronin’s work, however, should be studied or used with caution because he was known to travel with props and add these to his ethnographic photographs to make them more appealing. Pictorialism became very popular in 1906 and like many photographers at the time Cronin became concerned with capturing aesthetically pleasing photographs (Hayes, 2007: 143). His photographic technique later changed to capturing new mine workers that came to the compound still having remnants of the homestead. He would intentionally ask them to pause whilst holding items which they had brought with them to the mines from home. After many of his photographs became well known he decided to focus specifically on ethnographic photographs. He purposefully went out searching for people to photograph. His photographs were captured with an intention of portraying the “other” (Godby, 2010). There is not much

information about the photographic processes that Cronin used but what we do know is that in the books that he published the photographs are numbered in plate numbers. In chapter 2 of this dissertation, the methods of preparing a screenplate were discussed. The negative screenplates that Cronin used are glass coated gelatin plates which he then used paper to print them on to form the book (Sutton, 2016). The images in Cronin's book are a representation of gelatin silver glass plate negatives. Gelatin silver glass plate negatives were mostly used during 1878-1940. The plate was covered with a gelatin coating that had silver particles that would make a negative photographic image. The photograph would turn out a neutral grey or black colour (Lavédrine, 2009: 244-245).



Figure 16 - A photograph by Duggan-Cronin taken from his book titled: *The Bavenda, the first volume of The Bantu Tribes of South Africa: Reproductions of photographic studies.*

Between 1919 and 1939 Cronin travelled through southern Africa and captured seven thousand negative (Godby, 2010). Not all the negatives made it to print. In 1928, Cronin published his first book called *The Bavenda*, the first volume of *The Bantu Tribes of South Africa: Reproductions of Photographic Studies*. The book was a first of the volume of 11 books that he would produce until 1954, which was the year of his death. The photographs he took hung in his home in Kamfersdam in Kimberly, which he later turned into *The Bantu Gallery*. De-Beers supported the initiative of turning the house into a gallery it was later incorporated into the Mc Gregor memorial museum (The McGregor Museum, 2019). Duggan-Cronin was a very productive photographer and documented much of South Africa and its peoples, and his collection is well-known. It was selected as one of the three main case studies for the present research and is further discussed in chapter 4.

2.3.3 Re-imagining self through photography

The Bantu are depicted in Duggan-Cronin's works in a form or way that Europe desired- as exotic 'others'. In the works of the following photographers and authors, we see a representation of life during apartheid as the people wanted to see themselves. These works are currently housed at institutions that form a part of the case study that this paper focuses on.

The works of Santu Mofokeng in the photographic book, *The Black Photo Album: Look at Me 1890-1950* shows a different perspective than the one shown by the works of Duggan-Cronin. In addition to creating an archive of the Bantu people, Mofokeng was also interested in representation and challenging the narrative of what a civilised native looked like. Mofokeng asked questions of identity, class, aspiration, and desire.

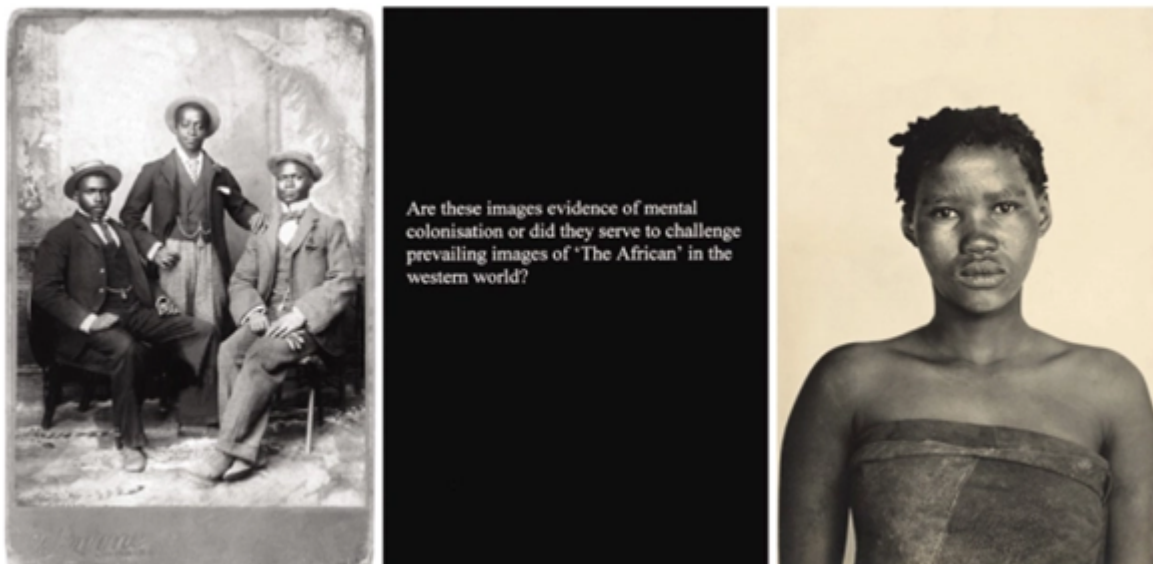


Figure 17 - A photograph included in Santu Mofokeng's *The Black Photo Album: Look at Me* versus a photograph by Duggan Cronin named *Korana girl* (Art Blart, August 2013).

What Mofokeng captured was a way that black people choose to see themselves during that same period that Duggan-Cronin was photographing (Walther Collection, 2012). From the works of both photographers, the question is whether Mofokeng collected photographs of the colonised native, or whether he was challenging the way that Africans are being perceived by the ethnographic photographs that were being circulated at the time.

Mofokeng first had his photographic experience as a teenager when he received a second-hand camera as a gift from his sister (Mofokeng, 2000:41). Growing up in Soweto during apartheid put him in a position to capture what was happening at the time. Mofokeng attended school at Morris Isaacson High School. The school formed part of the Soweto uprising of 1976. In 1985 Mofokeng went on to become a darkroom assistant for *Beeld*, a well-known Afrikaans newspaper, before joining the Afrapix, a collective of black and white activists who were concerned with documenting the realities of apartheid (SAHO, May 2020). Afrapix focused on ways that it could get black photographers in the townships to capture photographs of the anti-apartheid movement. Afrapix was also focused on breaking the limitations or bans that were placed on black South African photographers (SAHO, 2020).

The difficulty that Mofokeng had to face when capturing his subjects is the gap in knowledge that existed around photography in the black community. In the township the process of developing photographs was not understood, so whenever the photographs were under or overexposed he would be accused of burning his subjects, darkening, or bleaching them (Mofokeng, 2000:43). As a result, he would not receive any payment resulting in shortage of income, making it impossible for him to buy more film (Mofokeng, 2000:44). He also found himself having to allay fears of those who believed that their photograph carried their shadow or soul with them (Mofokeng, 2000:40-43). Producing a photograph during the apartheid area was more than capturing riots and uprisings. It was navigating through a world of being misunderstood by the subject, in addition, having a camera brought with it a sense of eliteness and he was often perceived as the other because to have a camera implied having wealth, which isolated the photographer behind the lens from his own community. O'Connell states that photographs sit at an "intersection between past, present and future" making those pictures that did not make it to the archive part of the present (O'Connell, 2018: 2). Mofokeng states that photo albums are important in the township as they are treasures in family history. The photographs in these albums are of happy memories showcasing dressed up family members surrounded by food and drinks. Going through a photo album symbolized going through a family's history, as such it was impolite to refuse to sit and see a family photo album cause it became a way of welcoming one into the family (Mofokeng, 2000: 43). The Ngilima photographic collection, much like the work of Mofokeng, shows the black and coloured community as they preferred to see themselves. Ngilima's photographs unlike most photographs taken during the apartheid period show people who wanted to be photographed.

December was the busiest time of the year in terms of his photographic studio, as people wanted to be photographed in their new clothes that they had gotten for Christmas (Feyder, 2018:138). Ronald used the house lounge and dining area as a photographic studio. The lounge and dining area was an ideal place to take photographs because during the forced removals people were placed in what became known as match box houses. These houses were dry and did not have much character. Ngilima, by offering his house lounge and dining room, created a representation of how people wanted to see themselves photographed (Feyder, 2018:144). Ronald Ngilima started capturing his photographs in the early 1930's until his death on the 13th of March 1960. His son, Torrence, then continued with growing the collection until his death in 1998 (Feyder, 2018:138). Ronald stored most of his negatives inside Kodak boxes indicating that he had some form of archiving system that he was using. In fact, shoeboxes regularly appear as storage for family photographs. O'Connell mentions in her paper that she was going through a shoebox of family photographs when she found the two movie snaps photographs. The family's which she went on to interview also used the same system of placing their photographs in shoeboxes (O'Connell, 2018:9-10). The Ngilima collection is currently exhibited at the Bensusan collection at Museum Africa, however most of the work is permanently stored at the historical paper division of Wits University (Makatile, 2022).

These photographs were captured in an era of unrest, yet they showcase a different story-how the people decided to see themselves. The camera "changed the way that a family imagined itself" (O'Connell, 2018: 9). Movie snaps are one such type of photographs. The *Movie snaps studio* is a photographic studio based in the Cape which produced thousands of movie snap photographs during the year 1930-1980. Movie snaps were small black and white photographs sized 2.5 by 3.5 typically taken with a Kodak camera. Most of the photographs were captured in the same area in Cape Town near the city centre. Since most people at the time did not have their own cameras, they would get dress up and travel to the city to take photographs of themselves. There would generally be photographers present in the city taking a photograph then handing over a card that would inform you when your photograph would be ready for collection (O'Connell, 2018:9). What made Movie snaps so great is that all of the pictures were taken during the apartheid era but the photographs did not resemble the era which they were captured in. Movie snaps showed the people as they wanted to be seen and not as apartheid legislation saw them. Looking at a photograph taken at the city centre it simply shows a happy side. Its only when the people in the photographs are asked about the

area of the photograph that they would then describe the realities of apartheid. Movie snaps “speak of an existence of a certain way of life, a life that includes self-representation and flashes of freedom in times of un-freedom” (O’Connell, 2018:10).



Figure 18 - Movie snap Photograph titled Siona and Ma (1967) (O’Connell, 2018: 5)

In an era of colonisation and apartheid, identity and self-definition were taken away from the people. Legislation became a classifier for who and what you are. The race classification act prescribed to you who you are, where you qualify to live and work (Apartheid Museum, 2022). What the people in the townships managed to do is escape the identity and classification that they were given through a photograph. They managed to capture what they saw themselves as happy and smiling families dressed up and strolling the city centre. The photographs they created showed their lived lives that Rose called exceeding the coding of a photograph (Rose, 2013: 13). This type of casual yet historical photographs are mostly photographic negatives on film, negatives on plates and negative transparencies on paper and are likely to appear in many collections around South Africa, including family photographs, studio photography and photojournalism images, both original and reproduced in print in magazines and newspapers.

Lidudumalingani Mqomboti, a South African born contemporary photographer and filmmaker, who won the Cain prize for African writing in 2016, finds inspiration on the photographic styles that Mofokeng used. Mqomboti describes how Mofokeng’s photographic style speaks a poetic language bringing up close a reality of a particular time while at the same time imbuing it with a sense of mystery. When looking at South African

photographs one should always try and look at them within context because unlike most countries South Africa cannot fit into a single scope. It has different spaces, different people the photographs taken from such spaces and people breaks expectation of what the country and its people should look like (Ndukwu, 2022)

2.4 Conclusion

The manipulation of light sensitive materials has led to the development of various photographic techniques with each becoming more stable (and by default the image captured more permanent) than the one before it. The introduction of the camera in South Africa meant that stories could be told visually as told through the lens of the photographer, the photographer could become the storyteller. Photography in South Africa has been used to tell stories of identity and belonging as well as stories of heritage although these are always influenced by the storyteller's own narrative and biases. It is a long and complex history that can be represented through different photographic techniques. Naturally, a more complete photographic history of South Africa goes beyond the works of the above discussed photographers who merely illustrate some of the materials to be found as part of local and national heritage.

3. PHOTOGRAPHS AND THEIR SENSITIVITIES

3.1 Introduction

This chapter examines the ten agents of deterioration and the effects that each of them can have on a photographic collection. There is a multiplicity of causes photographic deterioration in South Africa. They include exposure of images to light, humidity, temperature fluctuations, improper handling, pests, pollution, and arson or vandalism related

crime. The so-called agents of deteriorations are those risk factors present in the collection environment which can precipitate damage and deterioration of collection items. In this research, the emphasis is on the risks to photographic materials, although the agents of deterioration place all cultural material under stress. Where possible, visual illustration of the effects of the damage is given. A holistic view of how the agents can be kept out is also discussed, which is the focus of preventive conservation and looks at how features outside the building, as well as within, can help prevent or combat the effects of the different sources of risk.

3.2 Agents of deterioration

The term agents of deterioration, was first used by Stefan Michalski when he identified the agents that cause change and damage to museum objects. The agents were later developed into the ten agents of deterioration, namely: Thieves and vandals, dissociation, fire, water, pests, physical forces, ultra-violet and infrared light, incorrect temperature, incorrect relative humidity, dirt and pollutants (CCI, 2017). Each of the agents affects objects differently. In this chapter I examine how each agent affects photographs.

3.2.1 Thieves and vandals

In any cultural institution, it is important to have security in place as cultural objects are susceptible to theft due to their value. Theft could cause potentially irreplaceable loss of objects. In many museums, they have adopted the policy of not mentioning the monetary value of their objects. This strategy could prevent future theft.

Vandalism on the other hand is purposeful damage, and these are mostly referred to as crimes of opportunity (CCI, 2017). An unfortunate event happened in November 2020 when Museum Africa was broken into. The break-in led to flooding damaging several collections including the Bensusan collection (Anon, 2020). The break-in at the Museum is a perfect illustration of how one of the agents can trigger another if not correctly handled and if no method of security response is in place.

3.2.2 Dissociation

Dissociation deals with the metaphysical element of a material. It considers the intellectual and legal aspects of a material. It happens as a natural human order of losing things, and can be accumulative or immediate. Whenever information connected to a photograph is lost, it is possible for the image to lose its value. Value becomes lost through dissociation because if a cross reference is lost the story becomes lost, leaving behind a photograph without data or information.



Figure 19 - Examples of dissociation include when an image can no longer be connected to its information, for example in this image where the glass lantern slide presumably broke and fell out of its frame. Photo courtesy of Laura Esser, 2022 (un-accessioned collection)



Figure 20 - Above, another example of dissociation specific to photographs is when single images become detached or are removed from a photo album. Photo courtesy of Isabelle McGinn, 2021 (UCT, Jagger reading room fire salvage operation 2021)



Figure 21 - Another example (left) when many objects become jumbled as in the case above, neglect over time and disasters such as flooding or fire can lead to previously ordered systems to become disordered. Photo courtesy Laura Esser, 2022 (un-accessioned collection)

Most museums have a numbering system which they use in their collection. Numbers get written on labels in different ways. The information connected to the object usually gets stored according to the numbering system. Whenever a label gets lost, in most cases information will also get lost. It is important to have a numbering system in place that will not be easily lost but can be filed along with your photographs in storage making sure that they are both linked with each other (Michalski, 2018). Dissociation also very easily occurs in institutions that are digitising because the process entails removing and separating items to scan them, and they often don't get placed back to their original storage spaces (Mckay, 2003).

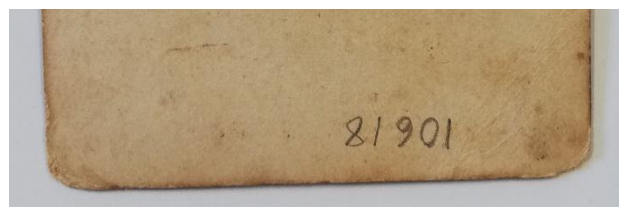
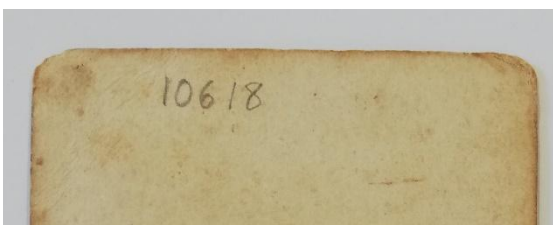


Figure 22 - Figure 14 Improper numbering that can lead to transcription errors. The same number on this photograph can be read 10818 (left) or 81901 (right). Photo by Jabulile Ntuli, 2020 (THC collection)

Figure 22 is an example of a bad numbering system. The number reads different when turned around. Numbering was also done directly to the object. It should always be avoided writing on an object. Ink can spread damaging your material (Michalski, 2018).

3.2.3 Fire

Damage caused by fire is, in many instances, irreversible and can result in total loss. For a fire to start, three elements should be present, including a source of ignition, combustible material to act as fuel (wood, paper, textiles) and oxygen. When all three of these sources are present a fire will ignite. To stop a fire, one of the three elements has to be removed. While having materials such as cellulose nitrate film in your collection might not start a fire, they will fuel combustion. Damage caused by fire includes discolouration due to smoke, warping, melting, shattering, cracking and embrittlement (Michalski, 2018). Soot and a powdery ash-deposit will be left on the surface, and this will be absorbed by materials causing irreversible soiling. In most cases it is better to have preventative measures in place because fire damage cannot be restored.



Figure 23 – Fire damaged photographs tend to exhibit blistering, discolouration, soot damage and in extreme cases the paper burns, turns to ash and the photograph is no longer recoverable. Photograph Jabulile Ntuli, 2022 (THC Collection)

3.2.4 Water

The most common forms of water damage are due to accidents and neglect, including not closing taps properly and water spills from water bottles by people who have access to the collection. Leakage tends to occur in most storage facilities especially during rainy seasons if regular inspection of the building storage facility is not done. Damage caused by water on photographs includes gelatine swelling and stickiness causing it to stick to surfaces. Photographic dyes will run, causing bleeding and staining. Swelling will lead to separation causing the binder to lose from the support. Condensation should also be considered as possible water damage and storing photographs near walls and windows should be avoided as those are areas most susceptible to condensation.

3.2.5 Pests

For the purpose of this paper, I will only be looking at pests most commonly found in museum and gallery spaces and the damage that they cause on photographs. Mould spores and its colonies are depended on high relative humidity as well as moisture to grow and survive. A relative humidity of 65% is conducive for the growth of mould spores. Moisture and dampness create a perfect environment for the growth of mould (Michalski, 2018). Mould growth on photographs can be identified by coloured filaments and spread-out spots of material loss on the photograph. If not detected and stopped on time the damage will spread on the entire photograph. Gelatine's protein means that not only is it food for insects such as rodents and silverfish (fish moths), but its hygroscopic nature also attracts microorganisms such as mould. Silverfish will tunnel into the photograph causing irreversible damage (Lavédrine, 2003:16).

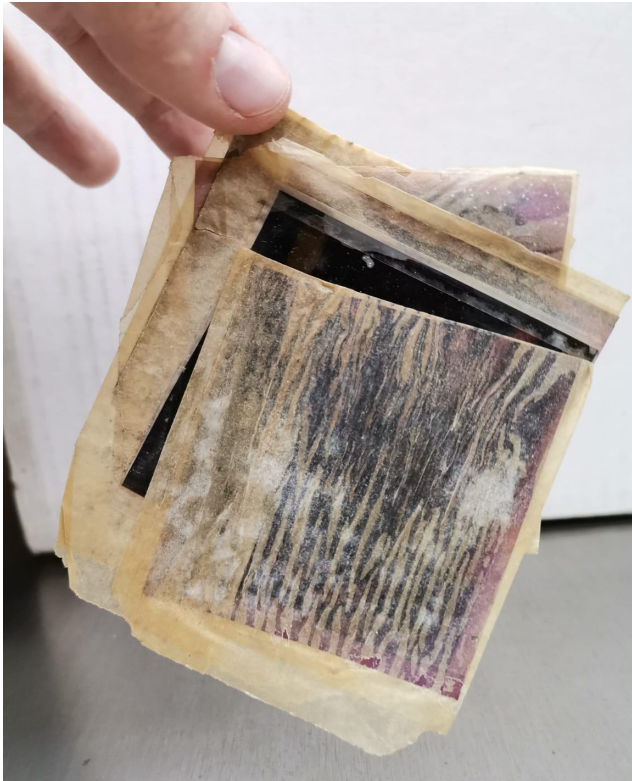


Figure 24 – Mould growth on the glassine sleeve of these water damaged negatives. Photo courtesy Laura Esser, 2022 (Un-accessioned collection)

3.2.6 Physical forces

Physical force will cause damage that might not be reversible. In photographic collections force will cause tears, creases, bends and cracks. There are four physical forces to be on the lookout for:

- **Impact:** when objects strike each other or when they strike a hard surface. The damage that will occur will depend on the hardness of the surface or object that gets hit. Glass lantern slides, and glass plate negatives are all prone to breakage and chipping.
- **Shock** is usually due to a strong impact caused by earth's gravity. Shock occurs during shipment and when objects are moved from one place to another. However, shock should be differentiated from vibration. Vibration, unlike shock, involves continuous movement of the object. Vibration can be random or harmonic. Continuous vibration will cause more damage to your object than one random vibration.
- **Pressure** applied to an object will almost certainly cause breakage, tears and deformation, resulting in damage to both hard and soft objects.
- **Abrasion** will always happen when objects are pressing against each other with applied pressure. The amount of damage that will be caused by abrasion will depend

on pressure, the durability of the surface and the amount of dirt such as dust that is on the surface (CCI, 2017).



Figure 25 – example of abrasion and scratches as the effect of physical forces on photographic prints. Photograph Jabulile Ntuli, 2022 (THC Collection)

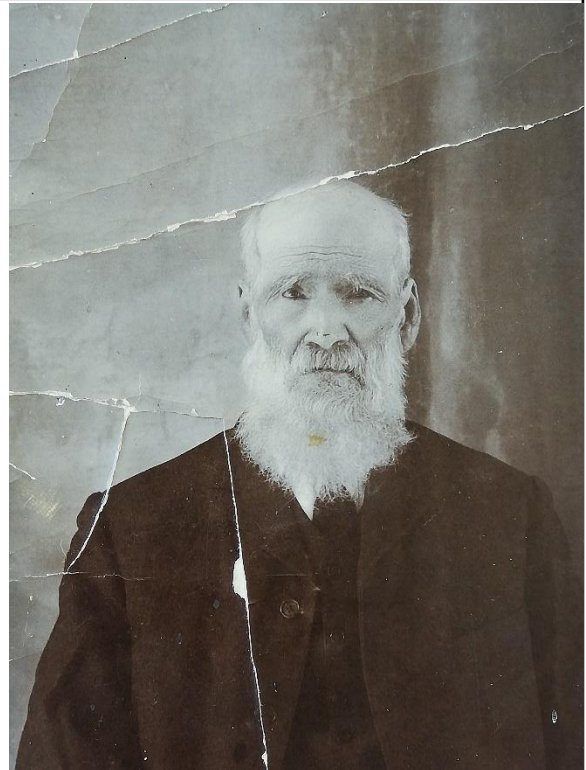


Figure 26 – Example of folds on photographic prints. Photograph Jabulile Ntuli, 2022 (THC Collection)



Figure 27 – Example of physical forces causing breaks in glass lantern slides. Photograph courtesy of Laura Esser, 2022 (un-accessioned collection)

3.2.7 Light

When working with light it is important that light levels should be kept as low as possible (although not so low that visibility is impossible). There are different kinds of light or visibility, each causing a different form of deterioration; the first being visible light. This is the band of radiation that human eyes are sensitive to sunlight and other forms of natural light. Light will cause colours to fade and it also lightens colours. The rate at which colour will fade depends on the material composition of the object. Visible light breaks down paper and fades the colouring agents used on photographic materials. It also breaks down the organic structure of a material, which will lead to the deterioration of photochemical materials. Protein-based photographs will also deteriorate because the heat that gets generated by light will break down their genetic structure causing them to deform. The rate at which the deterioration happens is dependent on the time of exposure (Michalski, 2018). When photographs are exposed to ultraviolet light for a long period the material will start disintegrating, causing structural weakness. Yellowing, discolouration and chalking will be eminent.

Another form of lighting is Infrared, which can be referred to as both incorrect lighting as well as incorrect temperature. Infrared can heat the surface which it is shining on. When

dealing with infrared I would suggest that incorrect temperature be taken into consideration. Damage that occurs due to light is a relative build up. It is a cumulation of damage that happens over the years. To avoid damage caused by light, photographs should not be exhibited for a period of longer than six months. Whenever a photograph is exposed to light the exposure time should be measured. When damage does occur it often affects the whole photograph and not only parts of it. Moreover, having knowledge of the rates at which photographic dyes may fade is vital in predicting the lifespan of exposed photographs. For example, chromogenic photographs are unusual in that their colour shift happens in the dark when they are not exposed to light. Chromogenic prints will darken, losing their colour, turning yellow, blue or magenta depending on which layer the damage occurs on. Refer to paragraph 2.6 for Chromogenic prints and how the gelatine based dyes are layered. When storing these kinds of photographs there should be some exposure to light (CCI, 2017). The photographs below show the different kinds of deterioration that are caused by light as well as the darkening that happens to chromogenic prints that are not exposed to enough light.



Figure 28. - Colour fading of chromogenic photographs, here each photograph is fading in a different colour spectrum. The first is yellowing, the second is turning magenta and the third is turning blue (Government of Canada, Canadian Conservation Institute. CCI 129982-0019).

3.2.8 Temperature and relative humidity

The environment in which photographs are stored is very important. When photographs are stored in an environment with the incorrect relative humidity it can cause the photographic binder to melt. Gelatine binder will become soft and sticky when relative humidity is too high and shrinkage, cracking and curling will occur in low humidity. Though relative humidity

cannot be avoided because it is a part of the environment, it can be controlled. Whenever air gets cooled or heated the relative humidity will change affecting the objects stored in that environment. A relative humidity of over 75% causes a damp environment. Mould growth becomes susceptible when relative humidity is over 60%. Relative humidity and the incorrect storage temperature is very much linked (Robb, 2002). High temperature causes cycling, which leads to the movement of moisture within the chemical structure of a photograph. The chemical changes that happen due to movement absorption and release of moisture will cause structural change to a photograph, such as cracking and embrittlement. High temperature should be avoided when handling cellulose nitrate film sheets as they can catch fire when exposed to heat above 38°C (Michalski, 2018). It is thus important that such photographs should be identified before storage and stored in a chemically sensitive room.

All materials have different needs in terms of temperature and humidity, which is why museums prefer to store similar materials together as this makes controlling appropriate environmental conditions easier. For example, leather can be stored at room temperature and relative humidity around 40%; photographs have much different needs with some requiring cool to sub-freezing temperatures and dry conditions below a relative humidity of 30%. If leather is stored alongside photographs in conditions suitable for photographs, that are the cold and dry conditions will cause leather to lose moisture and embrittlement will start (CCI, 1992). These competing needs become important to consider when storing photographs such as Daguerreotypes and Ambrotypes, which often have leather backing (refer to Figure 1).

The recommended relative humidity for a photographic collection is between 30-40%. Temperature is much more complex to handle than relative humidity. Temperature should not be so low that it creates an impossible working environment. A lower temperature can control the relative humidity when the temperature drops it is likely that relative humidity will also be affected. Cooler temperature does allow for a longer life span, studies have shown that for every drop of 5°C the life span of a museum object doubles (Michalski, 2018). Temperature should be kept as stable as possible and even fluctuations as little as 2°C are best avoided. The ideal storage temperature for photographs including those containing cellulose nitrate, cellulose acetate, and chromogenic dye is between 10-16°C. However, that temperature is not conducive for a work environment, a temperature of 18°C is acceptable for storage usage if the area doubles as a working environment.



Figure 29. - dimensional changes such as curling are typical of humidity fluctuations. Photograph courtesy of Laura Esser, 2022 (un-accessioned collection)

3.2.9 Dirt/pollutants

We currently live under conditions where air pollution is hard to avoid. Most airborne pollution is released through the burning of fossil fuel and gasses released by vehicles. When released into the atmosphere, these gases react not only with each other but with sunlight as well causing transformation to occur within their chemical structure.

Airborne pollution contaminates photographs through compounds such as smoke, dust and soot. Air pollutants that can be harmful on photographs are hydrogen sulphide, which is often characterised by the rotten egg smell that it emits. This gas can tarnish silver and copper at a very fast rate when the relative humidity is above 35%, leading to silver mirroring and other oxidation of the metal salts in the image layer. Nitrogen oxide forms whenever fuel gets burnt at a high temperature. Nitrogen can weaken the chemical structure of proteins. It can be particularly damaging to a photographic collection as it will break down the gelatine layer as gelatine is a protein but also quickens the decomposition rate of the cellulose ester in the paper component of photographs. Silver gelatine photographs tend to be more sensitive than colour photographs because it attracts pollutants easier than other photographic prints due to their hygroscopic nature. Colour photographs are often discoloured by sulphur dioxide, oxidants that can cause yellowing (Lavédrine, 2003:99-101). Dust is also classified as an airborne contamination as it travels through the air along with other factors and once it settles on photographs it will scratch the surface it lands on when movement happens. Dust is hygroscopic in nature it attracts and holds water. It will also spread whichever dirt, including mould, to any surface that it lands on. To stop these chemicals from interacting with

photographs it is best that storage facilities should have filters that will absorb chemicals and purify gaseous contaminants (Robb, 2002).

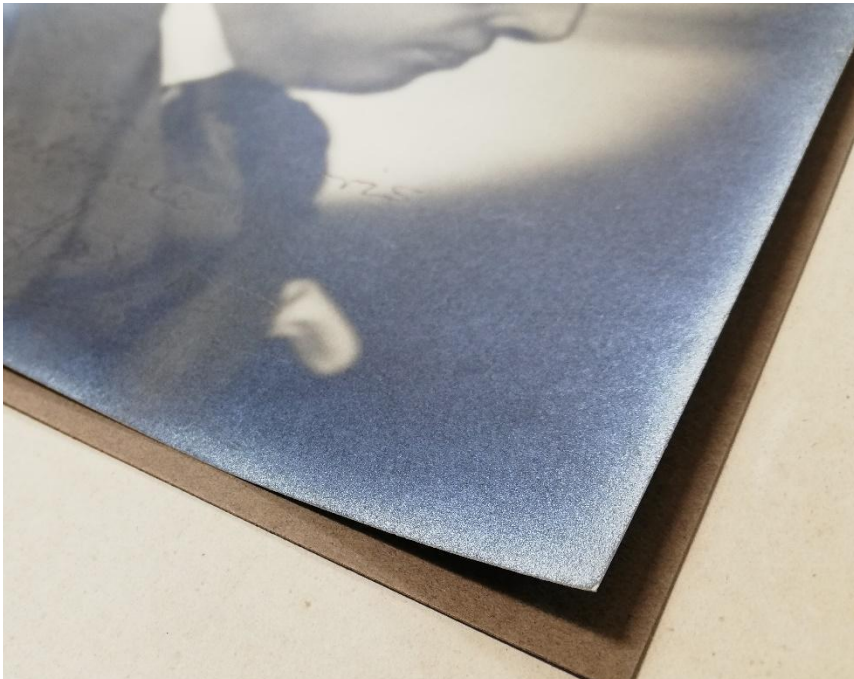


Figure 30. - silver mirroring on a 20th century silver gelatine photograph as a result of the oxidation of silver salts in the presence of sulphur dioxide. Photograph courtesy of Isabelle McGinn, 2021 (private collection)



Figure 31 - Water damage as a consequence of firefighting efforts, photographs have stuck together and dirt and soiling solubilised in the water has now soiled and stained the photographs. Photograph courtesy of Isabelle McGinn UCT, Jagger reading room fire salvage 2021.

3.3 Procedure

Procedure refers to the way that things are done in and by the organisation. Regular cleaning of the space should be done making sure to inspect the space as you are cleaning. An inventory should be kept analysing what is in the collection. This can help to spot if anything within the collection goes missing or is misplaced. Check your storage space for leakages as well insect droppings as this could indicate infestation. Make sure that the lighting is correct and have measures in place that explain why the light is kept low. Have a staff that understands their working space and environment. Engage with the community where possible this will help in drawing volunteers that will be keen to help. Volunteers are easy to train and can help especially when there is no budget allocation for your institution (CCI, 2020)

Each of the above-mentioned points have five ways or methods that can be used to protect your collection. These are also referred to as the stages of control:

- **Avoid:** Avoiding the agents of deterioration may not always be possible as some of the threats may already be present in your collection.
- **Block:** Where the agents can be avoided and already exist in the collection make sure that they are blocked so that they do not continue to spread.
- **Detect:** In order to detect you need to follow the guidelines that you set out for avoid and block. Detection is implemented by scheduled inventories and looking for symptoms of the agents.
- **Respond:** Here you have to respond to the information that you gathered when you were detecting possible threats. This is a crucial step that should not be missed. Once you forget or choose not to respond the data collection and monitoring process will be in vain.
- **Recover:** Recover deals with treating the damaged objects in the collection. The aim of preventative conservation is to make sure that you do not reach the level of recovery.

3.3.1. Minimising damage and deterioration through a holistic risk management strategy

The best way to minimise damage to collections is by applying a preventative conservation framework. Preventative conservation is concerned with putting measures in place that will prevent and reduce future damage as well as minimise the possibility of potential damage. The management and emergency plan of a storage facility plays a crucial role in the preventative conservation of an institution (Levin, 2022). This is a tool that can help protect your collection against damages caused by the ten agents of deterioration. When applying preventive conservation, such risk management measures start from outside the building inwards, with each additional barrier layer offering an additional layer of protection for the object inside (see figure 32).

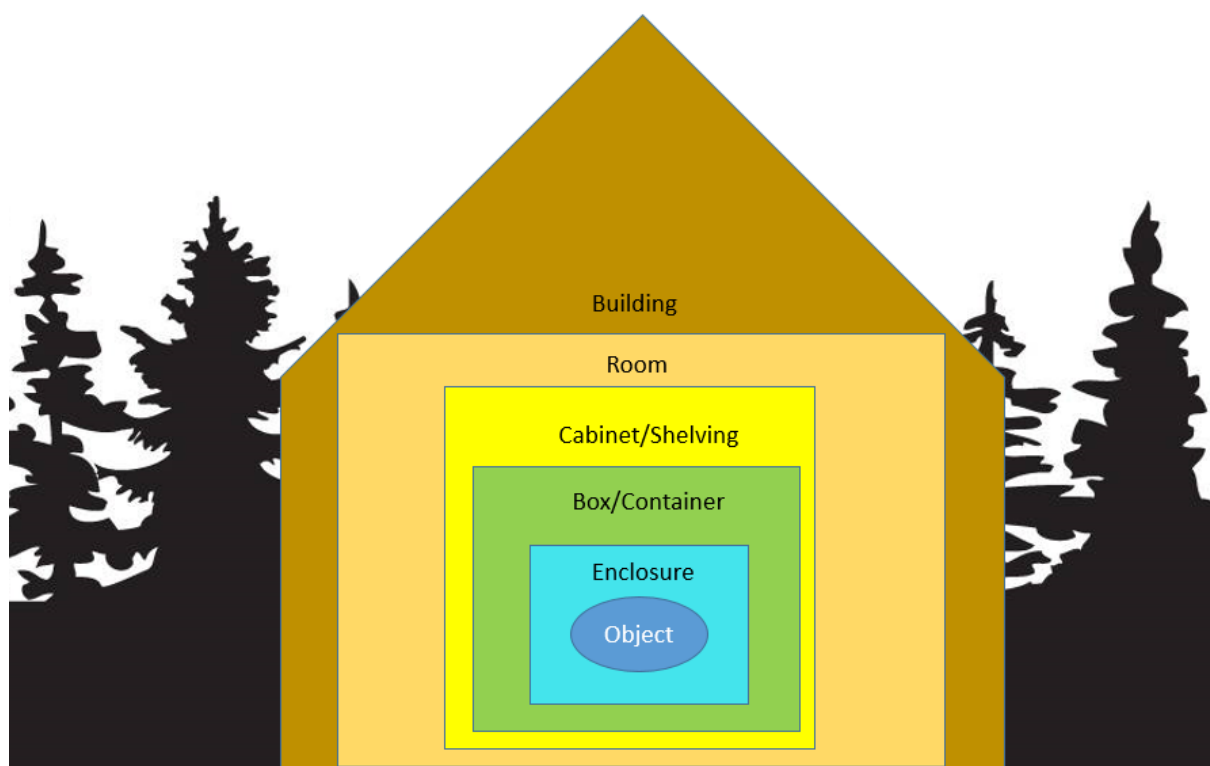


Figure 32 . - Layers of protection around an object, adapted from Hill-Kipling, M. 2021. *Layers of Museum Storage*

The Canadian Institute for Conservation simplifies this by suggesting preventative actions can be taken at three levels in the institution, namely the building, the enclosure, and the object and if these levels are followed, it will slow down loss caused by any of the ten agents of deterioration (CCI, 2020).

3.3.2 The physical building features

Here the duty is to make sure that a building is fit for purpose. Evaluating the environment immediately surrounding the building can assist with preventing risks. Large trees for

example can drop leaves into gutters and downpipes, blocking them and causing water to fill up and spread into the roof structure and eventually the building. The exterior of the building envelope itself needs to then be checked for impermeability including roofs, pipes, and a drainage system that will effectively remove water from the roof and divert it away from the building to prevent flooding. The building should also be evaluated as to how much pollutants it lets in through open windows, doors, vents and ventilation systems. The sturdiness of the building should also be evaluated regularly, whilst fire prevention measures such as compartmentalising using fire doors ensures that if a fire breaks, out it will not be able to spread through the entire building. A stable building should be able to withstand all ten of the agents of deterioration.

3.3.3 The enclosures (cabinets, display cases, boxes in storage)

These are the furniture, boxes and bags that enclose the items in your collection. It can be anything from boxes to shelves and drawers. Museum-grade enclosures are expensive, and many institutions use enclosures such as envelopes, boxes and polyethylene-based zip-lock bags. Whenever they are being used regular monitoring should be done to ensure the selected approach is appropriate, working optimally and not causing harm. For example, plastic locks in heat and condensation could occur inside it and cause water damage to everything stored inside it. Boxes and paper envelopes become breeding ground for mould. Shelving systems and cabinets should be checked for strength and balance and should be kept clean and orderly (CCI, 2020).

3.4 Conclusion

By understanding the so-called agents of deterioration, their appearance and origin it is possible to follow a preventive conservation strategy that identifies and minimises risks present in an institutional environment, whether this is a gallery, library, archive or museum. From this section, I will now focus on how preventive conservation is carried out in the three case study institutions which house photographic collections, and question whether preventive conservation as a risk management strategy is understood and how it is implemented.

4. EXPLORING SOUTH AFRICA'S PHOTOGRAPHIC HERITAGE THROUGH CASE STUDIES AND A SURVEY

4.1 Introduction

As outlined in the introductory chapter to this research, the focus was to identify the main challenges that exist in the conservation of South African photography, why these challenges exist and how these can be resolved. The methodology used included a questionnaire-based survey and a selection of three case study collections. The questionnaire was circulated amongst membership of the South African Museums Association (SAMA), and the same questions were posed to the three case study collections for consistency and comparative purposes. The case studies were selected based on their size and notoriety within South Africa namely the Bensusan Museum of Photography (housed at Museum Africa in Johannesburg), The Duggan-Cronin Gallery (which falls under the auspices of the McGregor Museum) and the Rashid Lombard Collection which is destined for inclusion in the University of the Western Cape (UWC) Archives. The research is interpreted in a qualitative approach which allows for concepts to be explored and analysed as opposed to quantitative, which deals with numerical analysis (Streefkerk, 2022). Chapter 4 will thus present the data gathered through the questionnaire on a question-by-question basis. This will allow initial observations on each question. The chapter then moves to review the three selected case studies, comparing each against the data obtained from the survey. The chapter concludes by summarising the findings, which will then inform the proposed local solutions in chapter 5.

4.2. The questionnaire-based survey

Looking exclusively at the three case studies is quite limiting and may not be representative of the state of preservation of photographic collections in South Africa, particularly with smaller institutions, or those with fewer resources. As such, in addition to looking at the three case studies mentioned above, I reached out to the South African Museums Association to

circulate a questionnaire to their members. The South African Museums Association also known as SAMA is a non-profit organization established in 1936 which aims to promote and protect the profession of Museology in South Africa. It also aims to bring and create knowledge about South Africa's cultural and natural heritage (Anon, 2020). SAMA has over 300 members throughout South Africa, including individual and institutional members. Their website lists 162 individual museums, galleries, libraries, archives, heritage centres and schools.

Analysis of the questionnaire response assists in answering conservation questions as well as to provide a better understanding of the various collections holdings. Answers from the questionnaire are used to identify shared problematic areas and causes. The data collected in both the survey and supplemented by interviews with custodians helps in developing different archival techniques which are locally appropriate. Data is analysed and interpreted through datagrams and pie charts. In Chapter One I stated why the three above mentioned institutions were targeted. Not only do they house different collections, but I believe that they have different techniques which they use for archiving. For example, The Rashid Lombard collection has started digitising some of their collection, Museum Africa/ Bensusan Museum has a collection that not only consists of photographs but photographic equipment as well. The Duggan-Cronin has some of the earliest photographs taken in South Africa.

4.3. Data dissemination

The survey was circulated through SAMA to their membership and kept open for two weeks to give potential participants time to respond. Clear limitations to this approach included the voluntary nature of the survey, there was no way of predicting if any responses would be received. 16 institutions participated in the survey, including the three case studies and the following data is based on their answers. Interestingly this included large and small collections in both the public and private domain.

In alphabetical order, the institutions that participated included (further information on each collection can be found in Appendix G):

- Amazwi South African Museum of Literature, Grahamstown.

- Brenthurst Library, Johannesburg.
- Comrades Marathon Association, Pietermaritzburg.
- Dala Indyebo projects, Centurion, Pretoria
- East London Museum, East London.
- Erfenisstichting Archives, Pretoria.
- Holocaust & Genocide Centre, Cape Town (HGC- CT)
- Holocaust & Genocide Centre, Durban (HGC-DBN)
- Holocaust & Genocide Centre, Johannesburg (HGC-JHB)
- Mogale City Museum, Krugersdorp.
- South African Naval Museum, Simonstown.
- Talana Museum, Dundee.
- University of Pretoria (UP) Mapungubwe Archives, Pretoria.
- University of Pretoria (UP) Museum Archives, Pretoria.

Participants were asked to identify their role with regards to the collection. Knowing the person's role suggests different levels of subject specialism with regards to photographic materials. Out of the 16 institutions that responded only 3 institutions had technical conservators¹ answering the questionnaire. As noted in the introduction chapter of this research, there are few trained conservators in South Africa. Many who have the job title of 'conservator' function more as collection caretakers and conservation technicians versed in the approaches and techniques for preventive conservation, rather than fully understanding the material science and chemical interactions of the materials they work with.

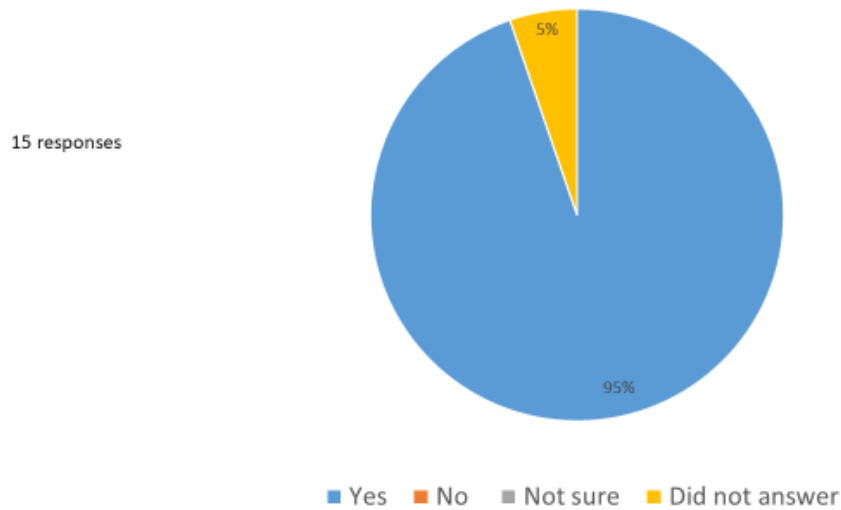
4.4. Survey results

The following section outlines the results of the survey by looking at each survey question in turn, outlining the number of responses to the online questionnaire and illustrating these answers visually through graphs and charts.

¹ According to Purdue University a technical conservator is someone who should have the technical skills to manage, preserve, treat and conserve works according to their requirements. Conservator should also be able to aid or minimize deterioration in order to have objects in their original state or in a state where they are stable enough to use. Conservators should always keep in mind that whichever method they use to treat their objects should be reversible (Purdue University, 2021).

Question 1: Does your institution have photographic materials such as photographic equipment e.g.: camera, photographic paper, film, photographs in the collections?

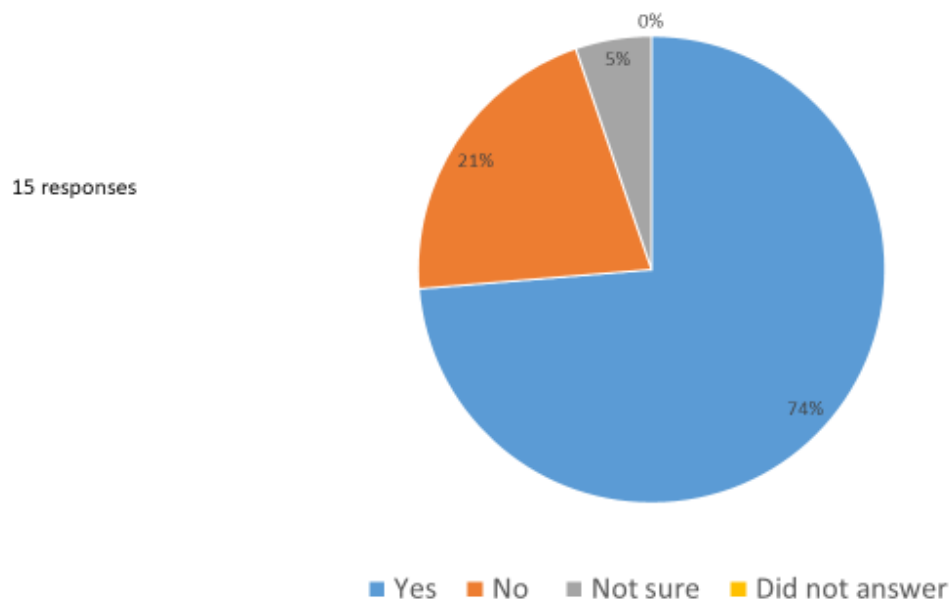
Graph 1 – Institutions which collect photographic materials



All survey respondents indicated that indeed this is the case, with the exception of the Mapungubwe Archives at the University of Pretoria who did not answer question 1, which may be an omission, as they do have photographs in the collections. This served as an advantage as all of the institutions that took part in the survey could be able to answer most questions.

Question 2: Does your institution actively collect photographic materials such as photographic equipment e.g.: camera, photographic paper, film, photographs? (Select which is appropriate)

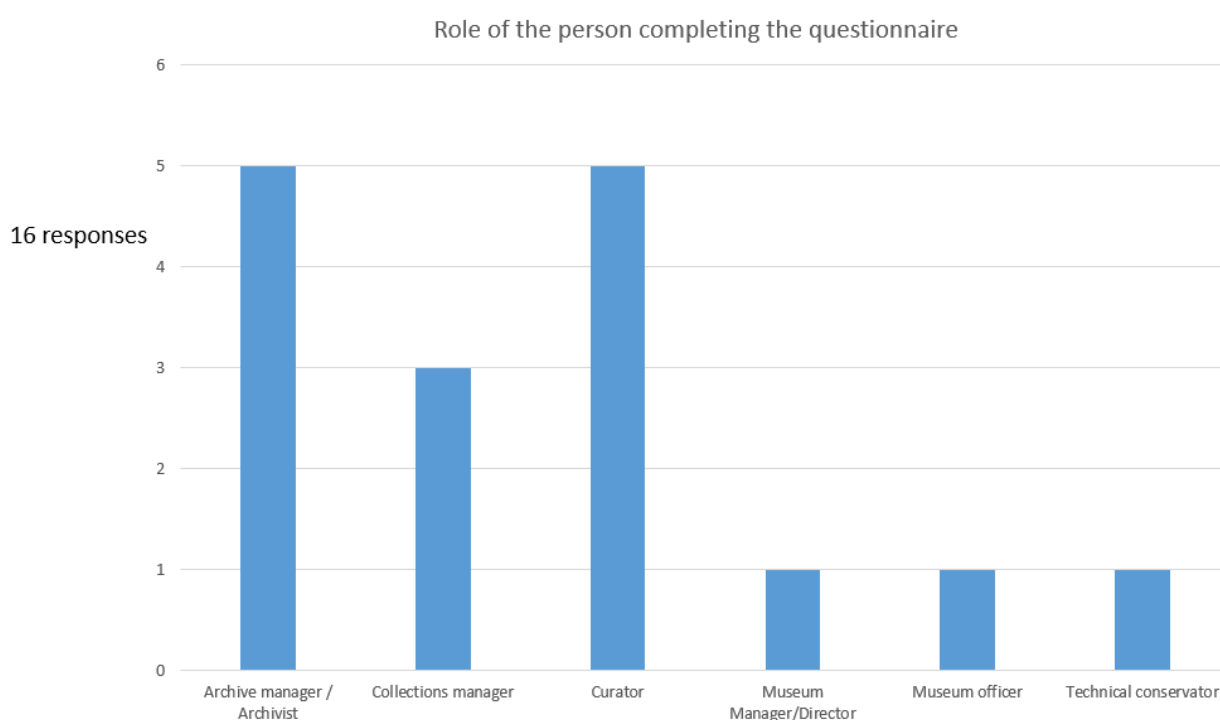
Graph 2 – Institutions which actively collect photographic materials



Of the 15 institutions that answered the second question, 14 answered yes (74%), 4 answered no (21%), and only 1 institution was unsure if they were still actively collecting. Responses to question 2 suggests that most of the respondents who participated are actively growing their collections. If there were certain concerns that are currently not addressed, those concerns are likely to get bigger. For example if there is currently a lack of storage that concern will only get bigger as the collection grows, and overcrowding in storage increases the likelihood of damage and deterioration if storage condition are poor, leading to a proportionately greater loss of photographic heritage in the event of a disaster.

Question 3: Please briefly describe who is responsible for the preventative conservation/care of your collection and their training or experience.

Graph 3 – Person responsible for the conservation/care of the collection and their training



Question 3 was answered by 16 institutions, the East London Museum did not answer. The dominant answer was that the curator or in house archivist is responsible for the preventative care and conservation at the institution. The following institutions are the exceptions, including the Johannesburg Holocaust and Genocide Centre where the Collections Manager has a Masters in Arts (MA) in Museums and galleries, and the MA included a course in preventative conservation. All remedial treatments are outsourced where necessary. Likewise, their counterpart at the Durban Holocaust and Genocide Centre consults with experts for their conservation work; and the Bergtheil Museum archivist indicated attending preventative conservation workshops.

The Brenthurst Library is the only one of the institutions that answered that they have an in-house conservation studio and bindery and encourage their staff to attend professional development opportunities that are relevant to their collections, including book, paper and photographic conservation. The Brenthurst Library also have a trained book and paper conservator on staff.

The Mapungubwe Archive from the University of Pretoria has access to the UP Museum in-house conservation services and lab and the collection itself has an archivist. The Mapungubwe Archive personnel are trained in preventative conservation, and there is UP Museum staff who is trained to carry out interventive conservation of paper-based objects.

Considering that there is very limited conservation training in South Africa, it is no surprise that there is no dedicated conservation staff who has expertise in photographic collections and the curators fulfil multiple roles in their institutions. Encouragingly where resources permit, some of the institutions have promoted in-house conservation facilities and staff training. This suggests there is scope for additional training in the care of photographic collections.

Question 4: If known, please select the types of objects in your collection from the list below (select all that apply)

Graph 4 – Types of objects in the photographic collections surveyed

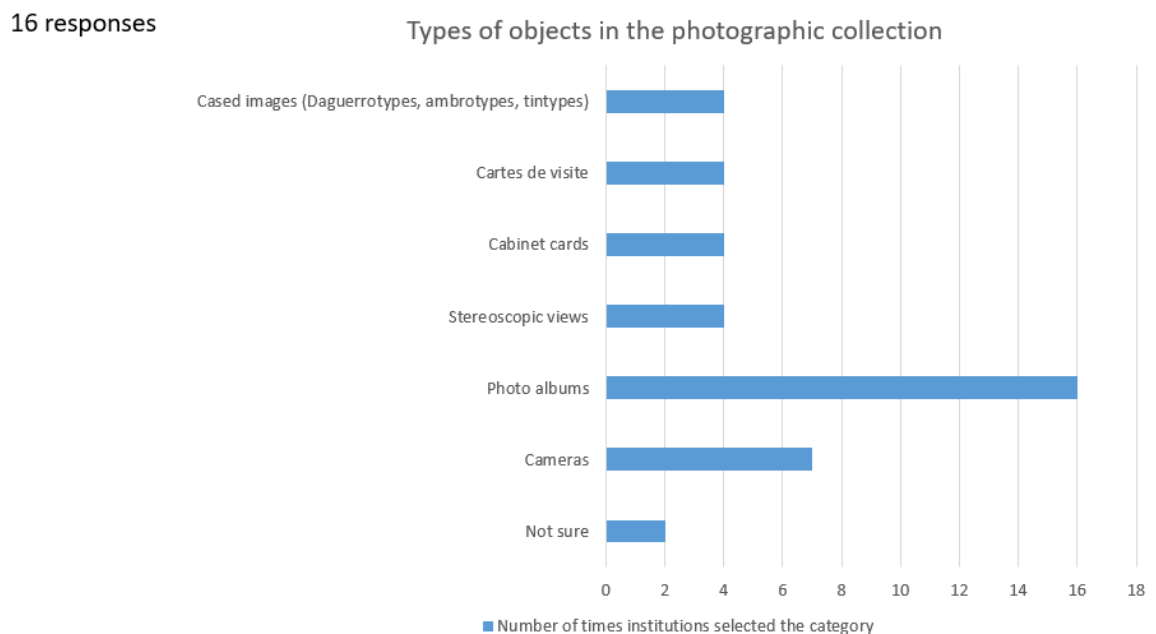
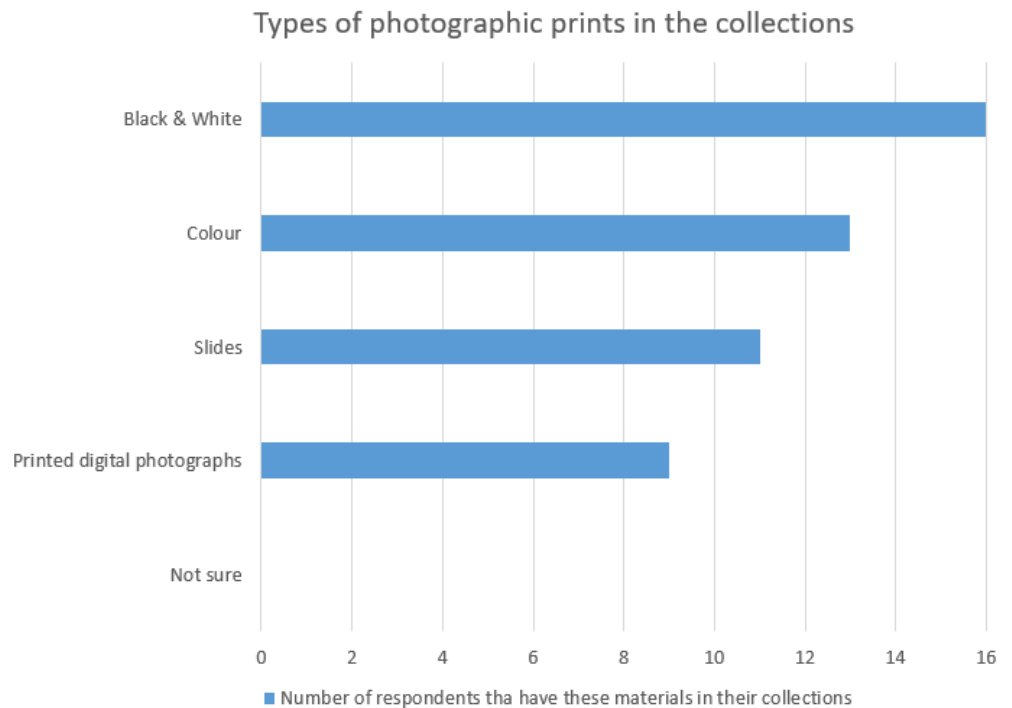


Photo albums were by far the most prevalent photographic object in collections surveyed with all 16 respondents indicated having photo albums in their collection. The Durban HGC indicated having photo albums and selecting not sure in addition, suggesting that other than photo albums they are uncertain as to what other materials are in the collection, whilst the Johannesburg HGC indicated having photo albums, cameras and cartes-de-visite, but not sure if there were other materials. Caring for photo albums requires special attention as they contain not only the photographic material but paper and board materials which have different requirements. Observations suggests that photographic collections go beyond photographic prints and negatives and any possible training opportunities also need to include mixed media objects such as photo albums.

Question 5: If known, please select the types of photographs in your photographic collection from the list below:

Graph 5 – Types of photographs in the collections surveyed

16 respondents

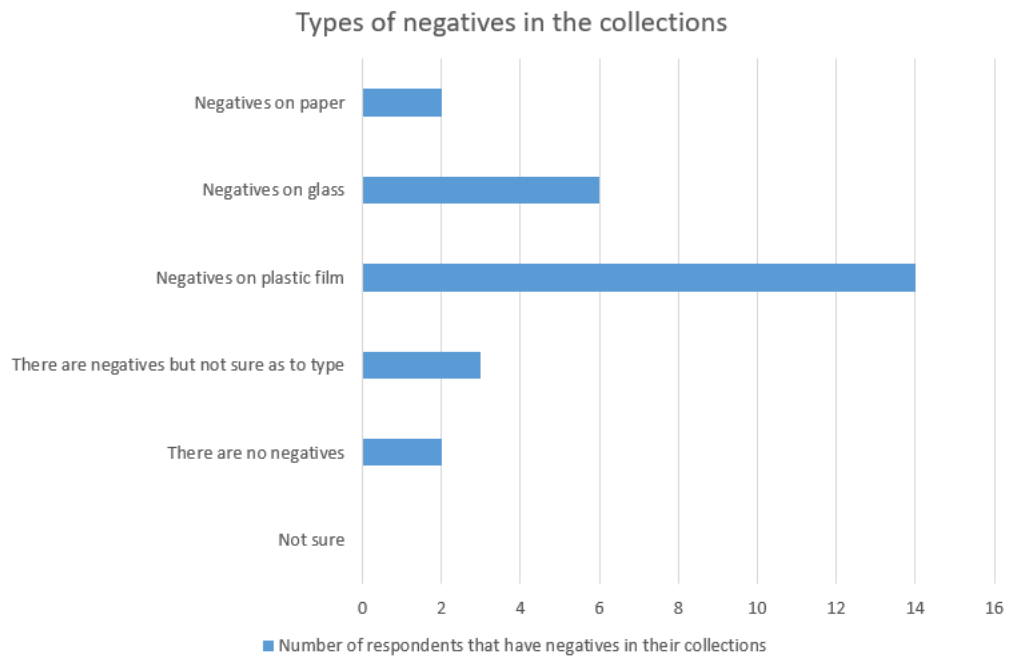


All respondents surveyed indicated having black and white photographic prints (100%), most also had colour prints, slides and to a lesser extent printed digital photographs. Slides were used in 1935 it makes sense that most institution should have less of these type of photographic print as it was not really used in South Africa at the time. Answers to this question suggests that for most institutions' collections have a wide range of different photographic materials to look after.

Question 6: If known, please select the types of negatives in your photographic collection from the list below (select all that apply).

Graph 6 – Types of negatives in the collections surveyed

16 responses

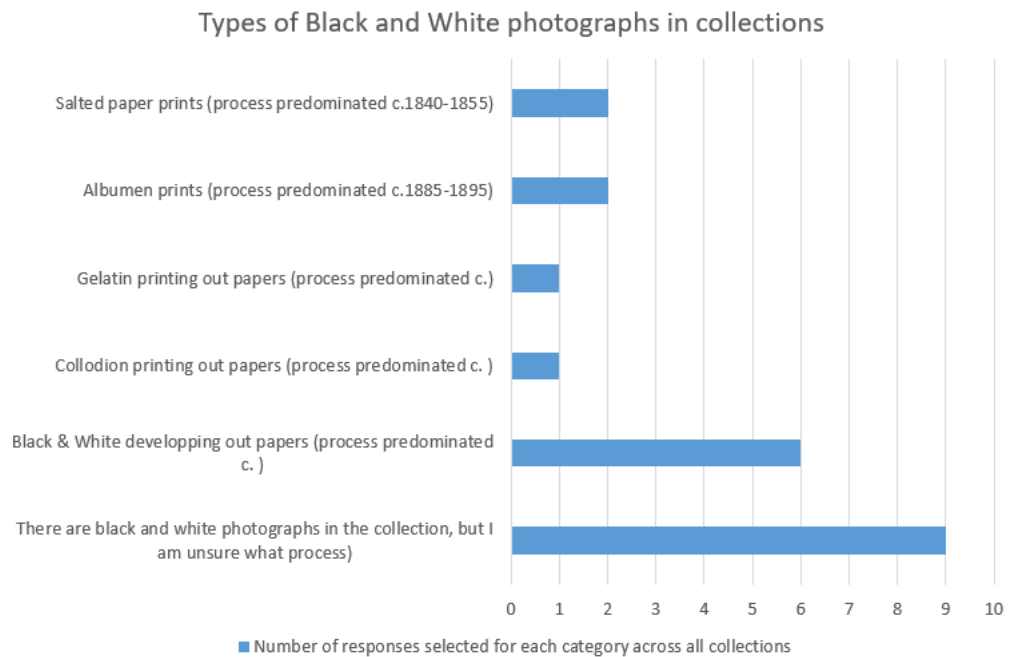


In the responses to questions 5 and 6 none of the respondents selected ‘not sure’ which suggest that the respondents know what type of photographs and negatives they have in their collections. In question 6 it appears that negatives on plastic film comprise the largest number of negative types in collection with 14 out of 16 respondents selecting these, followed by glass plate negatives with 6 out of 16 responses. Three respondents indicated that they are unsure about what types of negatives are in the collections but also selecting negatives on plastic film, which suggests that they may be aware that there are different types of negatives on plastic films but are unsure if these are cellulose nitrate, cellulose acetate, and polyester. As all of these have different ageing properties and storage requirements as outlined in chapter 5, it would be important to tell the difference.

Question 7: If known, please select the types of black and white photographs in your collection from the list below (select all that apply)

Graph 7 – Types of black and white photographs in the collections surveyed

15 responses

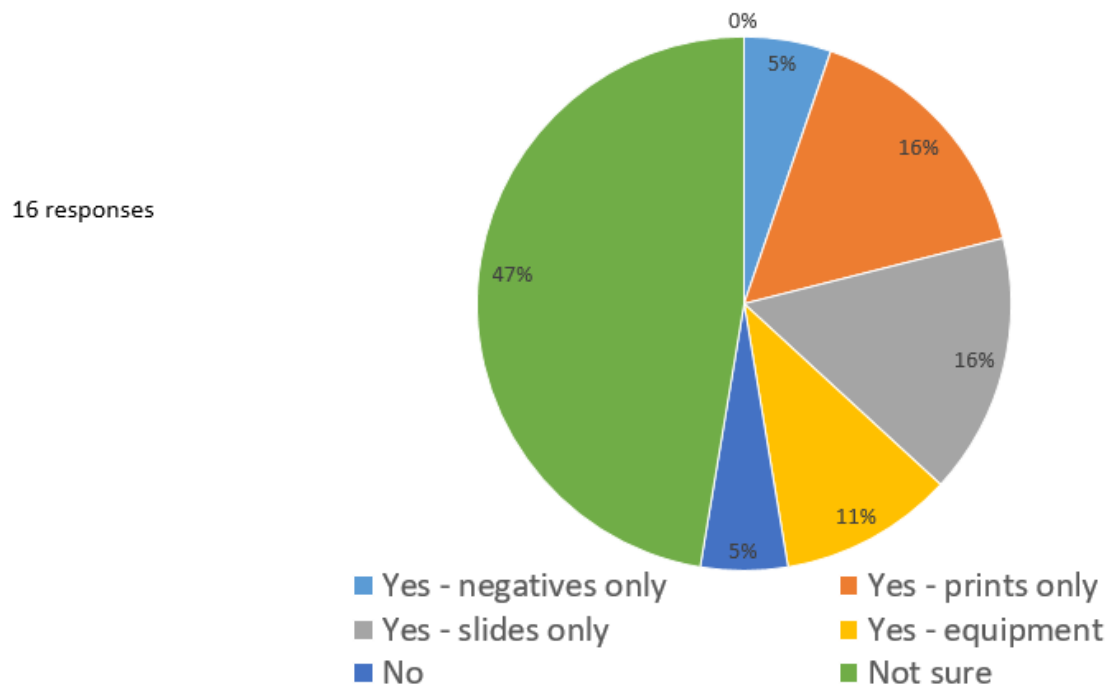


Question 7 was quite technical in identifying historic processes. One respondent, namely the Genadendal Mission Museum did not answer the question. Most of the responses, namely 10 out of 15 suggest that the respondents know there are black and white photographs in the collection, but they are unsure as to which processes were used. The other responses may have been guided by the addition of the date ranges or museum records which indicate the processes used. The diverse answers show that there may be limited in-depth understanding of the different processes and how to identify them. The identification of black and white processes is more important in terms of historical interpretation than with regards to conservation as these different paper-based prints all have similar requirements with regards to temperature and humidity.

Question 8: If possible, do you know the extent of your collection’s photographic holdings. i.e. roughly how many items in your collection?

Graph 8 – Types of photographic materials in the collections surveyed

Extent of the collections photographic holdings



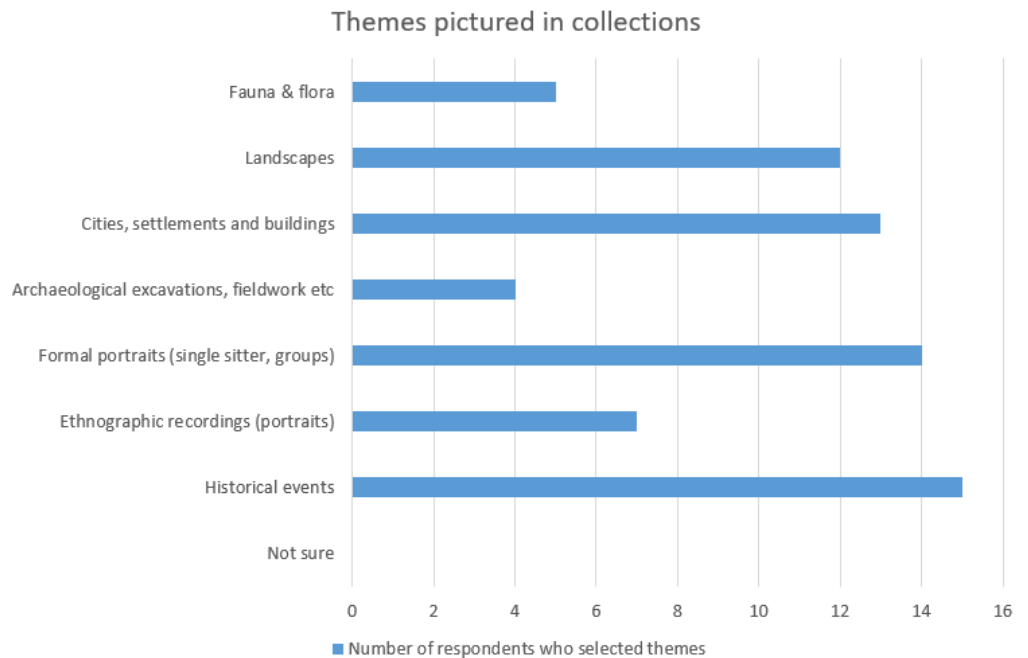
Although the collections surveyed are quite extensive, exact numbers are not available for all the institutions surveyed. Most institutions knew the total of parts of their collections only, for example negatives only (UP Museum Archives, Mapungubwe Archives), prints and slides only (Durban HGC, Cape Town HGC, Talana Museum) and only Bergentheil Museum knew the total number of pieces of photographic equipment. Of the 16 responses, 9 respondents (47%) were not sure as to their total holdings, whilst the Comrades Marathon Association had no idea and answered ‘no’.

Some of the participants emailed through their total number of items in the collection including the Amazwi South African Museum of Literature who offered an amount of 9600 items, and the Brenthurst Library which estimated its holdings at 10,000 items. According to Meyer (2005:35) the South African naval Museum included 10 000 images of mixed subject matter. The collections are quite vast and as most institutions indicated they are still actively collecting, these figures have surely grown since Meyer’s publication of the article 17 years ago which suggests that resources required to look after these collections will increase as the collections do, and so planning for sufficient storage space and materials needs to be factored in.

Question 9: What themes are illustrated in your photographs? (Please select all that apply)

Graph 9 – Themes represented in the collections surveyed

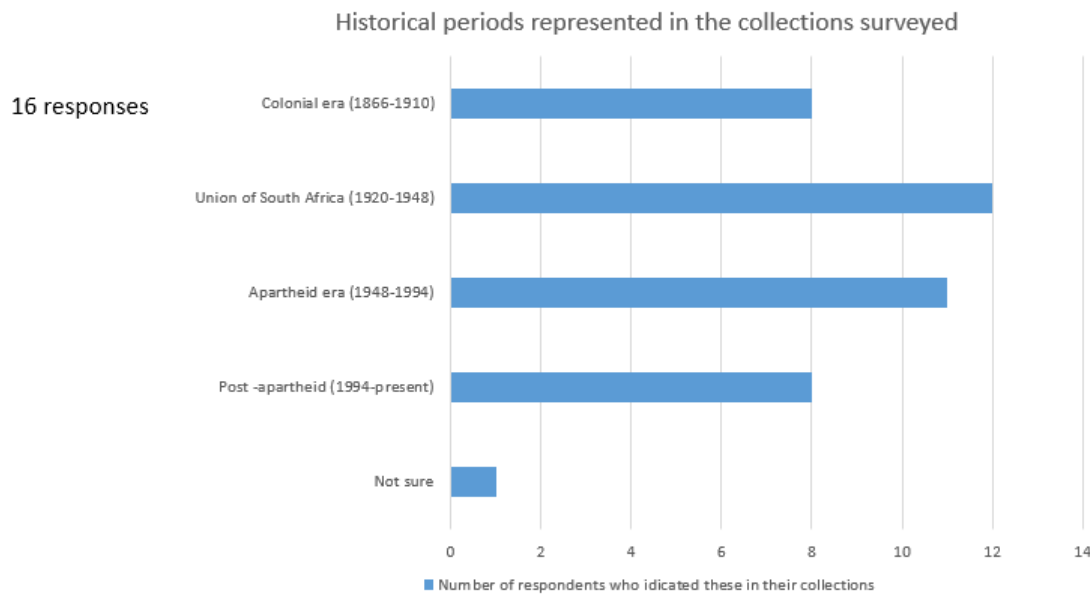
16 responses



The answers to question 9 indicate that the photographic collections are not focused on a single theme, hence there is more than a single response from respondents. Historical events form the clear majority in terms of representation in different collections, interestingly only the UP Museum Archives indicated they didn't have any historical events pictured in the archives. Cities and settlements are well represented following historical events. Formal portraits are also well documented as older photographs were taken in photographic studios. Knowing that the collections depict different events, people and contexts allows for a more holistic view of South Africa's past.

Question 10: Which parts of South African cultural history would you say your photographic collection represents? (Please select all that apply).

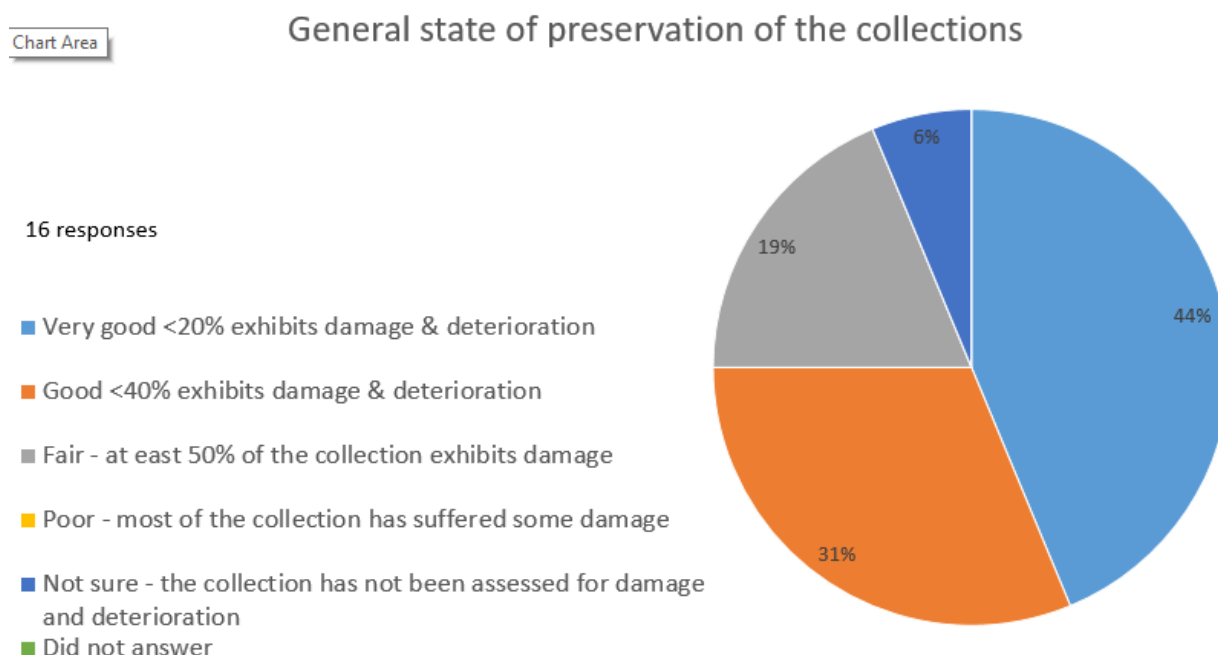
Graph 10 – Historical periods represented in the collections surveyed



The Union of South Africa and the apartheid era appear to be the most represented time periods in the collections surveyed, whilst the colonial era is the least represented. This is quite logical as the camera was still being introduced to South Africa during this era as discussed in chapter 2. In addition, the time period of the Union of South Africa from the 1920's and apartheid era extending to the mid 1990's mark a time of rapid change, growth and industrialisation, global events, globalization and political unrest in South Africa mirrored in the development and history of the world stage, where there was a greater need for information exchange, publishing and publicising newsworthy events and the general proliferation of images. Perhaps if the survey had been answered by older archives such as the Western Cape Archives, responses would have included more on the colonial era.

Question 11: How would you rate the general state of preservation of your collection? (Damage is understood as any of the following: folds, tears, foxing, mould growth, water damage, fire damage)

Graph 11 – General state of preservation of the collections surveyed

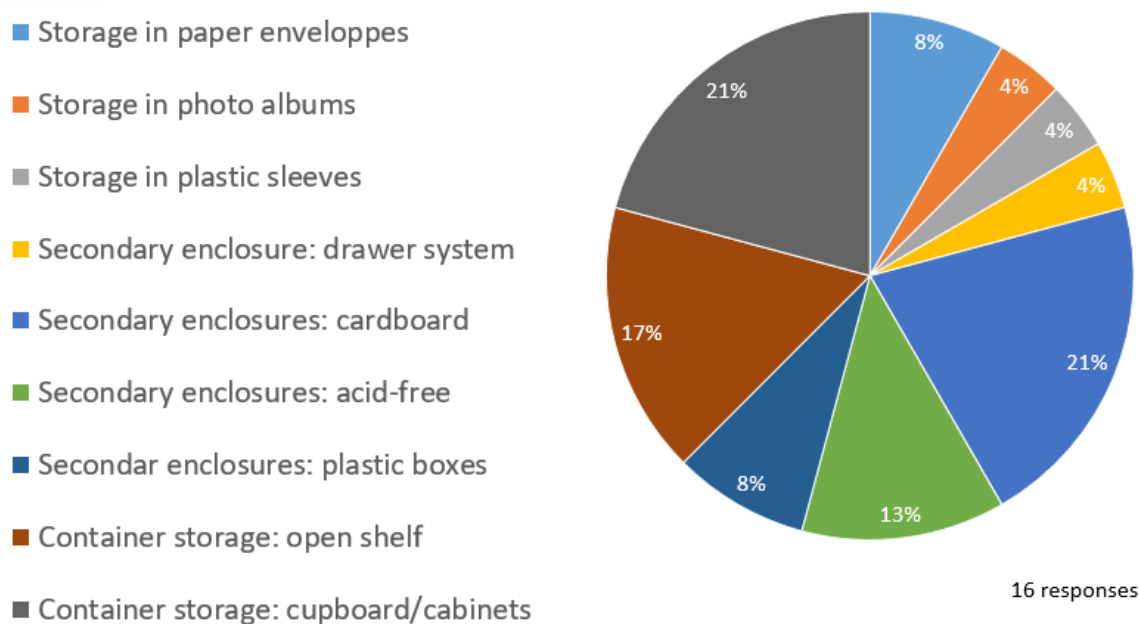


The clear majority of the 16 respondents, namely 7 (44%) suggested that their collections are in a good state with less than 20% of the collection exhibiting damage; followed by 5 collections (31%) stated as being in a good condition with less than 40% of the collection exhibiting damage, and three respondents (19%) suggesting that the collections were in a fair condition with at least half of the collection exhibiting some form of damage. One of the respondents said they were not sure as to the extent of damage if any as the collection had not been assessed for damage and deterioration. While this may seem to be a good sign that photographic collections are well looked after, it is important to keep in mind two important factors which may bias these results, the first being a lack of objectivity with regards to one's own collection, and the absence of a comparative collection or standards to categorise damage.

As few of the respondents are actually qualified conservators, their assessment of damage may differ to that of a trained conservator, and particularly a conservator specialising in photographic collections. It does however give one a sense that the collection caretakers do have an idea to look out for damage and deterioration, which suggests an understanding of preventive conservation.

Question 12: Please explain where and how your photographs are stored at your institution for example in the basement on shelves in enclosed boxes.

Graph 12 – Types of storage methods used in the collections surveyed

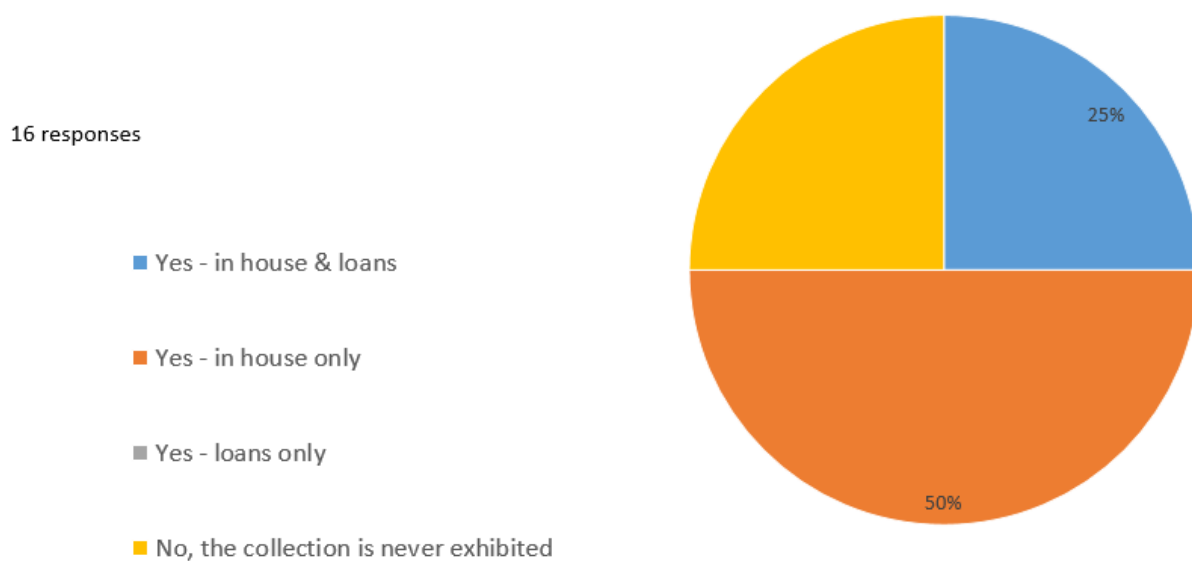


The answers to question 12 suggest that most of the respondents understand the basic principles of preventive conservation and photographs are stored away from direct sunlight and in climate controlled areas in the various institutions. Most institutions follow standard archiving techniques but few use acid free storage materials and boxes, cupboards and zip lock plastic bags are still the norm. This is likely due to questions of availability of appropriate storage materials and limited resources. The Genadendal Mission Museum did not answer the question, and the remainder of the collections surveyed exhibited a wide range of storage methods, some more appropriate than others including: photo albums, paper envelopes, plastic sleeves, cardboard boxes, cabinets and drawer systems.

These storage methods may not all be appropriate, but having photographs in layered enclosures in sleeves or envelopes placed within boxes on shelves, or in storage cabinets, creates a microclimate system of buffering against temperature and humidity fluctuations in addition to keeping light and particulate contaminants away. Some of the enclosures mentioned could however be potentially harmful over time and therefore circulating appropriate references, or targeted training on storage of photographic collections and appropriate archival storage materials may be beneficial.

Question 13: Is your collection used for exhibition, either in house or loans? (select which is appropriate)

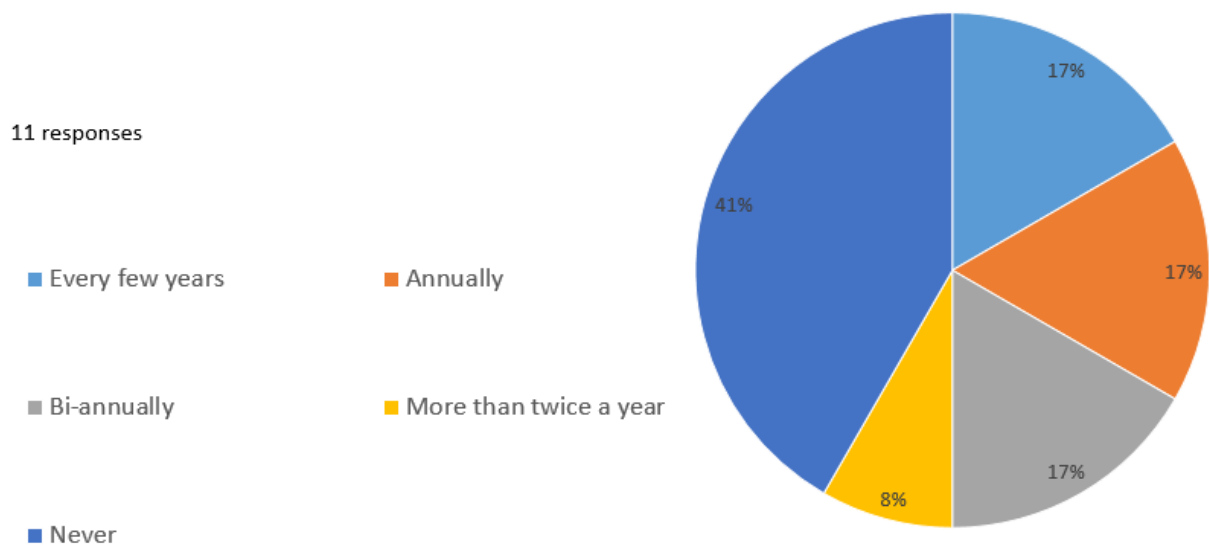
Graph 13 – Use of the collection for in-house or loan exhibition



Most of the collections are used for exhibition and some loans, with a very high percentage of collections that are never exhibited. 8 of the 16 respondents (50%) answered yes to using in-house exhibitions or loans, 4 respondents (25%) said they exhibit their photographs in house only and 4 respondents (25%) indicated that they never exhibit their collections. When a collection is being used for exhibitions, it is important to be aware of potential damage that can occur whilst exhibiting the collection such as light fading and dust collection being aware of potential danger will give you the means of blocking it out. When a collection is going on loan it is recommended that guidelines of use, handling and care from its original institution should be sent out with it, to make sure that no damage occurs to the photograph whilst it is on loan. On another note, it is quite worrying that 25% of the respondents indicated they do not use their collection, as one could argue as to the value of the collection if it is unused. This could place these collections at particular risk if scant resources are allocated to a collection with little purpose, it becomes difficult to motivate for keeping the collection, let alone upgrading storage, storage enclosures or any improvements.

Question 14: If you answered YES above, how often would you say you send items out for exhibition?

Graph 14 – Frequency of exhibitions



Only 14 respondents answered question 14, however this includes the Mapungubwe Archive and UP Museums who indicated the question was not relevant to them, suggesting that they do not loan items.

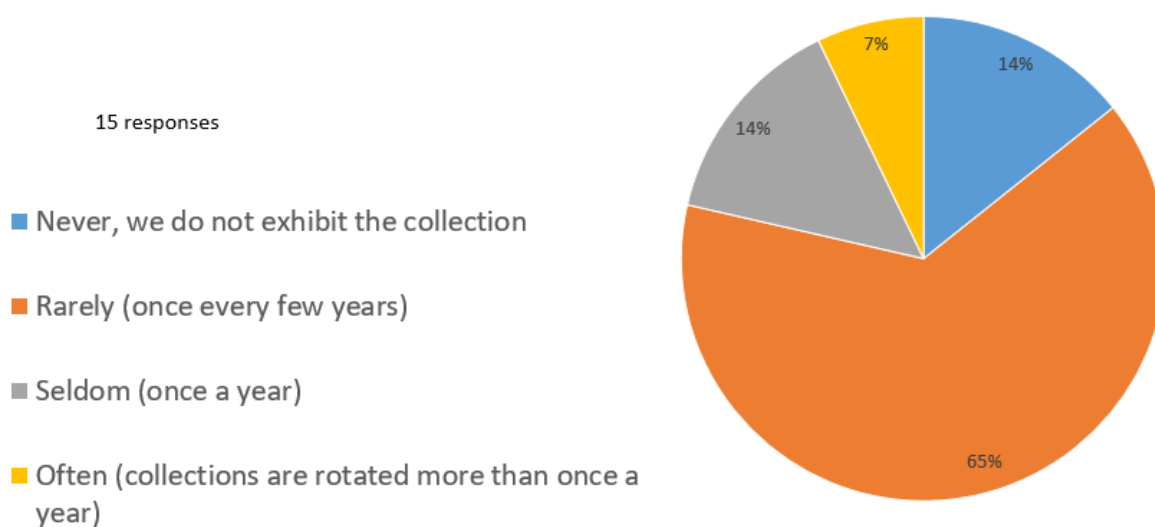
The Brenthurst Library on the other hand indicated that photographic items are used regularly for exhibitions, as did the Amazwi SA Museum of Literature and Talana Museum who have photographs as part of their displays if these are applicable to their exhibition. The South African Naval Museum have photographs on permanent exhibition and are thus in the process of scanning these to replace the original with a reproduction for display.

None of the other institution indicated exhibiting their photographic items, however they do loans on request, including the Bergtheil Museum which is a part of a group of museums (about one annually within the group), the Johannesburg and Cape Town Holocaust & Genocide Centres (the former fulfils one or two requests annually, whilst the latter has loaned items on three occasions in the past decade), East London Museum and Brenthurst Library all indicated that they usually send reproductions for loan requests.

The responses to questions 13 and 14 suggest that for this group of participating institutions exhibition of their photographic collections is not their core business. Most of the institutions focus on in-house use of their photographic collections. The Erfenisstichting Archives for example suggest that they only use their photographs every few years, and mostly for marketing purposes.

Question 15: If your collection is exhibited in-house, how often is your collection rotated (Please select applicable answer from the list)?

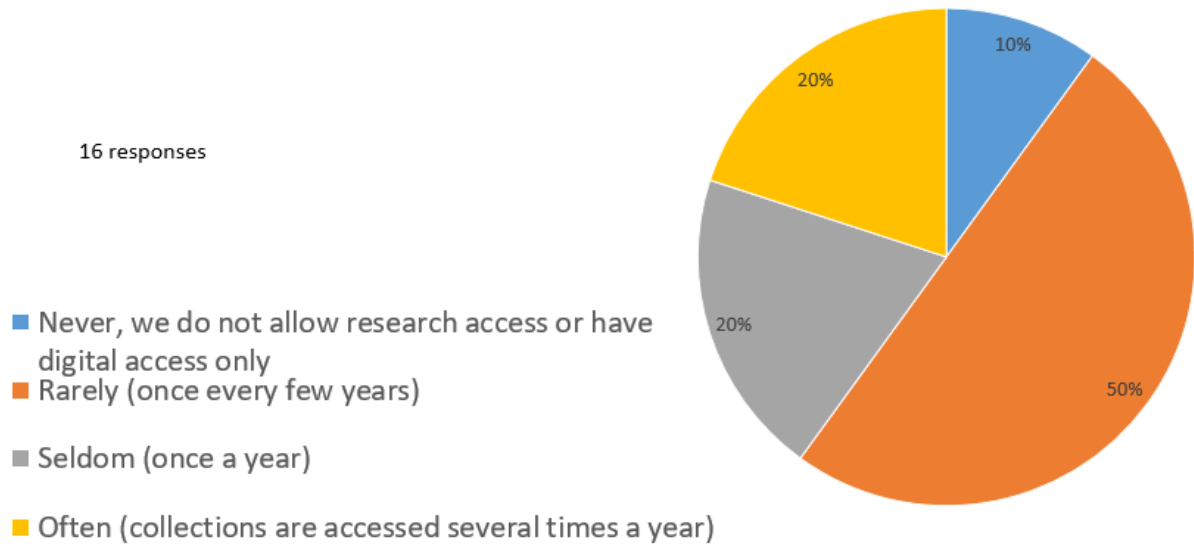
Graph 15 – Rotation of the collection on exhibition



The France museums recommend that more fragile artworks should be rotated every four months especially for collections that are sensitive to light in order to minimise the irreversible effects of light damage (France Museums). As most institutions surveyed, namely 9 of the 15 respondents (65%) said that their collections rarely go on exhibition, this is not much of a concern. 1 of the respondents (7%) said that their items from their collection go on exhibition often and as a result the collection is rotated more than once a year, which is hopefully sufficient to not engender too much damage. The importance of limiting exhibition time and rotating items, with long ‘rest periods’ between exhibitions, or rather using reproduction images for more permanent displays should be emphasised for institutions with photographic collections. Many museums exhibit photographs as part of mixed displays such as natural history museums or military museums and as the focus of their mandates is one other more durable materials, photographs are often displayed to illustrate permanent exhibitions and their preservation is often an afterthought.

Question 16: If your collection is accessed for research purposes, how often do visitors come in:

Graph 16 – Frequency of access for research in the collections surveyed

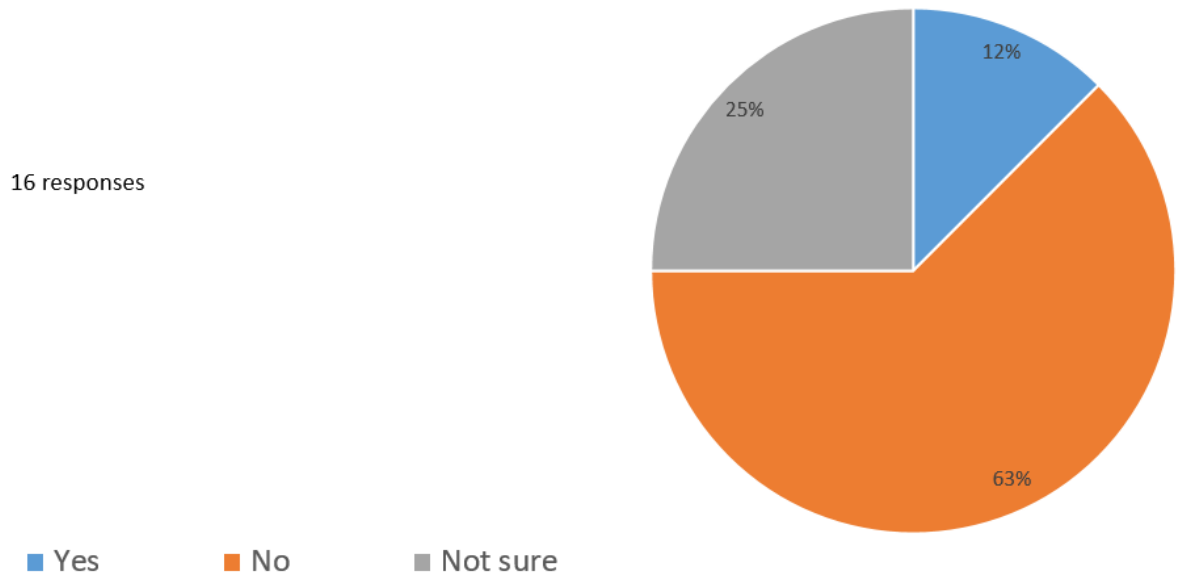


Half of the respondents answered that their collection is accessed once every few years for research purposes. Answers to question 16 suggest that research access is the main use of the photographic collections. Research access much like exhibitions can accelerate the rate of damage on photographs, albeit manifesting in different types of damage. Where photographs on exhibition are likely to suffer light damage, and exposure to atmospheric pollutants, photographs that are handled can additionally be exposed to contamination through touch and physical damage in terms of tears, creases, stains etc. from mishandling. The South African Naval Museum is the only institution that indicated that they only allow digital access for research. Interestingly the institutions that focussed on access through exhibitions were completely different to those that focussed on access through research avenues. The Naval Museum for example seldom rotates their photographs on exhibition and their collections are accessed several times a year for research, this is likewise the case at the Brenthurst Library, Bergtheil Museum.

Question 17: Are there guidelines in place for users (researchers and staff) as to how to handles photographs?

The majority of institutions surveyed indicated they have guidelines in place in question 17. Question 17 and 18 are linked, as further details were requested as part of question 18 and will thus be discussed under question 18.

Graph 17 – Availability of handling guidelines for collections surveyed

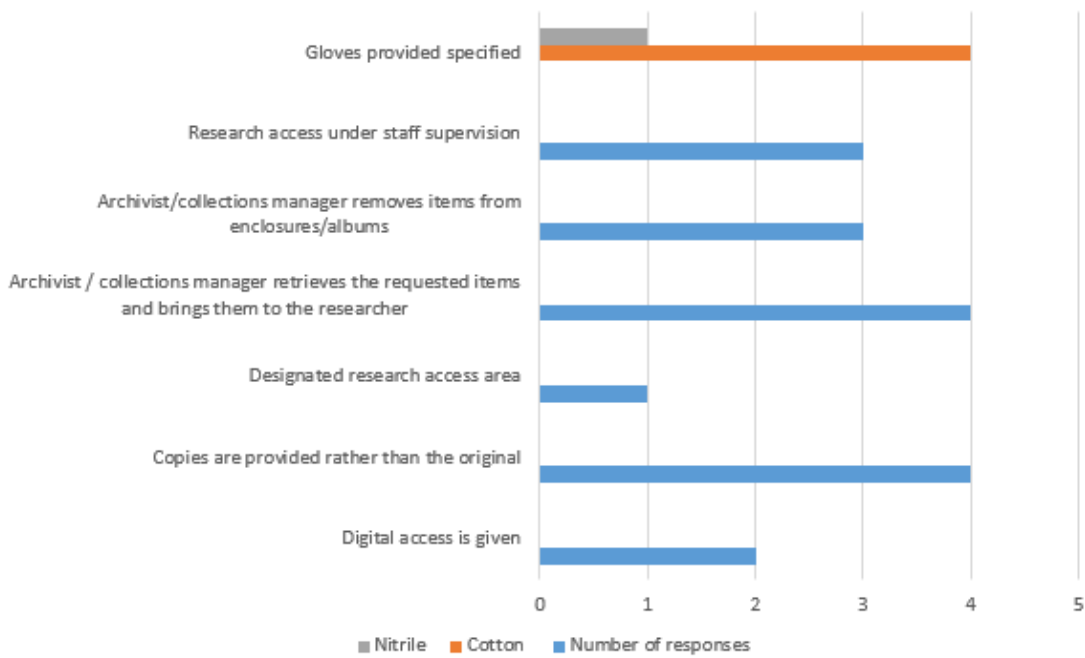


Question 18: If you answered YES above, please detail what those guidelines are. If you answered NO above, please explain why there are no guidelines.

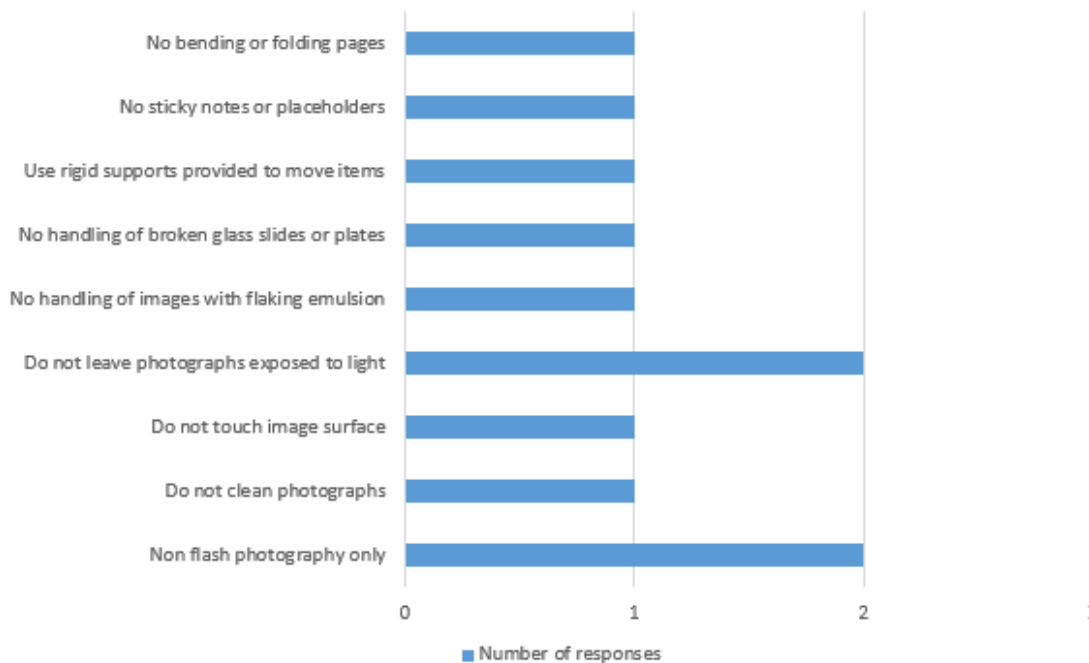
The two institutions who did not have guidelines in place, did not offer any reasoning as to why there was an absence of guidelines. Of the 14 remaining institutions who indicated having guidelines in place, 4 of these only mentioned having general guidelines or library guidelines but did not go into any specifics.

Guidelines discussed by the survey participants included general guidelines (see graph 18) on access and use of gloves, and then more specific guidelines on handling and working with the photographs (see graph 19). Only 3 participants offered specific guidelines aligned to an understanding of potential risks to photographs, namely, the East London Museum, the Bergtheil Museum and the Amazwi Museum of Literature. The South African Naval Museum have some guidelines but indicated that they “need to develop proper handling procedures including handling with gloves, the use of acid-free storage sleeves etc”.

Graph 18 – General guidelines listed by the participant collections



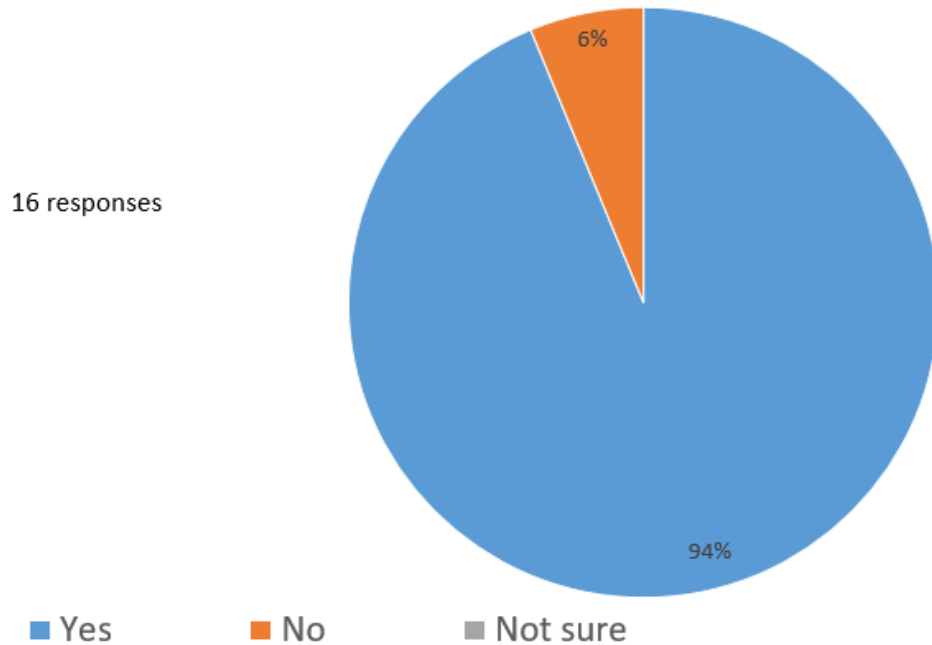
Graph 19 – Specific guidelines mentioned by some of the survey participants



As can be seen from the various responses listed above, there is a vast set of suggested handling practices which are dependent on the knowledge and understanding of the fragility of photographic materials by staff, but also suggests that research access to photographs in an appropriate manner is linked to available resources including presence of staff, staff time

commitments to assist, pre-planning of research access to allow for the reproduction of images etc.

Question 19: Have you, or are you in the process of digitizing your collection or parts thereof? (Select which is applicable)



15 of the respondents indicated that they were currently in the process of digitizing their collection or parts thereof. Considering how easily photographic images can be damaged through mishandling, it is encouraging to see many institutions are creating digital copies and surrogates. To better understand the motivation for and extent of digitization projects, techniques and prioritization, question 19 had several follow up questions and the various results will be discussed in question 19b, and questions 20 to 22.

Question 19b: If you answered yes above, please describe how much of your collection has been digitized?

The institutions indicated that they have started with digitization have a minimum of 10% of their holdings that has been digitized. Methods of digitization vary from cameras to scanning equipment.

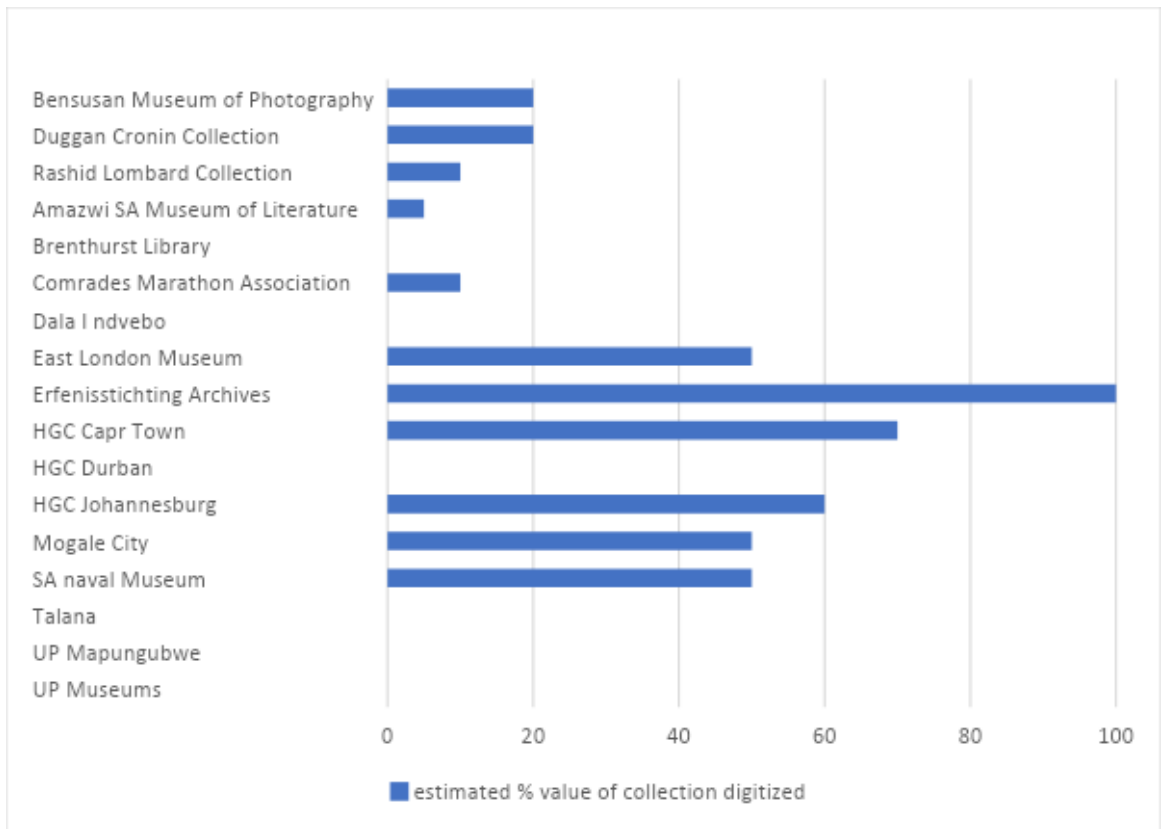
For the Amazwi South African Museum of Literature whose focus is not on photographic collections “[digitization is] Mainly ad hoc digitising as needed for queries” to fulfil research requests. The South African Naval Museum have digitized a large portion of their collection

starting with the negatives and state “Other printed photos are scanned occasionally, but only if needed for research or display purposes”.

For other institutions, digitization is only starting, the University of Pretoria Museums Archive for example stated that “Digitisation has only just begun, and so far only on an as-needed basis. So only a handful of photographs.”

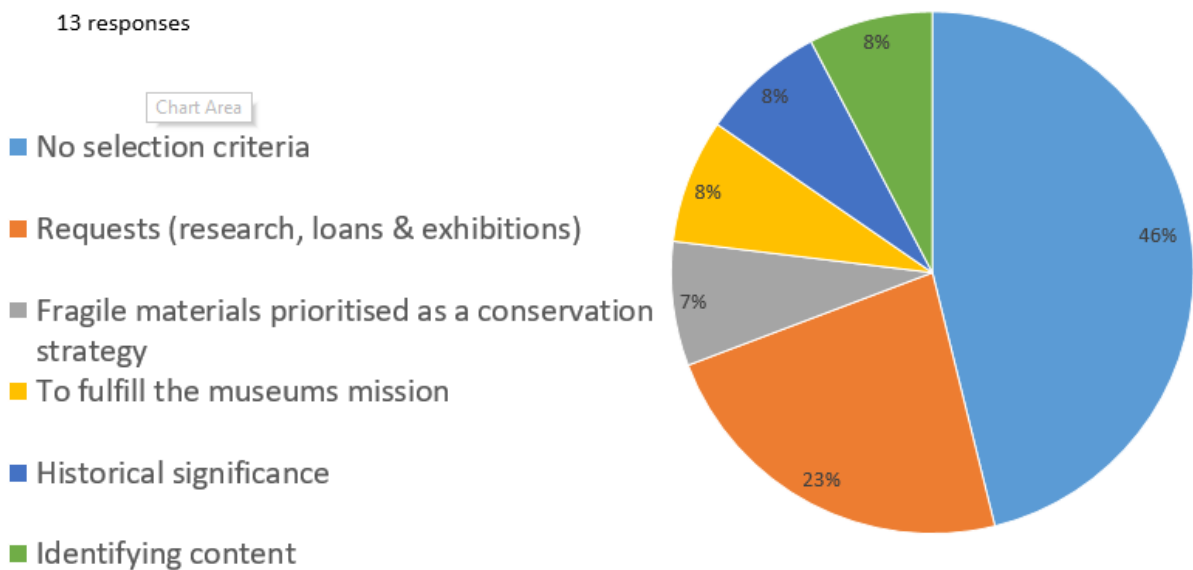
A few of the institutions surveyed also offered additional comments on how they digitise their collections, including the Durban Holocaust and Genocide Centre who use a “Digital camera and cell-phone camera. “It's not high end, but it provides a usable output, given our budget constraints.” Talana Museum also indicated they digitise their collections using “Scanning with handheld scanner for newspapers, a scan for documents and photographs as well”. Based on the responses received although digitisation features in the collections management and future planning of institutions, most respondents surveyed are only starting with digitisation. The focus is neither exclusively as a conservation strategy or to facilitate research access, but is done on an ad hoc basis as the need arises.

Graph 21 – Estimated % of the collection digitised in survey responses



Question 20: If you are digitizing are you selective on what gets digitized and what is your selection criteria as to what gets digitized.

Graph 22 – Criteria for digitization selection in collections surveyed

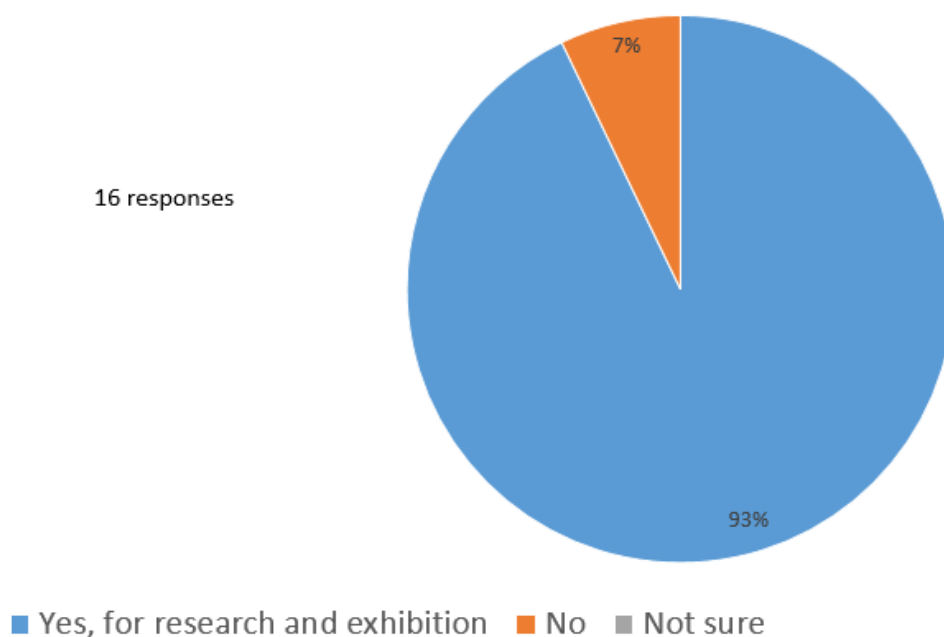


All the institutions answered that they plan to digitise most of their collections in the long run. A few respondents indicated that there is no selection criteria, including the East London Museum, the Talana Museum and the Erfenistichting Archives. For the others priority is given to material that is requested for loan, exhibition or research access the University of Pretoria Museums, the Amazwi SA Museum of Literature, SA naval Museum) and particularly fragile or sensitive items (Amazwi SA Museum of Literature). This ties in with the answers given in question 19 where digitization is carried out as needed.

Question 21: Does your institution make use of reproduction images? (Select which is applicable)

As the previous two questions indicated that digitisation is done on a needs basis, one could expect the use of reproduction images to be quite limited and dependent on requests for access either for research or exhibition purposes. This is indeed reflected in the answers to question 21, where 13 of the 16 respondents (93%) indicated they make use of reproduction images for either research or exhibition.

Graph 23 – Use of reproduction images



Question 22: If you answered yes above, how do you reproduce images? (Select which is applicable)

Graph 24 – Methods used for the reproduction of photographs

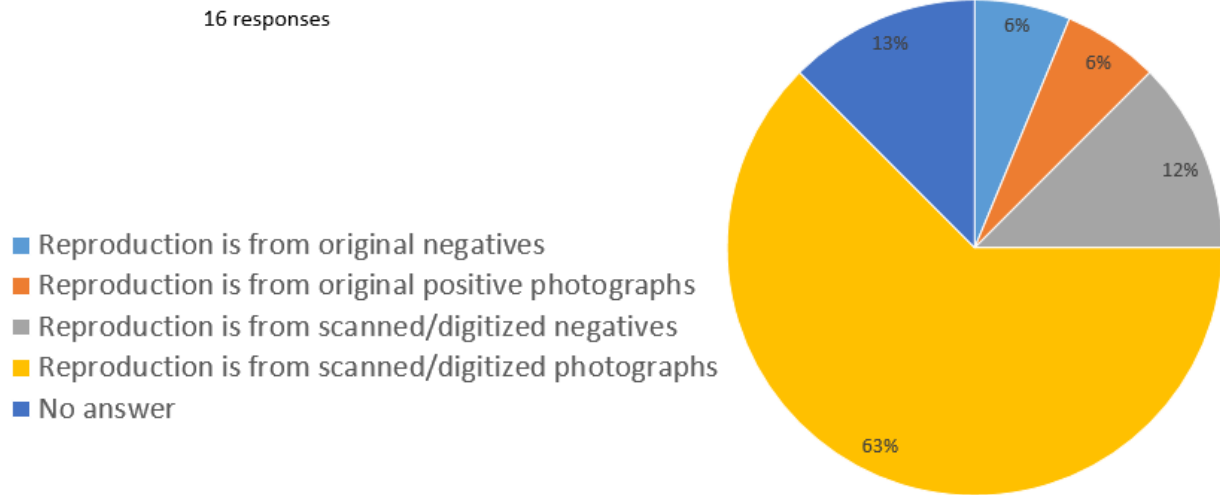
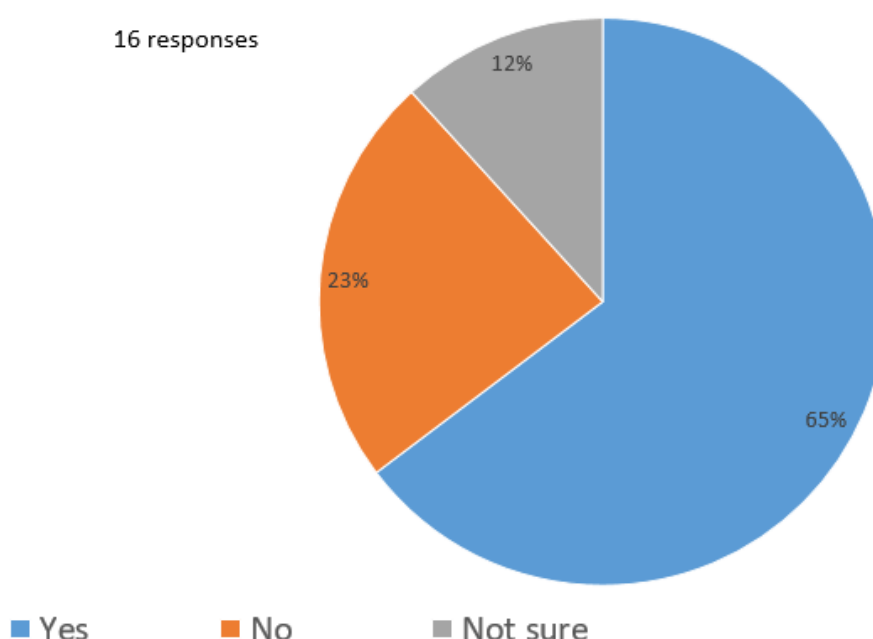


Photo reproduction in simpler terms is making a photocopy of a photograph (Merriam-Webster: 2022), by scanning and reprinting the photograph, or reprinting of the photograph using the negatives if they are available. 11 of the institutions answered that they reproduce images from the scanned or digitised image as seen in the pie chart.

Most of the institutions reproduce from scanned or digitized images which is 10 of the 16 respondents. 2 of the respondents also reproduce from scanned or digitized negatives. 2 institutions still reproduce from the original photographs they have. Scanning from a reproduced or digitized image will influence the output image, which may exhibit colour variations and where colour may not always be consistent with the original image. In addition, sharpness and clarity of the image may also be affected and details may be lost which could affect research interpretation of the image, for example signage, building or vehicle names may no longer be legible.

Question 23: Is there a disaster management plan in place at your institution? (Select which is applicable)

Graph 25 – Availability of a disaster management plan for collections surveyed

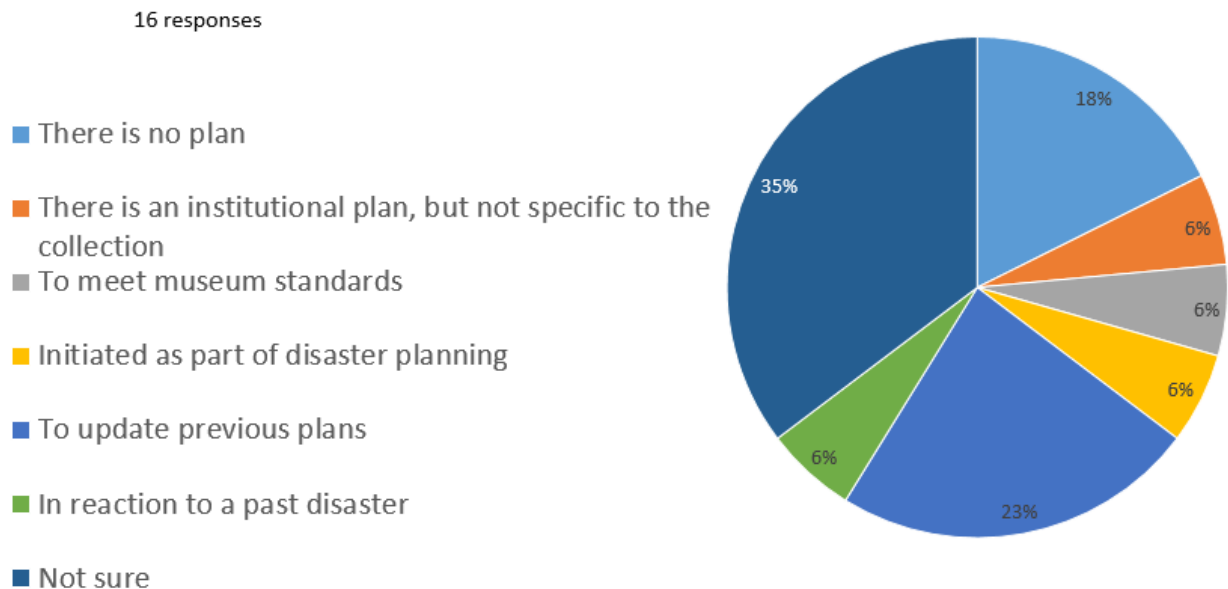


A disaster management plan should provide a step-by-step guide to its institution about what should be done when a disaster happens. Disasters can include, fire, floods and any other human caused emergency (The Getty Conservation Institute, 1999). Section 26(g) of the Municipal Systems Act 32 of 2000 as well as sections 52 and 53 of the Disaster Management Act 57 of 2002 states that all municipal entities should have a disaster management plan in place. However, the primary responsibility for the final approval of a disaster management plan in South Africa rests upon the government (City of Tshwane disaster management offices, 2011). As such municipal museums may have additional troubles trying to have an in-house disaster management plan endorsed.

Encouragingly the vast majority of the 16 institutions surveyed, namely 11 of them (65%) have a disaster management plan in place. Worryingly, 4 of the institutions indicated they do not have a disaster management plan in place and 1 respondent was not sure. To gain more insight into this initial response, two follow up questions were asked both for those who have a disaster management plan (question 24), as well as for those that indicated they did not (question 25).

Question 24: If you answered YES above, do you know when and why was this plan was put in place?

Graph 26 – Reason for initiating a Disaster Management Plan in the collections surveyed

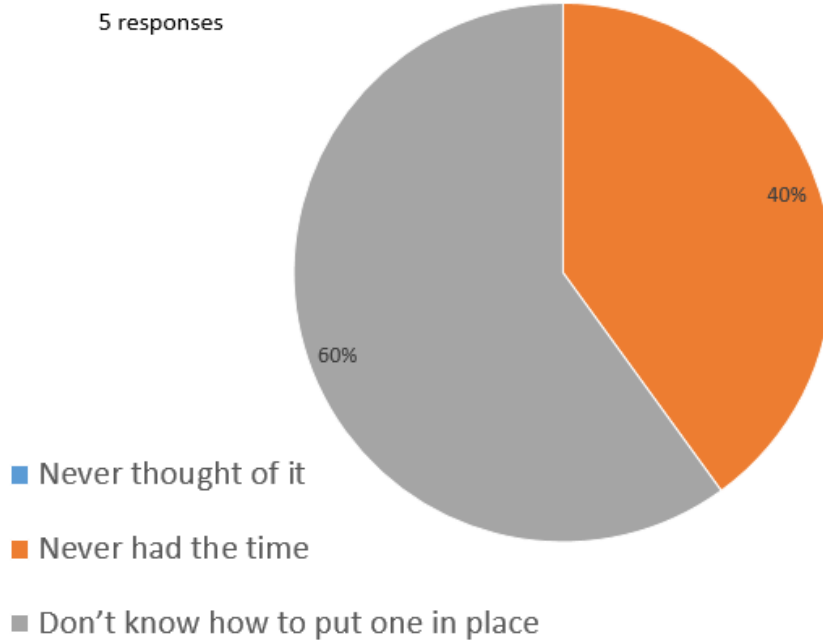


The responses to question 24 were unexpectedly quite diverse. 3 institutions (18%) reiterated that there is no disaster management plan in place at their institutions. The South African Naval Museum indicated that they have “a general South African Navy Occupational Health and Safety [OHS] plan for the building, but not specifically written for the museum’s library or archives, but utilised nevertheless”, the OHS plan covers emergency situations as per South African legislation. As occupational health and safety procedures and guidelines are legal requirements, this is likely to be reflected in other institutions as well where a general plan is available to safeguard human life, with no other planning available specific to the collections although this is a requirement for basic museum standards as per SAMA’s *Professional Standards and Transformation Indicators* point 1.10, which states “Every museum must have a disaster plan (including evacuation procedures).” (SAMA, 2006:9). The University of Pretoria Museums Archives was the only institution who indicated they were busy drafting an emergency plan to meet minimum standards. The Cape Town HGC have since the 2021 UCT fire started updating their emergency preparedness and disaster management plan initially drafted in 2012, as a direct response to their experience. Many of the other institutions have had plans in place for several years, the Brenthurst Library for example have had a plan in place since 1984 and it is currently being updated, The Erfenisstichting Archives have had a plan in place since 2012, The comrades Marathon Association’s plan was created in 2016 and updated in 2020, the East London Museum

drafted theirs in 2019. It is also encouraging to see that institutions are regularly reviewing their risk management plans, such as the Amazwi South African Museum of Literature who has annual reviews by external auditors of their risk management planning.

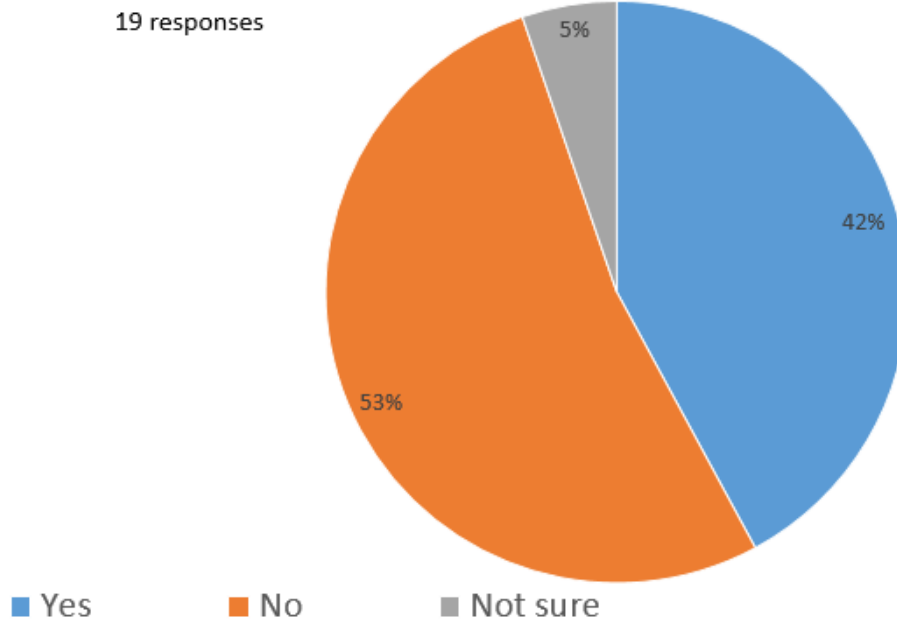
Question 25: If you answered NO above, do you know why there is no disaster management plan in place at your institution? (select which is applicable)

For the remaining 5 participants that answered question 24 saying that they do not have a disaster management plan at their institution, 2 respondents indicated the delay was a result of time constraints including the Johannesburg HGC, Durban HGC. 3 participants including indicated they would not know how to put together a disaster management plan including the Talana Museum, Mogale City Museum and the Mapungubwe Archives at the University of Pretoria. Most of these institutions have small staff contingents and the curator fulfils multiple roles in the care and management of the collection. As every institution should have a disaster management plan in place, this is a concern, and perhaps developing training on emergency preparedness and disaster management would assist both those that do not have the knowledge, as well as afford those who do not have the time, the opportunity to focus on creating a plan for their respective institutions.



Question 26: Has your institution ever experienced damage to its collection as a result of flooding, leaks, mould growth, fire, theft or vandalism?

Graph 28 – Damage to collections as a result of disasters or incidents in the collections surveyed



8 of the 19 respondents (42.1%) indicated that they have experienced damage to their collections because of a disaster such as flooding, leaks, mould growth, fire theft or vandalism. These 8 institutions do not include the 5 who indicated they do not have a disaster

management plan. Although the Cape Town HGC has not had any disasters at their institution, part of their collection was kept at UCT which had a fire outbreak in April 2021. To this day they are unsure how much, if any of their collections survived the blaze as UCT is still working through identification of all the recovered material. Having a plan in place will help guide the institution on what it should do when a disaster occurs, and the right people to contact to help deal with the disaster swiftly to prevent major loss.

Question 27: If you answered YES above, please explain which remedial actions were taken to mitigate after disaster and improve storage.

Only 7 of the 19 respondents answered question 27, including the Cape Town HGC, Mogale City Museum, the Brenthurst Library, University of Pretoria Museums and Mapungubwe Archives, East London Museum and Mogale City Museum. The prevalent action taken is construction work to the building itself.

As part of the Cape Town HGC collection was located at UCT, it is worth mentioning how UCT dealt with the recovery and salvage of its collections after the 2021 fire. UCT initially separated materials from the Jagger Library and Reading Room into materials that were dry and went into temporary storage, materials that were damp and needed to be dried, and wet materials that would be kept wet and in stasis in freezer containers until they could be freeze dried (McGinn & Minicka, 2021:14-16). The University libraries have since been busy with salvage operations and there is yet no full inventory of what was salvaged versus what was lost, as most of the material is still in temporary storage locations awaiting treatment. As part of its remedial actions, UCT sent some items from special collections to conservators in Cape Town (Singer,2021), they have had visiting conservators and interns, hired two conservators and is establishing an on-site conservation facility to deal with materials in-house (Stinger ,2022).

The Brenthurst Library also noted damage in the form of “occasional leaks; mould a recent issue in the open areas. Conservation staff treat any damage; air-conditioning system in process of upgrade to improve humidity control and installation of charcoal filters. Never any issues in the room where AV material is stored.” Without giving specification, Mogale City Museum also indicated renovations to their building.

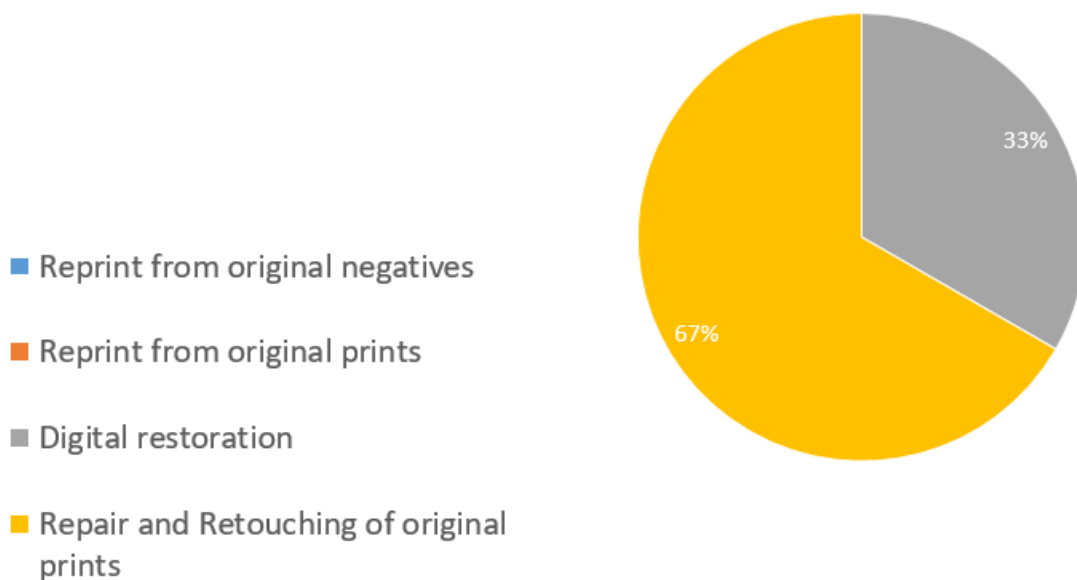
At the University of Pretoria, both the Mapungubwe Archives and the University of Pretoria Museums indicated the “Theft of photographs from albums by researchers took place in earlier years before the establishment of a formal archive repository. Since its inception, the archivist acts as a supervisor over the researcher while they peruse the photographic collection.”

The East London Museums likewise indicated the photographic collections were moved to a more stable and secure location. This is an indication that the buildings housing these collections themselves are either not in an overall good condition, or that necessary maintenance has been deferred and systems are now collapsing.

Although The South African Naval Museum answered the question saying they had had “No floods, leaks, mould growth, fire, theft or vandalism but a general deterioration of the image quality because of improper storage and handling in the past that damaged the photo or negative.”

Question 28: If original photographs or negatives were damaged, was any remedial action taken on these original photographs or negatives, please explain.

Graph 29 – Remedial strategy used by institutions surveyed when collection items have been damaged



Only three institutions responded to question 28, the SA Naval Museum has contracted a graphic designer to scan and carry out digital restorations for damaged photographs, which

can then be reprinted or kept digitally without interfering with the original negatives and photographic prints. The Mapungubwe Museum Archives were the only institution who had attempted to repair original photographs using archival mending paper, and the Erfenisstichting plan to send their damaged photographs to a photographic conservator. There are very few conservators working with photographic materials as was evident at the UCT recovery efforts when I volunteered in the triage tent in 2021. Only two conservators who spent any time on site had had previous experience and felt comfortable working directly with remedial treatment of sensitive photographic materials.

In some instances photographs were completely lost, such as the Cape Town HGC. Whilst the East London Museum was unsure of remedial actions taken.

Question 29: If remedial action is taken, please supply the names of companies or individuals to which you referred the photographic materials for conservation-restoration treatment.

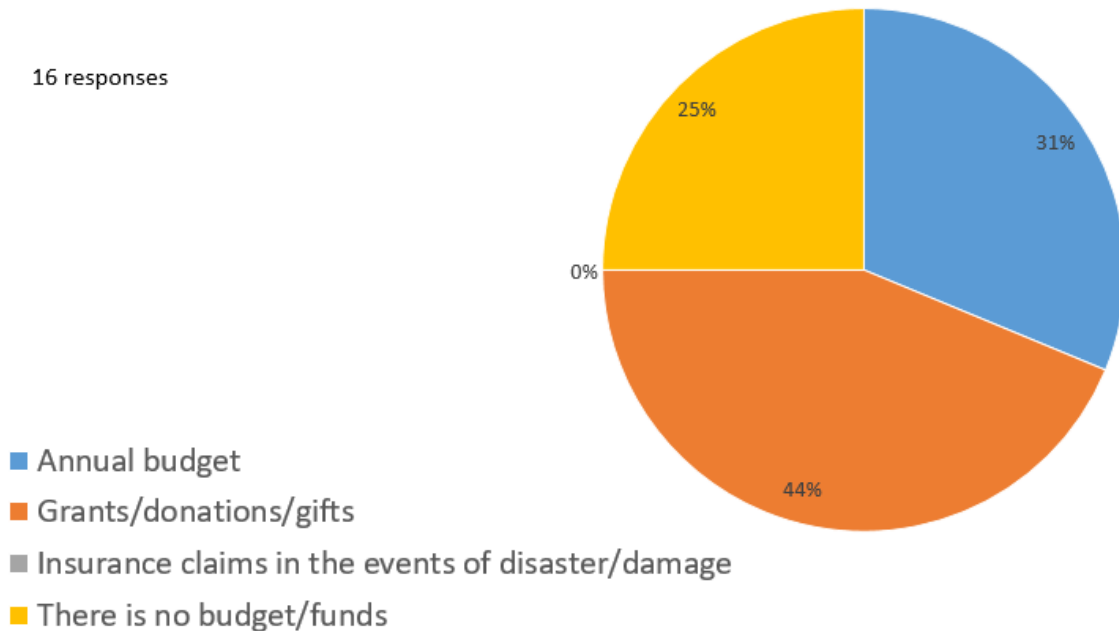
The following institutions/ places were mentioned by respondents as companies and individuals who do their conservation-restoration treatment: University of Pretoria, Brenthurst Library, Dennis Da Silva (Alternative Print Workshop), Bernard Clarke Photographer, Sandra Markgraaf (Art Revive), Navy News Magazine graphic artist. Other known conservators who have worked on photographic materials but were not mentioned include DK Conservators in Cape Town (see DK Conservators, 2022), who have since been involved in UCT's recovery efforts (Stinger, 2022).

Question 30: How do you fund preservation / conservation of your collection?

As expected, funding is a concern for all the respondents. 5 respondents (31%) indicated they have an annual budget from which they can fund conservation/preservation of the collections, 4 respondents (25%) have no budget allocations for conservation/preservation, whilst the remaining 7 respondents (44%) rely on donations, grants and gifts to fund their preservation/conservation efforts. None of the participants indicated they would have to rely on an insurance claim to conserve their collections should a disaster happen. This may be something worth investigating for smaller institutions in particular to ensure there is access to emergency funding for first response, and the purchase of materials or conservation services post salvage. Similarly to ensuring that there is temporary storage facilities to move a collection to in the event of a large scale disaster, ensuring there is an emergency fund to

obtain equipment, materials or services forms part of disaster management planning (see, Disaster Planning, 1999).

Graph 30 – Source of funds for preservation/conservation in the collections surveyed



4.5. Examining the case studies

4.5.1. The Bensusan Museum of Photography

Museum Africa first operated as a market in 1913 before it was transformed into a Museum in 1990 it was the Africana Collection in 1994 the Museum was revamped and reopened as Museum Africa. The Museum has different departments such as the Geology Museum, a library, and the Bensusan Museum of Photography (City of Johannesburg, 2018). The Bensusan Museum of Photography has an extensive collection of photographic records, documents, and cameras. The Museum started operating in 1986 when Arthur Bensusan, after which the museum is named, donated his photographic collection to the City of Johannesburg. Bensusan’s collection consisted of 5000 photographs, 400 antique cameras and 2000 photographic books dating as far back as 1860. Included in the collection is what is believed to be the first photograph which illustrated the horrors of war taken in 1854 and depicting a Crimean War scene. The museum also claims to have a camera believed to be that

of Winston Churchill. In 2001 the Bensusan Museum also added a camera obscura on top of the Museum Africa building as part of the Blue IQ project².

4.5.1.1. Scope of the collection, acquisition and staff (questions 1- 10)

The Bensusan Museum of Photography is under the care of a curator who has twenty years' experience in the care and functions of museums and has acquainted herself with aspects of preventative conservation. The collection consists of the following types of photographic objects including cased images (Daguerreotype, Ambrotype and Tintype), cartes-de-viste, cabinet cards, stereoscopic views, photo albums and cameras. The photographic collection consists of black and white, colour, slides and printed digital photographs with over 8000 items in their holdings (Meyer, 2005:35) and are still actively growing their holdings. This is a very large collection, similar to that of some institutions surveyed, such as the South African Naval Museum which has over 10 000 items. The depicted cultural history stretches back from the colonial era to the present. This can be linked to the fact that though the camera was still being introduced in 1866 to South Africa the Bensusan consists of a donated collection that stretches beyond the introduction of the camera in South Africa. Themes depicted through the photographs include fauna & flora, landscapes, cities settlements and buildings, formal portraits and ethnographic recordings.

4.5.1.2 Conservation of the collection (questions 11 & 12)

According to the curator of the Bensusan, the collection is in a very good condition with less than 20% of the collection exhibiting damage. This is comparable to the 44% of respondents that also mentioned that their collections were in a very good condition in question 11. In addition, there is a comprehensive management plan in place for storage and photographs are also stored in cabinets. Slightly problematic is the storage of parts of the collection in less than ideal conditions in suitcases and in an overflow space due to lack of funds. This problematic temporary storage arrangement which has now become more permanent in nature will likely increase risk of damage and deterioration for those portions of the collection, possibly leading to loss.

4.5.1.3 Use of the collection (exhibition, loan, research access, handling) (question 13-18)

² The Blue IQ project is an initiative of the Gauteng province to invest in economic infrastructure in the sectors of tourism, transport, technology and high-valued manufacturing (Blue IQ, 2003). A camera obscura is a device that lets light in it through a small hole on one side and projects the image as reversed onto the other side (Taggart & Cole, 2022)

Collections at Bensusan are used for both in house and loan exhibitions which compares to the 50% of respondents that indicated this as their main use of the collections. The Bensusan Museum of Photography has a permanent photographic display covering the history of photography with camera equipment, photo albums, cased images and prints on exhibition. Similarly to 65% of the survey respondents, the collection items on permanent display are not rotated and many exhibit signs exhibition fatigue with light damage, colour shifts, tears, curling, contaminants and pollutants. In addition to the permanent displays, prior to the political changes at Museum Africa in 2017, the Bensusan Museum used to put together several exhibitions a year, 3 in 2004 and 2005 respectively, and then erratically one a year or even one every few years. These have now largely stopped altogether.

When it comes to research access, 20% of the survey respondents indicated their collections are often accessed for research purposes, likewise the Bensusan Museum is accessed often. Proper handling procedures have been put in place “as per heritage and photographic collection dictation” because the collection is often accessed by researchers and so guidelines had to be in place (Duduzile Madonsela, 2022).

4.5.1.4 Digitization (questions 19-22)

The museum is currently in the process of digitizing their collection, similarly to the 95% of survey respondents in question 19. Graph 21 which shows the estimated percentage of the collection digitised includes the three case studies for reference. The graph indicates that the Bensusan Museum lags behind some of the other institutions surveyed, with an estimated amount of 20% of their collection already digitised but is ahead of others including the third case study collection, namely the Rashid Lombard collection. In terms of prioritisation for digitisation, they are motivated both by conservation concerns and fulfilling requests which is similar to the other institutions surveyed. Their sensitive photographic prints are prioritised and because their collection is being used for research purposes, they also make use of reproduction images they reproduce from their original positive photographs.

4.5.1.5 Disaster preparedness & recovery (questions 23-30)

42% of institutions surveyed had experienced a disaster, as did the Bensusan Museum in November 2020. A burglary led to flooding and subsequent water damage to parts of the photographic collection. The curator implemented a disaster management and recovery plan. This is similar to the scenario of the Cape Town HGC who developed their plans in response to a disaster. Prior to this there was no disaster management plan in place because the curator

never had the time, not an unusual circumstance as this is also the case for Durban HGC and Johannesburg HGC. Budgetary constraints and no budget allocation for disaster events meant that the institution had to improvise when dealing with the 2020 flooding. The curator implemented an operational plan in order to deal with damage. Objects were assessed, dry and wet materials were separated from each other and removed from the affected area. Professional help was requested and an experienced photographer and master printer in the form of Dennis da Silva³ was contracted. Permission was asked to hire an in house conservator but that has been a challenge. Some “invaluable” material was lost due to the flooding and some sort of remedial action was taken to restore the damaged photographs.

4.5.2 The Duggin-Cronin Collection

As outlined in chapter 3, Alfred Martin Duggin-Cronin was an Irish immigrant to South Africa who developed a keen interest in indigenous populations after he served in the First World War as part of the German regiment. The war made him realise that the indigenous way of life were slowly starting to change, and as a result he began photographing them and their ‘endangered’ way of life from 1919 with the support of the McGregor Museum. The McGregor Museum funded most of his photographic expeditions and supported him in exhibiting his photographs from 1919 to 1939. Along with the funding from McGregor Museum his expeditions also received funding from The Union Research Grant Board which was a government fund as well as the Carnegie Foundation (Hart, 2017). Upon his death in 1954, the McGregor Museum became the official custodian of his life’s work, including his photographic equipment and over 7000 negatives including glass plate negatives and nitrate negatives. The collection includes cased images, carte de visite, cabinet cards, stereoscopic views and photo albums, several thousand contact prints and enlargements (email from Robert Hart to Isabelle McGinn 13 May 2022).

³ Dennis da Silva Dennis da Silva and Janus Boshoff co-founded the Alternative Print Workshop in Johannesburg in 2014. Da Silva and Boshoff are widely recognized in the South African photography industry as experts of analogue photographic and darkroom processes (da Silva, 2017).

4.5.2.1 Scope of the collection, acquisition, and staff (questions 1- 10)

The McGregor Museum-photographs collection also referred to as the Duggin-Cronin is under the supervision of a photographs collection manager the collections manager received training in basic identification and care of historic images. The institution consists of photographic materials and is also actively collecting photographic equipment. The institution houses the following types of photographic objects cased images, cartes-de-visite, cabinet cards, stereoscopic views, photo albums as well as cameras. The above mentioned consists of black and white photographs, colour photographs, slides as well as printed digital photographs. The black and white photographs in the collection is gelatine printing out papers this is a process that predominated between 1895-1905 they also have black and white developing out papers dated between 1905-1960. The South African cultural history represented is the colonial era, The Union of South Africa as well as the apartheid era till the present. The cultural history is illustrated through photographs of fauna and flora, landscapes, cities, settlements and buildings, archaeological excavations, formal portraits, ethnographic recordings as well as historical events. The collections manager is unsure of how many items are in the collection, however Meyer (2005:35) mentions 7282 negatives which indicates once again a very large collection on par with the Bensusan Museum and the South African Naval Museum.

4.5.2.2 Conservation of the collection (questions 11 & 12)

The collection is an old collection, similarly to the Bensusan Museum collection, stretching back into 1930 when Duggin-Cronin started the then called Bantu Gallery (Anon, 2022). Unlike most of the other institutions which are noted as in very good condition, with less than 20% of the collection affected, the Duggin-Cronin Collection's collection manager has noted the collection as being in a fair state with half of the collection exhibiting some damage. This vast difference is unexpected as the Duggin-Cronin collection is focussed only on photographic collections. This could perhaps be explained by the Duggin-Cronin's collections manager focussing only on the photographic collection, unlike curators or archivists at other institutions who work with different material types, he may therefore have a better understanding of the subtleties of what could be considered damage in photographs, and not evaluating damage to books and paper in the same manner as damage to photographs. The Bensusan and Duggin-Cronin collections are similar in composition and age and yet their general condition is also vastly different, with Bensusan's noted as in a very good condition. This is somewhat confusing and may warrant further investigation as the Bensusan has

suffered damage from a past water event, and part of their collection is in poor storage conditions in suitcases, whilst the Duggin-Cronin has appropriate storage conditions, and no disasters were recorded. This contradiction may be a result of a lack of standardised terms for noting damage across institutions. The storage system in place at the Duggin-Cronin differs for every print size, with A4 sized prints and smaller are stored vertically in filling cabinets. Vertical storage avoids prints pressing on each other and causing damage. Larger prints are stored on a flat metal shelf whilst negatives are stored in boxes. There is also a built above ground storage vault with temperature control.

4.5.2.3 Use of the collection (exhibition, loan, research access, handling) (question 13-18)

The collection is used for exhibitions both in house and loans. For loans, the institution usually sends out copies instead of loaning out original photographs unless in the case where an original is requested. In house exhibitions are only rotated once every few years which leads to exhibition fatigue and damage to photographs but is consistent with the other institutions surveyed and the Bensusan Museum. The collection is also accessed several times in a year by researchers, and guidelines are in place for both staff and researchers on how to handle photographs. Users are required to wear gloves when handling photographs, researchers sit in a consulting room and the collections manager will bring them the requested photographs. The photograph is assessed for damage before being given to the researcher. If it is in a very fragile state, it will only be handled by the staff, if deemed to be in a stable condition and not overly fragile, the user will be given instructions on how to handle the photograph.

4.5.2.4 Digitization (questions 19-22)

Similarly, to most of the institutions surveyed, Duggin-Cronin has initiated digitisation. The extent of digitisation of the Duggin-Cronin collection is illustrated in graph 21 where it is easily compared to the other case studies and institutions surveyed. The Duggin-Cronin is on par with the Bensusan collection, having digitized at least 20% of their collection. It falls short of some of the others, such as the Erfenisstichting Archives which may be due to staff numbers, or the number of requests for digitisation among other things. The emphasis appears to be on fulfilling requests, as stated in their response “Frequently requested photographs are scanned as per request, requested material is also then digitised”- Robert Hart. The use of reproduction images for research as well as exhibition is implemented photographs are reproduced from scanned or digitised photographs.

4.5.2.5 Disaster preparedness & recovery (questions 23-30)

The entire museum and its collections has a disaster management plan which was drawn up in 2017-2018. The institution has never experienced any damage to its collection due to flooding, leaks, mould growth, fire, theft, or vandalism, which means that all damage and deterioration observed in the collection is related to natural ageing processes, and possibly storage practices. They have a disaster management plan in place, drawn up from 2017 to 2018. Unlike most of the institutions surveyed, Duggin-Cronin has an annual budget to help fund preservation and conservation.

4.5.3 The Rashid Lombard Collection

The collection consists of photographic negatives, colour negatives on plastic film, and slides, as well as both black-and-white and colour prints. Before the planned relocation to the University of the Western Cape the collection was stored in the Lombard's family home in cupboards and a dedicated backroom filled with boxes of files for storage. Lombard's interest in starting an archive started in 1986 when he was sent to New York by the ANC Movements art's organisation which formed part of the African Art's fund. Upon his return home his wife Colleen Lombard started with the process of archiving his work, neatly organising everything in files and boxes and labelling them. In 2014 Lombard stopped being the director of the Cape Town International Jazz Festival, giving him time to focus on his plan of coming up with an archive for his work. The goal that he had in mind was to digitise his collection and move it into a building where he would be able to create a centre for photography fitted with a darkroom and making it accessible and affordable for all photographers. Lombard's archive will be moved to the Senate House building at the University of Western Cape once renovations to the building have been completed. The building will be fitted with a temperature-controlled, waterproof and fireproof vault in order to preserve the photographs, especially the more sensitive negatives (Khan, 2022).

4.5.3.1 Scope of the collection, acquisition, and staff (questions 1- 10)

The Rashid Lombard Pty Ltd- Rashid Lombard archive is currently under the care of its managing director Yana Lombard, Rashid Lombard's daughter, who completed the questionnaire. The collection consists of photographic equipment such as photographic paper,

film and cameras. Rashid Lombard's collection consists of over 500 000 photographs that were taken over a period of 50 years, from 1960 to date.

Preventative conservation and care of the collection is the responsibility of Rashid Lombard, the author of the work. Mr Lombard has training in archiving from Magnum photo in New York. The photographic collection consists of black and white photographs, colour photographs as well as photographic slides. The collection also has negatives on plastic film as well as other forms of black and white photographs of which they are not sure of the type. The collection is a comparatively young collection in contrast to that of the Bensusan Museum or the Duggin-Cronin Collection and illustrates the apartheid and the post-apartheid eras (1948- early 2000's). These time periods are represented through landscapes, cities, settlements and buildings, formal portraits, ethnographic recordings as well as historical events, and of course, the annual Cape Town Jazz Festival⁴.

4.5.3.2 Conservation of the collection (questions 11 & 12)

The collection is noted as being in a very good condition with less than 20% of the collection showing damage, which compares to most of the institutions surveyed. The collection is currently stored at Rashid Lombard's home on shelves and enclosed boxes including shoe boxes, which compares to some of the smaller institutions surveyed. The collection will soon be moved to the University of the Western Cape where it will be better stored in a newly purpose refurbished building and where storage enclosures can be improved upon.

4.5.3.3 Use of the collection (exhibition, loan, research access, handling) (question 13-18)

The collection is used for both in house as well as international exhibitions, usually about 5 a year which is much more than all of the institutions surveyed and the other two case studies. Unlike the other formal collections in museums, libraries and archives, this collection is stored in Lombard's home, visitors to the collection are not frequent and there are as yet no handling guidelines.

4.5.3.4 Digitization (questions 19-22)

Parts of the collection have started being digitised, with 10% of the collection already completed. This is lower than most of the collections surveyed and the Bensusan and Duggin-Cronin, but once again may have a lot to do with the fact that this is a private

⁴ The Cape Town Jazz Festival is the largest music event in Sub-Saharan Africa, featuring local as well as international artists. It is held at the Cape Town International Convention Centre (Anon, 2019)

collection. As digitization is done by the Lombards' themselves, selection for digitization is thematic, reviewed annually and relates to what is deemed relevant to the collection, exhibitions or research undertaken. Some photographs are reproduced from original negatives and the plan is to include a photographic studio in the new building for digitization and reproduction.

4.5.3.5 Disaster preparedness & recovery (questions 23-30)

The managing director of the collection never had the time to implement a disaster management plan, however thankfully, the collection has never suffered any sort of damage. It is a private collection and managed without a dedicated budget with funds allocated as the need arises.

4.6 Conclusion

The three case studies were selected based on their notoriety, these are very well-known collections and thus one could assume, possibly more likely to have certain standards in place, particularly for the two formal collections, namely the Bensusan and Duggin-Cronin. By including a privately run collection such as that of Mr Rashid Lombard, I was hoping to see if the attention given to a private collection by its creator was comparable to that of a more formal setting of a museum, as this may be more akin to what would be happening in very small archives and collections. By looking at the three case studies against the backdrop of the survey, it is much easier to notice similarities and differences. The three different case studies show that photographic collections are housed in vastly different environments. Despite their age, the McGregor Museum housing its old collection never experienced any form of damage from specific events, however the collection has started to decay on its own, leaving half of the collection damaged. This suggests that either the photographic material is unstable or that the storage environment could be damaging the photographs, or more likely has to do with the training and expertise of its collections manager. The Bensusan Museum also housing an old collection suffered damage by theft and subsequent flooding. Duduzile Madonsela, curator of the Bensusan said that some invaluable items were destroyed in the process.

Based on the responses from both the survey and the case studies, there is a definite understanding of the fragility of photographic materials. For the most part, there appears to be an accompanying basic understanding of preventive conservation and collections care in terms of the requirements for restricted access, proper handling guidelines, use of gloves and a clean space for research. In this sense, there appears to be no glaring differences in how the collections are run, whether large or small, private or government funded. In both cases resources appear constrained, particularly when it comes to minimal staff numbers, resulting in one person tasked with different roles and responsibilities limiting their ability to attend to all matters of collections care in an equal manner. Activities such as disaster management planning are thus postponed.

In addition, the questionnaire responses highlighted a need for more consistent access, handling, digitisation and restoration guidelines. At the moment most of the surveyed institutions are storing their photographs based on archival techniques used for paper and books which shows that most institutions are not aware of the specific storage requirements for photographic materials. There is a potential gap for skills training or continuing professional development in the following areas, namely correctly identifying photographic processes, gaining a better understanding of the ageing characteristics of different photographic materials, and improving storage conditions. Based on the known sensitivities of photographic materials outlined in chapter 3, I will now turn my attention to international guidelines and recommendations for preventing damage and deterioration of photographic collections, and how these can be used to mitigate potential risks to these sensitive collections in chapter 5.

5. INTERNATIONAL GUIDELINES AND LOCAL SOLUTIONS FOR PHOTOGRAPHIC COLLECTIONS

5.1 Introduction

As outlined in chapter 2, the deterioration of photographic materials can be due to a variety of factors such as inappropriate storage, temperature and humidity, light, incorrect framing methods, pollution, pests, and mishandling (Fahey, 2016). Photographs should be stored within protective enclosures that are suitable for photographic collections, and storage of materials such as folders, sleeves and paper need to adhere to the standard set out by the international organization for standardisation (ISO). The specifications listed in the ISO for the enclosures of photographic material make sure that the storage materials will not damage the photographs or accelerate their decay (ISO, 2013:5). In chapter two I discussed the ten agents of deterioration and how they cause damage to photographic materials. In this chapter, I look at the international standards that have been put in place to reduce the impact of the agents of deterioration on photographic materials. As conservation specific retailers are not readily available in South Africa, most conservation grade materials have to be ordered and shipped from suppliers overseas. With funding constraints and restrictive procurement policies, this can be complicated for institutions to access conservation grade materials. As such the international guidelines and recommendations will be explored by offering low-cost solutions that can be implemented in a South African context, offering local alternatives where possible and including means of testing materials for suitability in appendix B.

5.2. Blocking thieves and vandals

Vandals and thieves as a threat are so particular to the context of each individual institution that they have to be reviewed on a case-by-case basis and is therefore beyond the scope of this discussion. General guidelines that would apply focus on restricting access and insuring supervision when access is granted both on display, in storage or for research. As outlined in

chapter 3 a risk management approach starts with the building and its environment as the first line of defence in avoiding and blocking risks to the collections.

5.3. Preventing Dissociation:

Dissociation can be avoided when every information and movement partaking to an object is documented. The name given to the object should be clear the name under which it will be accessioned should also be clear. The name of the object should then be linked with all its accession information. A unique accession number (catalogue number) can then be given to the object that will allow you to locate it on a system that has been put in place for accessioning (CCI). Make sure that the cataloguing system that you are using can be migrated to the latest computer systems. The following is important to have in place (CCI):

- A labelling system that is constantly applied and followed.
- Agreed upon labelling material and method.
- Have a system in place for replacing faded and deteriorated labels.
- Always maintain the same system for documentation.

To avoid dissociation photographs should be individually marked. This can be done either indirectly by labelling the sleeve or envelope before placing the photograph in it, or by directly applying a number to the back of the photograph. Although some sources will suggest the use of a stable archival pen which won't bleed, feather or smudge, if changes to the labelling are ever needed, ink is indelible whereas pencil can be erased. The choice is often a result of a particular institution's policies whether the museum accession number needs to be applied in a permanent manner or not. Pens such as the Sakura Pigma Micron® pens are available locally and are preferred as they have permanent, acid-free, fade resistant, chemically stable pigment-based inks that do not bleed or run (Preservation Equipment Ltd, 2022). Conservators prefer to avoid ink to label a photograph directly as it may diffuse through the paper (Lavédrine, 2009:294-295), likewise adhesive labels should be avoided as either the solvent or adhesive component can diffuse through the paper, labels can fall off over time or cause deformation on the face of the image.

Photographs are thus best marked using pencil which allows for changes of labelling if ever required. Usually, a 2B pencil works well as it is soft enough for most photographic papers,

glossy paper may often require a softer 3B, which should be tested for smudging first. The number should be applied on the edge of the photograph, away from the image.

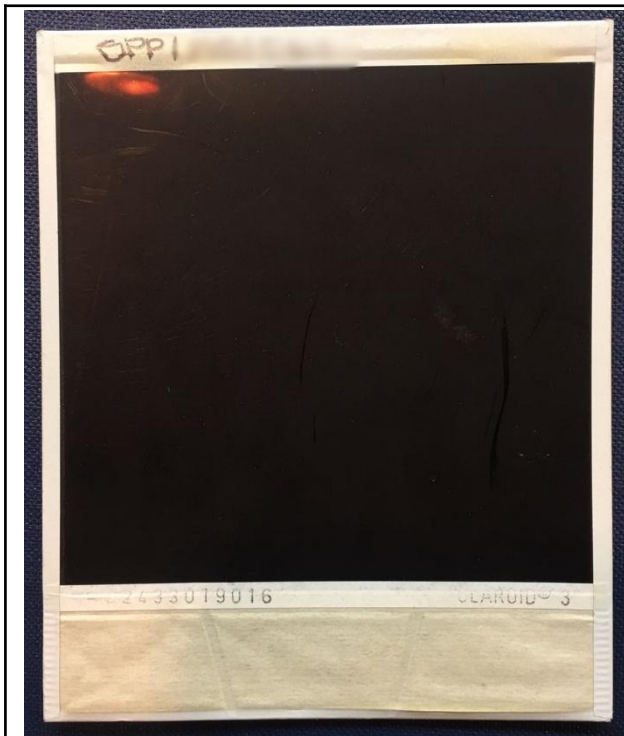


Figure 1 – A 9B Faber Castell PITT graphite pencil was used on the glossy paper reverse of a Polaroid® print

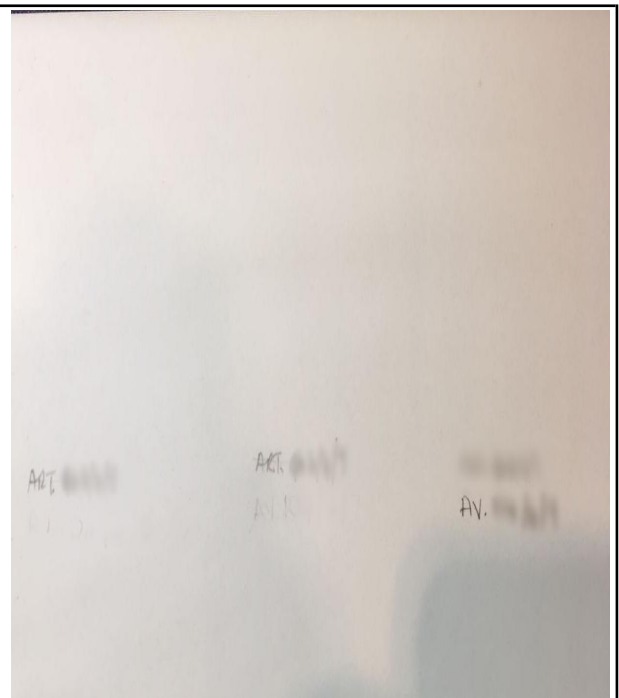


Figure 2 – Glossy paper presents a particular challenge, and the following were attempted: a 2B Staedler is visible but difficult to write neatly (1 and 2) , the PITT HB (3) and PITT 3B (4) were barely visible, whilst the 9B Faber Castell PITT graphite pencil wrote clearly with good contrast and no smudging (5)

5.2 Preventing fire

Since the runaway fire that damaged the Jagger Library and Reading Room at the University of Cape Town, fire as a threat to collections has been highlighted. In Chapter 4.6.27, the Cape Town HGC indicated that they still have no idea what of their collections previously housed at UCT had survived, if any and since they are looking into installing a water and fireproof safe to house their collections. In chapter 3 I discussed the preventative measures that can be put in place in order to prevent fire damage from occurring because unfortunately damage caused by fire is irreversible. Preventing fire includes being prepared. The drafting and implementation of a disaster management plan can go a long way in preventing a fire event, ensuring a speedy and appropriate response in the event of a fire emergency and minimal loss

of collection materials. There are a number of references freely available online to assist institutions in developing their own context appropriate plans such as the “Be prepared: Emergency planning toolkit for museums” (Norfolk Museums and Archaeology service, 2008). Implement fire safety strategies in your building. Identify potential fire threats where possible and how these can be avoided, or its effects mitigated. Make sure that you identify and prioritize the threats. When threats are found make sure to regularly inspect them and have a check list in place, making sure that all the risks have been assessed. Consider areas which will be subjected to water damage if fire sprinklers were to go off and the amount of damage that water would cause on the material. Where possible invest in fire doors and barriers. Using water mist instead of sprinkler system for fire detectors. Always monitor your fire protection system to make sure that it is operational.

In our South African context, fires can be unpredictable and in certain locations such as the Western Cape, these can be seasonal. Starting from the building and its environment, firescaping shows promise in being a helpful additional measure to help mitigate the effects of fires from external sources. The following recommendations are also feasible in a South African context.

Recommendations for fire prevention (CCI):

- Starting from the exterior of the building as illustrated in figure 32, risks of fire can be lessened by ensuring natural firebreaks around the building. Parking lots, roads and open spaces can all provide much needed areas with no fuel to allow a fire to progress (Wilson, Anon). Firescaping uses landscaping and plant selection to create landscaped firebreaks to control fires from outside affecting the building. This is not because plants are fireproof, image are plants such as succulents which contain a lot of moisture will be slower to ignite than pine trees which contain flammable turpenes (Kent, 2022).
- Develop and implement a fire protection plan address possible fire hazards in your building and how they can be prevented. Train staff on fire prevention.
- Find an electrician to check the wiring of the building to make sure that they are not hazardous. Make sure that electricity circuits are not overloaded.
- Make sure that your building is fitted with fire protection such as a fire alarm, fire suppression fitted eras may be too expensive to attain in a South African context.

5.3 Preventing water damage

All photographs are susceptible to be damaged by water even the smallest amount of water can cause damage to a photograph. Water damage in a photographic material can be problematic as water will cause gelatine to be sticky attaching to another object or surface and will absorb water in it. The water retention can be drawn out but the stains will be left behind. The Bensusan Museum of photography experienced a burglary in November of 2020 where a hand wash basin was stolen and the incident led to flooding (Anon, 2020). Water damage can also be experienced as a result of firefighting and recovery efforts where water is often used to douse the flames. When the Jagger Library and Reading Room at the University of Cape Town (UCT) caught alight as a result of a runaway fire, water was used to douse the flames which lead to materials being soaked and water damaged (Minicka, 2021:14). When planning storage facilities it is best to try and store items in drawers, boxes and bags that are waterproof. If this is possible damage caused by water due to leakages or extinguishing fire can be avoided (Michalski, 2018). The Be prepared: Emergency planning toolkit for museums booklet mentioned under fire offers a step by step guide of how to deal and prepare for a disaster that has been caused by water even offering an easy to follow checklist (Norfolk Museums and Archaeology service, 2008)

Water poses a serious threat to collection and if water damage is not handled correctly, it is usually compounded and leads to other forms of damage such as staining, tearing, and mould growth. Although implementing preventive measures is usually easier and cheaper than remedial action, it may not always be possible or feasible, for example a museum placed near a river which floods during unusually heavy storms may not be preventable, but the ensuing damage could be avoidable or at least minimized through sound preventive practice.

The following guidelines should apply to limit the effects of water damage:

- Ensure the building is sound and impermeable, that the roof is in good condition, that flashing, gutters and drainage are kept clean and free of debris and that all the elements that allow water to be evacuated and directed away from the building are operational to remove water effectively.

- Ensure that storage areas are preferably placed above ground and not in a basement where flood waters would get trapped and rise.
- Avoid open windows and doors during heavy storms where rain can always come through, and ensure they are correctly sealed and not leaking.
- Ensure that the most vulnerable portions of a collection such as photographs are placed on shelving or in containers at least 50cm off the ground.
- Be aware of potential risks in your storage or exhibition area such as water piping in the ceiling or walls.
- Ensure that storage units and containers are not placed directly under plumbing lines or fire sprinklers, if this cannot be avoided, keep the top shelf open to break any water flowing or dropping from above.
- Ensure your institution has a disaster response plan in place and kept updated with accompanying staff training to ensure appropriate procedures are well understood and easily followed in case of a water event or water damage.

Remedial action after any water damage is to prioritize evacuating the water and drying the area by ensuring that there is enough air flow and ventilation to prevent a prolonged humidity spike that can lead to mould growth (Lavédrine, 2003:128). Water pumps or even a vacuum cleaner with wet/dry functions can assist in reducing water levels by suction, and mobile drying units such as turbodryers and dehumidifiers will assist with drying. Although some of the larger equipment may not be feasible in a South African context as they are costly and there might be budget constraints for most institutions, small household appliances such as mobile fans can also assist in increasing airflow and speed up the drying process.

The following can be done to photographs damaged by water:

- Vulnerable photographs should be given priority, this includes:
- Photographs can be individually air dried if it a small number on blotting paper, polyethylene racks or blank newspaper prints with the print side facing up (Lavédrine, 2003:129).
- If the damaged photographs have soiling on them, they should be rinsed in distilled water at a temperature of less than 18°C, this does not apply to chromogenic slides and gelatine-based photographs as the emulsion will swell in water, thus these should be chemically treated.

- Rinsed and dried photographs can be sealed in a polyethylene bag and stored in the fridge. Chromogenic slides require a stabilizer bath and gelatine requires a formaldehyde solution to harden the gelatine. Prints should be naturally air dried on top of blotter paper.
- Negatives that are on flexible bases should be rolled out of their jackets and hung to dry. Glass mounts should be removed from their casing. Film should be rinsed out in cold water and where possible dried in a motion picture film processor if this is not possible they should be hung vertically to dry, film should not be air dried (Lavédrine, 2003:128-131).

5.4 Controlling pests

Other than using an Integrated Pest Management (IPM) approach which makes the collections environment inhospitable, there are not many options available to dealing with pests without resorting to fumigation which introduces pollutants. To make sure that insects don't live in your museum or gallery, proper housekeeping should be maintained. Regular cleaning of storage spaces will give insects less breeding ground and remove food. Where possible materials should not be stored on the floor. Prohibit eating and drinking as food lures insects. Whenever you decide to fumigate in your space the following is recommended (CCI, 2017)

- Before any steps can be taken it is advisable that the objects should be removed from the room that will be fumigated so that the chemicals that are being used to fumigate do not land on your collection. As the chemicals in the fumigant are unknown to you and they may cause damage to your collection. The area should then be allowed to off-gas for xx before returning the collection to storage.

In chapter 3 I discussed the damage that can be caused by mould unfortunately as mould spores are omnipresent in the air, there are no other ways to stop the growth of mould but through clean filters on ventilation systems and controlling the relative humidity. Mould blooms occur at above 65% RH which itself is damaging to photographic materials which prefer a drier environment of between 30% and 40% RH.

5.5. Controlling Physical forces:

In chapter 3 the damages that can be caused by physical forces were looked at and discussed, and most are linked to mishandling and poor storage conditions which allow for deformation, bending or breakages to occur. Ways to block and avoid the damage caused by physical forces include (CCI, 2017):

- Making sure that storage shelves and cabinets are stable.
- Making sure that shelves, drawers or boxes are not crammed with collection items so that abrasion when retrieving objects is avoided.
- Remembering that at times it may be better to lift entire containers, rather than a few single fragile photographs.
- If the containers are too large or heavy to be moved safely, trolleys and other moving equipment should be used or the help of additional staff requested.
- When transporting or moving objects make sure that they are supported in such a way that will not allow them to vibrate or move when they are being transported. A good example when moving single large flat items like photographs is to place them on a sturdy support and secure them so they are not accidentally lifted by air current.

When damage occurs on an object due to physical force make sure that you take pictures of it and document the damage as a permanent record associated with the object. It is also advisable to minimise any handling for compromised items such as broken glass plates and slides, or photos where the emulsion layer is flaking, as any additional handling or moving could result in more loss to the object.

5.6. Controlling light

All photographs are classified as light sensitive objects the maximum lighting that they can be exposed to is 150 lux (Lavédrine,2003:161). Damage caused by light is accumulative over time and is irreversible to minimize the damage caused by light exposure time to light of a photograph should be kept to a minimum and the light should be controlled and kept within the minimum lux. When photographs are exhibited the exhibition period for more sensitive photographs should not be longer than six months for a circulation period of five years.

Minimising contact with light in storage is achieved by placing photographs in secondary enclosures. The types and suitability of storage furniture and enclosures will be discussed in section 5.2

Recommendations for dealing with light on exhibition:

- Mounting and framing photographs for exhibition with UV filtering glazing.
- Reduce light exposure time, this can be done by installing curtains in front of photographs that are on display the curtains can be pushed aside for viewing purposes. Cover display cases when photographs are not being viewed.
- Try and block out daylight that might be entering into the Museum by using curtains, blinds, or shutters. This will ensure that you are able to control the amount of light within the Museum.
- If possible, only turn on light on demand, if there is no need for visibility lights can be kept off.

5.7. Controlling temperature and relative humidity

Temperature and humidity are mostly problematic when they fluctuate. Whenever temperature or humidity changes photographic materials will react by either absorbing water or by giving it off. Paper and gelatin easily absorb water, gelatin is a reactive component and can absorb more vapor than paper (Lavédrine, 2003:85-87). Unstable temperature will breakdown the colour/dyes in colour photographs. The “rule of thumb” is that if temperature is lowered by 5°C the lifespan of the material doubles. Photographic materials such as film on cellulose acetate bases and colour photographs accumulate less damage when they are stored in much lower temperatures whilst black and white prints and dye-transfer prints don’t require such low temperatures.

Ideally international guidelines suggest general storage should be below 20°C and between 20%-40% RH, with film-based negatives preferring a 20%-30% RH (National Park Service, 1997:1).

Thus, the best is to keep fluctuations to a minimum by the use of climate control, the recommendation being no more than a couple of degrees and no more than 3% RH (National Park Service, 1997:1). Temperature fluctuations should be avoided where possible, however

the problem in South Africa includes the high costs of installation of HVAC systems and the maintenance thereof is often an after-thought or deferred due to constrained budgets. In addition, South Africa has an unstable electricity supply from ESKOM(the electricity supply commission) and so installing a heating ventilation and air conditioning systems as climate control is not always feasible.

A South African example of a well-funded climate-controlled museum is the Amazwi South African Museum of literature. The Museum began with manuscripts by Professor Guy Butler of Rhodes University in 1960. In 1980 the Museum became a declared cultural institute, and in 2016 the Museum moved into a new custom designed green building (Amazwi, 2022). A green building has the following benefits that are also positives for conservation, including solar energy which means that though ESKOM can implement power cuts, there is a backup system in place that will kick in when the national grid fails. A green building has good natural ventilation that results in good air quality and the building itself is designed in such a way that it reduces fluctuations in environmental changes. The climate inside the Museum will be stable (Moore, 2022), and so their conditions in storage are ideal. For the collections this translates into little additional measures to improve the climate system. An institution which does not have these funds can still benefit from climate control on a smaller scale, either by controlling just one room for more sensitive materials, or through the use of microclimates controlling storage conditions.

The international standard for storing photographs is through the use of cool storage which ranges from 12-18°C with an RH of 30-40%; or cold storage above freezing (1°C to 12°C), or below freezing (0°C to -17°C) (National Park Service, 2009: 1). Cold storage ensures longevity to sensitive and vulnerable photographs without damaging them any further (Lavédrine, 2003:97). Where it is not possible to acquire a cold storage unit or control the temperature and humidity in the room with ventilation and (de)humidifiers, an upright household freezer can be used (National Park Service, 2009:1).

The National Park Service conserve-o-gram on Cold Storage for Photograph Collections suggest the following storage options for different types of photographic materials including:

- Cool storage (12-18°C): black and white silver gelatine prints and polyester-based black and white silver gelatine film (National Park Service, 2009:2).

- Cold storage (1°C to 12°C) deteriorated photographic prints; prints that are very faded or brittle from poor quality mounts, poorly processed prints (which often exhibit staining) and albumen prints (National Park Service, 2009:2).
- Cold storage below freezing (0 °C to -17 °C) is recommended for all cellulose nitrate and cellulose-acetate film-based materials, all colour photographs; transparencies, slides, prints and negatives.

There are some photographic materials that due to their complex structures should be kept in cool conditions but never laced in freezing conditions and include: Glass plate negatives and glass lantern slides, cased photographic images such as daguerreotypes, ambrotype and tintypes, and Polaroid® prints (National Park Service, 2009:2).

When storing photographs in a fridge, they should first be placed either in a polyethylene plastic⁵ bag such as your everyday food grade zip lock bag. However, the preferred method of storing photographs in cold storage is using vacuum packaging in plastic envelopes. When using impermeable plastic envelopes, the humidity in the cold storage/ fridge does not need to be controlled, as moisture will not be able to get into the envelope. When removing photographs from cold storage this may cause the formation of moisture on the photograph. When using a permeable (such as paper) storage envelope it is advised that the photograph should be left in the bag for at least an hour or up to a day to make sure that the photograph is able to adapt to the new temperature that it is being introduced to (Lavédrine, 2003:97). Cold storage does limit everyday access to the photograph.

5.8. Controlling dirt/pollutants

The damage caused by dirt and pollutants is cumulative over time. It is advisable that dirt caused by pollutants should be regularly checked and cleaned in order to avoid build up. Consider both indoor pollutants as well as outdoor pollutants that can be carried into the Museum space. In chapter two I looked at the damage caused by pollutants such as gases and dust. Air borne pollutants when they come into contact with a humid environment are able to

⁵ Polyethylene (PE) is an inert and stable plastic that is acceptable for use in museum settings. It is usually represented as plastic recycling code 2 (HDPE – high density polyethylene) or plastic recycling code 4 (LDPE – low density polyethylene).

cause chemical altering behaviour to silver. When silver ions are destabilised, they can start forming salts and sulphur predominates that will appear as yellow stains or cause the photograph to start fading (CCI, 2017). In the photographic collections questionnaire institutions indicated that their collections are used for research purposes and are brought out of storage for such purposes. Human contact is bound to transfer oily acids and grease onto the surface of a photograph.

To avoid and minimize potential damage when handling a photograph (CCI):

- Wear nylon or vinyl gloves; cotton gloves can be used but are not recommended as they are breathable oils from skin can still get transferred onto the photograph.
- Keep photographs in their protective sleeves when providing access to them for research.
- Use a rigid board or a heavier support when handling a fragile photograph. Do not come in direct contact with the photograph.
- Make sure that the collection is not accessed near open windows or doors.
- Use proper handling techniques when dealing with the photograph.

Other sources of pollutants and contaminants are introduced either in the environment or direct contact with photographic materials in the form of enclosures, boxes and containers that store the collection items. These will be discussed in detail in section 5.2.

5.8 Storage recommendations

Storage of collections allows for increased control over the potential threats to collection material, provided appropriate methods and materials are used. Storage methods and techniques will depend in large part as to the type of photographic material to be stored. As discussed in chapter 3, storing materials with the same requirements together facilitates storage solutions, similarly when selecting enclosures for your collection where and if possible, try and store photographs of the same type together.

Albums with photographic images can be stored in a loose-leaf ring binders made of cardboard, polyethylene or polypropylene and can then either be stored in cabinets or

appropriate casings, but it is recommended that they should be stored in boxes to help support the items and prevent deformation (Lavédrine, 2003: 55). If placing photographs in albums for storage, ensure the appropriate photograph storage sleeves are used. Old-fashioned magnetic photo albums with self-stick pages should be avoided as storage systems, as these cause damage to photographs over time. The pages are covered with an adhesive layer that becomes very acidic, yellows and darkens over time, often causing colour shifts in the photographs. In addition, the adhesive becomes embedded in the photo paper complicating the removal of the photographs which can easily tear and curl.

When storing cellulose acetate films for example, rather than being rolled, the films can be cut into strips then stored in paper sleeves. This stops the accumulation of acetic acid which can be damaging, prevents the film from being in contact with one another and sticking or rubbing against one another. Similarly, polyester based films can be placed in paper or polyester jackets and there is no need to cut them as they are already cut in smaller strips from the developers (Lavédrine, 2003:56).

When storing photographic prints, the first consideration should be to determine how frequently they will be used. If the print will be frequently used it is advisable to store it in a window mat. A window mat is a backing board that has been folded in half and a square cut out on the other half to make a window through which the print can be seen, as illustrated in figure 33.



Figure 33 - Example of mat window By: Katheleenheri in craft

Archival museum board or card stock can be used to make the window, using low-quality cardboard runs the risk of sticking to the photograph permanently and discolouring it, and so correct material choice is vital. A window mat has the advantage of covering the photograph so that no contact is made directly with it during handling. Most institutions do not have the time nor the resources needed to create mats, especially for large collections, and so the easiest method to implement is paper sleeves. A distinct advantage of matting photographic prints, especially high use ones, is that these are easily framed for exhibition once in their mats. Therefore matting and framing should be considered for high use collections as a priority measure. Framing should be done in a dust free dry space where humidity and dust will not be able to rest on the photograph otherwise the dust will be trapped inside the frame packaging and moisture as well. Photographic frames are usually made from aluminium or lacquered metal or varnished wood. In paragraph 5.7.7 the damaging effects of these materials were mentioned. Before a photograph can be framed it can be placed inside a mat window this will ensure that the metals press against the cardboard and not the actual photograph. The front covering is usually glass institutions that have access to funding have started replacing the glass glazing with acrylic sheet material that have UV filters, this provide an extra layer of protection against UV light. This is an expensive material that cannot be accessed by all institutions (Lavédrine, 2009:299).

5.8.1 The enclosures (cabinets, display cases, boxes in storage)

Because photographs are sensitive by nature their storage materials should be chosen with great consideration to avoid the introduction of additional pollutants. In most collections clean gloves made of cotton or latex should be worn when handling photographs in order to avoid skin contact that will leave behind fingerprints, perspiration and body oils. Avoid using any material that contains rubber, and also avoid metals as when rubber and metal ages, their chemical composition changes and they will react with the photographic material. Paper clips and rubber bands should thus be avoided, and if found, should be removed as they will rust and oxidize, damaging the photographs.

Envelopes and boxes are the preferred methods of storing photographs as they are able to protect from the agents of deterioration (Lavédrine, 2009:285). Horizontal storage is preferred for most photographic types as storing photographs horizontally provides better support for the photograph and avoids mechanical damage. When placing photographs inside

a box, do not pile too many prints on top of each other as this will cause pressure on the photographs at the bottom of the box and if the images are of different sizes, then smaller images should be placed above larger ones as in the case of the reverse, bending and curling of larger format prints placed on top of smaller ones will occur (Lavédrine, 2003: 56).

Vertical storage is preferred for photographic negatives glass plate negatives should be stored vertically to avoid breakage when using vertical storage photographs should first be protected with acid-free material (NorthEast Document Conservation Center, 2019). Materials which are appropriate for storage are those which are in line with the regulations set out by the ISO such as cardboards with an alkaline reserve and synthetic polymers, polymers used for boxes should contain antioxidants as well as antimony oxide. Corrugated cardboard is less expensive and is easier to obtain it is also easy to put together. They are however not always of good quality and may start showing signs of aging after repeated use. Metal shelving units are the preferred method of storage aluminium, plated steel are good materials for storage they should no solvents. Most office metal furniture available in store met the requirements for photographic shelving. All wood storage cabinets made of solid wood, plywood, or any other form of engineered wood should be avoided if possible because wood releases volatile organic compounds that may cause damage to the photograph. If wood storage is already in place photographs should be properly enclosed in their wrappers before they can placed in the drawers or shelves, thus providing the collection items with a protective barrier layer. Using acid-free tissue paper can be sufficient, however it is important to remember that it will absorb acids over time and needs replacement every so often.

The following table illustrates materials recommended for storage as well as materials that should be avoided when storing photographic materials (Lavédrine, 2009: 286).

Table 1 - Materials used for photographic storage

Material name:	Do not use:	Recommended Materials
Paper	Avoid paper and cardboard with unknown material composition.	Any conservation-quality paper and cardboard as approved by the ISO
Plastic	Cellulose acetate	Polyester

	Cellulose nitrate	Polyethylene
	Polyvinyl acetate	Polypropylene
	Polyvinyl chloride (PVC)	Polystyrene
	Vulcanized rubber (Elastic bands)	Teflon
	Plastic of unknown composition	Acrylic glazing
	Polymers with chlorine	Polycarbonate
		Acrylonitrile butadiene styrene

5.8.2 Paper

Storage paper should be carefully selected so that it will not cause damage to silver-based images or black-and-white photographs. The manufacturing process of making paper involves treatment with calcium carbonate which is an alkaline reserve that neutralizes acid. Acidic material will deplete the alkaline reserve turning acid free paper acidic even acid free paper should be regularly checked and rotated as it can also turn acidic if it comes into contact with the wrong materials (Silva, 2015). Poor-quality acidic paper will deteriorate and may cause damage and deterioration to photographs that are in close contact with it. Acid free paper is usually stamped with a quality certificate this allows you to read its main quality and the test method to which it was subjected paper with an alkaline reserve is not recommended as it can react with the compounds of the photograph (Silva, 2015). Hence it is better to use acid-free paper, or to use paper with an alkaline buffer, although buffered paper can be damaging to protein-based materials such as gelatine, and certain photographic dyes (Western Australian Museum, Anon). A basic pH is measured on a scale of 0-14, a pH value of 7 is neutral it is neither acidic (Lavédrine, 2009:287) or basic a pH value below 7 means that it is more acidic and a pH level more than 7 means that it is more basic (Anon, 2022). Storage paper should be chemically stable paper made of cotton fibres or bleached wood pulp is recommended it should have an alpha-cellulose content of 87% and should not contain any

dyes, waxes, metals, or any material that can be deemed as damaging to a photograph. When it is not possible to get such paper, it is recommended to try and get a hold of graphic art paper as this type of paper has nearly the same components as photographic archival paper (Lavédrine, 2009:287).

5.8.3 Plastic

Plastic storage materials depend on the type of application that they are going to be used for. Polyester gives the advantage that it allows for viewing of the photograph without having to remove it from its enclosure. The recommended plastics are polyester and polyethylene terephthalate (PET) it is known in different trade names such as mylar, melinex and terphane it is physically and chemically stable for storage and use. Polyethylene is a cheaper alternative; however it is less transparent and not as durable as polyester. Plastics made from plasticized polyvinyl chloride (PVC) are not recommended as they yellow and may release hydrochloric acids and plasticizers that can damage photographs. Paper is still the recommended storage material above plastic as plastic is able to create moisture (Lavédrine, 2009: 289).

5.9. Digitisation

The online access of photographic images has increased over the years and collections that would not have been easy to access are now available on the internet. Digitization has become a tool for cataloguing and a way of saving the information contained in the photograph image (Lavédrine, 2009:306). In the photographic questionnaire, all 19 institutions that took part indicated that they are in the process of digitizing some of their collections with the most vulnerable and most used photographs taking priority. As a result, it is important to touch on digitization when talking about guidelines and recommendations. However, digitization and digital information storage should not be considered as an alternative for the conservation of original photographs, and the condition of the original photograph should be stabilized during digitisation. A photograph's material and physical manifestations should be considered during digitization. The materials that make up a photograph vary and are not all the same and this is information that is somewhat lost with a digital surrogate of the photograph. The reproduction does not have the qualities that the original has image modification opens up once a digital print has been created such as contrast, brightness, sharpness and colour balancing once these have been altered the original is no longer comparable with its digital version. Because modification is bound to happen in

order for the image to be viewable on a digital platform intervention should be kept to a minimum, and only implemented to provide visibility of the image; modifications should be documented so that they are not considered as part of the original photograph (Lavédrine, 2009: 306-307).

The quality resolution of the image will be dependent on the type of method used to capture the photographic image, as seen in the questionnaire response (see question 22), capturing the image can include scanning as well as photographing of the original image as the Durban HGC explains, saying they do so using a digital camera and cellphone camera and although “not high end, it provides a usable output, given our budget constraints”. Although this allows for quick and easy digitisation, there are a few drawbacks namely, quality and sharpness of the resultant image, variable lighting conditions due to different set ups or changing weather conditions if photographed in daylight and this could affect colour perception.

There are various scanners available on the market drum scanners can scan large formats in high quality resolution they are however expensive to attain. Flatbed scanners are the easiest to get and they are found in most office spaces they can scan sizes of photographic slides all the way to an A3 size. Legibility is usually always achievable at a resolution level of 200 to 400 dpi (Lavédrine, 2003:195). When conserving a document the aim is to make sure that it stays accessible as well as readable, future observers should be able to see some equivalent of what we are seeing today. Always make a hard copy backup in case the digital copy disappears or becomes unreadable considering that technology is ever changing and the method used to access the online data may change. Always consider how people will be able to access your documentation if technology evolves into versions that your digital storage method is not compatible with (Lavédrine, 2009:310). Therefore, keeping up to date with digital migration presents additional constraints on time and resources.

5.10 Conclusion

As a result, it is clear that photographic conservation in South Africa requires special attention due to its climatic conditions, which include high levels of lights, humidity, temperature swings and a high crime rate. This chapter recaps the agents of deterioration,

how they can be avoided and blocked out of the museum space in order to protect photographic collections. South African examples of blocking out the agents were looked at based on the answers received in the questionnaire. Recommendations of good storage practices as developed by international standards may not always be applicable to South Africa as they are costly to implement. As a method of managing storage facilities focus was given on creating micro-environments as this is easier to achieve and less costly. With digitizing there are aspects of longevity that should be considered and backup system to the digital copy should remain available because technology is ever changing, and it might not be possible to recover a digital document using current technology in the future.

6. CONCLUSION

The focus of the paper was to provide an overview of the South-African photography heritage, the evolution of photography and the challenges in the conservation of photograph in South African heritage, as well as to develop recommendations which include increased public awareness, access to preservation materials and best conservation practices.

It can be noted that photographs have been used to tell stories of the past as well as the present; they have become tools of narration and are important for visual representation. The development of the camera came with new techniques of editing our pictures each different from the one before it. The aim was to find a way that would permanently fix an image onto a solid base. In addition to fixing black and white, a new way of fixing colour was developed. Each journey had its own chemical composition and new and better ways of improving photography was discovered. Given the history of South Africa photographs were used to tell stories of what was happening in the country. During the colonial period pictures were used to create an image of what Africa looked like to those Europeans who could not experience it for themselves. However, the picture that was illustrated was not always accurate and had elements of pictorialism to it. As a response to pictorialism in South Africa Santu Mofokeng compiled a book with photographs showcasing how people choose to see themselves. The book does not only consist of his own work it includes then work of other photographers with captions. Much like the work of Santu there developed Movie snaps in Cape Town during the apartheid era where people dressed up and had moving pictures taken of them in their Sunday

best. Choosing to see themselves the way they wanted to be represented despite of how they were represented at the time. Each of these photographs tell stories of belonging and identity hence the three case studies were approached as they house photographs telling these stories. The aim was to find out as to the conservation aspects which they have in place to care for these photographs a survey was also sent to SAMA to circulate through their network. The survey indicates that there is a need for photographic conservation in South Africa it also shows that not much is known as to how to care for photographs most institutions care for them in the same way that they would care for paper.

Recommendations

Photographic preservation is undoubtedly a crucial aspect of our memories and cultural heritage. At the conclusion of the study, the researcher developed the following recommendations for professional conservators, art gallery managers, caretakers, among others:

- Preventative frameworks: It is recommended that basic preventative frameworks such as proper handling and storage of photographs are implemented and strictly complied with by conservators. Controlling the environment and avoiding exposure to light can also aid in conserving photography. In addition, making digital copies and storing them in several places is recommended. Seeking the services of a professional conservator to assist in assessing the state of photographs and suggest the best solutions for their long-term preservation is yet another beneficial solution to photographic deterioration.
- Educational workshops: Art gallery, and Museums personnel, as well as general members of the public can be trained about the best practices to ensure that sentimental images are preserved for future generations. For example, prints should be preserved in acid-free and lignin free photo albums while avoiding exposing them to direct sunlight. Film negatives, digital photographs, as well as polaroids individually require special care in preserving them.

- Further research: Research is crucial to the conservation of photography as it enhances understanding of the causes of deterioration, crafting of new preservation strategies and improving capabilities to preserve photographic heritage. Through research, South African conservators can procure conservation grade materials of high quality that ensure that photographs are preserved for future generations while maintaining their appearance and state over time.
- South Africa test methods: Last but certainly not the least, it can be argued that South Africa, amongst its African counterparts, has been at the forefront of developing innovative and effective ways of photographic conservation. South African conservators can continue to lead the agenda for climate digitisation, preventive conservation and materials science.

. The study could not go deep enough further research can be done from its basis. Simple resolutions were given of how to avoid, block and detect some of the damages that can be caused by the agents of deterioration. However, workshops would be more beneficial as they would not only educate but will show how the steps can be implemented for better use the survey also showed that most institutions were not aware of the type of photographs which they have showing that there is a lack of education in terms of photographic types. Conservation grade material is expensive and is not always available in South Africa test methods were attached as an appendix to show how institutions can test their own materials making sure that it is safe to use on photographs. This paper briefly described what conservation is, what types of photographs exist and their chemical composition though it did not describe all of it. The ten agents were discussed as to how they relate to photographs. Digitisation is often used as a way to conservation though it is not. The concept of digitisation and how it relates to conservation was also discussed. In whole, this paper is a small preventative conservation guide for photographs.

In final analysis, this paper provided a summary of the historical development photography with reference to the social development of the medium and the legislative framework in a South African context. Thereafter, the delicate nature of photographs and the agents responsible for deterioration were explored before administering a 30-question surveys to assess the condition of photography with a view to developing guidelines, recommendations,

and solutions for institutions to safely store photographic collections for conservation, cultural or historical, sentimental, artistic, evidence and commercial reasons.

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**APPENDIX A – LETTER TO SAMA FOR SURVEY
PARTICIPANTS**

30 May 2022

Letter of introduction and permission to use questionnaire responses for research

Dear Sir/Madam

You are herewith invited to participate in a Masters mini dissertation by Jabulile Ntuli for the requirements of the M(Soc)Sci Tangible Heritage Conservation at the University of Pretoria. The study is provisionally titled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied.*

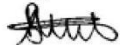
The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward.

The data will be used to further our understanding of South Africa's photographic heritage, its distribution nationally and where needed improve the general state of conservation, aiming for benchmarks in best practice. The data will be archived at the UP School of the Arts for 15 years. Unfortunately, you will not receive any compensation for your participation and no benefits can be promised. However, the hope is that your participation will contribute to the knowledge base of photographic materials.

Permission is requested for use of the data collected in the attached questionnaire.

Any questions you may have about this study can be directed to Jabulile Ntuli at 072 703 9391 or jabulilintuli@gmail.com, or the dissertation supervisor Isabelle McGinn at 083 953 0587 or isabelle.mcginn@up.ac.za.

Regards



Jabulile Ntuli

Research Consent Form

Statement of voluntary consent:

When signing this form, I am agreeing to voluntarily participate in the research entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward. Data collection will be carried out using a questionnaire emailed to me on behalf of the researcher through the South African Museums Association. I have had a chance to read this consent form, and it was explained to me in a language which I understand.

I have had the opportunity to ask questions and have received satisfactory answers. I understand that participation is voluntary, unremunerated and that I can choose to opt out, or withdraw at a later stage even if I initially opted in. By signing this form I also agree that data generated during the research process will be kept at the School of the Arts, at the University of Pretoria for 15 years and can be accessed by requesting permission from the researcher or the dissertation supervisor.

Opting in (Circle which is appropriate): YES/NO

I wish to (circle applicable):

- a. Use my real name:
- b. Use the following pseudonym:
- c. Remain anonymous

Signature of participant:.....

Print name:.....

Capacity:.....

Date:.....

Place:.....

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher:.....

Print name:.....

Date:.....

Place:.....

APPENDIX B – LETTER OF INTRODUCTION AND RESEARCH PERMISSION FOR THE CASE STUDY COLLECTIONS



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

School of the Arts
Tangible Heritage Conservation

30 May 2022

Letter of introduction and permission for research in the photographic collection

Dear Sir/Madam

My name is Jabulile Ntuli from M(Soc)Sci Tangible Heritage Conservation at the University of Pretoria. I am requesting your permission to use your collection as a case study for my research titled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied.*

The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward. The data will be used to further our understanding of South Africa's photographic heritage, its distribution nationally and where needed improve the general state of conservation, aiming for benchmarks in best practice. The data will be archived at the UP School of the Arts for 15 years, where other researchers will also be able to make use of it. Unfortunately, you will not receive any compensation for your participation and no benefits can be promised. However, the hope is that your participation will contribute to the knowledge base of photographic materials.

Permission is requested for an on-site visit to the collection, to view and document its storage and display areas if accessible.

Permission is further requested for a one-on-one interview with the collection custodian. The interview format whether in person, telephonic or via email will be determined by the availability of the custodian, particularly if they indicate they would prefer an in-person interview.

Any questions you may have about this study can be directed to Jabulile Ntuli at 072 703 9391 or jabulilintuli@gmail.com, or the dissertation supervisor Isabelle McGinn at 083 953 0587 or isabelle.mcginn@up.ac.za.

Regards

A handwritten signature in black ink, appearing to read 'Jabulile Ntuli'.

Jabulile Ntuli

APPENDIX C – LETTER OF CONSENT BENSUSAN MUSEUM OF PHOTOGRAPHY

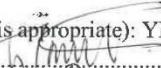
Research Consent Form

Statement of voluntary consent:

When signing this form, I am agreeing to voluntarily participate in the research entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward. This will be done through interviews, written exchanges and where possible an on-site visit. I have had a chance to read this consent form, and it was explained to me in a language which I understand.

I have had the opportunity to ask questions and have received satisfactory answers. I understand that participation is voluntary, unremunerated and that I can choose to opt out, or withdraw at a later stage even if I initially opted in. By signing this form I also agree that data generated during the research process will be kept at the School of the Arts, at the University of Pretoria for 15 years and can be accessed by requesting permission from the researcher or the dissertation supervisor.

Opting in (Circle which is appropriate): YES/NO

Signature of participant: 
Print name: DUDUZILE PHISOANE MADONSECA
Capacity: CURATOR, BENSUSAN MUSEUM OF PHOTOGRAPHY
Date: 17 AUGUST 2022
Place: NEWTOWN, JOHANNESBURG (GAUTENG PROVINCE)

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: 
Print name: Jabulile Ntuli
Date:
Place:

Interview Consent Form

We are requesting your permission to audio-record our interview as part of this study entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. If you agree to be recorded, we will use the recording to take notes, transcribe the full text, and possibly select quotes to be used during the final presentation and publication of research findings as part of the completion of a Masters mini-dissertation.

In addition, we would like your permission to store the digital copy of your audio recording for use by other researchers affiliated with Tangible Heritage Conservation at the University of Pretoria's School of the Arts, should we need to review past data collected for future relevant studies.

This recording is optional. You may choose to give permission for one or both uses of the recording, or you may decide not to participate in the recording at all. Your decision will not affect your ability to contribute to the research as you may select to be interviewed and the interview not recorded.

If you agree to participate and be recorded, we will keep the recordings on a password protected cloud drive that is only accessible when permission is granted by the administrator. To protect your confidentiality, we will code all recordings in line with what the participant has given permission to use as an identifier—**real name, self-selected pseudonym, or a randomly assigned number** for those who wish to remain **anonymous** to the researchers of the study.

I wish to (circle applicable):

- a. Use my real name:
- b. Use the following pseudonym:
- c. Remain anonymous

I agree that my audio recording may be taken as part of the research for the mini-dissertation research entitled: *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied*.

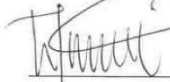
Quotes from my audio recording may (circle applicable):

- a. be used in a public conference presentation
- b. be used in a final research report where my real name may be used
- c. be used in a final research report where a pseudonym is used to ensure confidentiality
- d. not be used in a public conference presentation
- e. not be used in the final research report

You have the choice of how long we may keep your tapes (circle applicable)

- a. My audio recording may be kept permanently for research, educational or training purposes.
- b. My audio recording must be destroyed after completion of study.

I understand that my consent for this part of the study is optional, and I am free to refuse this request and still participate in the study. I understand that I may request at any time during the research that my audio recording be destroyed and the research staff will honour my request promptly. My signature below indicates my consent for the use of these recordings.

 P. DUBU MADONISELA

Signature of Participant

17 AUGUST 2022

Date

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: 

Print name: Jabulile Ntuli

Date:

Place:

APPENDIX D – LETTER OF CONSENT DUGGIN-CRONIN COLLECTION

Research Consent Form

Statement of voluntary consent:

When signing this form, I am agreeing to voluntarily participate in the research entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward. This will be done through interviews, written exchanges and where possible an on-site visit. I have had a chance to read this consent form, and it was explained to me in a language which I understand.

I have had the opportunity to ask questions and have received satisfactory answers. I understand that participation is voluntary, unremunerated and that I can choose to opt out, or withdraw at a later stage even if I initially opted in. By signing this form I also agree that data generated during the research process will be kept at the School of the Arts, at the University of Pretoria for 15 years and can be accessed by requesting permission from the researcher or the dissertation supervisor.

Opting in (Circle which is appropriate): YES/NO

Signature of participant: R. Hart

Print name: Robert Hart

Capacity: Collection manager

Date: 12 August 2022

Place: Kimberley

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: J. Ntuli

Print name: Jabulile Ntuli

Date:

Place:

Interview Consent Form

We are requesting your permission to audio-record our interview as part of this study entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. If you agree to be recorded, we will use the recording to take notes, transcribe the full text, and possibly select quotes to be used during the final presentation and publication of research findings as part of the completion of a Masters mini-dissertation.

In addition, we would like your permission to store the digital copy of your audio recording for use by other researchers affiliated with Tangible Heritage Conservation at the University of Pretoria's School of the Arts, should we need to review past data collected for future relevant studies.

This recording is optional. You may choose to give permission for one or both uses of the recording, or you may decide not to participate in the recording at all. Your decision will not affect your ability to contribute to the research as you may select to be interviewed and the interview not recorded.

If you agree to participate and be recorded, we will keep the recordings on a password protected cloud drive that is only accessible when permission is granted by the administrator. To protect your confidentiality, we will code all recordings in line with what the participant has given permission to use as an identifier—**real name, self-selected pseudonym, or a randomly assigned number** for those who wish to remain **anonymous** to the researchers of the study.

I wish to (circle applicable):

- a. Use my real name:
- b. Use the following pseudonym:
- c. Remain anonymous

I agree that my audio recording may be taken as part of the research for the mini-dissertation research entitled: *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied.*

Quotes from my audio recording may (circle applicable):

- a. be used in a public conference presentation
- b. be used in a final research report where my real name may be used
- c. be used in a final research report where a pseudonym is used to ensure confidentiality
- d. not be used in a public conference presentation
- e. not be used in the final research report

You have the choice of how long we may keep your tapes (circle applicable)

- a. My audio recording may be kept permanently for research, educational or training purposes.
- b. My audio recording must be destroyed after completion of study.

I understand that my consent for this part of the study is optional, and I am free to refuse this request and still participate in the study. I understand that I may request at any time during the research that my audio recording be destroyed and the research staff will honour my request promptly. My signature below indicates my consent for the use of these recordings.

Ryhurst
Signature of Participant

12 August 2022
Date

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: [Signature]
Print name: Jabulile Ntuli
Date:
Place:

APPENDIX E – LETTER OF CONSENT RASHID LOMBARD COLLECTION

Research Consent Form

Statement of voluntary consent:

When signing this form, I am agreeing to voluntarily participate in the research entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. The research aims to look at the size of photographic collections in South Africa as well as the type of photographic materials at different institutions. For conservation purposes the study will also look at current conservation practice and challenges at different institutions including handling, storage and exhibition guidelines in order to inform locally appropriate best practice for other collections going forward. This will be done through interviews, written exchanges and where possible an on-site visit. I have had a chance to read this consent form, and it was explained to me in a language which I understand.

I have had the opportunity to ask questions and have received satisfactory answers. I understand that participation is voluntary, unremunerated and that I can choose to opt out, or withdraw at a later stage even if I initially opted in. By signing this form I also agree that data generated during the research process will be kept at the School of the Arts, at the University of Pretoria for 15 years and can be accessed by requesting permission from the researcher or the dissertation supervisor.

Opting in (Circle which is appropriate): YES NO
Signature of participant: *R. Lombard*
Print name: RASHID LOMBARD
Capacity: AUTHOR / OWNER OF RL ARCHIVES
Date: 22/09/2022
Place: CAPE TOWN

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: *Jabulile Ntuli*
Print name: Jabulile Ntuli
Date:
Place:

Interview Consent Form

We are requesting your permission to audio-record our interview as part of this study entitled *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied* by Jabulile Ntuli. If you agree to be recorded, we will use the recording to take notes, transcribe the full text, and possibly select quotes to be used during the final presentation and publication of research findings as part of the completion of a Masters mini-dissertation.

In addition, we would like your permission to store the digital copy of your audio recording for use by other researchers affiliated with Tangible Heritage Conservation at the University of Pretoria's School of the Arts, should we need to review past data collected for future relevant studies.

This recording is optional. You may choose to give permission for one or both uses of the recording, or you may decide not to participate in the recording at all. Your decision will not affect your ability to contribute to the research as you may select to be interviewed and the interview not recorded.

If you agree to participate and be recorded, we will keep the recordings on a password protected cloud drive that is only accessible when permission is granted by the administrator. To protect your confidentiality, we will code all recordings in line with what the participant has given permission to use as an identifier—**real name**, **self-selected pseudonym**, or a **randomly assigned number** for those who wish to remain **anonymous** to the researchers of the study.

I wish to (circle applicable):

- a. Use my real name:
- b. Use the following pseudonym:
- c. Remain anonymous

I agree that my audio recording may be taken as part of the research for the mini-dissertation research entitled: *Identifying challenges in the conservation of South African photography based on three case studies: Looking at why these challenges exist and how they can be remedied*.

Quotes from my audio recording may (circle applicable):

- a. be used in a public conference presentation
- b. be used in a final research report where my real name may be used
- c. be used in a final research report where a pseudonym is used to ensure confidentiality
- d. not be used in a public conference presentation
- e. not be used in the final research report

You have the choice of how long we may keep your tapes (circle applicable)

- a. My audio recording may be kept permanently for research, educational or training purposes.
- b. My audio recording must be destroyed after completion of study.

To BE DISCUSSED (u)

I understand that my consent for this part of the study is optional, and I am free to refuse this request and still participate in the study. I understand that I may request at any time during the research that my audio recording be destroyed and the research staff will honour my request promptly. My signature below indicates my consent for the use of these recordings.

M. M. M. M. M.
Signature of Participant

25/08/22
Date

By signing below, I indicate that the participant has read and, to the best of my knowledge, understands the details contained in this document and has been given a copy.

Signature of researcher: A. A. A.
Print name: Jabulile Ntuli
Date:
Place:

APPENDIX F - TESTING MATERIALS FOR SUITABILITY

This appendix contains several tests that can be used to determine the suitability of materials for safe archival storage.

Test for acidity:

A pH pen contains a pH ink indicator the ink is either green or red and changes colour at a specific ph. It is important to read the instructions that come with your ph. pen as they may have different colour indicators. The test can be run in different way either the whole paper can be tested, or a strip can be cut of the paper (Odegaard *et al*, 2005:180-181). These are usually available online through conservation retailers.

Method:

Draw a line on the paper that you want to test using the ph. pen wait for the ink to dry into the surface of the paper for at least 30 seconds. It is safer to draw more than one line at different areas of the paper to see if they all change into the same colour. The colour of the drawn strip will change into a different colour if the paper is acidic (Odegaard *et al*, 2005:180-181).



Figure 33 ph. testing pen on munchkin (graphic art) paper. Photograph by Jabulile Ntuli

Lignin test:

The test helps to determine the presence of lignin in paper. Lignin is present in most paper fibres made from wood and generates oxidizers, reducers, acids and chromophores over time. This can be particularly damaging to photographs causing yellowing, colour shifts and embrittlement. This test requires the following: Phloroglucinol, Hydrochloric acid, and Methanol. Protective gloves should be worn when handling the above-mentioned chemicals as they can be harmful

Method:

Testing lignin can be done by using phloroglucinol to make phloroglucinol mix 0.25g of phloroglucinol, 15ml of methanol, 15ml distilled water and 15ml concentrated hydrochloric acid. To test take one drop of the mixture and drop it onto the paper that you are testing wait for about a minute to see colour change. If lignin is present in large amounts the drop area will turn into a bright beetroot red colour or violet. If the presence of lignin is low a weaker looking stain will form that should be viewed under low power magnification. After using the mixture store it in a dark bottle and cover it with aluminium foil store away from direct sunlight (Odegaard *et al* , 2005:156-157)

Test for halogens:

Testing for halogens will help with determining the presence of chlorine, bromine, iodine and polyvinyl chloride PVC in plastic films. These plastic additives leach out of the plastics over time and into the photographic materials they are in contact with and these same additives can extract and dissolve dyes.

Method:

For the test a copper wire is needed something to create a fire with and a holder that will make sure that the heat doesn't get transferred to you.

First start by cleaning the wire that you will be testing with by holding it over a flame for a few seconds. The wire will get hot so do make sure that you are holding it with something that will stop the heat transfer such as a tong or rubber grip pliers. Take the hot wire and stick it onto the plastic material that you want to test make sure that the plastic melts onto the wire coating it. Set the coated wire a flame and observe the colour of the flame. The flame will turn a green colour if there are halogens present it will burn green for a longer period if there are polymers such as PVC present in the plastic (Odegaard *et al*, 2005:106-107)

APPENDIX G – LIST OF SURVEY PARTICIPANTS

1. Amazwi South African Museum of Literature, Grahamstown

Amazwi South African Museum of Literature is the new name of the National English Literary Museum. The museum now has a mandate to collect literary artefacts from all the linguistic communities of South Africa.

<https://amazwi.museum/>

2. Brenthurst Library, Johannesburg

The Brenthurst Library is a private repository of Africana in Johannesburg built by Harry Oppenheimer in 1984 as he started to disengage from the family's mining interests. It houses a collection of some 20,000 volumes, including rare manuscripts and documents.

<https://www.brenthurst.org.za/about-bl/>

3. Comrades Marathon Museum, Pietermaritzburg

The Comrades Marathon Museum houses close to a century's old history about the comrades marathon as well as its runners. The building is an old Victorian house that has been newly renovated located near the Scottsville race course.

<http://www.comrades.com/>

4. Dala Indyebo projects, Centurion-Pretoria

Website is unavailable

5. East London Museum, East London

Natural and cultural history museum features exhibitions on specimen, reptile skulls and skeletons. The museum was established in 1921.

<http://www.elmuseum.za.org/About-Us/>

6. Erfenisstichting Archives, Pretoria

Erfenisstichting archives is a non-profit company that aims to preserve and conserve the Afrikaner culture and history. The archives is also actively involved in the protection of other Afrikaner sites across Southern Africa. Their library and archives are open for researchers as well as other academics.

<https://es.org.za/en/home/>

7. Holocaust & Genocide Centre, Cape Town (HGC- CT)

The Holocaust and Genocide Centre commemorates the victims and the survivors of the Nazi regime and the Rwanda genocide it also highlights the dangers of racism and deals with more recent issues such as xenophobia, bigotry and homophobia. Aims to give visitors a bigger understanding of what it means to be human.

<https://ctholocaust.co.za/about/>

8. Holocaust & Genocide Centre, Durban (HGC-DBN)

The vision and mission of the Holocaust and Genocide Centre are all the same.

<https://dbnholocaust.co.za/>

9. Holocaust & Genocide Centre, Johannesburg (HGC-JHB)

<https://www.jhbholocaust.co.za/about/>

10. Mogale City Museum, Krugersdorp

The Mogale City Museum was named after chief Mogale who was the last pre-colonial leader over the era. The museum is located in what was previously a magistrate court. It showcases exhibitions on mining, Anglo-Boer War, archaeological, natural as well as cultural history.

<https://www.mogalecity.gov.za/mogale-city/explore-our-city/public-facilities/museums/#:~:text=Mogale%20City%20Museum%20is%20housed,room%20from%201891%20to%201976>

11. South African Naval Museum, Simonstown

The South African Naval Museum showcases the history of the South African Navy from 1922 to date. It showcases the South African involvement during the First and Second War as well as the transformation that took place in the Navy after 1994.

<https://sanavymuseum.co.za/about/>

12. Talana Museum, Dundee

Talana Museum is set in a large heritage park that consists of 42 buildings with 24 of them having exhibitions. Exhibitions cover war, mining, agriculture as well as domestic life.

<https://www.talana.co.za/>

13. University of Pretoria (UP) Mapungubwe Archives, Pretoria

The University Museum actively tells stories and curates the collective memory of the institution. The purpose is conservation, the creation of dialog, engagement, and research.

<https://www.up.ac.za/museums-collections/article/2888711/mission-vision>

14. University of Pretoria (UP) Museum Archives, Pretoria

The University of Pretoria Museum archives conserves and curates the collections of the museums affiliated with the institution. The key collections are housed at the historical buildings the Old Merensky as well as the Old Arts building. Collection consists of sculptures, Southern African ceramics as well as ceramics from around the world.

<https://www.up.ac.za/museums-collections>