A technical survey of Lucky Madlo Sibiya's (1942 – 1999) materials and techniques employed in his carved and painted wood panel artworks.

by

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SUMMARY AND KEY TERMS

Title of dissertation: A technical survey of Lucky Madlo Sibiya's (1942 – 1999) materials and techniques employed in his carved and painted wood panel artworks.
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The study aims to achieve an understanding of the artist's materials and techniques used by Lucky Madlo Sibiya when he created his carved and painted wood panel artworks. A survey of the artist's materials and techniques is of great importance, because he is represented in multiple institutional, corporate and private collections – including the University of Pretoria. His carved and painted wood panel artworks are also reaching an age (at least 20 years old, as 2019 is the twentieth anniversary of his death) when they would soon require conservation and restoration, if not stored and displayed according to sound conservation conditions and standards. For best-practice conservation and restoration, in-depth knowledge of the materiality of an artwork is needed. In order to reach an in-depth knowledge of the materiality of Sibiya's carved and painted wood panel artworks, the survey intends to examine and document through the combination of various historical, visual and analytical techniques artworks with unrefuted provenance. The analytical techniques used are popular in heritage conservation, because they are non-invasive and non-destructive. They include provenance studies, visual examination, technical photography, X-ray Fluorescence and Fourier-transform Infrared Spectroscopy. In combination, the techniques should reveal the materials and techniques Sibiya employed. This knowledge will be used to safeguard and preserve this part of South African art heritage.

Key terms: Lucky Sibiya; visual examination; art documentation; Technical Photography; X-ray Fluorescence Spectroscopy; Fourier Transform Infrared Spectroscopy; Munsell Colour System.

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PLAGIARISM DECLARATION

I hereby declare that *A technical survey of Lucky Madlo Sibiya's (1942 – 1999) materials and techniques employed in his carved and painted wood panel artworks* is my own original work, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Salomé le Roux

October 2020

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CHAPTER ONE
INTRODUCTION

1.1 Background and aims of the study

Lucky Madlo Sibiya was a modern black South African artist who lived between 1942 and 1999. As is the case with multiple modern black South African artists, living and working during the apartheid government, Sibiya became an artist that was neglected during his lifetime because of his race. He was a talented artist, noticed by prestigious artists and galleries, yet did not reach the same fame and affluence as some of his contemporaries, for example, Sydney Kumalo (1935 – 1988) or Gerard Sekoto (1913 – 1993). For this reason, the research questions the dissertation wishes to answer are: Who was Lucky Sibiya, and what were the materials and techniques used and followed by Sibiya when he created his carved and painted wood panel artworks? A survey of the artist's materials and techniques is of great importance, because he is represented in multiple institutional, corporate and private collections – including the University of Pretoria. His carved and painted wood panel artworks are also reaching an age of at least twenty years (as 2019 was the twentieth anniversary of his death), and it is necessary to gather information in a timely manner for the long-term preservation of Sibiya's artworks. For best-practice conservation and restoration, in-depth knowledge of the materiality of an artwork is needed.

First, the biography of Sibiya is determined through literature study and archival research. In order to reach an in-depth knowledge of the materiality of Sibiya's carved and painted wood panel artworks, the survey intended to identify artworks by Sibiya with unrefuted provenance, while simultaneously obtaining consent to examine and document these identified artworks.[1] Once permission was obtained, the artworks were examined[2] and documented[3] through: 1) Initial documentation of empirical data; 2) Provenance; 3) Visual examination; 4) Technical Photography; 5) X-ray

[1] A formal letter of permission was obtained from Mr GC de Kamper, the Museums' Collection Curator (see Appendix A for the letter). The letter states the study's intent and outcomes, and that information about the artworks will be widely available in the submitted dissertation and a possible journal publication.
[2] The examination of an artwork entails determining the "structural and aesthetic soundness of a work of art" and "the methods and materials of fabrication for that work of art" (Ocon [sa]:6).
[3] The examination of Sibiya's artworks are also documented, which is the process of recording "the current condition and fabrication of a work of art through photography, microscopy, radiography, ultraviolet/visible fluorescence and infrared reflectography" (Ocon [sa]:6).

Fluorescence Spectroscopy; and, 6) Fourier Transform Infrared Spectroscopy. The analysed data was then presented in reports that correspond to each artwork, which is then available to conservators, restorers and scholars. The methods and process of examination and documentation are explained in chapter 1 section 4.

1.2 A brief literature study

The first group of resources consulted helped the establishment of a comprehensive biography of Lucky Sibiya. The available books on the artists of South Africa are *Looking at South African Art: A Guide to the Study and Appreciation of Art* (1988), by Frieda Harmsen, *The Dictionary of South African Painters and Sculptors, Including Namibia* (1988), by Grania Ogilvie and Carol Graff, and, *Art and Artists of South Africa: an Illustrated Biographical Dictionary and Historical Survey of Painters and Graphic Artists since 1875* (1970), by Esme Berman. However, these books are compilations of biographies and art terms, and while each of them has an entry on Sibiya, they do not focus on the artist. For the purpose of writing a more comprehensive biography of Sibiya, these sources do provide introductory information, but I also needed to look at the following sources: An article, *Lucky Madlo Sibiya* (1999), by John Peffer-Engels and Everard Read Gallery's artist profile for Sibiya, available on their website. Both of these sources focus on Sibiya, but neither are comprehensive. Thus, in order to discover currently unknown aspects of the artist's life, the University of Pretoria's Art Archive, the Pretoria Art Museum Archive, and the Everard Read Gallery archive and library were consulted.

An insightful book for the documentation of empirical data, and what information to include, is the fourth edition of *Basic Condition Reporting: A Handbook* (2015), edited by Deborah Rose Van Horn, Heather Culligan and Corinne Midgett. Another resource that provides accurate information on how to document an artwork is the *International guidelines for museum object information: the CIDOC information categories* (1995), by Alice Grant, Josephine Nieuwenhuis and Tony Petersen. The provenance research is based on advice and cautions in the chapter 'Provenance' in *Authenticating Art and Artifacts: An Introduction to Methods and Issues* (2017), by David Cycleback. Even though the book has a dedicated chapter on provenance, it is also widely discussed throughout the text, because provenance is an essential aspect of identifying authentic artworks.

The visual examination of the artworks is based on the seminal book *Seeing through paintings: Physical examination in art historical studies* (2000), by Andrea Kirsh and Rustin S Levenson. Even though it is based on Western easel paintings, their techniques and methods to examine artworks are useful to employ for Sibiya's artworks, because Sibiya's artworks can technically be classified as painted surfaces on a wooden substrate (which is not uncommon in Western artworks). The authors write clearly and precisely with techniques and methods that are easy to duplicate and apply. The book *Conservation of wood artifacts: a handbook* (2001) by Achim Unger, Arno P Schniewind and Wibke Unger moves the theory directly to Sibiya's painted wood artworks. The book is a series of essays looking at the identification, investigation and treatment of materials associated with painted wooden art objects. Examples are mainly drawn from the western art world, but once again the author's methods and techniques guide the study's processes. The next important text that drives the available and chosen techniques and methods, is *Analytical techniques in materials conservation* (2007), by Barbara Stuart. The book discusses a wide variety of analytical techniques and their application to conservation and it increases knowledge of wider possible techniques in cultural heritage. The final book of significance is *The Science of Paintings* (2000), by W Stanley Taft and James W Mayer. The book offers good explanations of the composition of paintings and describes the chosen techniques in a practical manner. The combination of these four books guided the application of the chosen and available techniques to artworks by Sibiya.

While each of the four above mentioned books also discuss aspects of Technical Photography, the seminal handbook for conducting Technical Photography is *The AIC Guide to Digital Photography and Conservation Documentation* (2017) by Jeffrey Warda (ed), Franziska Frey, Dawn Heller, Dan Kushel, Timothy Vitale and Gawain Weaver. The handbook gives detailed information on necessary equipment, efficient layouts and how to resolve potential problems. The book guides the reader through the process on a step-by-step basis, and was easy to understand and apply to the study.

For X-ray Fluorescence Spectroscopy, there are three important chapters in *Radiation in Art and Archeometry* (2000) edited by DC Creagh and David A Bradley: 'The infrared examination of paintings' by Franz Mairinger; 'The ultraviolet and fluorescence study of paintings and manuscripts' also by Franz Mairinger; and, 'X-ray Fluorescence Applications for the Study and Conservation of Cultural Heritage' by M Ferretti. These chapters are descriptive and provide examples on the techniques' application on paintings. Along with the chapter on the application of X-ray Fluorescence, there is a seminal handbook that is used: *Handheld XRF in Cultural Heritage: A Practical Workbook for Conservators* (2020) by Aniko Bezur, Lynn Lee, Maggi Loubser and Karen Trentelman. The handbook deals with everything from safety during XRF to the analysis of data. The book is also important, because it focuses specifically on handheld XRF instruments,[4] and is written for conservators who conduct materials analysis. The final source for XRF analysis is a chapter 'Handheld XRF for the Examination of Paintings: Proper Use and Limitations' by Chris McGlinchey in *Handheld XRF for Art and Archaeology* (2012).

The final group of resources pertain to the FTIR analysis of Sibiya's paintings. The first resource is a book titled *Infrared Spectroscopy in Conservation Science* (1999) by Michele R Derrick, Dusan C Stulik and James M Landry. The book can also be described as a handbook, because it discusses the theory of infrared radiation, sampling, analysis methods and interpretation of spectra. It has an entire section on infrared reflection measurements, and is informative and precise on how to conduct the technique and how it is useful for material analysis. The next source is 'Analysis of Cultural Heritage Materials by Infrared Spectroscopy' by Andrea Poliszuk and Gabriel Ybarra, in *Infrared Spectroscopy: Theory, Developments and Applications* (2014). The chapter uses paintings specifically as an example/case study, and describes the research process well.

1.3 The theoretical approach and research methodology

The examination and documentation of an artwork, and specifically an artwork signed as or by Lucky Sibiya, starts with an in-depth documentation of the observed data.

[4] The Tangible Heritage Conservation programme has a Bruker Tracer 5i handheld X-ray Fluorescence spectrometer.

This includes the title, date, signature, description, medium, measurements, owner, and location. It is also essential to record any special physical characteristics, the artwork's general condition, the observed manufacturing information and the artwork's history from the owner or custodian. After these initial steps, the investigation moves onto provenance. Provenance is essential, because a direct line to the artist establishes the artwork's authorship and makes it a reliable source of study. However, if an artwork does not have a sound provenance, it does not immediately rule out its genesis.

Subsequently, the artwork is inspected under normal white light, which includes normal and raking illumination – often with the aid of magnification. It determines the surface characteristics of the artwork and reveals a great deal of information on the artist's technique. Substantiating information is obtained by examining the artwork with a high-powered digital USB microscope. Next, ultraviolet-induced visible florescence is studied. It entails examining the artwork with a black light which makes different elements and materials fluoresce distinctively. Each of these steps are also photographed as part of the Technical Photography examination.

The next step is to image the artwork using visible light-induced reflected infrared photography. Different wavelengths of infrared can be allowed to pass through the lens of a camera which makes subsurface layers of the artwork visible. This information allows the investigator to see whether Sibiya might have made underdrawings or changed his mind about an element that is now overpainted. The final two techniques used are X-ray Fluorescence (XRF) Spectroscopy and Reflected Fourier Transform Infrared (FTIR) Spectroscopy, because they are complimentary techniques. XRF determines the inorganic, elemental characteristic of the materials of the artwork, which infers pigments. While FTIR can be used to get an idea of the type of binder Sibiya preferred – for instance, whether it was oil or acrylic.[5] The FTIR is used in reflective mode and thus does not require the sampling of the painted surface.

[5] It is also capable of identifying a wide range of organic and inorganic pigments.

1.4 Feasibility and significance of the study

The University of Pretoria has three carved and painted wood panel artworks by Sibiya. For this mini dissertation, these three artworks were examined and documented. The study is significant, because the examination and documentation of Sibiya's materials and techniques have never been conducted. The study is important for valuable information it will compile for conservators and restorers commissioned with the preventative and remedial conservation of Sibiya's artworks. Besides these two motives, Sibiya is gaining more and more prominence and value (monetary, cultural, artistic, historical) in the South African and International art markets, and the study can contribute to the establishment of the original and spurious artworks by Sibiya.

1.5 Preliminary outline of chapters

Chapter two discusses the available biographical information on the life of Sibiya. It also lists solo and group exhibitions in which Sibiya participated, and identifies known public commissions Sibiya undertook during his lifetime. Chapter three discusses the three selected artworks: *The Doorhandle* (1987); *A Family Group* (diptych) (1987); and *The Sun Man* (1995). Each section incorporates the documentation, provenance, visual examination, normal white-light examination, ultraviolet-induced visible fluorescence examination, and magnification and microscopy which correspond to the appropriate artwork.

Chapter four delves into the layers of the three selected artworks. Instead of using the different artworks as subsections, it examines and analyses the artworks according to the remaining three techniques: Technical Photography; X-ray Fluorescence Spectroscopy (XRF); and Fourier Transform Infrared Spectroscopy (FTIR). Each technique is briefly explained in relation to cultural heritage before the data is analysed in their various spectra. The results are given for each technique in accordance with each artwork. The final chapter is the conclusion, which entails a summary of the chapters: the answers to Sibiya's materials and techniques. The chapter ends with the limitations of the study and suggestions for further research.

CHAPTER TWO
LUCKY SIBIYA

2.1 Introduction

In this chapter the available archival research and resources on the life, artistic style, materials and iconography, as well as exhibitions, public commissions and represented collections of Lucky Sibiya are compiled. The chapter is written from available resources at the time of writing, and it is definitely not a complete and comprehensive account of his life. The biography section has missing information of about ten years, and the artistic style, materials and iconography is based on literary research. Determining the materials and techniques is evidently the purpose of the subsequent chapters.

2.2 Lucky Madlo Sibiya

2.2.1 His life

Lucky Madlo Sibiya (Figure 1) was born in Vryheid, KwaZulu-Natal, South Africa, on 24 December 1942. Sibiya grew up with eight siblings and his sangoma father.[6] According to Sipho Mdanda (2007:166), "[w]hile growing up, Sibiya enjoyed the beauty and the serene nature of Vryheid". At the age of eleven, in 1953, he and his family moved to the mixed-race suburb of Sophiatown, Johannesburg. His father accepted a job opportunity as a cook at the Clifton Hilton Hotel in Johannesburg (Anonymous 1996:[sp]). While working as a cook, his father continued to practise as a sangoma, and sangoma ditaola, rituals and traditions, consisting of bones and symbolic objects that became a source of inspiration for Sibiya later in his art career (Peffer-Engels 1999:86).

After residing in Sophiatown for two years, due to the Natives Resettlement Act, Act No 19 of 1954 (Apartheid Legislation 1850s-1970s 2019:[sp]),[7] the Sibiya family was relocated to South Western Townships (Soweto) in 1955. It was here that Sibiya started carving various designs on found objects (Mdanda 2007:166). Soon after this

[6] In research, there is no mention of his mother.
[7] This Act allowed the National Party Government to forcefully remove black South Africans from any zone in the Johannesburg magisterial district – with specific focus on Sophiatown (Apartheid Legislation 1850s-1970s 2019:[sp]).

Figure 1: A photograph of Luck Sibiya by Robert Marneweck, *'n Onlangse foto van die kunstenaar, Lucky Sibiya*, [sa]. (Engelbrecht 1982:6).

relocation, Sibiya was once again displaced, this time by his father, who sent the young boy to Hammanskraal, about 50km north of Pretoria north of Johannesburg.[8] The purpose was for Sibiya to complete his schooling at St Peter's Seminary School – which he accomplished seven years later (Peffer-Engels 1999:86; De Jager & De Beers Centenary Art Gallery 1992:156).

From an early age, he displayed artistic talent and inclination. While a pupil at school, he also "developed a style of calabash engraving" (Peffer-Engels 1999:86). These calabash engravings Sibiya sold as decorated lampshades. After completing his schooling at St Peter's, he spent a great deal of time working on his designs, some of which he sold to various gallery owners (Mdanda 2007:166). During a visit to a gallery not named in the source, Sibiya met fellow artist Zwelidumile Jeremiah Mgxaji (1942 – 1991), better known as Dumile Feni. Through Dumile Feni, Sibiya met Bill Ainslie

[8] Later in his life and artistic career, Sibiya worked in retreat at St Peter's Seminary in Hammanskraal while preparing for exhibitions (The Star, 24 September 1975).

(1934 – 1989), who sequentially introduced Sibiya to Cecil Skotnes (1926 – 2009).[9] At the time, Ainslie ran an artist's studio in Saxonwold, Johannesburg, that "was a haven for artists, musicians and poets at the height of apartheid", and Skotnes was Recreation Officer and instructor at Polly Street Art Centre (Mdanda 2007:166; Miles 2004:32).[10]

Sibiya was mainly a self-taught artist, but from the mid-1960s he received guidance from both Ainslie and Skotnes. Skotnes is accredited with introducing Sibiya to "cutting and pigmenting large wooden panels" (Peffer-Engels 1999:86). According to Everard Read Gallery's website profile of Lucky Sibiya (Everard Read [sa]),[11] Skotnes was eager to accept Sibiya as a private pupil,[12] who was keenly influenced by his mentor's engraved wood paintings. Mdanda (2007:166) is of the opinion that Skotnes also inspired Sibiya to gravitate towards conceptual art. Although art historians have argued that Skotnes was Sibiya's mentor, Pippa Skotnes (Cecil Skotnes's daughter) confirmed to Mdanda (2007:166) that the relationship was also based on friendship and mutual respect.

Sibiya had his first solo exhibition at Gallery 101 (Figure 2), and numerous one-man and group exhibitions throughout the 1970s and 1980s (see section 2.2.3 for a list of exhibitions). The early works (in the early 1970s) are referred to by Basson (1976:42) as 1,5m by 1m panels that were "softly coloured", and that frequently featured stylised birds or horses. In 1972 Sibiya refers to his oeuvre of woodcuts as his "'couples exhibition', because of the two strong forms in each of the works that are balanced and related to one another" (Anonymous 1972a:[sp]). In the same article, it is stated that Sibiya ventured into bone carvings around this time (Anonymous 1972a:[sp]) and exhibited his first silkscreens in 1973 at Gallery 21 (Anonymous 1973a:[sp]). Despite this success, Peffer-Engels (1999:86) states that Sibiya struggled to earn a living from his art during these two decades. Sibiya had to provide for his siblings and own

[9] Cecil Skotnes and Bill Ainslie were two influential South African visual artists in the twentieth century.

[10] The Polly Street Art Centre offered art classes mainly to urban black African artists (Miles 2004:16).
[11] Everard Read Gallery is Sibiya's South African gallery representatives.

[12] According to Mdanda (2007:166), "Skotnes felt the formal art programmes offered at the [Polly Street Art] Centre would derail the excellence in Sibiya's oeuvre."

children, which placed him under severe pressure.[13] According to Mdanda (2007:166), due to his sense of failure to support his family, he was driven to "severe drinking."[14] Despite his struggling existence, Sibiya visited Europe and the United States of America. In 1973 Sibiya exhibited 15 of his works in Washington, DC (Anonymous 1972a:[sp]; Anonymous 1972b:[sp]). This trip was his first overseas travel (Anonymous 1972a:[sp]). The catalogue for his exhibition at the University of Pretoria states that he went abroad in 1974 (Anonymous 1996:[sp]), while Basson (1976:42) states that it was in 1975.

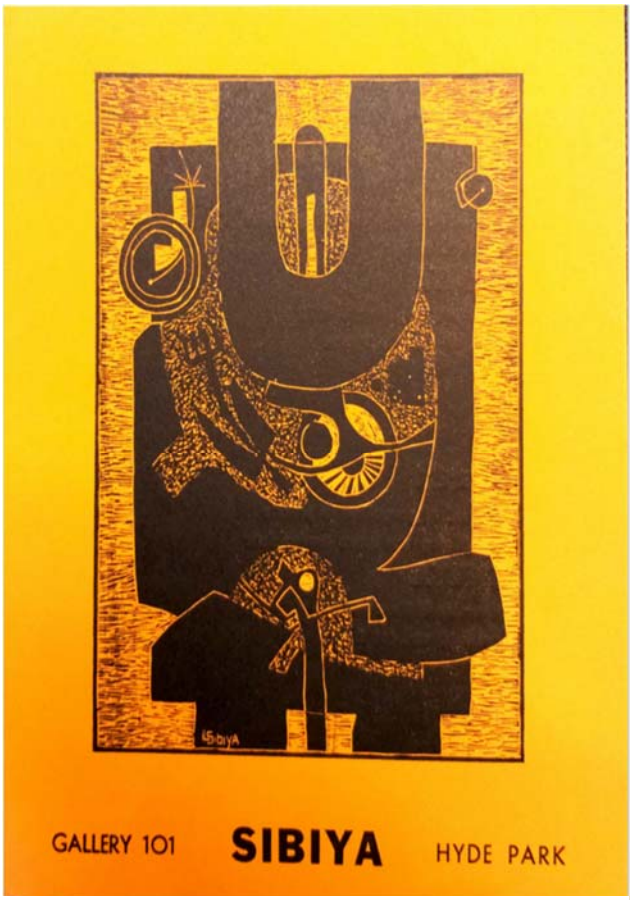

Figure 2: Front cover of the invitation to Sibiya's first solo exhibition. (Anonymous 1971:[sp]).

After his first travels abroad, back in South Africa, Sibiya saw the *Umabatha* play by Welcome Msomi (1943 – 2020) in Durban, Natal (now Kwazulu-Natal) (De Villiers 1977:[sp]).[15] Sibiya said that he "was very impressed by the way they expressed the African tradition and mingled it with the Western theme of Shakespeare" (Sibiya in De Villiers 1977:[sp]). The play is described as follows: "[t]he witchcraft, intrigues, plottings [*sic*], assassinations in William Shakespeare's Macbeth are, in *Umabatha*, cleverly allied to those that occurred in the development of the Zulu nation" (Basson 1976:46). Sibiya then created 15 prints and a series of woodcuts depicting various scenes or aspects relating to "the African culture, rituals, symbols and dances" (Greig 1975:[sp]; Sibiya in De Villiers 1977:[sp]).

[13] From the research, it is not mentioned how many children Sibiya had.
[14] This statement could not be verified from other sources.
[15] The exact date is unclear. The play was first performed on 3 July 1970, then on special occasion on 24 November 1971, and again in July 1972, all at the Open-Air Theatre at the University of Natal in Durban. Consequently, the play opened the World Theatre Season (WTS) at the Aldwych theatre, London, on 3 April 1972 (McMurtry 1999:309). In 1973, the play was presented at the "Jabulani Amphitheatre in Soweto, and toured to Scotland, Italy, Israel and the United States" (McMurtry 1999:326). The play "closed in New York in 1979, after boycotts by anti-apartheid supporters" (McMurtry 1999:326). It is further unclear during which tours Sibiya accompanied the troupe.

The earliest exhibition of the *Umabatha* prints and woodcuts was in September 1975, at Gallery 21 (Anonymous 1975:[sp]). Hereafter, Sibiya travelled along with the *Umabatha* play to the United Kingdom and Europe.[16] From sources, it is only evident that in London he exhibited at The Old Vic, and in Tel Aviv at The Royal Caesaria (Anonymous 1984:[sp]). During this visit, he exhibited his woodcuts and prints, which he states were mainly secondary editions, because the works were already very popular (De Villiers 1977:[sp]).[17] Sibiya (De Villiers 1977:[sp]) believed that his *Umabatha* prints was his way of introducing himself to the international art scene.

From the late 1970s to the early 1990s (just more than 10 years), there is a gap in the literature and archival information about the private life of Sibiya. It is unclear whether he stayed in Hammanskraal (De Jager & De Beers Centenary Art Gallery 1992:156; Anonymous 1989:[sp]) or Soweto (Anonymous 1972a:[sp]) during this time, or if he travelled locally or abroad.[18] One article mentions that in 1972, Sibiya was still unmarried (Anonymous 1972a:[sp]). The following can be determined from newspaper clippings:

- A 1978 article refers to an exhibition at the Totem-Meneghelli Gallery which featured carved wood panels, carved bones, and pastel and oil paintings on paper and canvas. The critic, John Dewar (1978:[sp]), describes the exhibition as sombre and conservative with a move towards more basic colours.
- Another 1978 article relating to the Federation of Black Arts (FUBA) states that Sibiya served on the governing body (Anonymous 1978:7).
- One snippet reveals that an unknown number of Sibiya's designs were recreated as tapestries and exhibited in August 1983 as part of "The Collector's Range" exhibition at the Total Gallery (Anonymous 1983:3).
- Dewar (1989:5) writes that Sibiya was a soft-spoken artist and an unassuming man. He also mentions that Sibiya's symbolic imagery (such as "the lion of peace and birds of peace") were gleaned from his travels locally and abroad.

[16] Sibiya was so close to the production and production team, on one evening, when there was a missing actor in the play, Sibiya stood in and played a warrior (De Villiers 1977:[sp]).
[17] The titles of the 15 prints are: Sangomas welcoming Mabatha; Dingane's fight; Sangomas' confrontation; The drums; Mabatha agrees to kill Dingane; Mabatha and the sangomas; The assassination; The nation mourns; Mabatha is king; The feasting at Mabatha's kraal; The ghosts of Bhangane; The destruction of Mafudu's kraal; The impis; The death of Kamandonsela; The death of Mabatha (Basson 1976:47).
[18] He referred to his house as his "'well-known matchbox house'" (Figure 1) (Anonymous 1972a:[sp]).

Of the final years of his life, it is known that he was able to move his family from Hammanskraal to Pretoria (where he was building a studio) circa 1995, and that his work grew in scale and gained market value at the start of Democracy (Peffer-Engels 1999:86). Everard Read Gallery in Johannesburg planned an exhibition of Sibiya's works in February 1999, but, due to his tragic and untimely death in a car accident, 24 January 1999, the exhibition became a memorial to the artist (Peffer-Engels 1999:86).

2.2.2 His style, themes, materials, techniques, and iconography

According to Grania Ogilvie and Carol Graff (1988:604), Sibiya worked in oil, acrylic and powdered pigment, which he applied to carved wood, carved wooden panels, paper or canvas. However, he also tortuously worked found objects, made from wood, metals, leather, steel and clothing, and created woodcut and silkscreen prints. Some of his most interesting works were created with elephant and giraffe bones – he carved and blackened these objects (Anonymous 1972a:[sp]) – which he displayed as sculptures (Basson 1976:43). A single article, *Sibiya uses imagination* (Dewar 1973:[sp]), also mentions at least nine artworks that incorporate beads and oil paint on canvas, exhibited in 1973 at the Totem-Meneghelli Gallery.[19]

Frieda Harmsen (1985:73) refers to the paintings on carved wood as "engraved paintings" inspired by Skotnes. Sibiya's technique evolved from shallow relief engravings to carvings of wood and wood panels (towards the end of the 1970s). His engraved and carved artworks are more than mere decorations – they are closer to the process of sculpture (Anonymous 1996:[sp]). They are conceptually abstract visions, created by "rubbing powdered pigments" onto, and into, his creations (Everard Read [sa]). The Everard Read Gallery ([sa]) website profile observes that "[t]he most distinctive features of his style are his use of organic shapes which are connected with flowing, rhythmic lines, juxtaposed on a background of complex carved and painted relief and intaglio spaces." Sibiya's negative space, between organic shapes, are filled with intricate and decorative patterning (Anonymous 1996:[sp]). Unconventional of

[19] According to Dewar (1973:[sp]), Sibiya made the designs, selected the beads, and then had women in the Northern Transvaal sew the beads into place. Sibiya, (in Dewar 1973:[sp]), stated that "the success of these works could mean, for them, a form of employment." This statement by Sibiya, speaks to his sense of responsibility to provide for others.

Sibiya's woodcuts are "parts of [the] outline are [*sic*] filled with colour, a device which adds to the interest and fluidity of the patterning" (Basson 1976:46).

His palette is populated by reds, ambers, blues and browns, with occasional accents of green and white (Mdanda 2007:166). He uses black to enhance the bold shapes of his designs, and the colours are applied onto the wood – which almost appears like a patina. The bold black areas are juxtaposed by patterned areas of colour, which binds the composition together. His use of colour, which is warm, sensual, rich and vibrant, is in harmony with the texture and colour of the wood substrates, and do not dominate the natural surface and appearance of the substrates. Henry E Winder ([sa]:[sp]) states that Sibiya ground his own colours and furnished his own medium.

Significant of Sibiya's oeuvre is his ability to create textures on the wooden substrates. The medium of wood stimulated Sibiya due to its diverse possibilities (Anonymous 1996:[sp]). According to the catalogue for his exhibition at the University of Pretoria (Anonymous 1996:[sp]), "[t]he laborious physical effort that the technique demanded was almost negated in the sheer exhilaration of the self-expressive process". Rhoda Krut (1984:[sp]) reported that Sibiya used sapele and imbuia wood – yet, not solely. Dewar (1989:5) noted that he used aged kiaat and Rhodesian teak mostly, which were salvaged from scrap yards and other sources. He also incorporated 'flaws' – incisions, cracks or holes – into his compositions, because they "add to the atmosphere of the pieces, he [Sibiya] maintains" (Dewar 1989:5). Dewar (1989:5) reported that Sibiya also used cupboard doors for the base of panels, and for his large panel carvings he had the wood specially cut. A slightly earlier article, *Spiritual vision from Sibiya*, refers to Sibiya using oil on kiaat and acrylic on birch (James 1989:4).

Sibiya uses themes from Zulu mythology, traditions, and customs, learned from his childhood experiences of his father's sangoma practices. By the 1970s, Sibiya's depictions of machine parts, which started on the calabash engravings, were replaced by inspiration from his father's sangoma *kgetsi*[20] with bold motifs and intricate designs. Another recognisable characteristic of his works is the various human activities and abstract symbols (which act both as a shorthand visual language and as decorative

[20] A sangoma kgetsi is the individual's 'consultation kit'.

elements of composition) that are imaginative interpretations. Sibiya's iconography more or less stayed consistent throughout his career. He stylised his human and animal figures, and his recurrent motifs include the human figure, cattle, horses, birds, trees and the sun. His compositions flow, which shows mastery of his medium, and the picture plain is always fully worked while still not being overstated (Basson 1976:46). Dewar (1989:5) wrote of his process: "[t]he wood is raw before he [Sibiya] begins to carve and later, perhaps appropriately, he paints the surface black before sandpapering certain areas and adding the overriding colours."

2.2.3 His exhibitions, commissions and represented collections

Exhibitions

1971	• Gallery 101, Johannesburg (solo) • NICRO Art Dealer's Fair, Milner Park, Johannesburg (group)
1972	• Gallery International, Cape Town (solo) • Gallery 101, Johannesburg (solo) • Gallery 101, Johannesburg (25 African Artists) • Gallery 21, Johannesburg (Selection '72) • Gallery 21, Johannesburg (group) • St Peter's Seminary, Hammanskraal (solo)
1973	• Totem-Meneghelli Gallery, Johannesburg (solo) • Gallery 21, Johannesburg (group) • Gallery 21, Johannesburg (solo)
1974	• National Arts Society, Johannesburg (African Art) • Natal Society of Art, Durban (solo) • Gallery International, Cape Town (group) • Gallery 21, Johannesburg (solo) • Manzini, Swaziland (Swazi Trade Fair – exhibition with J Maseko) • Association of Arts Gallery, Pretoria • Gallery 82, Bloemfontein
1975	• Goodman Gallery, Johannesburg (SA Sculpture) • Gallery 21, Johannesburg (solo, Umabatha portfolio) • Totem-Meneghelli Gallery, Johannesburg (solo) • Gallery International, Cape Town (Umabatha portfolio) • Gallery 21, London, UK (African Art from SA)
1976	• Ceolfrith Arts Centre, Sunderland, UK (solo) • Canberra, Australia (SA Art - Canberra Week) • Colonnade des Arts, Lake Buena Vista, Florida, USA (group) • Uniefees School Hall, Pretoria (group) • RAU, Johannesburg (graphics - group) • Gallery International, Cape Town (group) • South African Association of Arts (Natal), Durban (Umabatha portfolio)

- South African Association of Arts, Pretoria (Umabatha portfolio)
- Association of Arts, Windhoek (two-person exhibition with L Sithole)
- National Museum and Art Gallery, Gaborone, Botswana (two-person exhibition with L Sithole)
- Totem-Meneghelli Gallery, Johannesburg (solo)
- Natal Society of Art, Durban (solo)
- Gallery 82, Bloemfontein (solo)
- Totem-Meneghelli Gallery, Johannesburg (solo)
- Lidchi Art Gallery, Johannesburg (African Art Mythical and Modern)
- Gallery 21, London, UK (group)
- St Peter's Seminary, Hammanskraal (organised and participated in group)

1977
- Gallery International, Cape Town (solo)
- Boffer Gallery, Pretoria (solo, group)
- Old Vic Theatre, London, UK (solo)
- Gallery 21, Johannesburg (Collector's Choice)
- Pietermaritzburg, Natal (Pietermaritzburg Group 8 exhibition)

1978
- Totem-Meneghelli Gallery, Johannesburg (solo)
- Gallery 21, Johannesburg (Collector's Choice)

1978-9
- West Germany tour (SA Graphic Art)

1979
- South African National Gallery, Cape Town (SA Printmakers)
- West Germany tour (Art from SA/Art from Soweto)
- South African Association of Arts, Cape Town (group)
- Gallery 21, Johannesburg (Winter '79 Selection)
- Touring group exhibition (Contemporary African Art in South Africa)

1981
- Akis Gallery, Johannesburg (solo)
- Club Urbis, Madrid, Spain (Contemporary Painters from SA)
- Jabulani Standard Bank, Soweto (Black Art Today)

1982
- South African Association of Arts, Pretoria (Umabatha portfolio)
- Antonio de Almeida Foundation, Porto, Portugal (SA Art)
- Gallery 21, Johannesburg (Pelmama Permanent Art Collection)
- Vaal Administration Board, Sebokeng, Transvaal (group)

1983
- WITS, Johannesburg (Art and Artists of SA)

1984
- Everard Read Gallery, Johannesburg (combined exhibition with Robin Lewis)

1985
- Africana Museum in Progress, Johannesburg (Tributaries)

1986
- UNISA, Pretoria
- Alliance Française, Pretoria (Historical Perspective of Black Art in SA)
- Gallery 21, Johannesburg (Contemporary African Art Selected Works from the Pelmama Permanent Art Collection)
- Gallery 21, Johannesburg (Make-me-an-offer sale)

1986-7
- JAG, Johannesburg (Johannesburg Art and Artists: Selections form a Century)

1987
- South African National Gallery, Cape Town (Contemporary SA Prints and Drawings)

	• Everard Read Gallery, Johannesburg (solo)
1988	• University of the Free State (exhibition with Ezrom Legae and Lucas Sithole)
	• RAU, Johannesburg (Sasol Art Collection)
	• Johannesburg Art Gallery, Johannesburg (Neglected Tradition)
1989	• Everard Read Gallery, Johannesburg (solo)
	• Everard Read Gallery, Johannesburg (group)
1991	• Everard Read Gallery, Johannesburg (solo)
	• Gallery 21, Johannesburg (Make-me-an-offer sale)
1996	• Everard Read Gallery, Johannesburg (solo)
	• Everard Read Gallery, Johannesburg (group)
	• Old Arts Gallery University of Pretoria, Pretoria (solo)
1998	• Everard Read Gallery, Cape Town (solo)
	• Durban Art Gallery, Durban (group)
1999	• Everard Read Gallery, Johannesburg (memorial exhibition)

Public commissions:

1973	• Sibiya created murals in wood and mosaic at the Leratong Hospital, Krugersdorp. It took a year to complete, and was presented in July 1973 (Anonymous 1973b:29).
Unknown	• Rainbow Chickens, Kwazulu-Natal.
Unknown	• Mosaic works for the University of the Witwatersrand, Johannesburg.
1981	• Photra Holdings, Johannesburg.

Represented collections:

His works are represented in the University of Pretoria Art Collection, the Sanlam Art Collection, “Arts Association SWA/Namibia Collection; Durban Art Gallery; Sandton Municipal Collection; SA National Gallery, Cape Town; University of Fort Hare; University of the Witwatersrand; [and] William Humphreys Art Gallery, Kimberley” (Ogilvie & Graff 1988:605). As well as, Bureau of Information, Pretoria; Africana Museum, Johannesburg; SA Broadcasting Corporation, Johannesburg; Berliner Missionwerk Library, Berlin; Municipal Library, Sasolburg; National Museum and Art Gallery, Gaborone; Vaal Administration Board, Sebokeng; The Campbell Collections of the University of Natal, Durban; The Gauteng Legislative Assembly; and, numerous corporate collections in South Africa, the United Kingdom and the United States of America (Everard Read [sa]).

2.3 Conclusion

Although periods of his personal life are still not known, from the extensive list of solo and group exhibitions and his representation in numerous local and international collections, Sibiya was a talented and sought-after artist. Although he has not received significantly equal attention as some of his black South African contemporaries, it is necessary to determine the artist's materiality and techniques of the selected artworks discussed in chapter three because, as stated in chapter one, he is widely represented in prominent collections and his artworks are reaching an age (at least twenty years old) when they would soon require conservation and restoration if not stored and displayed according to sound conservation conditions and standards.

CHAPTER THREE
THE SELECTED ARTWORKS

3.1 Introduction

The chapter discusses the selected artworks. It deals with the investigation of these artworks based on visual observation, and not scientific analysis. Before an artwork is examined using scientific techniques, it is necessary to attain as much detailed visual description as possible. The visual descriptions lead the scientific process. In other words, based on aspects observed with the naked eye, appropriate scientific techniques are identified and employed. The first step is to investigate the artworks with the naked eye, unaided with special equipment, to document the empirical data of each artwork. The study also identified the colour palette of Sibiya using the Munsell system. This is a three-dimensional colour-order system based on the appearance of five basic hues (Munsell Hue) – red, yellow, green, blue and purple – according to their saturation (Munsell Chroma) and lightness (Munsell Value) (Johnston-Feller 2001:49). The notation for an identified colour is Hue Value/Chroma, for example, 5.1Y 6/10. It is a useful system because the colours are represented in the *Munsell Book of Color* (Munsell Color 2012) with colour chips that were careful created for reliability.

After this process it is always necessary to establish – or often attempt to establish – the provenance of each artwork.[21] Provenance research entails the establishment of a chronological series of ownership from the artist to the current owner. It is supported by relevant documentation, such as receipts, letters from artists and owners, as well as documents that include reference to the respective artworks, for instance, old catalogues, pictures in newspapers, magazines, or handbooks, and even postcards.

Once observation without equipment is exhausted, the next step is to take a closer look with the help of magnification and microscopy, and different sources of electromagnetic radiation. Magnification and microscopy "provide information regarding colour, surface finish, degradation and production method", together with

[21] Although provenance research is not necessarily a visual analysis, it is a part of the first step, because often stamps, seals, writing, auction numbers, catalogue numbers, gallery labels, or any other information, is written on the artwork. This type of observed information greatly aids the establishment of an artwork's provenance.

important identifying marks, texture, and degradation (Stuart 2007:43). Regarding Sibiya's artworks, magnification and microscopy was used to study painting techniques, layers, brushwork, cracks, additives (such as fillers), and signatures (Cycleback 2017:129). Used in the examination was a USB digital microscope with 300x magnification potential and a 5-megapixel image sensor.

Then the selected artworks were exposed to the ultraviolet (UV) radiation from a Q-22 Ultraviolet light with 2 UV Bulbs of 110 Volt which has a peak intensity of 650 microW/cm^2 at 6 inches.[22] The bulbs used are BLE-220B, and are UVA. Exposure by this lamp causes ultraviolet-induced visible fluorescence – "[f]luorescence is a process in which a material absorbs electromagnetic flux of particular wavelengths and emits radiation at other, longer wavelengths" (Johnston-Feller 2001:205). Thus, certain materials are excited, causing them to emit characteristic visible fluorescence, which is used to identify specific pigments, varnishes, adhesives, and recent restorations.

Figure 3: Lucky Sibiya, *The Doorhandle*, 1987. Acrylic on carved wooden chair legs, 495 x 370 x 90 mm. University of Pretoria Art Collection, Pretoria. Photograph by the author.

3.2 The Doorhandle (1987)

3.2.1 Empirical details

- Stock photograph: (Figure 3)
- Object asset number: 449516
- Title: The Doorhandle
- Date: 1987
- Dimensions: 495 x 370 x 90 millimetres

[22] Ultraviolet light has four regions: UVA, UVB, UVC and UVD, which influence the fluorescence of specific materials (Cycleback 2017:114).

- Materials: Paint (analysis discussed in chapter 4) on carved wooden chair legs attached with two horizontal metal rods
- Techniques: The chair legs were carved and incised in the white areas with a 3mm chisel. The red and orange areas do not have chisel marks. The legs were then attached to each other vertically by placing two metal rods through the legs at the top and the bottom. The first layer was then painted, and it is unclear whether it was the red or white layer first. After, where holes and indents were, the legs were filled with a substance of unclear origin, although it appears to be an organic filler and glue.

- Classification: Painting; compiled carving
- Classification type: Figurative – six human bodies.
- Short description: Painted on six wooden, vertical pieces. Wooden pieces appear to be the legs of two chairs. The legs were carved and altered before paint was applied. The legs are red with whitish areas painted where the wood was carved and incised away. The white areas have prominent horizontal, smaller carved marks. Signed and dated on the verso in a black marker pen.
- Special physical characteristic(s): On the front of the artwork there is red paint visible on the metal rods, and the paint is applied thinly. The back is patched with an unknown substance on each of the legs and where the legs were filled it was done to create a smoother surface. It seems that the substance was filled into areas after the paint layers, because there is also 'filling' on the front over the paint. The substance used to fill the legs and make the surface smoother appears to be organic with a grass-like, stringy fibre appearance heterogeneously mixed with glue or resin. Three of the six legs have definite "feet" that were a part of the original legs. It appears to have been two similar chairs. On each end of the two rods are washers. The mounting system is wire wrapped and turned around two screws to form two separate loops. The mounting system was not done by the artist, because according to Mr de Kamper, the Museums' Collection Curator at the University, an artwork by another artist in the University of Pretoria's Art collection has the same system.[23]

[23] *Frustration* (1994) by Hannes Harrs, asset number 442174.

- Signature/monogram: On the back in the left lower corner. The left chair leg is signed “L Sibiya 87” above the asset number and barcode of the University.
- Signature type: Written in black marker pen

- Acquisition method: Purchased by the University’s Art Committee at the artist’s solo exhibition at the University of Pretoria
- Acquisition date: 1996
- Acquisition source: The artist

- Institution name: University of Pretoria
- Institution sub body: University of Pretoria Art Collection
- Institution address: cnr Lynnwood Road and Roper Street, Hatfield, Pretoria
- Institution country: South Africa

- History/provenance: Exhibited at the solo exhibition, Lucky Sibiya, at the University of Pretoria in 1996 from 8 to 25 October (Anonymous 1996:[sp]). Exhibited at various locations on the University’s campus.

- Current location: Office of the Collection Curator, Mr GC de Kamper
- Current location type: For research and analysis
- Normal location: The Forestry and Agricultural Biotechnology Institute building 2 on the Hatfield campus of the University of Pretoria.

- Condition classification:[24] Very stable; excellent
- Condition date: 7 March 2020

3.2.2 Munsell Colour System

Surprisingly, the red areas on *The Doorhandle* (1987) matched closer to the yellow-red hues – thus, 2.5Y 6/15 – which might suggest either a sublayer or a mixture. The lighter areas appear to be a white mixed with a yellowish ochre, which matches 2.5Y 8/4 (Munsell Color 2012).

[24] The reference table for the classification of an artwork’s condition is Appendix B.

3.2.3 Provenance

As determined by the acquisition information, *The Doorhandle* (1987) was purchased by the University of Pretoria's Art Committee at the artist's solo exhibition at the Old Arts Gallery, University of Pretoria, in 1996. Thus, this artwork has a direct line from the artist to the current owner and as such an unrefuted provenance. The artwork is number 34 in the catalogue for the exhibition (no photograph) (Anonymous 1996:[sp]).

3.2.4 Magnification and USB microscopy (Figure 4 and Figure 5)

Figure 4 is the reference images for the locations of the included magnification areas. Location 1, as seen in Figure 5, revealed a shiny substance on the surface of the artwork. Its gloss is significantly different to the rest of the surface, and it appeared to be in the shape of a droplet that ran over the specific area. Location 2 shows the surface dust on the artwork. As this is the top of the artwork it is understandable that when the artwork is hung on display that this area will gather significantly more dust and surface dirt than the rest of the artwork. Location 3 is an orange area on the fifth chair leg. The paint film appears grainy and adulterated with white specs and darker maroon parts. Location 4 is the white, yellow ochre areas that were carved and then painted. This paint film is the most grainy and coarse of the three observed colours.

The red image, location 5, has multiple circular hollows where solvents would have evaporated during the 'drying' process. It is also adulterated with a few white specs and brown impurities. The gloss on location 5 is matte in comparison with location 1. Location 6, on the verso of the artwork, appears to have a sponge-like, velvet textured substance adhering to the edge of the chair leg. It gives the impression of being a type of fine chalk or gypsum. Location 7, in the small circle, teeth marks from a kind of woodboring insect were observed. No other traces of insects were found on this artwork; thus, it is my opinion that these occurred some time ago.[25] Location 8 is a close-up image of the filling used at multiple locations on the artwork. As seen in the image, the notion that the substance is organic with grass-like, stringy fibres heterogeneously mixed with glue or resin seems accurate.

[25] According to Mr de Kamper, this artwork has never been treated for woodboring insect infestation.

Figure 4: Reference image of USB digital microscope locations on *The Doorhandle* (1987).

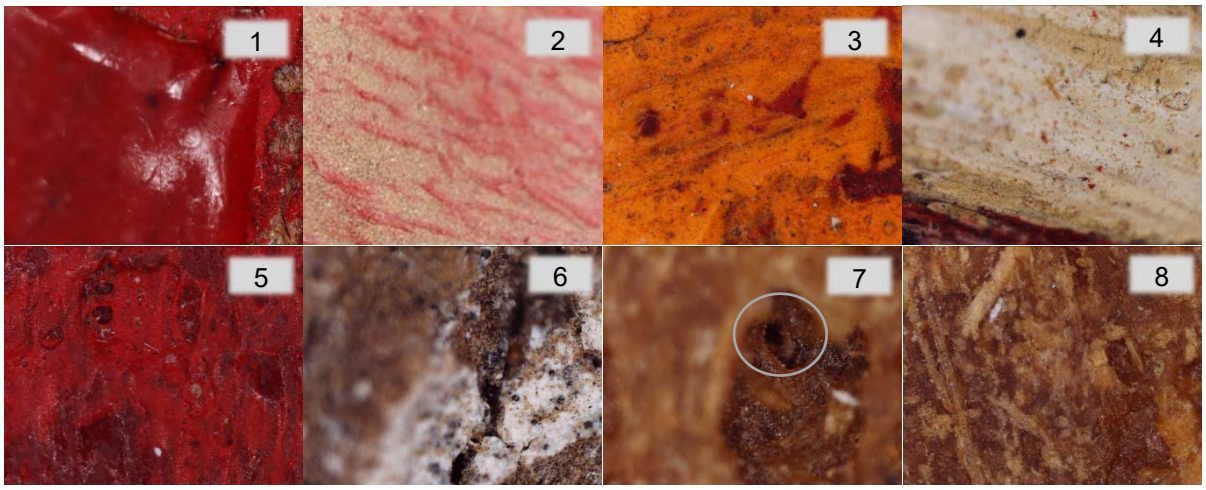

Figure 5: Close-up images of details observed with a USB digital microscope on *The Doorhandle* (1987).

Figure 6: Close-up image of Sibiya's signature on *The Doorhandle* (1987).

Sibiya's signature and the date of the artwork (Figure 6) on the verso was also examined with the USB digital microscope. The writing appears not to be covered by a varnish layer, and the choice of signing with a black marker is a unique feature in comparison with other unrefuted Sibiya artworks.

Figure 7: The filling that fluoresces slightly yellow on *The Doorhandle* (1987).

3.2.5 Ultraviolet-induced visible fluorescence examination

On the recto of the artwork most of the surface does not fluoresce. The materials absorb the electromagnetic spectra, except for glossy substance observed with the microscope at location 1 in Figure 3 and Figure 4. Under UV light the drop and run pattern is clearly visible. The run originates from one of the filling areas, which suggests that the glue or resin which suspends the grass-like fibres had dripped during the creation of the artwork. The filling areas on both sides of the artwork fluoresces slightly yellow (Figure 6). The dust fluoresces a light blue. The chalk or gypsum, seen under the USB microscope at location 6 (Figure 4 and Figure 5), fluoresces a cold white colour.

3.3 A Family Group (diptych) (1987)

3.3.1 Empirical details

- Stock photograph: (Figure 8)
- Object asset number: 490504 (left panel) and 490505 (right panel).
- Title: A Family Group
- Date: 1987
- Dimensions: 397 x 1590 x ≤19 millimetres
- Materials: Paint (analysis discussed in Chapter Four) on carved wooden panel

Figure 8: Lucky Sibiya, *A Family Group (diptych)*, 1987. Acrylic on carved wooden panel, 397 x 1590 mm. University of Pretoria Art Collection, Pretoria. Photograph by the author.

- Techniques: Created on found wooden panels which appear to be the sides of a small cupboard or bedside table. It appears that the process of production is as follows: first, the found panels were secured with glue at their joints (the other holes were not filled or covered up; thus, no other preparation of the substrate is evident). The recto was then carved and incised with a combination of a 7mm, a 4mm and a 2mm chisel. After which the fields were painted with yellowish tones and mixes, probably with a brush. Then, a roller was used to paint over the fields to cover the figures and abstract images with black paint. The next layer is also done with a roller in red but is not as prominent as the black. The orange areas were probably achieved through the mixture of the red top layer with the lower

yellow layer. Afterwards, certain aspects were touched up with a brush in various colours. The final discernible step was the painting of the sides with a roller in black paint (the black paint on the edge overlaps on the front at various areas).

- Classification: Painting
- Classification type: Figurative group
- Short description: Painting on carved wooden panels, with various figures and abstract forms depicted. Main colours used are reds, yellows, oranges, black and white. Both panels are signed.
- Special physical characteristic(s): The left panel has an ungeometric, irregular hole on the top right corner. The verso of this panel has a small plank that is fastened with three screws. The verso has two mounting hooks at the top and bottom. The joint of the two planks which make up the panel is visible, and the glue used to keep them together is visible in and over the joint. There are various small splatters of blue paint on the back. At the bottom, to the right of the mounting hook, the University's barcode is pasted. The verso also includes a pencil line across the bottom horizontally as well as numerous holes for supposedly previously removed screws from the original piece of furniture. On the right panel front the joint is vertically visible. On the verso of the right panel the joint and glue is visible (the glue is shiny). The artwork has the same mounting hooks at the top and bottom as the left panel. A very similar small plank is fastened with three screws to the top of the right panel, and at the bottom of the panel on the verso, there is a pencil line where another small plank would have been attached. Above the pencil line are three holes at the same distance apart from each other as the three screws of the small plank. The UP-asset barcode is attached to the right bottom corner. It seems that between the smaller top planks on both panels and holes about a quarter of the panels' distance from the top a drawer could have fit. Thus, it seems that the two artworks are opposite sides to the same small cupboard or bedside table. Both panels were fixed or strengthened before execution commenced.

- Signature/monogram: Yes, initial and surname on both panels (L Sibiya) without a date. On the left panel the signature is located horizontally in the left bottom

corner, and on the right panel, it is located diagonally in the right bottom corner.

- Signature type: Painted with a brush in black

- Acquisition method: Purchased by the University's Art Committee
- Acquisition date: 12/07/1995
- Acquisition source: The artist

- Institution name: University of Pretoria
- Institution sub body: University of Pretoria Art Collection
- Institution address: cnr Lynnwood Road and Roper Street, Hatfield, Pretoria
- Institution country: South Africa

- History/provenance: Exhibited at various locations on the University's campus.

- Current location: Office of the Collection Curator, Mr GC de Kamper
- Current location type: For research and analysis
- Normal location: The Forestry and Agricultural Biotechnology Institute building 2 on the Hatfield campus of the University of Pretoria.

- Condition classification: Very stable; excellent
- Condition date: 5 March 2020

3.3.2 Munsell Colour System

The reds match two distinct colour chips on the same hue, namely 7.5R 4/6 (from the bottom figure's right shoulder on the left panel, and the centre of the right panel) and 7.5R 3/12 (on the top, second from left figure's bottom). The orange is 2.5YR 6/15 (on the middle, right figure of the right panel). The black, identified in the signature (which appears to have been applied after the recto dried), is N.2. The dust blue, greyish area on the right panel matches 2.5B 6/2 (Munsell Color 2012).

3.3.3 Provenance

As determined by the acquisition information and the object's history, *A Family Group* (diptych) (1987) was bought directly from the artist on 12/07/1995 by the University's art committee, along with *The Sun Man* (1995). The artwork has been exhibited at various locations on the University's campuses (De Kamper, personal communication 2019, March 5).

3.3.4 Ultraviolet-induced visible fluorescence examination

The paint film on the recto of both panels absorbs radiation and does not fluoresce. However, on the right panel where the red line is placed over the artwork in Figure 8, a glue fluoresces white. On both recto, there are significant amounts of dust and organic particles that fluoresce a bright blue. The sides of both panels have no visible fluorescence. On the back of the left panel there are two types of fluorescence: the first is a yellowish substance (most likely older glue); and the second is the same white glue fluorescence that is visible on the recto of the right panel where the two pieces of wood were reinforced (Figure 9). On the right panel's verso, corresponding to the recto fluorescence on the joint of the panel, there is a white glue fluorescence along the joint. With UV radiation, it becomes visible that Sibiya smeared the glue over the joints on both verso with a piece of cloth or fabric (Figure 10). As these works have never been restored, it is most likely that Sibiya reinforced or strengthened his chosen substrate with glue.

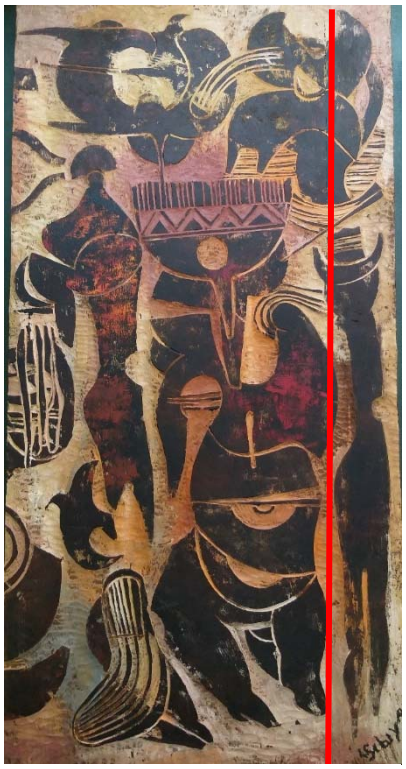

Figure 9: The joint where fluorescence is seen with UV radiation.

Figure 10: The joint where fluorescence is seen with UV radiation, and the smear made by a piece of cloth or fabric.

3.3.5 Magnification and USB microscopy (Figure 11 and Figure 12)

Figure 11 is the reference image for the locations in Figure 12. Location 1 reveals that Sibiya did not paint the entire recto with thick application but rather the paint was applied in various amounts – whether this was intentional or not is unclear. Location 2 is a close-up of the hole damage that is on the top right corner of the left panel. It reveals that the damage occurred before the execution of the artwork. Location 3 is

Figure 11: Reference image of USB digital microscope locations on *A Family Group* (diptych) (1987).

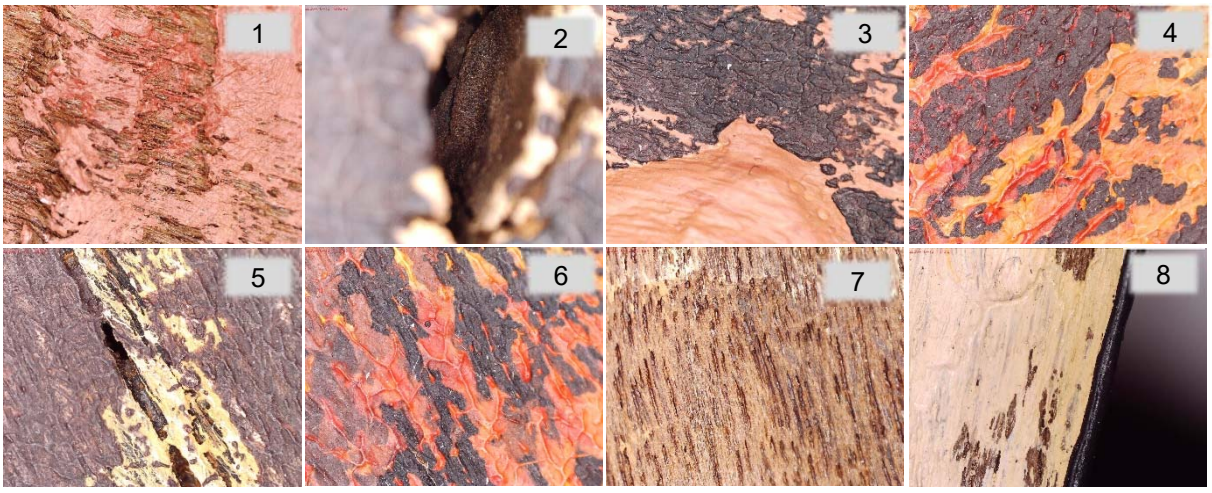

Figure 12: Close-up images of details observed with a USB digital microscope on *A Family Group* (1987).

clear evidence that the black is over the ground layers of ochres. Location 4 reveals that Sibiya added unmixed colours of red, yellow, and orange on top of the black, and did not necessarily premix colours. He also often used colours as pure from the 'tube'.

Location 5, on the right panel, is the joint that was reinforced with glue (also seen in Figure 10 under UV radiation from the verso). Location 6 reinforces the observation of location 4. Location 7 is an area to the right of the right panel where Sibiya did not deem it necessary to add any paint. It seems that the texture, colour, and appearance of the wood adds to the artwork's aesthetic, and in comparison with location 1, also shows that both panels are from the same species of wood. Location 8 proves that the sides of the panels were painted after the recto, because the black paint is slightly over the recto of both panels.

Figure 13: Lucky Sibiya, *The Sun Man*, 1995. Acrylic on carved West African wooden bed, 2855 x 545 x 70 mm. University of Pretoria Art Collection, Pretoria. (Curtesy of the photographer, Thania Louw).

3.4 The Sun Man (1995)

3.4.1 Empirical details

- Stock photograph: (Figure 13)
- Object asset number: 449515
- Title: The Sun Man
- Date: 1995
- Dimensions: 2855 x 545 x 70 mm
- Materials: Paint (analysis discussed in Chapter Four) on carved traditional West African wooden bed.
- Techniques: The entire substrate was first carved and then painted. Evidence of a 10mm, a 4mm and a 2mm chisel was found. The sequence of the paint on the head is brown, then red – which blended and made certain areas more maroon – and then orange.

Afterwards, the black cross and black around the circle ('hair') were applied with a roller, and then the orange with a roller over the black 'hair'. The circular head is outlined – visible on the lower right curve of the circle. Underneath the head, the whitish area, referred to as the chest, under closer inspection with an OptiVISOR,[26] is a ground layer of brown, then white, and then ochre. In the smaller half circle, also of the same colours, the paint appears granular and coarse. Both the entire chest and the small half circle is outlined in black with a thin brush. The left arm has no brown ground and the sequence of the paint layers are beige, red, blue and the black once again with a roller. The right arm which appears as a brownish maroon has a discernible red ground. After the mixing of the maroon from the red ground, the black was once again applied with a roller. Over the black there are mixtures of ochre and brown. The final layer on the right arm is orange. The area between the two arms (Figure 14) also has a brown ground layer, after which the whites, ochres and sienna were applied. In the centre of this area is a purer red and the same maroon as on the right arm. The orange in the grooves is underneath the red and maroon. The paint film here is very blotchy granular, and appears 'bubbly' – and is most probably mixed with an additive chosen by Sibiya. After close inspection, it was discovered that this area has tiny holes, and the granular substance was used to patch the area – the substance is also seen on the verso of the artwork. The mid-section, the orange

Figure 14: Detail of *The Sun Man* (1995).

Figure 15: Detail of *The Sun Man* (1995).

[26] OptiVISOR is a headband magnifier which permits handsfree magnified investigation of a subject.

underneath the arms, is layered in sequence from brown, then orange, and then red. This area is also granular, and has the appearance of flaking, but the paint film is intact – thus the appearance is intended. In this orange area there are various white specs. Underneath the orange, left from the dark blue area, the layers are a very dark brown ground with white and ochres. To the right of this area there is a hint of orange blended before the section ends in a shallow groove. Next to this, the prominent dark blue area, it has a lower level of a light blue, after which a dark blue and then black was applied. It appears that the black was added while the dark blue was still wet, because some blue and black mixed on the artwork. After the blues and black, some red and orange was added. Below the blue, the ground layer is once again brown and then black, but the two colours are quite blended, and there are visible brush strokes. The circle above the left leg is difficult to distinguish which colours were applied in sequence, because the red, orange, yellow, white, brown, and black is very mixed and haphazardly applied (Figure 15). It appears that the black is towards the end, and the brown does appear to be underneath all the other colours. The top of the left leg also has a brown ground layer, with white, yellow and ochres on top. In the middle of this leg, there is brown, red and orange visible underneath the black, after which additional red and orange was applied on to the black. At the bottom of the left leg, which is similar to the bottom of the right leg, the predominant brown ground layer is seen with black over, and then again some red and orange. It seems that the bottoms of the legs were done simultaneously, because they appear visually identical in technique and material. The phallus also has a brown ground layer, then black applied with a roller (clear strokes visible), and then the red, orange, yellow and white was added. At the top of the right leg the brown ground layer is visible, then black with a roller, then grey, yellow, ochre, white and orange, which is also blended at certain spots with a brush. The middle of the right leg is once again difficult to discern the sequence of the paint layers, but it seems to be the brown ground layer with additional red, the black with a roller, and more of the brown used in the ground layer. The sides of the artwork were done after the recto, as in *A Family Group* (diptych) (1987). The paint overlays at certain areas on the recto, with some blending of the same brown ground layer and black roller application. The verso of the artwork has no visible paint and seems unaltered from its original

state as a traditional West African bed. While documenting the artwork, a small termite (Figure 16) in one of the grooves around the midsection of the artwork was found.[27]

- Classification: Painting; carved wooden sculpture
- Classification type: Figurative
- Short description: Human figure standing upright. Big, roundish shapes. Main colours are red, blue, orange, yellow, ochre, and black. Carved from a traditional West African bed. Mounted on a pedestal.[28] Three hollow areas on the back.
- Special physical characteristic(s): On the recto of the artwork, the head of the sun man has a circular carving, red inside, with a black cross protruding from the red. The white/whitish area underneath the head has filling on various areas – this filling is not the same organic and glue mixture as *The Doorhandle* (1987). The midsection of the man is layers of blue, orange and ochre. On the top of the left leg is a circle. Between the legs appear to be phallus. The figure has no feet, and the legs end in stubs. On the verso of the artwork there are three hollowed areas that are approximately located at each third of the sun man's upper body. The verso is rough and abraded. There appears to be no preparation of the substrate before the execution of the artwork. The University's barcode and asset number is adhered to the back of the left leg. At the bottom of the right leg, close to the pedestal, there is a missing rectangular piece – it appears to have occurred before the creation of the artwork. On the pedestal is a description that reads:

  > The wood that was used for this sculpture was originally a traditional West African bed.

Figure 16: Termite found on *The Sun Man* (1995).

[27] The termite turned out to not be a sign of infestation of the artwork, but of the location where it was stored at that time.
[28] Dr Breedt, head of the Department when the artwork was bought from Sibiya, remembers that the pedestal was not a part of the original artwork, but was sourced by the University's Art Committee on behalf of Sibiya, in order for Sibiya to mount his artwork (De Kamper, personal communication 2019, March 26). For this reason, the pedestal is not analysed with the artwork.

Sibiya received this bed from a renowned African Art collector Vittorio Meneghelli. The mythology around this piece is that it carries the story of the Rulers of the Sun, which are deities in certain African folklore. The artwork pays tribute to the various deities in African Sun tradition.

- Signature/monogram: Initial and surname, “L Sibiya”, at the bottom of the right leg, vertically in red paint, with the numbers “95”.
- Signature type: Paint with a brush in red.

- Acquisition method: Purchased by the University’s Art Committee
- Acquisition date: 12/07/1995
- Acquisition source: The artist

- Institution name: University of Pretoria
- Institution sub body: University of Pretoria Art Collection
- Institution address: cnr Lynnwood Road and Roper Street, Hatfield, Pretoria
- Institution country: South Africa

- History/provenance: Bought from the artist, Exhibited at various locations on the University’s campus.

- Current location: The Javett Art Centre at the University of Pretoria (Javett-UP)
- Current location type: On exhibition
- Normal location: Staircase of the Club hall on the Hatfield campus of the University of Pretoria.

- Condition classification: Stable; excellent
- Condition date: 26 March 2019

3.4.2 Munsell Colour System

The following colours were matched at the locations seen in Figure 17:

- Location 1 is 7.5R 3/10 (the same as location 3).
- Location 2 is 7.5R 3/12 (the same as location 12).
- Location 3 is 7.5R 3/10 (the same as location 1).

- Location 4 is 7.5R 4/6, a brownish maroon hue.
- Location 5 is 2.5B 5/8.
- Location 6 is 7.5BG 5/1, bluish green area.
- Location 7 is 2.5R 5/15, a red where it mixed with orange.
- Location 8 is 10B 4/7, a dark blue hue.
- Location 9 is N.2, the black paint that was applied with a roller.
- Location 10 is 10YR 7/13.
- Location 11 is 2.5Y 9/2.
- Location 12, the signature, is 7.5R 3/12 (the same as location 2).

Figure 17: Reference image for the locations of the identified Munsell colours on *The Sun Man* (1995).

3.4.3 Provenance

As determined by the acquisition information and the object's history, *The Sun Man* (1995) was bought directly from the artist on 12/07/1995 by the University's art committee, along with *A Family Group* (diptych) (1987). The artwork has been exhibited at various locations on the University's campuses (De Kamper, personal communication 2019, March 5). Recently it was moved to the Javett-UP for its opening exhibition.

3.4.4 Ultraviolet-induced visible fluorescence examination

The recto of *The Sun Man* (1995), where the wood is not covered with a paint film, the wood has a lime green and yellowish fluorescence, especially visible in the lighter area underneath the head of the totem. Where the medium is mixed with a white powdery substance, the powder fluoresces bright white. The artwork's recto also has the same dust and organic particles that fluoresce a bright blue as seen on the other two artworks. The sides of the artwork have a purple fluorescence, and the verso, where no paint layer was applied, has a strong red fluorescence where the wood has worn.

The most common wood fluorescence is yellow and green, but some types of wood can also fluoresce orange, pink and red (Meier [sa]:[sp]).

3.4.5 Magnification and USB microscopy (Figure 18 and Figure 19)

Figure 18 is the reference image for the magnified images in Figure 19. Location 1 reveals the light blue that was also applied first under the dark blue in the mid-section. It is also evident that the black was applied onto the light blue with a roller after the blue had dried. Location 2 shows clear brush strokes, as well as the 'bubbly' textured paint to the right of the image. Location 3 is the midsection where it appears that the paint is flaking, but the close-up with the USB microscope shows that the edges of the orange are intact. The effect of this area was intentional. Location 4 represents an example of the granular and coarse paint that appears to have been mixed with a

Figure 18: Reference image of USB digital microscope locations on *The Sun Man* (1995).

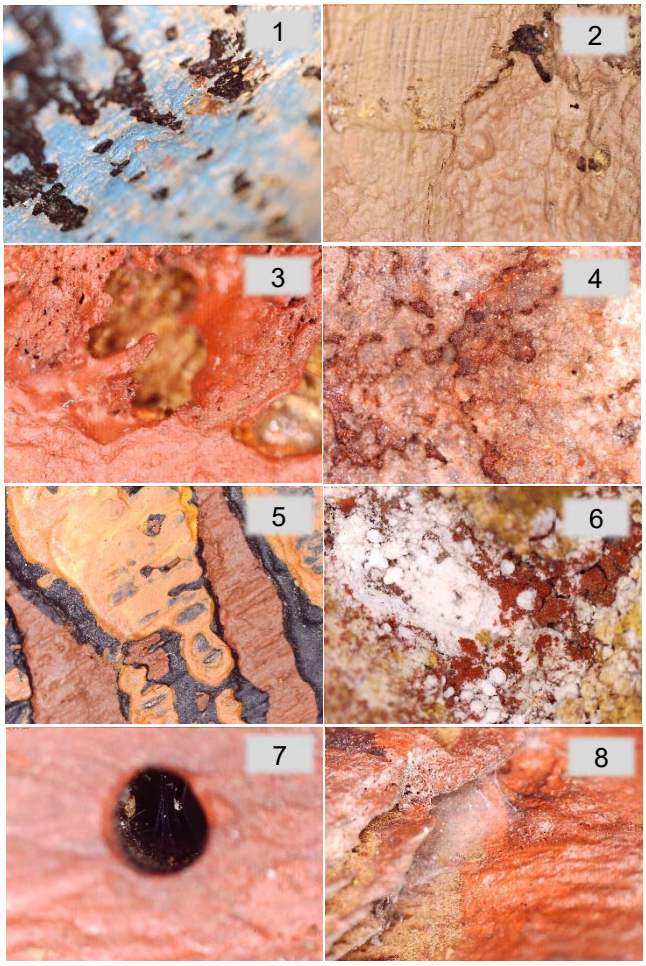

Figure 19: Close-up images of details observed with a USB digital microscope on *The Sun Man* (1995).

substance. Location 5, at the right edge of the artwork, is an example of distinguishing between the sequence of the paint application – here it was first the black, then brown, then the yellowish ochre. Location 6, in a groove between the left leg and the phallus, revealed more of the chalky, flaking gypsum that was found on the verso of *The Doorhandle* (1987). Location 7, an interior focus of the wooden bed, revealed a tiny, dead spider stuck in its web, while location 8 is a spider web on the exterior of the right leg.

3.5 Conclusion

In conclusion, the artworks by Sibiya in the University of Pretoria's Art Collection were carved and painted found objects. It is evident that the artist had attempted to 'repair' or strengthen his substrates with either glue or fillers. Regarding his general technique, after carving each piece, Sibiya applied multiple colours with both paint rollers and brushes. Both *A Family Group* (diptych) (1987) and *The Sun Man* (1995) have chisel markings that measure 4mm and 2mm. The multiple observed layers, especially on *A Family Group* (diptych) (1987) and *The Sun Man* (1995), suggests that the chosen paint medium would have been a faster drying medium than for example an oil. Sibiya also added certain substances to his paint, such as powdery, granular chalk or gypsum, to give the paint film more texture. In a personal communication with Pippa Skotnes (personal communication 2020, October 9), she confirmed that her father, Sibiya's teacher and mentor, predominantly used acrylic paints, mixed with additional powdered pigments and marble dust, on his carved wooden panels. Regarding the matching of his colours with the Munsell Colour System, two of the reds and the black were observed on both *A Family Group* (diptych) (1987) and *The Sun Man* (1995), 7.5R 4/6 and 7.5R 3/12, and N.2 (Munsell Color 2012).

CHAPTER FOUR
DELVING INTO THE LAYERS

4.1 Introduction

This chapter aims to discuss what is beneath the visible surface of the selected artworks by reviewing the results of three scientific techniques: Technical Photography, X-ray Fluorescence Spectroscopy (XRF) and Fourier Transform Infrared Spectroscopy (FTIR). The chapter starts with brief definitions of each technique that was used, after which the results are discussed. The first technique used was Technical Photography. Objects photographed under normal or reflected illumination provide a record of the appearance of the object as seen under standard viewing conditions.[29] Generally, this means using relatively flat and uniform illumination, with minimal surface glare. These images will also serve to record the relative prominence of certain important characteristics as seen in a normal viewing situation. The characteristics are the elements that guide research and provide clues to materiality and techniques. Visible light photography also includes raking illumination, specular illumination, transmitted illumination, darkfield and edge illumination, reflectance transformation imaging, and photogrammetry (Frey *et al.,* 2008:113-125). For this study, reflected and raking illumination photography were conducted with a Canon EOS 6D Mark II and Canon EF 24-70mm f/2.8L II USM lens.

Raking illumination photography is based on placing a low angle light source parallel to the artwork which puts the surface into relief. The purpose is to enhance surface texture and topography such as indentations, lifting paint, surface spalling, carve marks, tool marks, and irregularities (Frey *et al.,* 2008:116-118). Specular illumination creates a mirrorlike reflection that enhances the observation of topography, planarity, variations in surface sheen or the presence of coatings. Specular illumination photography is divided into two types: axial and oblique. Axial illumination is when the light source and the photographer is on the same axis, while oblique illumination is when the light source and the photographer are at opposite sides of the artworks, but at the same degree from the plane of the subject (Frey *et al*., 2008:118-121).

[29] Reflected illumination is not the initial stock photograph taken as part of the initial documentation – as seen in Chapter Three. Reflected illumination photography requires a professional photographic setup with consideration of required lighting and support systems (for example, easels).

Observed characteristics from the above defined techniques can then be recorded in additional detail in subsequent images using non-standard (non-normal) illumination techniques. For the study, the two non-standard illuminations used were Ultraviolet-radiation (already seen in Chapter Three) and Infrared radiation done with a Canon 6D 20.2 Megapixel Camera with UV-VIS-IR Functionality, the Canon EF 24-70mm f/2.8L II USM lens, and the necessary filters.[30] Ultraviolet-induced visible fluorescence photography is the capturing of photographs with a digital camera while the object is illuminated with UV lamps (Frey *et al*., 2008:154-157). In this case, the objects were illuminated with the same UVA lamp used in Chapter Three for visual examination. The camera had a UV pass filter with IR blocking capability (the X-Nite 330nm Coated Filter). This technique can be used to identify "materials used in works of art (e.g. oils, gums, and resins; many common adhesives; some pigments and dyes; and many other organic and inorganic materials)" (Frey *et al*., 2008:150).

With visible light-induced reflected infrared photography different wavelengths of infrared can be allowed to pass through the lens of a camera which makes subsurface layers of the artwork visible. This information allows the investigator to see whether Sibiya might have made underdrawings or changed his mind about an element that is now overpainted. The artwork was illuminated with two visible-light sources, on either side of the artworks, which contains the infra-red-light spectrum. Infra-red radiation can be photographed through a visible-light blocking filter and an infra-red passing filter (the visible light filter is an X-Nite Band Pass Series 1 (BP1) 320 – 670nm; and the infrared filters are X-Nite 715nm, X-Nite 850nm and X-Nite 1000nm).[31] In reflected infra-red digital photography the light source is reflected from the surface and the images produced often reveal hidden elements that are not visible with the naked eye under normal illumination. These elements are clues to technique, authorship, restoration and original or supplementary additions.

X-ray fluorescence spectroscopy (XRF) was performed to learn about the pigments that were likely to have been used in the production of the artworks. Non-invasive and

[30] Ultraviolet and infrared radiation is from opposite sides of the visible spectrum.
[31] Any IR wavelength beyond 1000nm cannot be captured with a digital camera (Frey *et al*., 2008:132).

non-destructive XRF provides information regarding elemental composition of each area studied – thus, about the elements present in the paint layers at the surface and below. The presence of specific elements provides an indication of the pigments that are present in the examined area(s). As X-rays are sufficiently energetic to detect the elemental composition not only of the uppermost pigmented layers but also of those present in under-layers of the work, elements detected may be from a preparatory layer or pigments from underlying paint layers, as well as from the painted surface. The presence of specific pigments may be inferred from the detection of elements or combination of elements with different degrees of certainty as some elements or combination of elements may be characteristic of multiple pigments (Bezur & Sperber, 2016:5). Determination of the specific stratigraphy of the various paint layers requires removal of a sample for cross-sectional analysis (not done as part of this study), and conclusive pigment identification requires complementary analysis via a compound-specific technique such as X-ray diffraction (XRD) or Raman spectroscopy.

A Bruker Tracer 5i handheld x-ray fluorescence spectrometer was used to perform non-destructive elemental analysis in the locations indicated. The spectrometer is equipped with a rhodium (Rh) X-ray tube. Spectra were acquired for 90 seconds live time using 40 kV accelerating potential, 5 μA current, and without any beam filters. Air-path XRF instruments, such as the one used in this analysis, are generally not able to detect the low energy X-rays emitted by elements with atomic number less than ~12, so elements such as carbon, nitrogen, oxygen and sodium cannot be detected.

The goal of conducting Fourier Transform Infrared Spectroscopy (FTIR) was to determine, if possible, the binding medium Sibiya used on the selected artworks. This is a molecular spectroscopy technique capable of characterising and identifying inorganic and organic compounds. The material or sample of interest is irradiated with an infrared (IR) beam after which molecules absorb IR wavelengths with frequencies corresponding to certain vibrational motions within the molecule. Infrared spectrometers detect which specific frequencies are absorbed and to what degree, and display spectra that can be regarded as molecular fingerprints for compounds. The instrument used was a Bruker Alpha II-R (A241/DV) sampling module, in reflectance mode, with an integrated video camera, that has a spectral range of 375 – 7 500cm^{-1} and a sampling spot of 3mm. The technique was chosen for its non-invasive

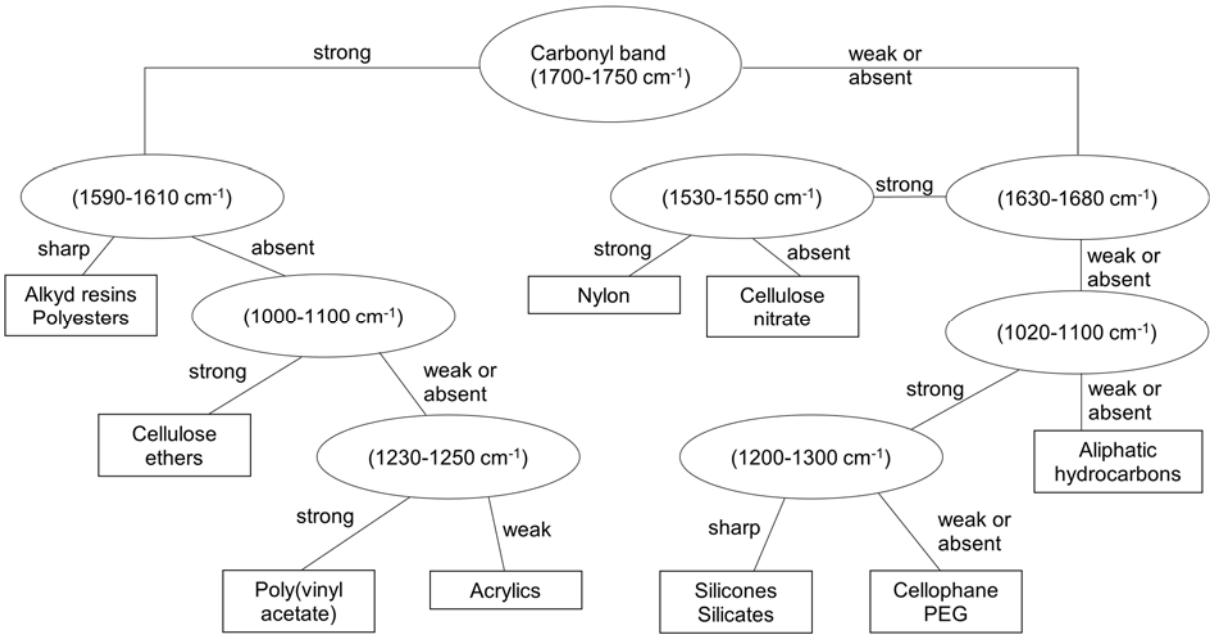

Figure 20: A flowchart for the characterisation of several classes of synthetic polymers by M. Derrick, D. Stulik and J. Landry (Derrick, Stulik, & Landry, 2000:111).

and non-destructive characteristics – the instrument is placed close to the plane to be tested and thus does not require removing a sample from the artwork.

The difficulty in interpreting FTIR spectra lies in the fact that the different compounds' peaks overlap each other, and dedicated libraries need to be used to identify specific compositional components. However, as the purpose was to merely determine whether Sibiya used an acrylic or oil medium on the selected artworks, an alternative approach was employed.[32] The spectra were classified with the help of a flowchart (Figure 20) that is based on the synthetic polymers' IR absorption band positions and intensities (Derrick, Stulik, & Landry, 2000:111).

4.2 The Doorhandle (1987)

4.2.1 Technical Photography

- Normal illumination photography:

[32] The flowchart for the characterisation of several classes of synthetic polymers was followed first, because of the information provided by Pippa Skotnes (personal communication 2020, October 9) about her father mainly painting his carved wooden panels with an acrylic medium.

In the photography studio at Van Wouw House, the home of MSocSci Tangible Heritage Conservation, *The Doorhandle* (1987) was photographed using natural light with the inclusion of the X-Rite ColorChecker Passport Photo II (Figure 21).[33] As the studio does not have incandescent fixtures (photofloods) or diffuse photographic light sources, the curtains and windows were open wide to let in as much morning light as possible. The photograph was not edited, simply cropped.

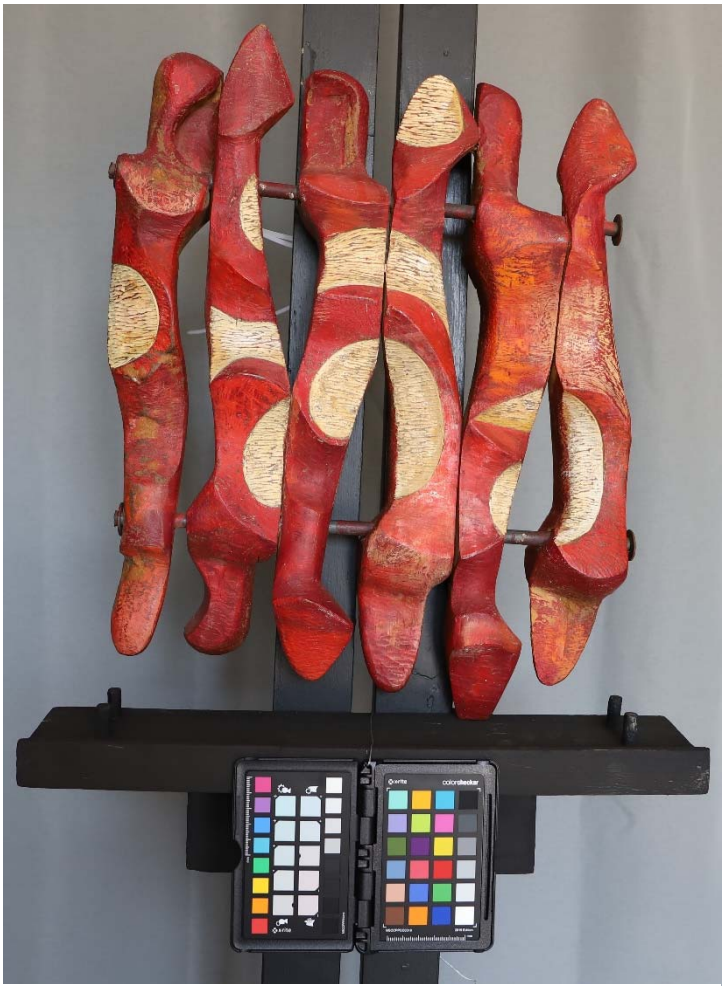

Figure 21: Lucky Sibiya, *The Doorhandle*, 1987 photographed in normal illumination.

- Raking illumination photography:

Raking illumination photography was also performed with the artwork on the easel, but the room was slightly darkened. A handheld light-source was placed to the left of the artwork (Figure 22) and from the top of the artwork (Figure 23).[34] The light source was a spotlight, but the required barn door and focusing condensers are not available in the studio. For raking illumination from the left side, it was easy to achieve a far enough distance from the subject to achieve sharp shadows. However, for raking illumination from the top, it was not as easy, due to the light source being handheld. Again, the X-Rite ColorChecker Passport Photo II was included as well as the required light direction indicator (Frey

[33] The X-Rite ColorChecker is included in the photographs to ensure accurate colour rendering from capture to post-production. The target "act[s] as technical metadata by providing known RGB values within the image" (Frey *et al*., 2008:42).
[34] Raking illumination photography is always performed from the left, top or both, in order to prevent inverted perception of depth (Frey *et al*., 2008:118).

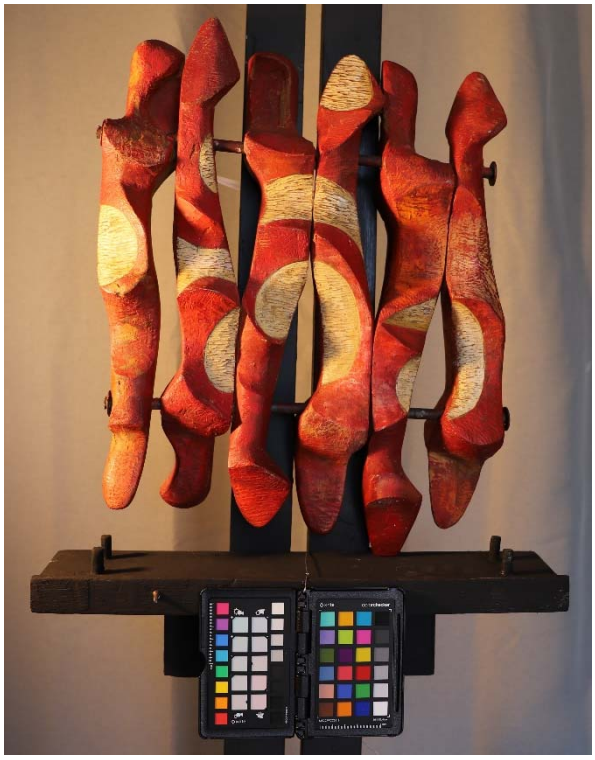

Figure 22: *The Doorhandle* (1987) photographed in raking illumination from the left.

Figure 23: *The Doorhandle* (1987) photographed in raking illumination from the top.

et al., 2008:118).[35] The raking illumination of this artwork reveals how carved and incised the wooden chair legs are into a three-dimensional artwork.

- Ultraviolet-induced visible fluorescence photography:

The UV-induced visible fluorescence photographs in this study was done with the UVA lamp used for visual inspection. Due once again to the nature of the lamp – that it is handheld and smaller in size – it was very difficult to radiate the subject with enough light to take photographs with the UV-VIS-IR modified Canon 6D. Thus, as an alternative, smaller areas were captured instead of a photograph of the entire artwork.[36] The photography studio was made as dark as possible, and 'close-up' images were captured. Figure 24 reveals the extent of the filling Sibiya used on the right chair leg. In the middle of Figure 25, the stripes and incisions, is where Sibiya exposed the wood, and it is thus the wood that has a greenish yellow fluorescence. In

[35] The light direction indicator is not prominent in the raking illumination photographs in the dissertation, but when viewed and zoomed on a bigger monitor screen, it is evident.
[36] For this reason, the the X-Rite ColorChecker Passport Photo II is not included in the photographs.

Figure 24: Close-up UV-induced visible fluorescence photograph of *The Doorhandle* (1987).

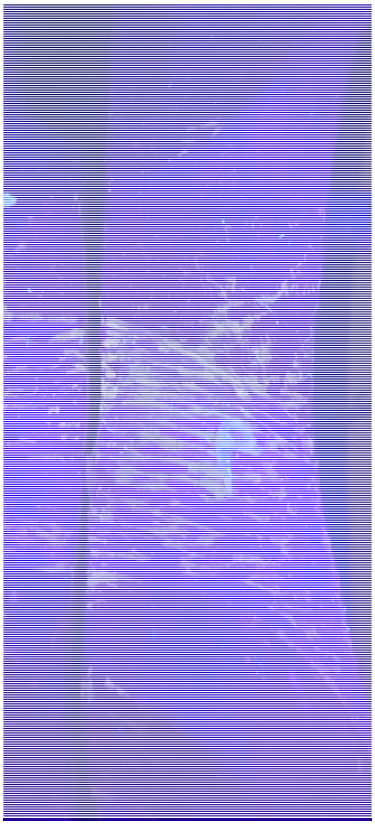

Figure 25: Close-up UV-induced visible fluorescence photograph of *The Doorhandle* (1987).

Figure 26: Close-up UV-induced visible fluorescence photograph of *The Doorhandle* (1987).

Figure 26 is the drop and run pattern referred to in section 3.2.5. The run originates from one of the filling areas, which suggests that the glue or resin which suspends the grass-like fibres had dripped during the creation of the artwork. Figure 25 revealed a very light white impurity of unknown origin.

- Reflected infrared photography: The outcome of reflected infrared photography includes the differentiation of materials (such as dyes, inks, retouching and original materials), the enhancement of inscriptions and the studying of underdrawings. Again, the images for reflected infrared photography

Figure 27: Close-up reflected IR photograph of *The Doorhandle* (1987) with a 715nm IR filter.

was captured by taking multiple photographs of different areas. The images of *The Doorhandle* (1987) revealed merely one finding at either of the three IR filters: the signature on the verso that was done in black marker pen, disappeared with all three IR filters (Figure 27).

4.2.2 XRF Spectroscopy

Non-destructive XRF analysis was performed on seven target areas to attempt to determine the pigments used by Sibiya. In summary, XRF data suggest the presence of cadmium red, titanium white, chalk, gypsum, yellow ochre, raw sienna, possible mars yellow and possible permanent white. Observed in all the areas is strontium and calcium, with the noticeable absence of arsenic and mercury which indicates that the artwork was not preserved with either of these treatments.[37]

In Table 1, as well as subsequent Tables, bold indicates a major response signal, normal text indicates a minor response signal, and italics indicates a species with weak response signal. Relative amounts are estimated based on peak intensity and are intended to be only a guide and are not quantitative.

Location	Description	Primary elements detected	Possible colourants
A1	Red	**Se**, **Cd**, **Ba**, Sr, *Ca*, *Ti, S*	**Cadmium red**, *titanium white, chalk, gypsum*
A2	Yellow/white	**Ti**, **Fe**, Sr, Ba, Ca,	**Titanium white**, **yellow ochre**, *chalk, gypsum, permanent white*
A3	Orange	**Cd**, **Se**, **Ba**, Ti, *Ca*, *Sr*, *Fe, S*	**Cadmium red**, **titanium white**, *chalk, gypsum, permanent white, yellow ochre*
A4	Filling	**Ti**, **Sr**, **Ba**, Sn, *Se*, *Fe*	
A5	Red	**Se**, **Cd**, **Ba**, Sr, *Ca*, *Ti, S*	**Cadmium red**, *titanium white, chalk, gypsum*
A6	Wood verso	**Ca**, **Sr**, Sn, *Ni*	No pigment
A7	Wood verso	**Ca**, **Sr**, Sn, *Ni*	No pigment

Table 1: Break-down of elemental peaks at locations, and possible pigments inferred on *The Doorhandle* (1987).

[37] As confirmed by Mr de Kamper, the Sibiya artworks in the University's collection were never treated with either arsenic or mercury pesticides (de Kamper, personal communication 2020, September 29).

Figure 28: Location of XRF analysis (recto) on *The Doorhandle* (1987).

Figure 29: Location of XRF analysis (verso) on *The Doorhandle* (1987).

Figure 28 and Figure 29 are the reference images for the locations of analysis. Location A1 is most probably cadmium red, because cadmium red has major cadmium, selenium, and barium signals. According to Feller (1986:65), the sulfoselenide deep cadmium reds [Cd(S,Se)] are often extended with the inert pigment barium sulfate ($BaSO_4$) to give the paint "the lithopone varieties" – which explains the combination of cadmium, selenium and barium. The detection of additives, such as barium sulfate, and more specifically the binding medium, is done by FTIR. This technique can detect almost every component in a paint film, but the interpretation of the spectra is often complicated because each component is overlaid.

Location A2 is most probably titanium white, yellow ochre, or a combination of the two, because under normal white light the area is not a bright white nor a yellowish ochre. Location A3, which is an orange area under normal white light, is most probably a combination of cadmium red, titanium white and yellow ochre. At location A4, which is the filling seen under microscopy in chapter three, it is not possible to infer a pigment.

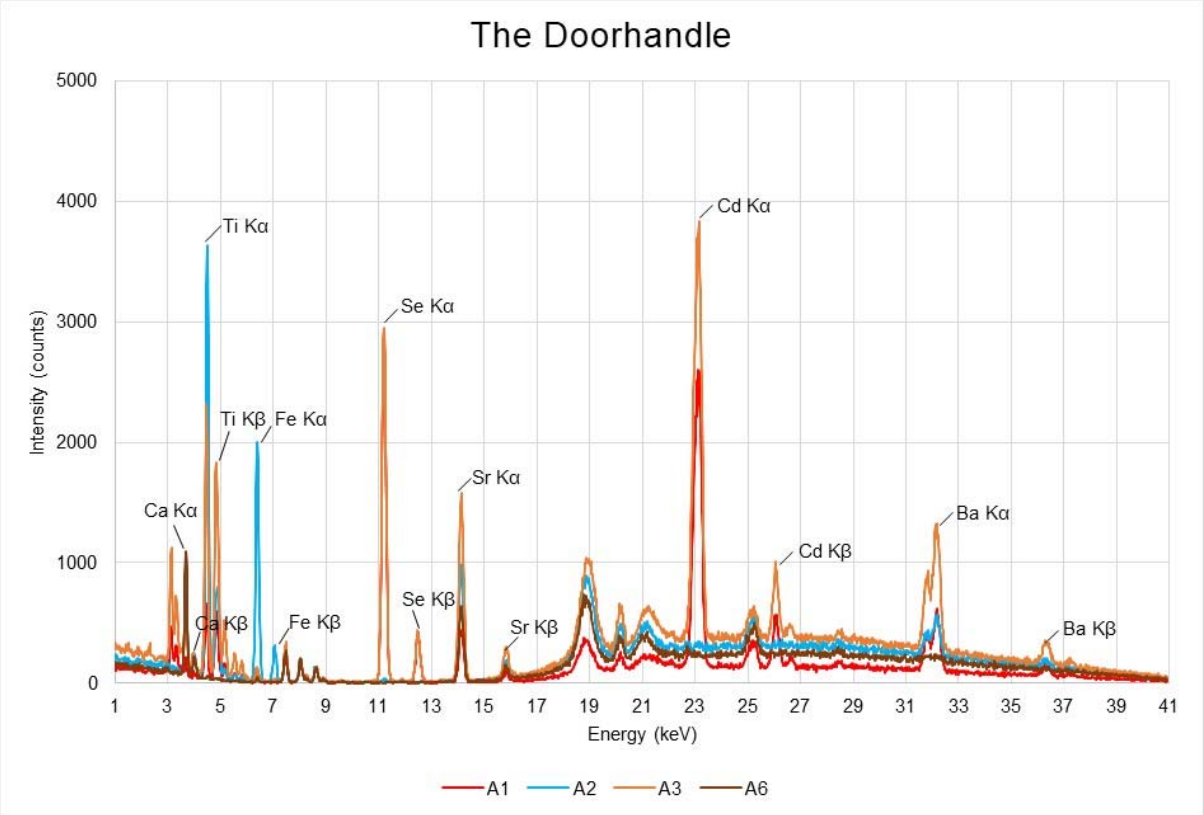

Figure 30: Elemental peaks of locations A1, A2, A3 and A6 on *The Doorhandle* (1987).

The substance used by Sibiya appears organic, and the techniques used to identify organic substances are XRD or Raman spectroscopy which falls beyond the scope of this study. Location A5 yielded the same results as A1, which is most probably cadmium red. Locations A6 and A7 were included for the purpose of establishing which peaks are associated with the wooden substrate and/or a wooden varnish, and can be excluded as possible pigments from the recto of the artwork. These two locations revealed species peaks of calcium and strontium.[38] Calcium carbonate is used as a filler in certain paints and varnishes. It is concluded that it is not in the paint film, but rather the original varnish of the chair legs, because the two elements are detected on the verso and the recto. The major elemental signals/peaks are represented in Figure 30, the spectra combination of Locations A1, A2, A3 and A6.

[38] All the locations where analysis was done, the spectra have calcium and strontium peaks.

4.2.3 FTIR Spectroscopy

Figure 31 is the reference image for the locations where FTIR spectra were taken. When both the FTIR spectra of *The Doorhandle* (1987) (Figure 32 and Figure 33) are interpreted according to the flowchart in Figure 20 it is evident that the spectra have strong intensities at the IR absorption band from 1700 to 1750 cm^{-1}, the carbonyl band. Then, the spectra have absent intensities at the IR absorption bands from 1590 to 1610 cm^{-1}, and from 1000 to 1100 cm^{-1}. Finally, the spectra have weak intensities at the IR absorption band from 1230 to 1250 cm^{-1}, which leads to the conclusion that the binding medium on *The Doorhandle* (1987) is an acrylic (Derrick, Stulik, & Landry, 2000:111).

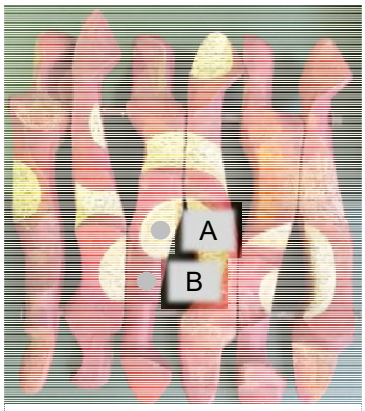

Figure 31: The FTIR locations on *The Doorhandle* (1987).

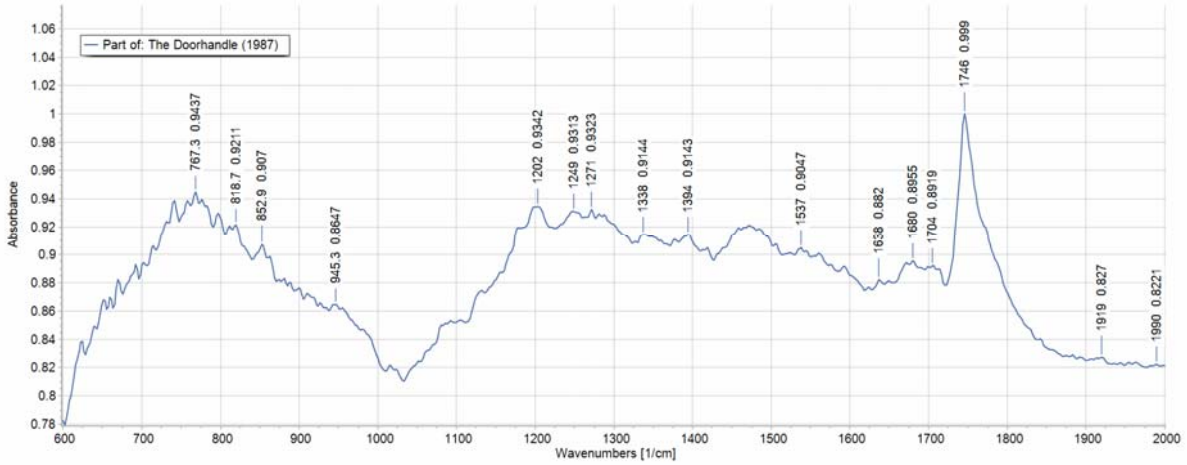

Figure 32: The FTIR spectrum of location A on *The Doorhandle* (1987).

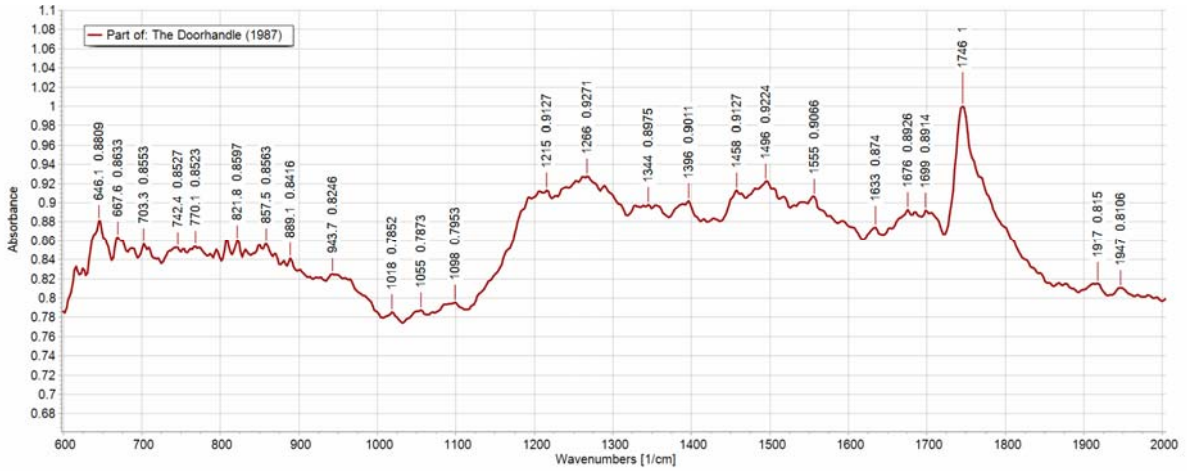

Figure 33: The FTIR spectrum of location B on *The Doorhandle* (1987).

4.3 A Family Group (diptych) (1987)

4.3.1 Technical Photography

- Normal illumination photography:

A Family Group (diptych) (1987) was photographed under the same conditions as *The Doorhandle* (1987) – using natural light with the inclusion of the X-Rite ColorChecker Passport Photo II (Figure 34). However, the easel is not able to safely and securely hold both panels simultaneously, so the two panels were photographed separately. Once again, the photographs were not edited, but were simply cropped and placed next to each other.

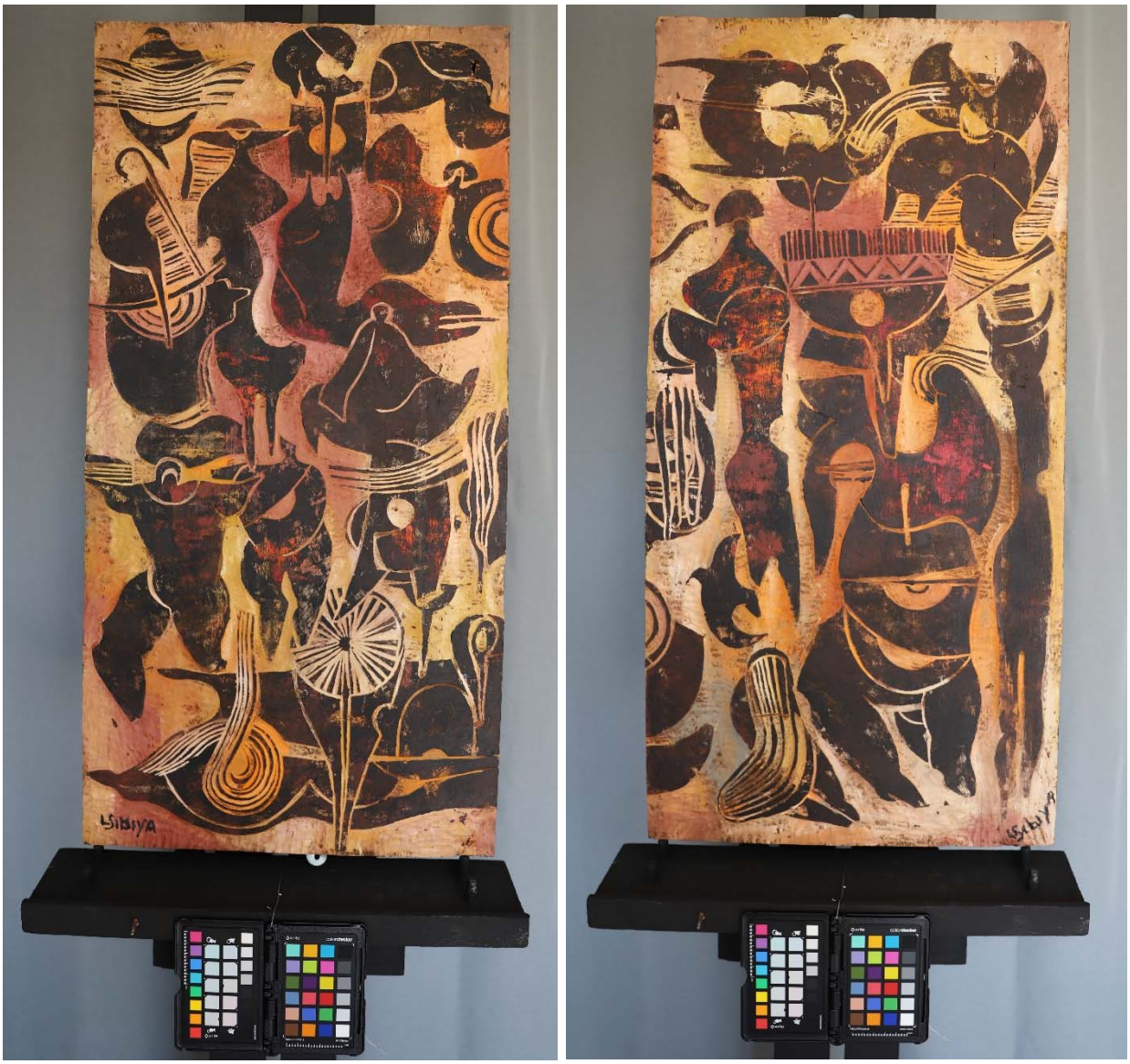

Figure 34: Lucky Sibiya, *A Family Group* (diptych) (1987) photographed in normal illumination.

- Raking illumination photography:

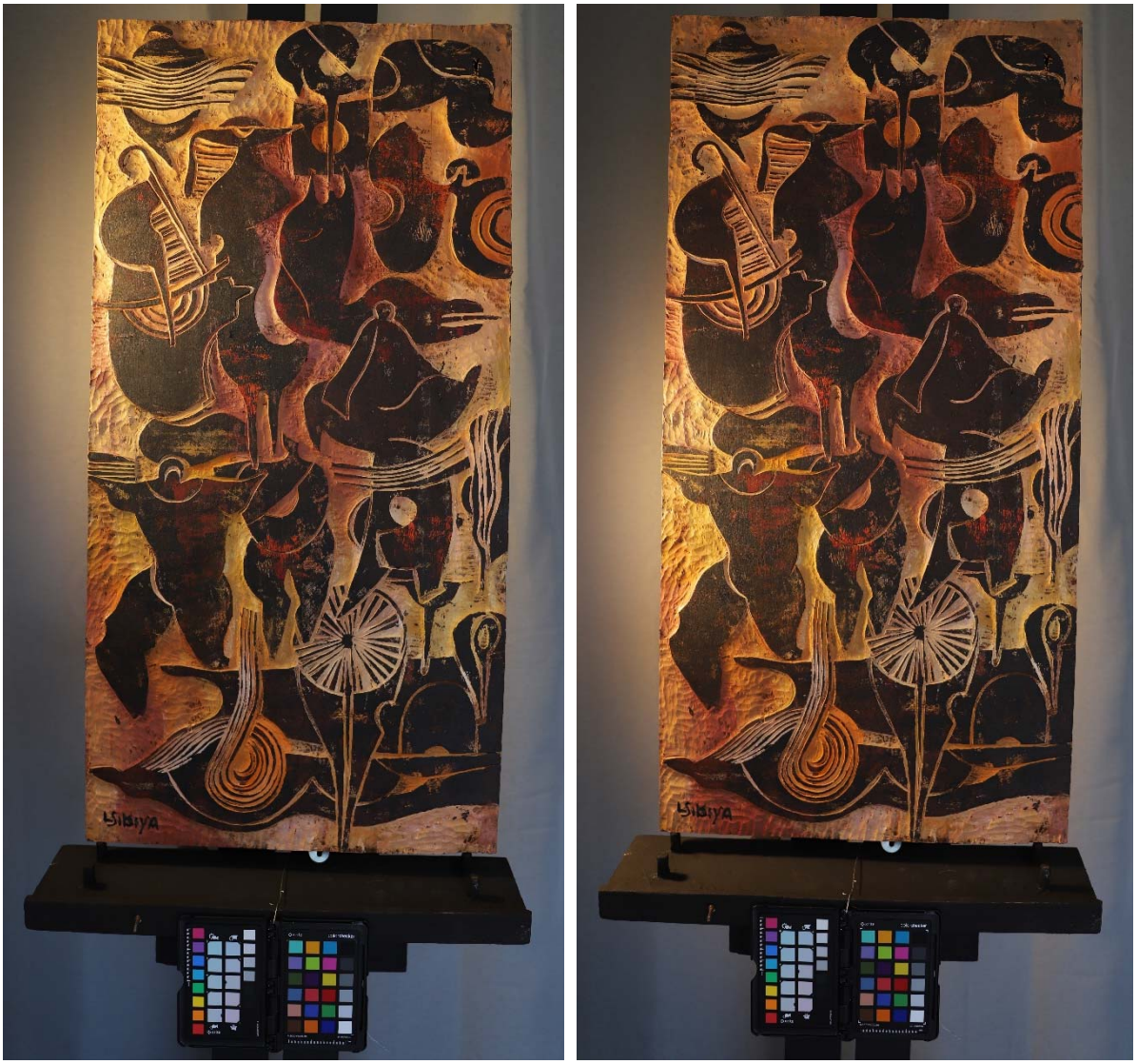

Figure 35: The left panel of *A Family Group* (diptych) (1987) photographed in raking illumination from the left at two levels.

Raking illumination photography was performed in the same conditions as *The Doorhandle* (1987) – on the easel, each panel separately, and in a slightly darkened studio. A handheld light-source was placed at two levels to the left of the left and right panels (Figure 35 and Figure 36) due to the size of the artwork in comparison to the light source, and from the top of the artwork (Figure 37 and Figure 38). The light source was a spotlight, but the required barn door and focusing condensers are not available in the studio. For raking illumination from the left side, it was easy to reach an adequate enough distance from the subject, but the results were a rapid falloff in intensity across the surface and loss of depth of detail to the right of the panels. Again,

lighting the subjects from the top was a challenging task, due to the handheld light source, and the same loss of depth detail to the bottom of the panel is evident – the light source is simply not wide enough. Once more, the X-Rite ColorChecker Passport Photo II was included as well as the required light direction indicator (Frey *et al*., 2008:118). The raking illumination of this artwork reveals how carved and incised the wooden panels are, and how the black figures and shapes protrude from the background.

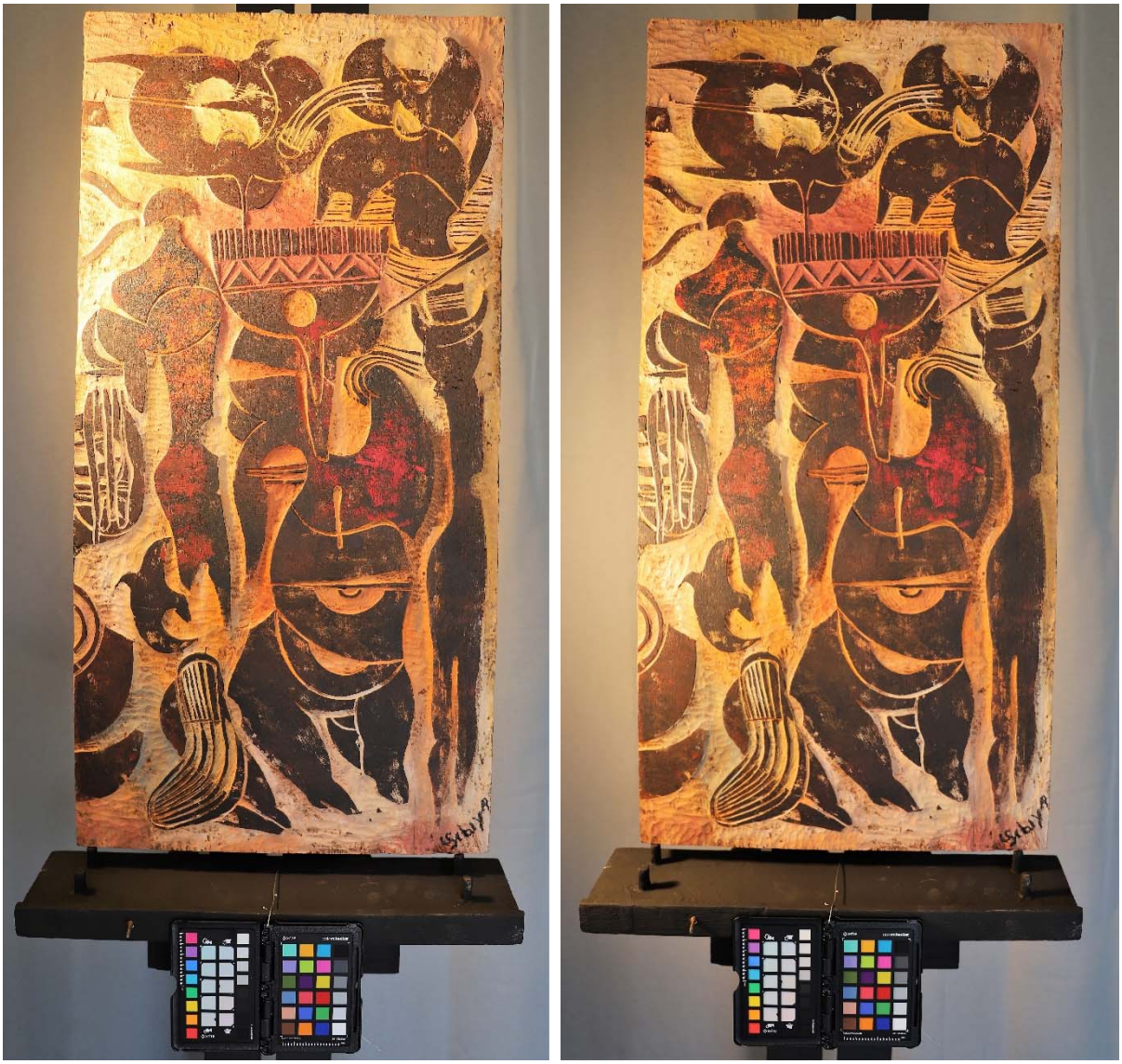

Figure 36: The right panel of *A Family Group* (diptych) (1987) photographed in raking illumination from the left at two levels.

Figure 37: The left panel of *A Family Group* (diptych) (1987) photographed in raking illumination from the top.

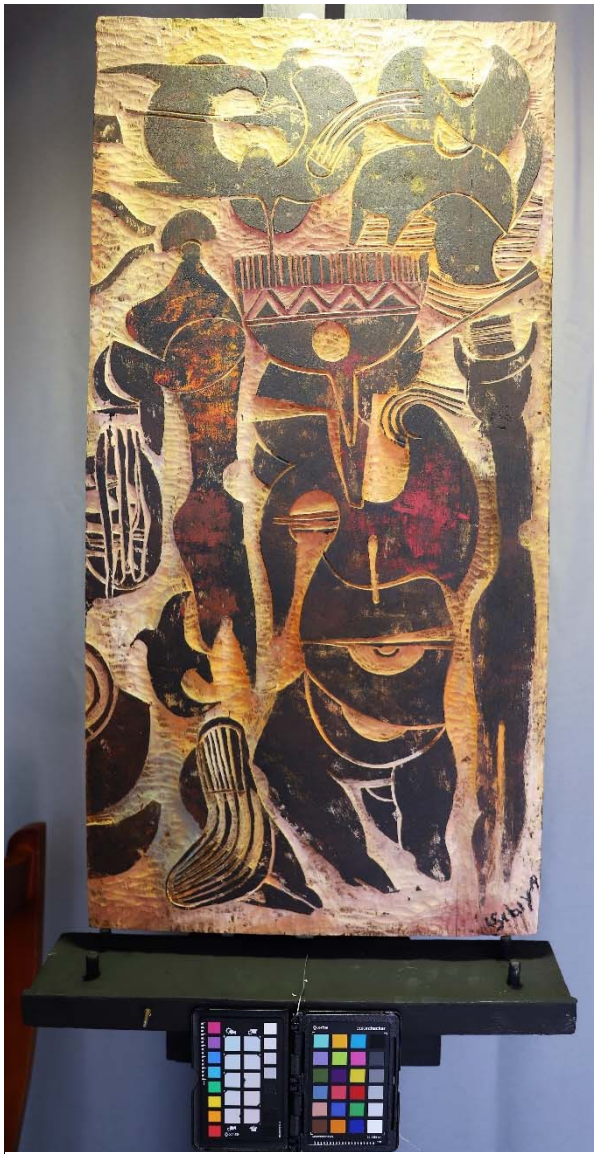

Figure 38: The right panel of *A Family Group* (diptych) (1987) photographed in raking illumination from the top.

- Ultraviolet-induced visible fluorescence photography:

A Family Group (diptych) (1987) was also photographed with the handheld UVA lamp and in close-up. The room was darkened as possible and only elements that had a distinct fluorescence were photographed and included in the study. Figure 39 revealed a very distinct lime green fluorescence of a type of fibre on the left of the left panel – it was the only one of its kind. Figure 40 revealed that the incised area, that is orange in normal light, between the black swirl at the bottom of the left panel, fluoresces red under UV radiation. Figure 41 is an image of the exposed wood that fluoresces a slight green, almost white, and on the black, there are speckles with a bluish-purple

Figure 39: A distinct greenish white fluorescence of a fibre attached to the left panel of *A Family Group* (diptych) (1987).

Figure 40: A red fluorescence in the swirl at the bottom of the left panel of *A Family Group* (diptych) (1987).

Figure 41: The exposed wood, and the impurities at the bottom right of the right panel of *A Family Group* (diptych) (1987).

Figure 42: The middle figure to the left of the left panel of *A Family Group* (diptych) (1987).

Figure 43: The head of the left bottom figure on the left panel of *A Family Group* (diptych) (1987).

fluorescence that appears to be dust and other organic matter. It was also unclear what causes the three light yellow areas to the left of the left panel that are next to the middle figure in Figure 42. In normal light conditions the areas are invisible. In Figure 43, the head and shoulders of the left figure at the bottom of the left panel, the wood fluorescence was very clear over the black painted areas.

Figure 44: Close-up reflected IR photograph of the left panel of *A Family Group* (diptych) (1987) with a 715nm IR filter.

- Reflected infrared photography:

A Family Group (diptych) (1987) was photographed in the IR regions like *The Doorhandle* (1987). However, proper mosaicking of the images was not possible, as the photography studio does not have access to Adobe Photoshop – the preferred software for technical post-processing. The need was also not evident due to no discernible observations. Yet, it was interesting to observe that no underdrawings or guidelines were found. Thus, either Sibiya did not create underdrawings on the selected artworks, but rather carved without guidelines, or he carved precisely over them, and by so doing removed them from record. Figure 44 is the bottom left figure on the left panel, and not underdrawings or guidelines are visible. The black figures and shapes absorb the IR wavelengths, while the background reflects. Figure 45 and Figure 46 is of the left panel with an 850nm IR filter and an 1000nm IR filter respectively.

Figure 45: Close-up reflected IR photograph of the left panel of *A Family Group* (diptych) (1987) with an 850nm IR filter.

Figure 46: Close-up reflected IR photograph of the left panel of *A Family Group* (diptych) (1987) with an 1000nm IR filter.

4.3.2 XRF Spectroscopy

Non-destructive XRF analysis was performed on nine target areas on panel one and seven target areas on panel two to attempt to determine the pigments used by Sibiya. In summary, XRF data suggest the presence of iron black, mars black, yellow ochre, raw sienna, cadmium yellow, cadmium red and titanium white. All the areas analysed in the artwork includes traces of nickel, copper, and zinc, which was also detected on the back of the panel. These three elements indicate the varnish on the entire verso and recto of the panels.

Location	Description	Primary elements detected	Possible colourants
B1	Black area	**Fe**, **Ti**, **Ca**, Ni, Cu, *Sr*, *Zn*	**Iron black**, **Mars black**, Ivory black, bone black
B2	Yellow	**Fe**, **Ti**, Cd, Se, *Ca*	**Yellow ochre**, **raw sienna**, cadmium yellow, mars yellow, titanium

			white, *cadmium red*, *chalk*, *gypsum*
B3	Brownish, light maroon	**Fe**, **Ti**, Sn, Ba, *Ni*, *Cu*, *Zn*, *Sr*	**Yellow ochre**, **raw sienna**, **red ochre**, mars yellow, titanium white, lead tin yellow, permanent white, barium sulfate
B4	Maroon, red	**Cd**, **Se**, **Ti**, Ca, Ba, *Sr*	**Cadmium red**, titanium white, *chalk, gypsum, permanent white, barium sulfate*
B5	Golden yellow	**Fe**, **Cd**, Se, *Ni*, *Zn*, *Cu*	**Yellow ochre**, **raw sienna**, cadmium yellow, mars yellow, cadmium red
B6	Lighter yellow	**Fe**, **Ti**, *Ni*, *Cu*, *Zn*	**Yellow ochre**, **raw sienna**, cadmium yellow, mars yellow, titanium white
B7	Golden yellow	**Cd**, **Se**, Ti, Fe, *Ni*, *Zn, Cu*	**Cadmium yellow**, **cadmium red**, titanium white, yellow ochre, raw sienna, mars yellow
B8	Black	**Fe**, *Ti*, *Ba*	**Mars black**, **Iron black,** *barium sulfate*
B9	Verso	Ni, Zn, Cu	No pigment
C1	Brownish, light maroon	**Fe**, **Ti**, **Cd**, Se, Ba, Sn, *Ni*, *Cu*, *Zn*, *Sr*	**Yellow ochre**, **raw sienna**, **red ochre**, **cadmium red**, **cadmium yellow**, mars colours, titanium white, *lead tin yellow, permanent white, barium sulfate*
C2	Orange	**Cd**, **Se**, Ti, Fe, Sn, Ba, *Sr*, *Ni*, *Cu*, *Zn*	**Cadmium red**, **cadmium yellow**, titanium white, yellow ochre, raw sienna, red ochre, mars colours lead tin yellow, permanent white, barium sulfate
C3	Maroon, red	**Cd**, **Se**, **Ba**, Ti, Fe, Sn, *Sr*, *Ni*, *Cu*, *Zn*	**Cadmium red**, mars red, red ocher, burnt sienna, burnt umber, titanium white, barium sulfate
C4	Dusty blue, grey	**Ti**, **Ba**, **Cd**, Sn, Fe, Sr, *Se*, *Ni*, *Cu*, *Zn, Mn*	**Titanium white, barium sulfate, permanent white, manganese blue**, cadmium red, cadmium yellow, lead tin yellow, iron black, mars colours, Prussian blue, yellow

			ochre, raw sienna, red ocher, burnt sienna
C5	Cream	**Ti**, **Fe**, **Cd**, Se, *Ca*, *Ni*, *Cu*, *Zn*, *Sr*	**Titanium white**, **Yellow ochre**, **raw sienna**, **red ochre**, **cadmium red**, **cadmium yellow**, mars colours, *chalk, gypsum*
C6	Black	**Fe**, *Ti*, *Ni*, *Cu*, *Zn*	**Mars black**, **Iron black**
C7	Verso	Ni, Cu, Zn	No pigment

Table 2: Break-down of elemental peaks at locations, and possible pigments inferred on *A Family Group* (diptych) (1987).

Figure 47: Location of XRF analysis (recto) on *A Family Group* (diptych) (1987).

Figure 47 and Figure 48 is the reference image for the locations of analysis. Locations B1, B8 and C6 are most probably iron or mars black because they have dominant iron peaks (see Figure 51 for the spectra of B8 and C6 – the signature). B2, a yellow area, has elemental intensities at iron and titanium, which suggests yellow ochre, raw sienna, cadmium yellow, mars yellow, and titanium white (see Figure 49). Location B3

and C1, which appears similarly in normal white light, differs in that B3 does not have a prominent cadmium, and its accompanying selenium, peaks. Otherwise, their spectra are very similar in appearance. It is possible that these two locations are a combination of yellow ochre, raw sienna, red ochre, cadmium red, cadmium yellow, and titanium white.

Figure 48: Location of XRF analysis (verso).

Location B4 and C3, both reddish maroon in normal viewing conditions, are likely a cadmium red and titanium white, which the possibilities of red ochre, burnt sienna, and burnt umber (see Figure 51). Locations B5, B6 and B7 are all different chromas of yellow. B5 and B7 indicate cadmium, selenium and iron which refers to the possibility of cadmium yellow, yellow ochre and raw sienna. However, B6, a lighter chroma of yellow, has dominant iron and titanium peaks which suggests yellow ochre, raw sienna, and titanium white (see Figure 49). Locations B9 and C7 are the respective versos of the diptych (Figure 52). These locations both have nickel, copper, and zinc

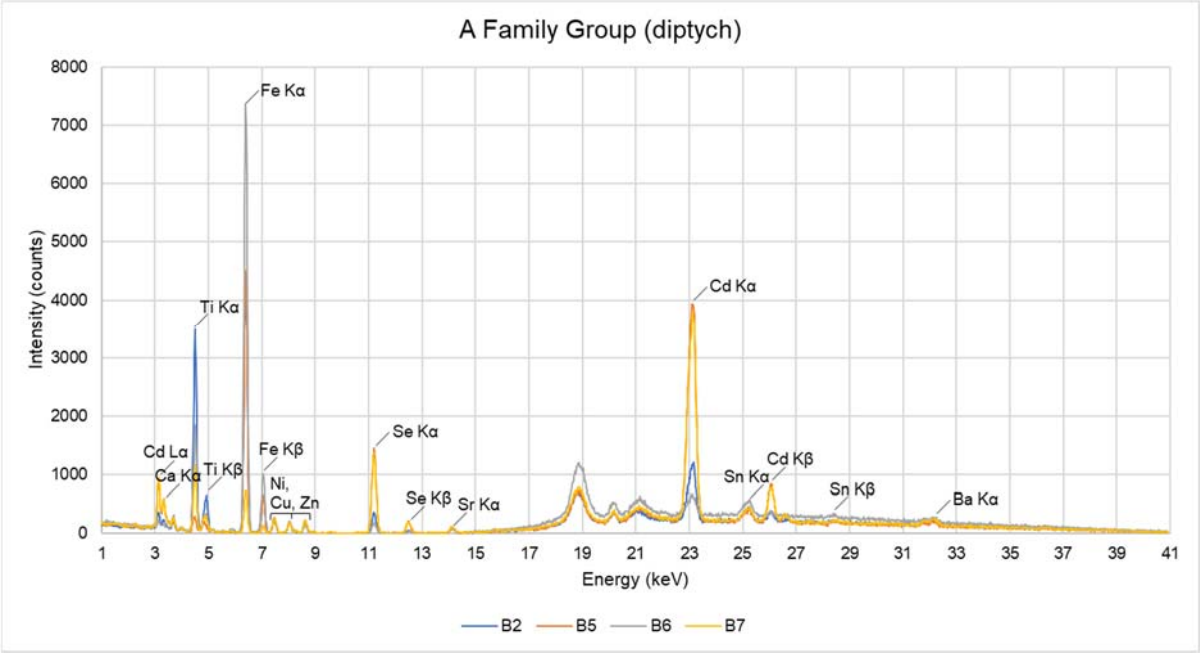

Figure 49: Elemental peaks of locations B2, B5, B6, B7 on *A Family Group* (diptych) (1987).

peaks. The combination of these three peaks explains their presence at all the other locations, and it is assumed that it is a kind of wood treatment.

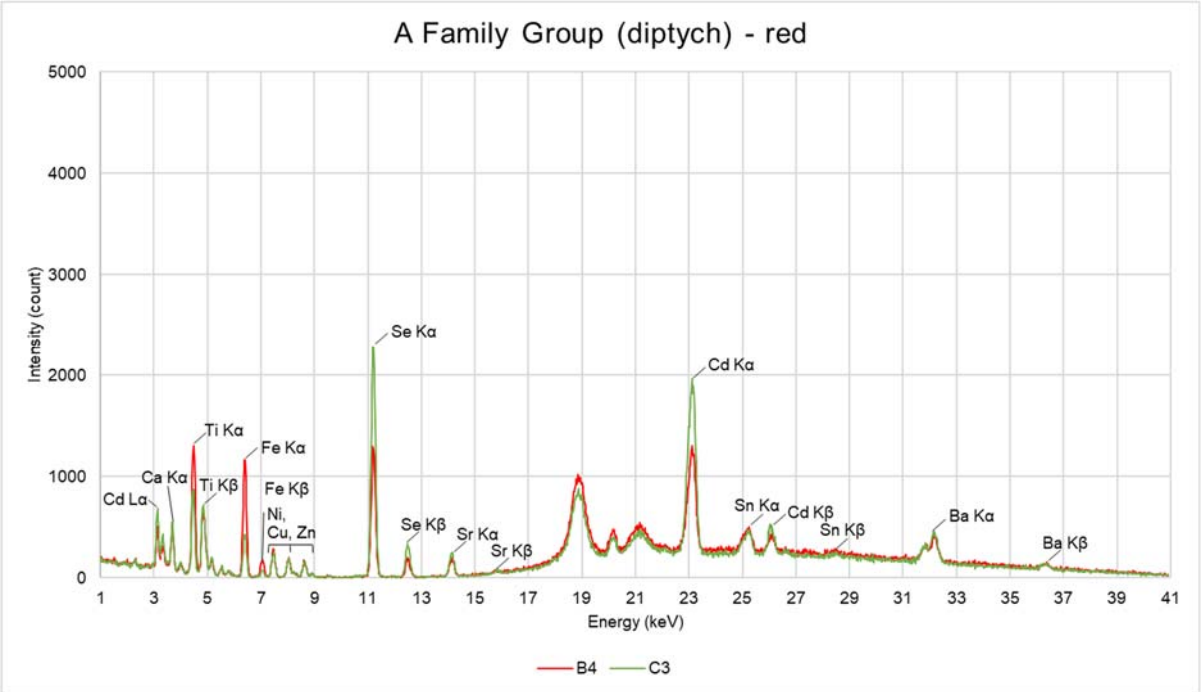

Figure 50: Elemental peaks of locations B4 and C3 on *A Family Group* (diptych) (1987).

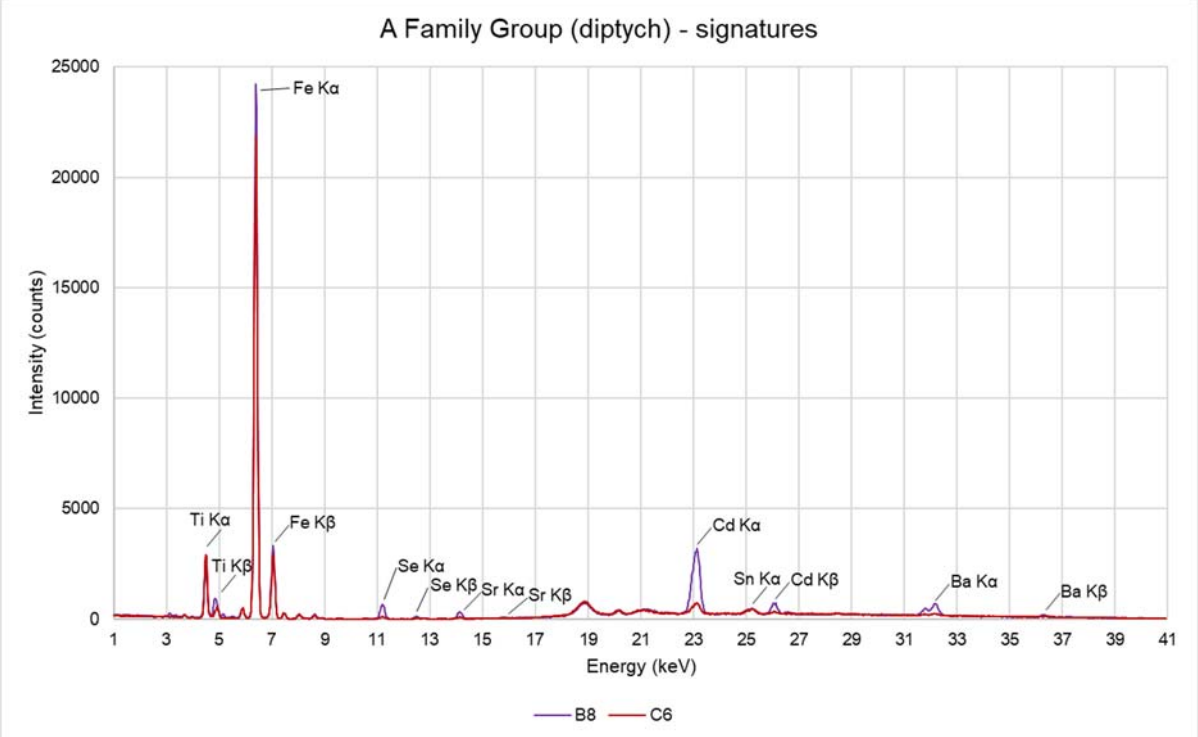

Figure 51: Elemental peaks of locations B8 and C6 on *A Family Group* (diptych) (1987).

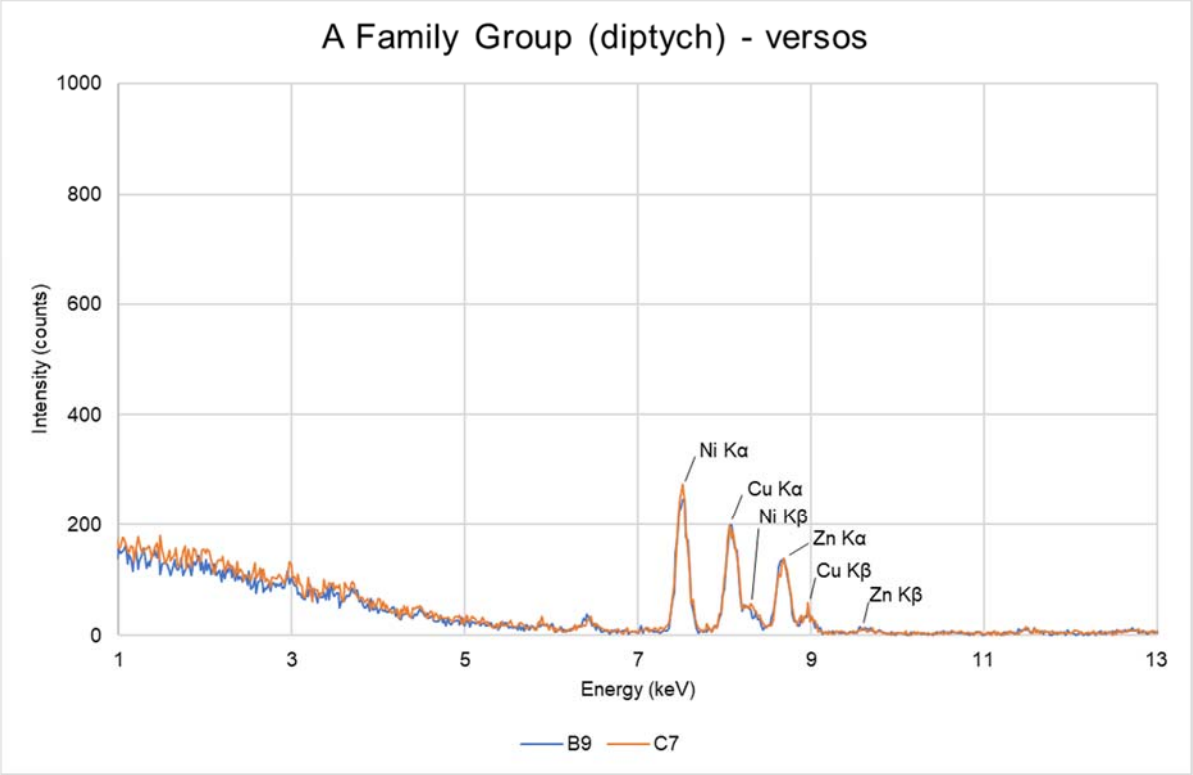

Figure 52: Elemental peaks of locations B9 and C7 on *A Family Group* (diptych) (1987).

4.3.3 FTIR Spectroscopy

FTIR spectra were taken on two locations on each of the panels of *A Family Group* (diptych) (1987) – one black area and one beige area on each panel. The FTIR spectra of each follow the same directions on the flowchart in Figure 20. Figure 53 to 56 show the spectra have strong intensities at the IR absorption band from 1700 to 1750 cm-1, the carbonyl band; absent intensities at the IR absorption bands from

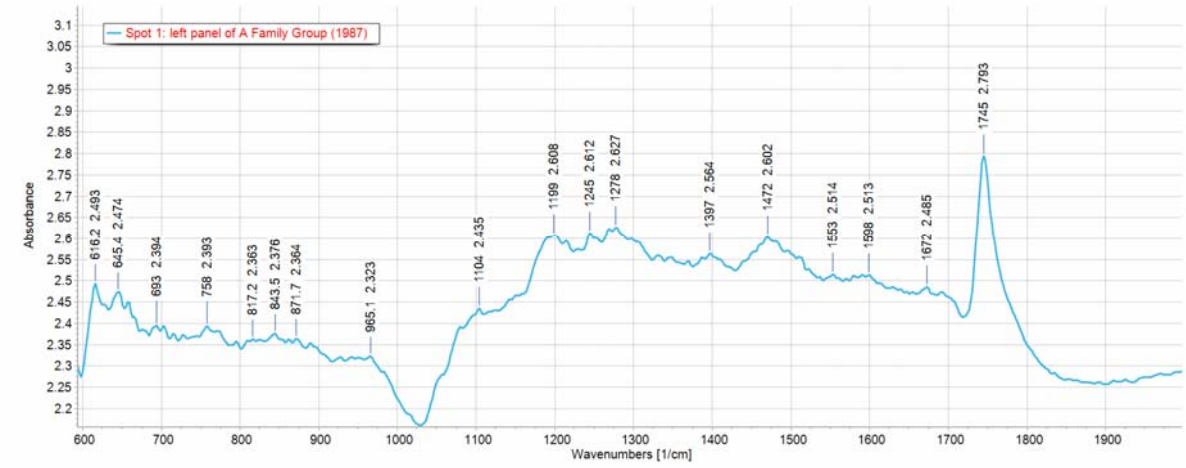

Figure 53: The FTIR spectrum of spot 1 on the left panel of *A Family Group* (diptych) (1987).

1590 to 1610 cm-1, and from 1000 to 1100 cm-1; and have weak intensities at the IR absorption band from 1230 to 1250 cm-1. In conclusion, the binding medium used on both panels of A Family Group (diptych) (1987) is an acrylic.

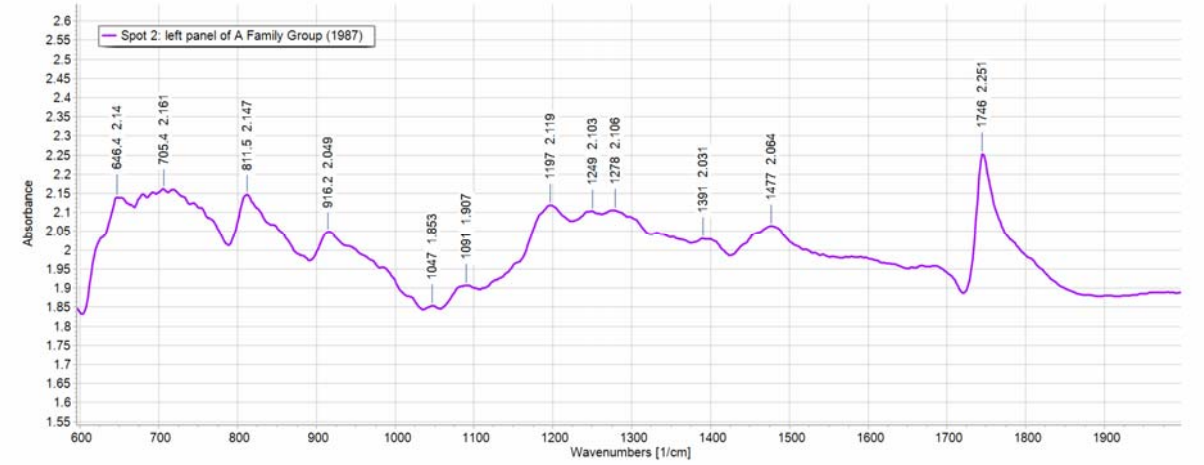

Figure 54: The FTIR spectrum of spot 2 on the left panel of *A Family Group* (diptych) (1987).

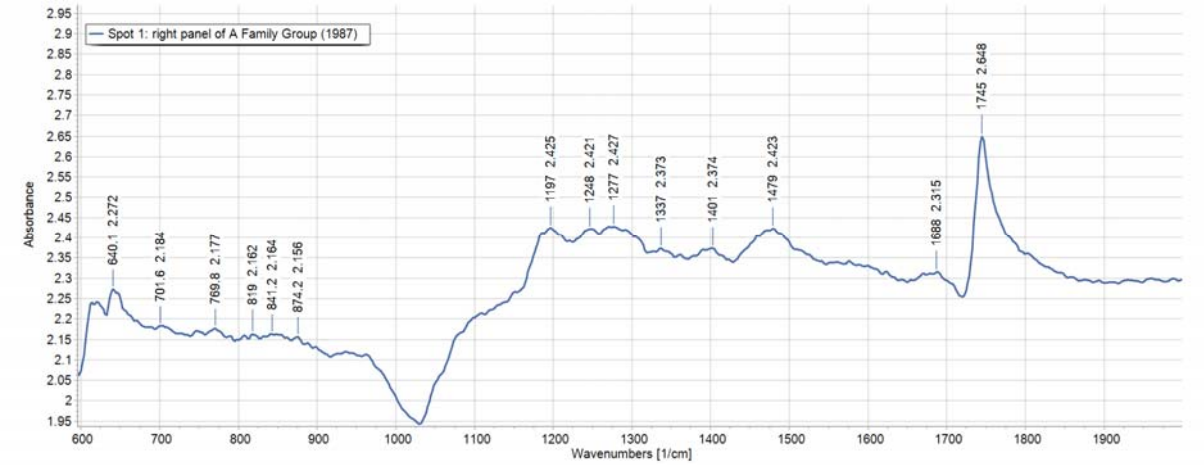

Figure 55: The FTIR spectrum of spot 1 on the right panel of *A Family Group* (diptych) (1987).

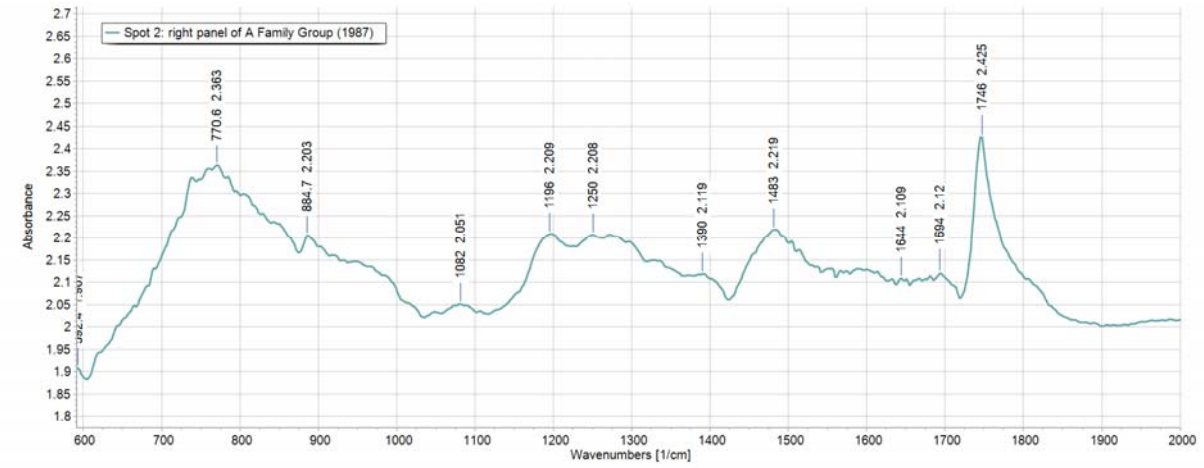

Figure 56: The FTIR spectrum of spot 2 on the right panel of *A Family Group* (diptych) (1987).

4.4 The Sun Man (1995)

4.4.1 Technical Photography

- Normal and raking illumination photography:

Normal and raking illumination photography of *The Sun Man* (1995) in the photography studio at Van Wouw House was unfortunately not possible at the time of writing. The artwork, as stated in Chapter Three, is on exhibition at The Javett Art Centre at the University of Pretoria (Javett-UP) and is simply too tall to fit into the studio. Thus, the photograph, curtesy of photographer Thania Louw, is included but as she did not photograph the artwork for conservation purposes, the X-Rite ColorChecker Passport Photo II is not included (Figure 12).

- Ultraviolet-induced visible fluorescence photography:

Due to *The Sun Man* (1995) being on exhibition and not able to fit into the photography studio, the artwork was covered with a big blanket in the exhibition gallery and close-up UV induced photographs were taken. Figure 57 shows that *The Sun Man* (1995) is also full of dust and other organic speckles that fluoresce bluish-purple. Figure 58 shows an orange fluorescence to the left of the right arm where in visible light it is an ochre colour, and the circular shapes that fluoresce greenish white is the exposed wooden substrate. Figure 59, the orange area in the middle of the artwork that is intentionally textured fluoresces red, and the white speckles fluoresces a bright white. The white speckles might be the chalk, gypsum or marble dust found with XRF Spectroscopy.

Figure 57: Underneath the blue area in the middle of *The Sun Man* (1995).

Figure 58: The area between the two arms of *The Sun Man* (1995).

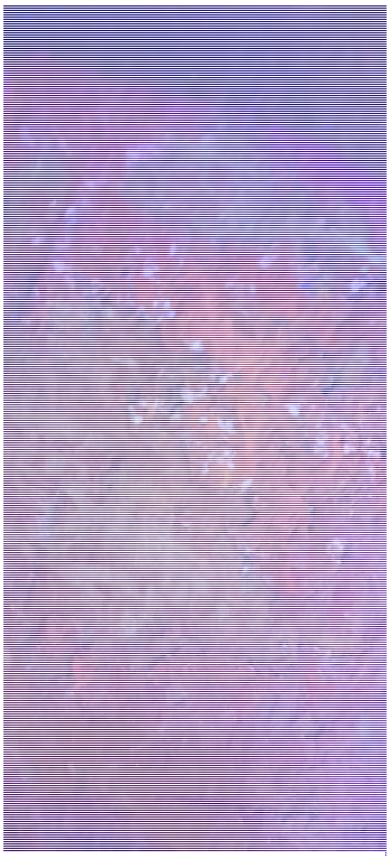

Figure 59: Orange area with white spots on *The Sun Man* (1995).

- Reflected infrared photography:

The Sun Man (1995) was photographed in the same conditions as the previous artworks, and mosaicking was again not possible. Thus, only the close-up images that reveals some interesting aspects are included. Figure 60, the cadmium red signature on the right leg, reflects the IR wavelengths with the 850nm filter and the 1000nm filter, but interestingly less with the 715nm filter. Figure 61 to Figure 63 revealed no underdrawings or guidelines, and the lighter scratches on the darker areas are the exposed wood, which reflects while the paints absorb respectively more.

Figure 60: The signature of *The Sun Man* (1995) with the 850nm filter.

Figure 61: The area above right leg of *The Sun Man* (1995) with the 850nm filter.

Figure 62: The middle section of *The Sun Man* (1995) with the 1000nm filter.

Figure 63: The left leg of *The Sun Man* (1995) with the 1000nm filter.

4.4.2 XRF Spectroscopy

Non-destructive XRF analysis was performed on nineteen target areas to attempt to determine the pigments used by Sibiya. In summary, XRF data suggest the strong presence of cadmium red, cadmium yellow, bone/ivory black, titanium white, ochres, sienna, and umbers.

Location	Description	Primary elements detected	Possible colourants
D1	Orange	**Cd**, **Se**, Sn, Ti, Ba, *Ni*, *Cu*, *Zn*, *Sr*	**Cadmium red**, **cadmium yellow**, lead tin yellow, titanium white, barium sulfate
D2	Black	**Ti**, **Ba**, **Ca**, Sn, *Ni*, *Cu*, *Zn*, *Fe*	**Bone black**, **ivory black**, barium sulfate, titanium white
D3	Red	**Cd**, **Se**, Ba, Sn, Sr, *Fe*, *Ni*, *Cu*, *Zn*	**Cadmium red**, barium sulfate,
D4	Filling (see Figure #)	**Fe**, **Ca**, Sn, Ti, Ba, *Ni*, *Cu*, *Zn*	Wood putty
D5	Red	**Cd**, **Se**, Ba, Sn, *Fe*, *Ni*, *Cu*, *Zn, Sr*	**Cadmium red**, barium sulfate,
D6	Reddish brown (see Figure #)	**Fe**, **Ca**, Sn, Ti, Ba, *Ni*, *Cu*, *Zn*	Wood putty
D7	Brown	**Fe**, **Ti**, **Ba**, **Cd**, Se, Sn, *Ni*, *Cu*, *Zn*, *Sr*	**Mars colours**, **yellow ochre**, **red ochre**, **Prussian blue**, **iron black**, **brown ochre**, **umber**, **sienna**, titanium white, permanent white, barium sulfate, cadmium red, cadmium yellow
D8	Blue	**Ti**, **Ba**, Sn, Ca, Cu, *Ni*, *Zn*, *Fe*, *Se*, *Sr*	**Titanium white**, **barium sulfate**, permanent white, lead tin yellow, chalk, gypsum, **azurite**, **synthetic copper blues**, **blue verditer**, indigo, Egyptian blue, *Prussian blue*
D9	Beige	**Ti**, **Ba**, **Fe**, Sn, Cd, *Ni*, *Cu*, *Zn*, *Sr*	**Titanium white**, **barium sulfate**, **permanent white**, **yellow ochre**, **brown ochre**, **sienna**, **umber**, **mars yellow**, cadmium yellow, lead tin yellow

D10	Orange with white specs	**Ca**, **Fe**, Sn, Ba, Ti, *Ni*, *Cu*, *Zn*, *Sr*	**Chalk**, **gypsum**, **yellow ochre**, **sienna**, **mars colours (red and yellow)**, lead tin yellow, barium sulfate, titanium white
D11	Light orange	**Cd**, **Se**, **Ti**, **Ba**, Sn, Fe, *Ni*, *Cu*, *Zn*	**Cadmium red**, **cadmium yellow**, **titanium white**, **barium sulfate**, **permanent white**, lead tin yellow, mars red and yellow
D12	Dark blue	**Ti**, **Fe**, **Co**, Sn, Sr, *Ni*, *Cu*, *Zn*	Titanium white, **Prussian blue**, **mars black**, **iron black**, **cerulean blue**, **cobalt blue**, cobalt violet, *cobalt turquoise light and dark*
D13	Yellow	**Cd**, **Se**, Ti, Ba, Fe, Sn, *Ni*, *Cu*, *Zn*, *Sr*	**Cadmium yellow**, cadmium red, titanium white, barium sulfate, yellow ochre, raw sienna, mars yellow
D14	Black	**Fe**, **Ti**, **Ba**, Cd, Sn, Ca, *Ni*, *Cu*, *Zn*, *Sr*	**Iron black**, **mars black**, titanium white, barium sulfate, permanent white,
D15	Yellow	**Fe**, **Ca**, Ti, Ba, Sn, *Ni*, *Cu*, *Zn*, *Sr*	**Yellow ochre**, **raw sienna**, **mars yellow**, **chalk**, **gypsum**, titanium white, barium sulfate, permanent white
D16	Dust blue, grey	**Cd**, **Ti**, **Ba**, Fe, Sr, Sn, Se, *Ni*, *Cu*, *Zn*	Cadmium red, cadmium yellow, **titanium white**, **barium sulfate**, **permanent white**, **iron black**, **mars black**
D17	White	**Fe**, **Ca**, Ti, Sn, Ba, *Ni*, *Cu*, *Zn*, *Pb*, *Sr*	Mars colours, iron black, bone black, **calcium**, **gypsum**, **titanium white**, barium sulfate, permanent white
D18	Signature (red)	**Se**, **Cd**, Ti, Ba, Fe, Sn, *Sr*, *Ni*, *Cu*, *Zn*	**Cadmium red**, titanium white, barium sulfate, red ochre
D19	Verso	**Ti**, **Cu**, Sn, Cd, *Ni*, *Fe*, *Zn*, *Pb*, *Se*	No pigments

Table 3: Break-down of elemental peaks at locations, and possible pigments inferred on *The Sun Man* (1995).

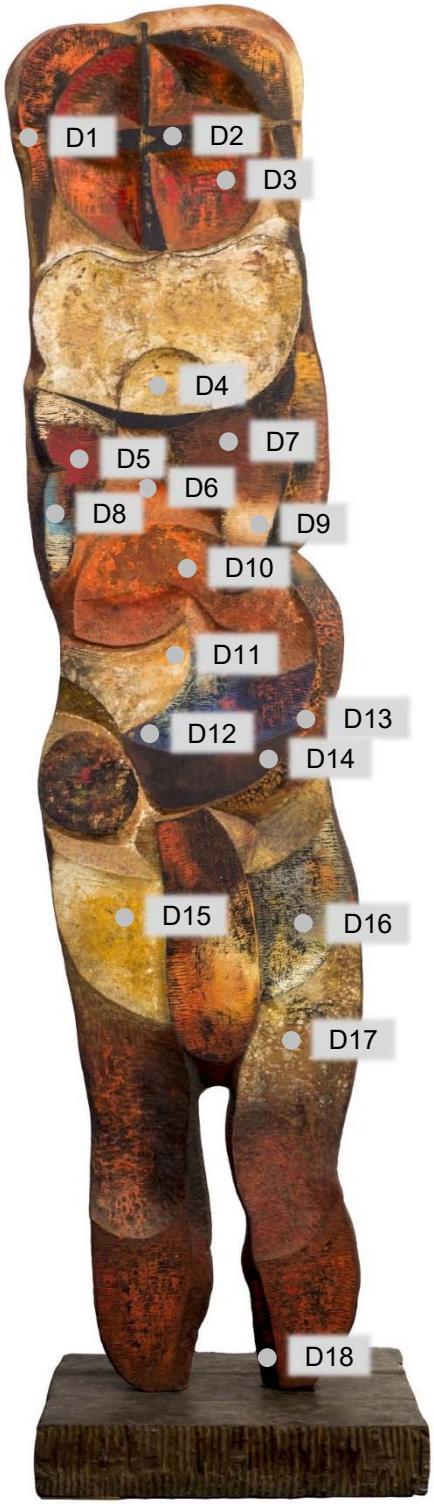

Figure 64: Location of XRF analysis (recto) on *The Sun Man* (1995).

Location D1 is most probably a combination of cadmium red and cadmium yellow. D2, the black cross over the "face" of the Sun Man, is likely a bone or ivory black. Both D2 and D14 are black areas on the artwork. In comparison, D2 does not have the prominent iron and cadmium intensities that D14 exhibit on the spectra (Figure 68). D3 and D5 strongly suggests cadmium red because the cadmium and selenium peaks are the most intense on both spectra (Figure 69). D4 is most probably wood putty, which commonly includes calcium carbonate, linseed oil and a colorant. Location D6 has a very similar spectrum as D4 (Figure 65), however, the D4 spectrum has more intense calcium and iron peaks – while D6 (Figure 66) has a more intense barium peak (Figure 70).

D7 is a brown area. To achieve a mixed brown hue, it is either a mineral pigment, such as burnt umber, or necessary to mix a primary colour with a complementary colour – and different ratios of each will

determine the hue of the brown.[39] Thus, there are many possible combinations. However, it is suspected to be a hue with iron intensities such as the umbers, ochres, and sienna. It was difficult to identify the blue colours. D8 and D12 had higher peaks at areas that do not infer a blue pigment (Figure 71), and at D8 only copper could be a cause for the blue pigment. Both indigo and Egyptian blue were considered as possibilities, because indigo is an organic pigment and it will not be detected with XRF, yet remains a possibility, and Egyptian blue has prominent elements of calcium, copper, and silicon.[40] In turn, D12 has high peaks at iron and cobalt which points towards blue hues such as Prussian blue, cerulean blue and cobalt blue. Location D9, which appears beige or a pale sandy colour, is possibly a combination of titanium white or barium sulfate (white) and an ochre, sienna, or umber. The determination of D10 was also strenuous because of the white specs that are seen in Figure 67. The spectrum has intense calcium peaks which suggests chalk or gypsum as possibilities for the white specs, while the orange hue is possibly ochre, sienna or a combination of red and yellow mars colours (Figure 72).

Figure 65: Close up of analysis location D4.

Figure 66: Close up of analysis location D6.

[39] For example, red and green, blue and orange, or yellow and purple.
[40] The raw XRF data for location D8 presented silicon dioxide traces.

Figure 67: Close up of analysis location D10.

The light orange, location D11, surmises a combination of cadmium red, cadmium yellow, titanium white and barium sulphate. Location D13, a small yellow spot next to the dark blue of location D12, is likely a cadmium yellow with traces of titanium white and barium sulfate. While D15 is also yellow in normal viewing conditions, this location has more intense iron and calcium peaks as D13. The pigments inferred at D15 for iron is either yellow ochre, raw sienna or mars yellow, and for calcium chalk and gypsum. Location D16, a dusty, greyish blue area, has surprisingly similar elemental peaks as location C14 in *A Family Group (diptych)* (1987) – both areas have titanium, barium, cadmium, iron, strontium, tin, and selenium peaks. It is inferred that the grey hue is a combination of titanium white, barium sulfate, iron black or mars black.[41]

Location D17 also has a confusing elemental intensity – iron – which is not a primary element for a white pigment (Figure 72). However, the strong calcium, titanium, and barium peaks refer to calcium, gypsum, titanium white, barium sulfate or permanent white. The signature, D18, is most likely a cadmium red pigment, because the spectrum has high intensity peaks at cadmium and selenium (Figure 69). The verso, D19, presents elemental peaks of titanium, copper, tin, cadmium, nickel, iron, zinc, lead, and selenium (Figure 73), yet the location did not have any colourant under normal viewing conditions.

[41] The confusing element is cadmium, which is either red, yellow, or orange pigments.

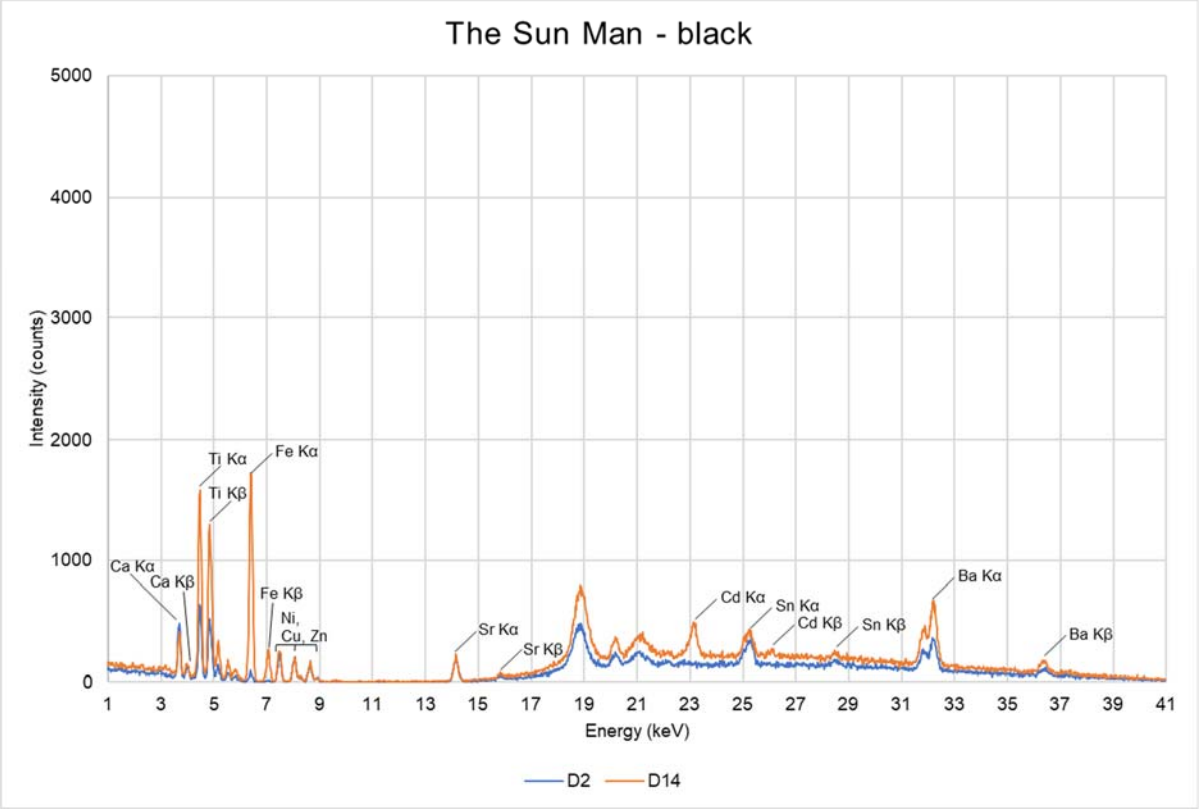

Figure 68: Elemental peaks of locations D2 and D14 on *The Sun Man* (1995).

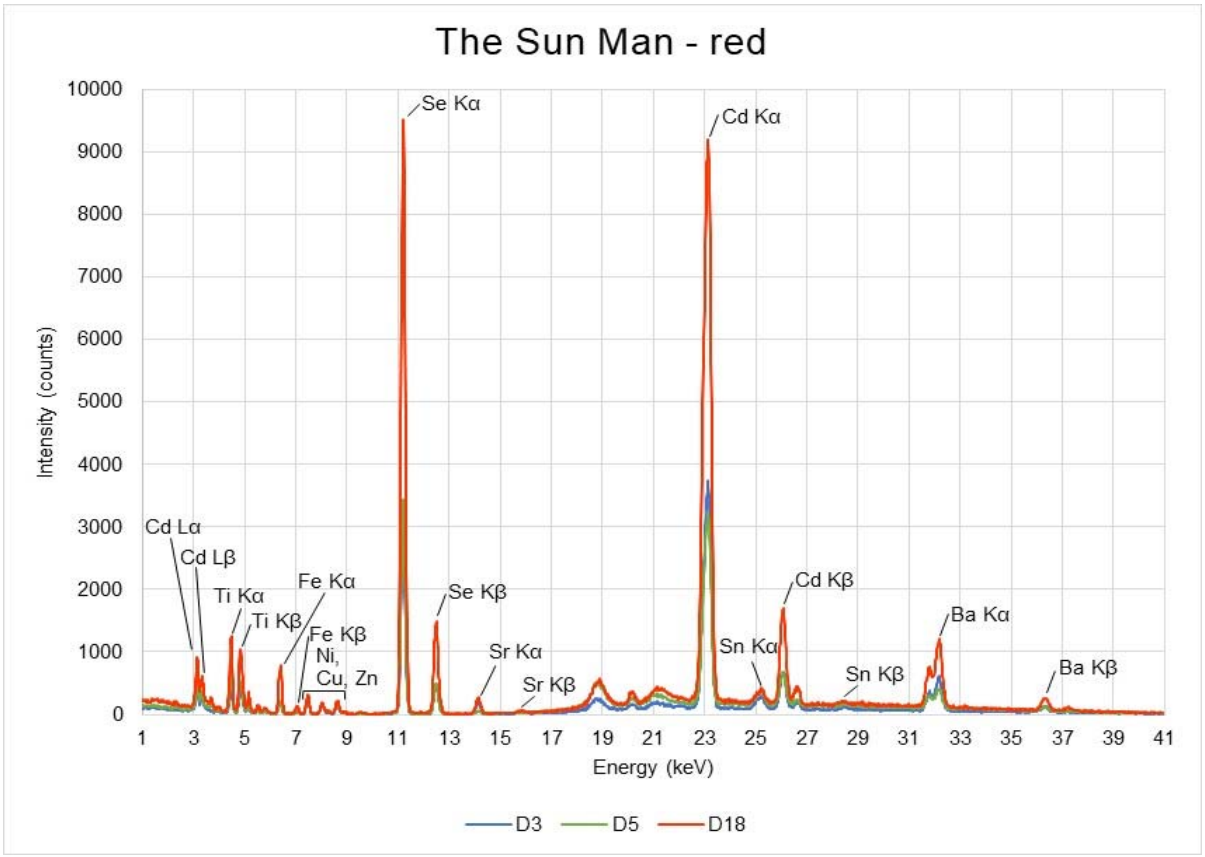

Figure 69: Elemental peaks of locations D3, D5 and D18 on *The Sun Man* (1995).

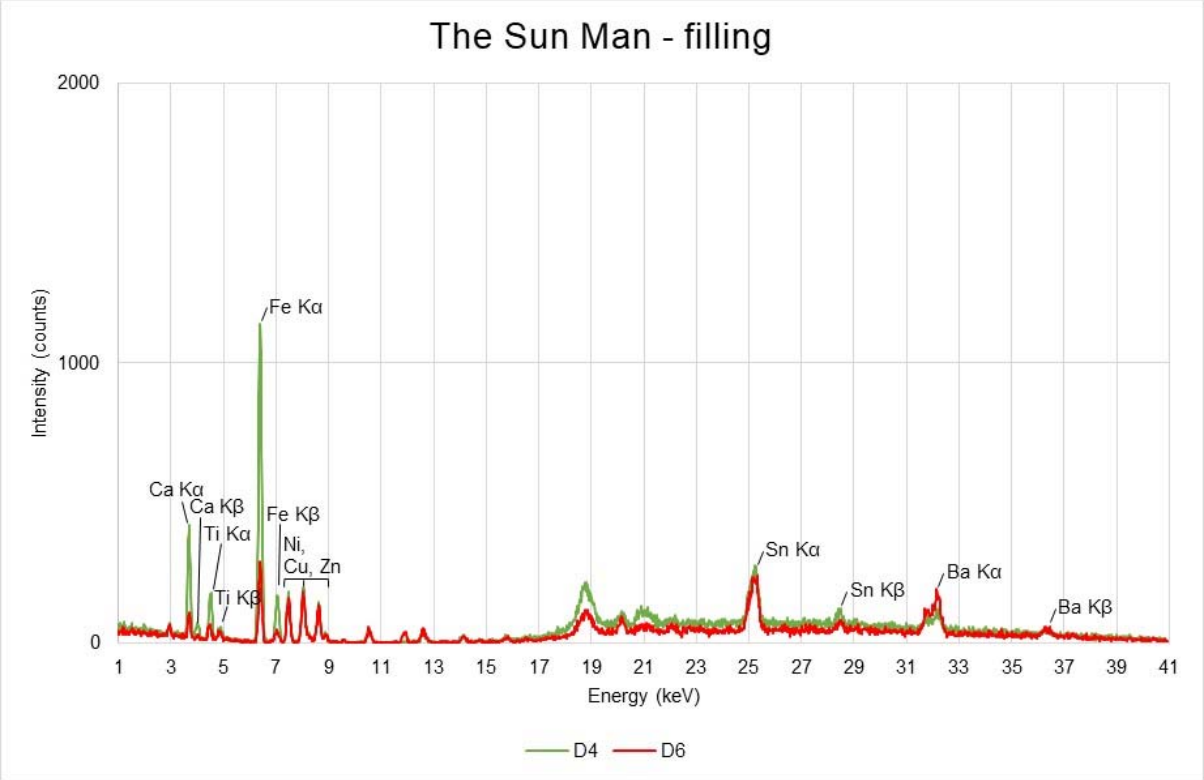

Figure 70: Elemental peaks of locations D4 and D6 on *The Sun Man* (1995).

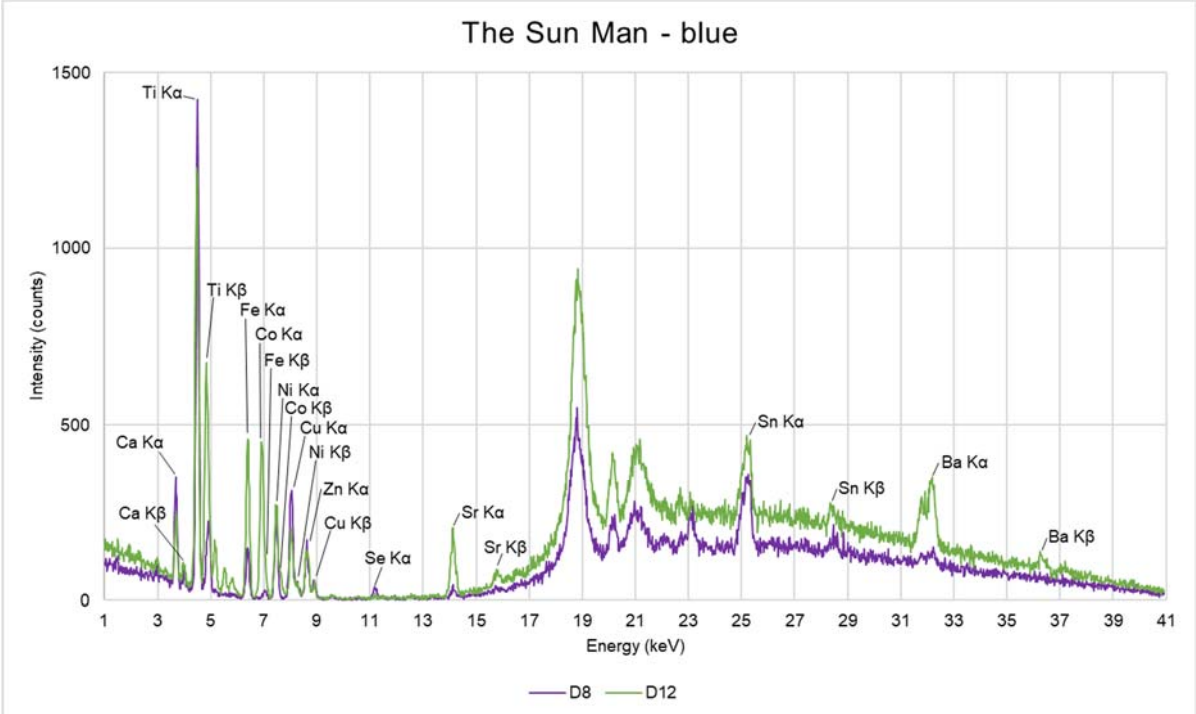

Figure 71: Elemental peaks of locations D8 and D12 on *The Sun Man* (1995).

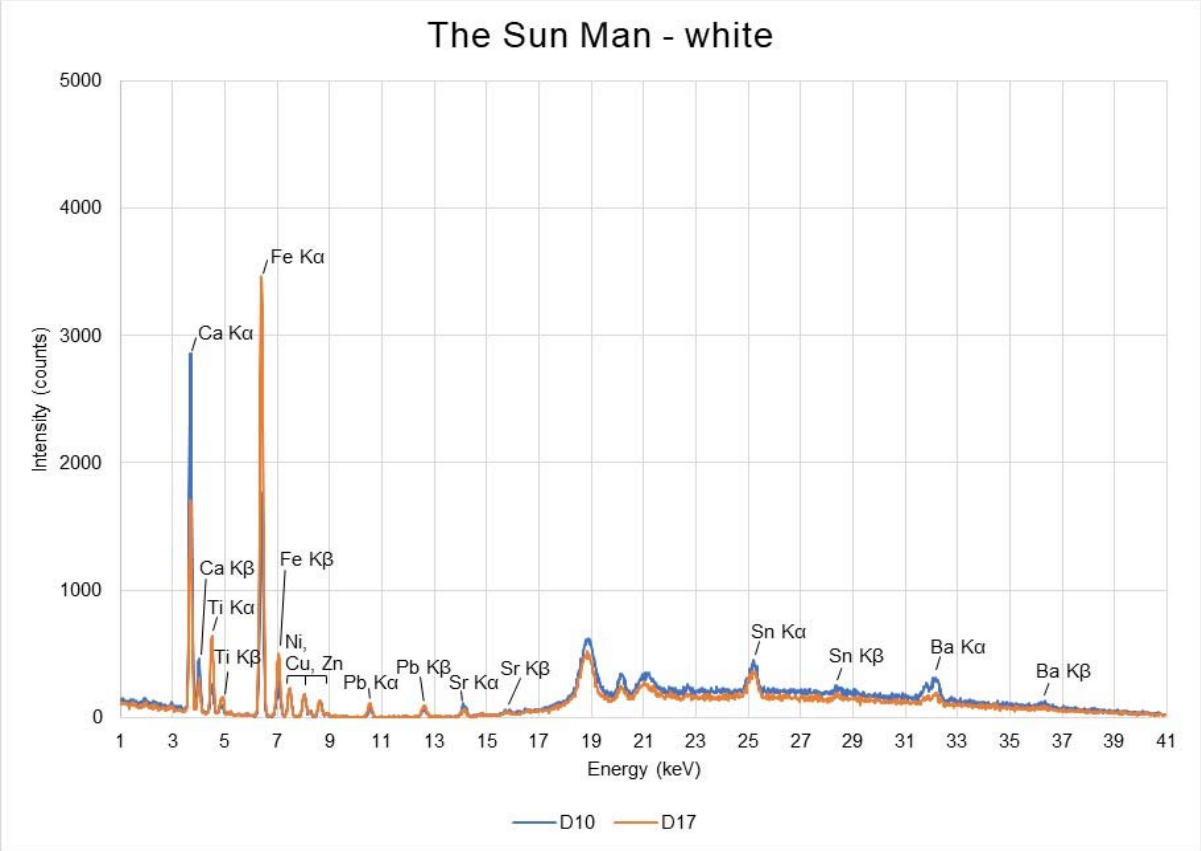

Figure 72: Elemental peaks of locations D10 and D17 on *The Sun Man* (1995).

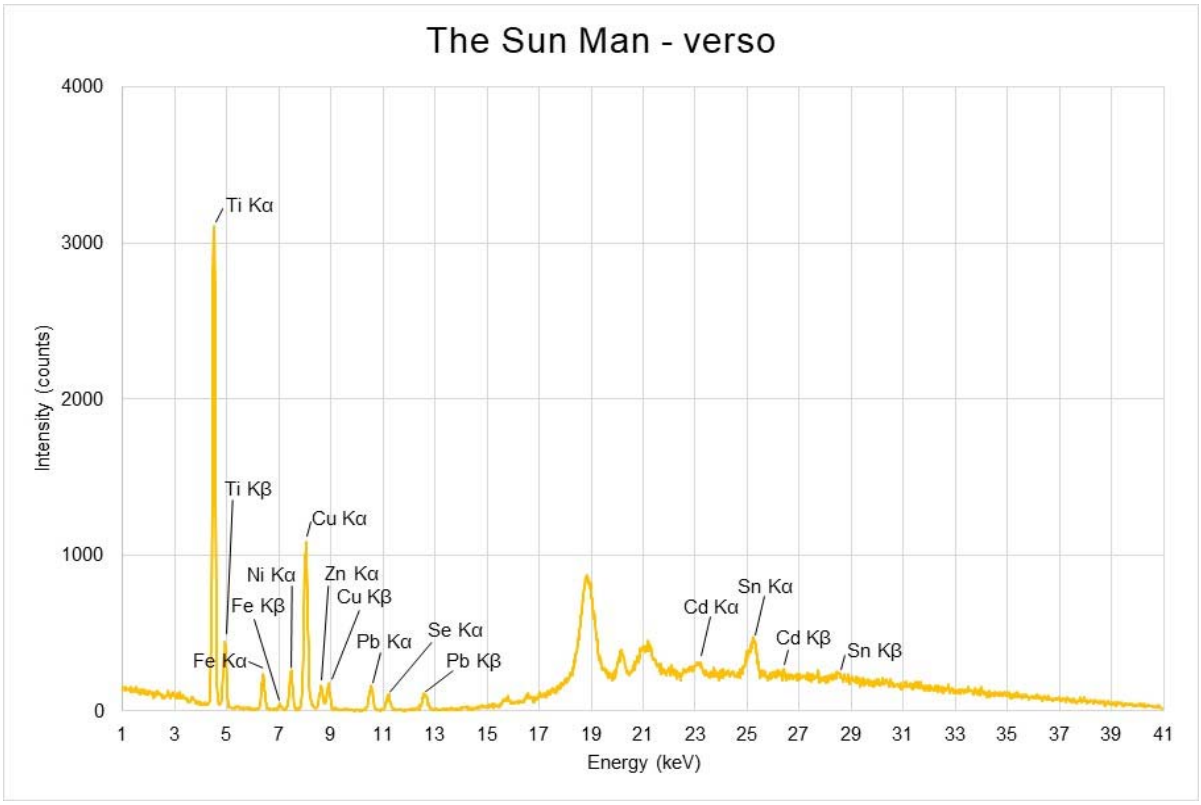

Figure 73: Elemental peaks of location D19, the verso, on *The Sun Man* (1995).

4.4.3 FTIR Spectroscopy

FTIR spectra were taken at two locations on *The Sun Man* (1995) – the first on the left leg, an orange spot, and the second on the right leg, a maroon spot. Due to the height of the artwork and a lack of secure support to raise the instrument higher, these two locations were chosen. The spectra follow the same path on the flowchart in Figure 20 as *The Doorhandle* (1987) and *A Family Group* (diptych) (1987) – a strong intensity between 1700 to 1750 cm^{-1}, absent intensities between 1590 to 1610 cm^{-1} and 1000 to 1100 cm^{-1}, and a weak intensity between 1230 to 1250 cm^{-1} (Figure 74 and Figure 75). Thus, these works were produced over an eight year period and all contain binding media identified as acrylic (Derrick, Stulik, & Landry, 2000:111).

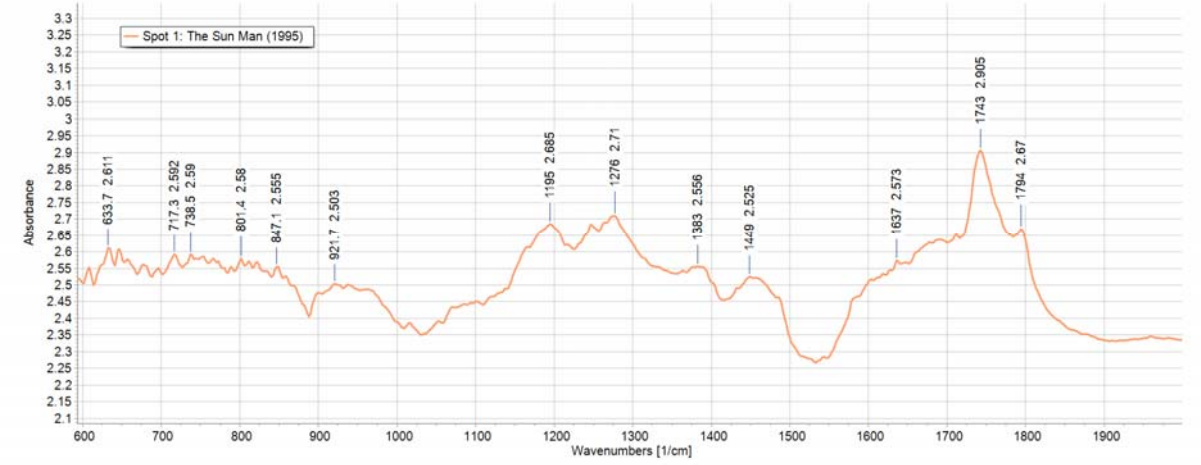

Figure 74: The FTIR spectrum of spot 1 on *The Sun Man* (1995).

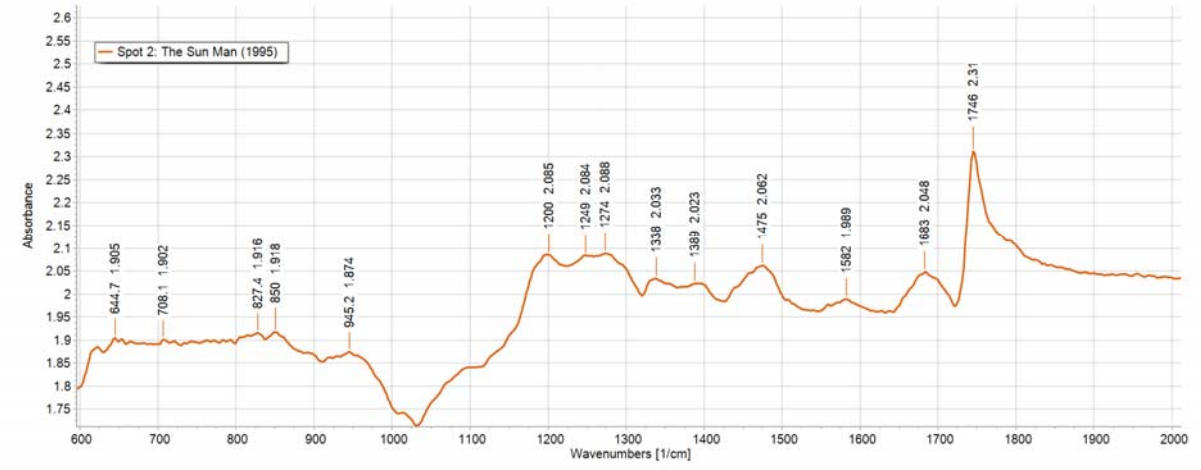

Figure 75: The FTIR spectrum of spot 2 on *The Sun Man* (1995).

4.5 Conclusion

In ideal conditions, the photographing of art objects in normal illumination require the indicated light sources at opposite sides of the camera, as well as positioning the lamps at 25° from the surface plane, as far from the subject as possible. The illumination is then also checked with an incident light meter, and it is necessary to ensure that the light sources do not hit the camera lens (Frey *et al*., 2008:113). Regarding the raking illumination photography, ideally the subject must be lit with narrow slit or beam of light and as far away from the subject as is allowed by the exposure requirements of the camera. The photographs produced by raking illumination should also not have a loss in detail further away from the light source, unfortunately not successfully achieved in this study.

Regarding the low intensity of fluorescence in the UV-induced visible fluorescence photography, several aspects can influence the intensity of fluorescence when exposed to UV radiation: “the nature and amount of the material; the extent of degradation; and the specific energy of the ultraviolet used to produce the fluorescence” (Frey *et al*., 2008:148). Obstacles faced were that the photography studio could not be completely darkened, that there is only access to one UV radiation lamp that is not of adequate size, and the necessary reference standards could not be included in the images.

The reflected IR photography did not reveal significant results. Of interests is that the artworks do not have evidence of underdrawings and guidelines – which were either never a part of Sibiya’s technique or was completely removed during the carving and incising of the artworks. For future reflected IR photography, the photography studio would need to be adjusted to darken completely, and the post-processing software needs to be acquired. The three filters are adequate, but it is sometimes necessary to be able to go beyond the 1000nm wavelength. Alternatively, the other end of the radiation spectrum could be used, X-rays, if even deeper paint film penetration is required.

When following the flowchart for the characterisation of several classes of synthetic polymers by M. Derrick, D. Stulik and J. Landry (2000:111), it is evident, based on the

intensities' strength, absence or weaknesses, that *The Doorhandle* (1987), *A Family Group* (diptych) (1987) and *The Sun Man* (1995) that the paint contains acrylic mediums or vehicles suspending the pigments identified with XRF Spectroscopy.

On a final note, regarding the analysis of all three artworks with XRF Spectroscopy, of significance is the observation of titanium, barium, chalk, and gypsum at multiple locations. The data also showed traces of aluminium dioxide (Al_2O_3), silica (SiO_2) and magnesium oxide (MgO). These elements can be detected due to their presence as fillers, extenders, or thickening agents. According to Tom Learner ([sa]:10), common extenders in modern paints are barium sulphate (which presents with trace elements of strontium – also in most of the locations), calcium carbonate (chalk), calcium sulphate (gypsum), aluminium dioxide and silica. Silica (SiO_2) is associated with small quantities of titanium dioxide (TiO_2), calcium oxide (CaO) and magnesium oxide (MgO) (Gysau 2017:27).

An alternative explanation for the presence of calcium, aluminium dioxide (Al_2O_3), silica (SiO_2), magnesium oxide (MgO) and even iron (Fe) is found in the process of Cecil Skotnes' (1926 – 2009) artistic technique. In a personal communication with Pippa Skotnes (b. 1957) on 9 October 2020, she confirmed that her father, Sibiya's mentor and teacher, used acrylic paints mixed with raw pigment and marble dust to enhance his panel paintings' appearance. Thus, if Sibiya followed Skotnes' example, marble dust consists of calcium oxide, aluminium dioxide, silica, magnesium oxide and ferric oxide (Singh & Madan [sa]:[sp]).

With regard to the detection of nickel, copper and zinc at all locations for *A Family Group* (diptych) (1987) and *The Sun Man* (1995), it was found that a wood preservative named copper 8-quiolinolate has been in use since 1969. If it is an option for the explanation of the presence of copper and nickel, it is because the preservative is manufactured by the condensation of copper 8-quinolinolate and nickel 2-ethyl hexoate (Hafizoğlu [sa]:[sp]). Other waterborne wood preservatives account for the presence of zinc, such as "zinc chloride, zinc metaarsenite (ZMA), copperised chromated zinc chloride (CuCZC), chromated zinc arsenate (CZA), and copperised chromated zinc arsenate (CuCZA)" (Hafizoğlu [sa]:[sp]). Also used for the preservation of wood is copper compounds, such as copper (II) sulfate and other copper salts;

organocopper compounds; and zinc (II) chloride and other zinc salts (Unger, Schniewind & Unger 2001:169,173,233).

CHAPTER FIVE
CONCLUSION

5.1 Summary of chapters

The dissertation set out to answer two main question: Who was Lucky Sibiya, and what were the materials and techniques used and followed by Sibiya when he created his carved and painted wood panel artworks? The reasons for choosing Sibiya for the investigation is because he has been neglected as an artist – even though he is represented in multiple public and private collections. Furthermore, his artworks are reaching an age where conservation and restoration might be required, and this necessitates an understanding of the materials he used.[42] Chapter One established that literature on the examination and documentation of artworks, Technical Photography, XRF Spectroscopy and FTIR Spectroscopy is wide-spread, and has been applied to multiple examples. However, literature on these techniques applied to South African polychrome artworks is absent because these techniques has almost never been used on South African artists. Chapter One also found that literature on the biography of Lucky Sibiya was inadequate and was limited to bits and pieces found in various archives.

Chapter Two employed the limited information found in South African artists' books and archival materials to stitch together a biography of Sibiya. The available materials were not enough to compile a complete picture – there are a few gaps that could not be filled – but it is the most comprehensive thus far. The chapter also used the available material to create a list of known exhibitions, commissions, and represented collections.

Chapter Three focused on the visual examination and documentation of the selected three artworks in the University's Art Collection. The examination and documentation were completed first without the aid of special equipment, looking at the artworks in as much detail as can be achieved with the naked eye. Afterwards, the Munsell Colour System aided the identification of specific hues, values and chromas in each artwork

[42] Sound preventative conservation and restoration is based on a thorough understanding of the materiality of an artist's artwork.

– some of the identified 'colours' overlap on the three artworks. Chisel markings of 4mm and 2mm also accord on *A Family Group* (diptych) (1987) and *The Sun Man* (1995). Furthermore, the chapter relied on magnification and use of a USB microscopy to look closer and determine special characteristics about the materiality and techniques of Sibiya.

Chapter Four explored the artworks beyond the visible surface to determine what were the pigments and medium used by Sibiya, and to further clarify his artistic technique. First, Technical Photography revealed that the three artworks have significant amounts of organic material, such as dust and fibres, on their surfaces. The reflected IR photography showed no underdrawings or guidelines, but the cadmium red signature on *The Sun Man* (1995) has a white fluorescence with the 850nm and 1000nm wavelength filters, and *The Doorhandle* (1987) signature disappears with all three IR filters. XRF Spectroscopy aided the identification of possible pigments inferred, and the FTIR Spectroscopy, facilitated by the flowchart for the characterisation of several classes of synthetic polymers by M. Derrick, D. Stulik and J. Landry (2000:111), identified Sibiya's medium as acrylic for the three selected artworks.

5.2 Contribution of study

The dissertation contributed to a more complete biography of Sibiya. The published biographies and lists of exhibitions and commissions were incomplete, all identifying some information but did not represent a more complete 'picture'. The study also established the identification and understanding of Sibiya's materiality and artistic techniques – both from historical research and analytical analysis. The study ascertained a process that can be duplicated in the research of other Sibiya artworks. This information aids the correct preventative, and perhaps remedial, conservation of the three artworks in the University of Pretoria's Art Collection, and also artworks in other private and corporate art collections. With the attention afforded to Sibiya and his artworks through the initiation of a deeper understanding of his materiality and techniques, he will receive more attention as one of South Africa's talented and valued artists. The knowledge of Sibiya's materiality and technique is also valuable in identifying original and spurious artworks signed as 'Sibiya'.

5.3 Limitations of study

To build a comprehensive database of Lucky Sibyia's materials it would have been necessary to analyse many more artworks to ensure the sample is representative of all his works, but due to the COVID-19 pandemic access to additional works were limited and the scope of the project was adapted to use three artworks in the University of Pretoria's collection to establish the analytical methodology which provides the most relevant information.

The study presented limitations in two areas: the photography studio and equipment; and the access to an FTIR Spectrometer in reflectance mode and spectral libraries. The MSocSci Tangible Heritage Conservation programme has started establishing a Technical Photography studio, but due to the programme being in its inaugural stage, the available equipment and lack of post-processing software are not sufficient to be able to conduct Technical Photography of a professional standard. The second limitation, access to an FTIR Spectrometer in reflectance mode, was resolved by the generous assistance of Bruker South Africa. The instrument, the Alpha II-R (A241/DV) was graciously lent to the programme for the completion of the research. Regarding the comparison of the spectra to libraries of known samples, the identification of the binding medium was achieved by following the flowchart in Figure 20. The FTIR Spectroscopy also does not allow for the identification of all components of a binding medium.

5.4 Suggestions for further research

Due to the fluorescence of the exposed wood observed with the UVA lamp, both in visual examination and UV-induced visible fluorescence photography, a study on the type of wood of each artwork will contribute to the sound conservation of the three artworks. For specific determination of pigment, binding medium, fillers and extenders, more invasive techniques could be employed – such as X-ray diffraction (XRD) or Raman spectroscopy. As these techniques require micro-sampling of the artworks, the benefit would have to be motivated. It is important to continue the methodology developed in this dissertation and execute XRF Spectroscopy and FTIR Spectroscopy on other artworks of Sibiya with unrefuted provenance to establish an extensive database of the artist's oeuvre.

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APPENDICES

Appendix A: Letter of permission from GC de Kamper

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

University of Pretoria Museums

31 March 2020

TO WHOM IT MAY CONCERN

I hereby grant permission for Mrs Salomé le Roux (10618156) to conduct research on the three Lucky Sibiya carved and painted artworks in the University of Pretoria's Art Collection. I also give Mrs le Roux permission to photograph these artworks and include them in her study.

I understand that the final research document will be submitted as a M(Soc)Sci Tangible Heritage Conservation dissertation, and that the findings of this study, or parts thereof, may also be submitted for publication in an academic journal.

Sincerely

Mr Gerard de Kamper

[Curator UP Museum Collections]

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Appendix B: Object condition assessment framework

STABILITY	**Stable**	**Potentially unstable**	**Unstable/ Steady deterioration**	**Highly unstable**
Definition	Condition not expected to deteriorate within the next 10 + years	Condition not expected to deteriorate within the next 5 - 10 years	Change in condition likely to be evident between 1 - 5 years	Change in condition likely to be evident within 1 year
CONDITION CODE	**Excellent**	**Good**	**Fair**	**Poor**
Definition	Little or no damage evident	Minor amount of damage and/or loss of original and added material, or with light discolouration or accretions	Noticeable damage and loss; and appears disfigured with visible accretions	Considerable and/or significant loss of original or added material or major damage/ breakage or disfigurement. May endanger other objects and surfaces
TREATMENT PRIORITY	**No treatment**	**Desirable**	**Necessary**	**Urgent**
Definition	Conservation treatment not required beyond routine maintenance	Conservation treatment desirable but not necessary to ensure long-term stability	Conservation treatment necessary to avoid further deterioration, loss or undesirable strain, and/or loss of significance/ value	Conservation treatment required to prevent significant deterioration in condition and/or loss of significance/ value