The Choirproject

Considerations for the storage of a composite contemporary artwork

Lee Andersson

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Title: The Choirproject: Considerations for the storage of a composite contemporary artwork: Tilda Lovell's The Choirproject

ABSTRACT

This thesis investigates alternatives for storing of the contemporary artwork Tilda Lovell's artwork The Choirproject by artist Tilda Lovell. The piece consists of a video and nine sculptures in composite materials, predominantly bones but also notably a rubber balloon and wax. Through a combination of literature review, documentation, analysis and artist interview the artwork was examined in order to determine suitable storage alternatives for the sculptures and the rubber balloon. The thesis has gathered information on the materials present in the artwork such as deterioration and suitable climate conditions, as well as information on anoxic and low temperature storage and adsorbers. Examination and documentation of the sculptures lead to condition reports on each figure and the discovery of corroding metal in some of the sculptures. The artist interview gave insight to the values of the artwork as well as the artist view on deterioration and conservation. Analysis using FTIR was carried out on the balloon to identify whether it was natural or synthetic rubber. Though the results were inconclusive the balloon is believed to be synthetic. Following the discussion with the artist it is interpreted that the bones in the artwork are the most significant and therefore the focus when discussing climate conditions for storage. After a comparison with cold storage, anoxic conditions were determined to be the most suitable alternative for inhibiting deterioration of the rubber balloon. It was also concluded that artist interview is an invaluable tool to a conservator and that collaboration between conservator and artist two is a must.

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Preface

For their assistance in making this thesis possible I would first and foremost like to thank my supervisor Stavroula Golfomitsou for great help and moral support. Thank you to Malin Borin for suggesting this wonderful artwork to devote my thesis to and for providing all the information that the museum had. A warm thank you to Tilda Lovell for giving her time to answer my questions and last but not least, I would like to thank Elyse Canosa for helping with analysis.

CONTENTS

1. INTRODUCTION

1.1. Background

The Choirproject (*Körprojektet* in Swedish), made by Tilda Lovell, is owned by the Gothenburg Museum of Art. The piece, which was created in 2005, is an animation depicting a gathering of figures that sings about their creation and their lives. Together with the video the museum owns the nine sculptures which the artists call props. The figures are made of various materials such as wax, textile, paper clay, steel wire, plastics and rubber, but primarily bone. The piece was bought by the Gothenburg museum of Art in 2005 from Galleri Bohman. The piece has been exhibited in the museum twice between 23/1-5/3 2008 and 2 /4–23 /10 2011 but is currently placed in a storage facility.

1.2. Problem formulation

Conservation of contemporary art has been its own expert field for a few decades, yet there are no clear guidelines and the field is still in need of further development. The approach differs from that of traditional conservation, stretching and challenging practices. Artists are using a variety of materials, many of which are materials which are never meant to last with short life expectancy, or deterioration being a part of the artworks meaning or context. The traditional ethics must therefore be reconsidered and weighed against the wishes and intent of the artist. Though, this needs to be done on a case-by-case basis. *The Choirproject* is made of a multitude of different materials which deteriorate at different rates, amongst them are plastics and rubber which deteriorates rapidly and bones which are affected by pests. For example, the rubber balloon from the artwork reached a state of deterioration where it could no longer be used. In 2015 it was replaced with a new rubber balloon that is now showing signs of deterioration. The balloon is currently stored in low temperatures but there is a need of exploring other options. Besides the balloon, the artwork is stored in archival grade cardboard boxes in one of the storages located in the museum building. The two largest figures have separate boxes while the others are stored in groups in two other boxes. The thesis explores the need of the different materials present in the artwork and ways of inhibiting their deterioration through preventive actions.

1.3. Research questions

- What is the most appropriate way to store the rubber balloon to mitigate deterioration?

- How can the figures be stored to best fulfil the materials needs for suitable climate conditions and mitigate deterioration while still preserving the meaning of the artwork?

- What is the artist's view on deterioration, longevity and materiality of the artwork and how can the view be applied to preventive actions?

1.4. Purpose and aim

The purpose of this thesis is to document the artwork to create a plan for its safe storage. Several methods will be used including literature review of theory of contemporary art, review of scientific papers on the deterioration and needs of the materials the artwork is made of and interviewing the artist to record her wishes and beliefs on deterioration and conservation. These will help to understand the needs of the tangible as well as intangible aspects of the artwork and with that discuss preservation and conservation alternatives that does not cause conflict between the artist's intent and conservation ethics.

The aim is to assist the Gothenburg museum of Art in the decision-making when creating a conservation plan for *The Choirproject* by using the thesis as a reference to the condition of the artwork and the artist intentions. The aim is also to contribute with knowledge of conservation of contemporary art.

1.5. Limitations

This thesis concerns the storage of the artwork, thus excluding any remedial conservation. The focus lays on preventive measures for storing the artwork, however, no preventive conservation will be performed, and no boxes will be made as the thesis is based on documentation and condition assessment of the materials. Analysis of the materials is limited to identifying the nature of the rubber balloon. Lastly, no preservation of the video will be discussed due to the subject being of a specialization which is not within the realm of this thesis.

1.6. Methodology

The methodology of the thesis is a combination of artist interview, literature review, documentation and examination of *The Choirproject*.

2. THEORY

In the strive to make what is considered to be the right decision we develop theories to understand cultural heritage and to use it as a guiding star. Though, no lone theory can be correct as every theory is a reflection of the particular time and place in which it was developed. This chapter hopes to give insight into recent developments in the conservation theory and the continuous need to challenge it.

2.1. Conservation theory

Alois Riegl, a key author in early conservation theory, argued in his book *Modern Cult of Monuments: Its Essence and Its Development* that we as viewers assign monuments their values and significance rather than the objects inherently possessing them. Depending on if it is a deliberate or unintentional monument, we are given the value by the maker or define it ourselves (Riegl 1996, p.72). Riegl also identified the following values in monuments; age value, historical value, deliberate commemorative value, use value and newness value (Riegl 1996, pp.72-80). Age value is found in deterioration, the imperfections and visual sign of the passage of time in stark contrast to modern creations. Any attempt to preserve a monument is a violation of its natural aging and thus diminishes the age value (Riegl 1996, pp.73-74).

Opposite to age value, historical value originates in a monument's features as far as possible remaining original which require human interference. (Riegl 1996, p.75).

In 1963 Cesare Brandi published his book *Teoria del Restauro* or *Theory of Restoration*. In the book, Brandi discusses the creation of art, the role of the artist and conservation. He emphasises the difference between works of art such as paintings and common products which, despite being aesthetically creative, are still made to fulfil a practical function (Jokilehto, 2017, pp.279-280). Based on that division he describes conservation as the methodological moment of appreciation and recognition of a work of art, separate from objects of common use (Jokilehto, 2017, p.281). As Theory of Restoration was written in Italian and was first translated to English in the 90's, their theory hasn't been that implemented, and though the text has been cited by many over the years, the true philosophy behind the word is lost outside of Italy (Jokilehto, 2017, p.277). The theory has not been without criticism for its focus on aesthetic value over the object as a whole which has also made it difficult to apply to objects which are not necessarily aesthetically significant (Jokilehto, 2017, p.285).

During the 20th century charters, guidelines and documents were created that became central to conservation theory. The Venice Charter was drawn up in 1964 during the IInd International Congress of Architects and Technicians of Historic Monuments to give an international framework for the conservation and restoration of historic buildings. It was adopted a year later in 1965 by the International Council on Monuments and Sites (ICOMOS). In the charter it is stated that monuments are to be viewed and preserved no less as works of art than as historical evidence" (ICOMOS 1964:3). In order to ensure that conservation in no way risk the harm of a monument or the loss of its values, the treatments must be performed on a base of knowledge, the original material must be respected, and any new material must be distinguishable from the original (ICOMOS 1964:9). Every previous intervention is a part of the building's life and as such must be respected, the removal of previous interventions is not for a single individual to decide. (ICOMOS 1964:11). Furthermore, the techniques used must be known to be good through scientific data and experience. (ICOMOS 1964:10) and every step of the conservation should be accurately recorded (ICOMOS 1964:16).

Later in 1994, The Nara document on Authenticity was written in the spirit of the Venice Charter. The document was written in the context of rising nationalism and emphasises that authenticity cannot be a fixed criterion as its interpretation is not universal between different cultures or even within any separate culture (ICOMOS 1994: 11). Conservation, according to the document is based on an understanding of authenticity (ICOMOS 1994: 10), though it may be a complex task to decipher where the authenticity lay in an object as it is connected to a number of different values depending on the object's nature, history and cultural context (ICOMOS 1994:13).

Within the theory of conservation there are terms that have had a major impact on the way conservators approach or are expected to approach objects. The term minimal intervention is the principle of keeping conservation treatments to a minimal (Muñoz-Viñas, 2005, p.188). It gained common popularity in the second half of the 20th century and grew to become a major principle within the field (Muñoz-Viñas, 2009, pp.48-49). Despite being an integrated part of conservation theory, the term is faulty as it is an oxymoron. It is always possible to envision a more minimal approach to conserving an object, meaning that a minimal intervention is never actually achieved (Muñoz-Viñas, 2009, p.49).

When conserving an object, some of its meanings and values will inevitably be altered or erased. The aim should therefore be to preserve the object's preferred meanings while compromising as little as possible its ability to convey any other meanings. Words such as minimal and intervention simply do not convey this and therefore it has been suggested to replace the term with balanced meaning-loss (Muñoz-Viñas, 2009, pp.55-56).

The commonly used term reversibility simplified refers to the ethical principle to only use materials and techniques in conservation interventions that doesn't prevent the object from being brought back to the state it was in before the intervention (Muñoz-Viñas, 2005, p.185). As with minimal intervention the term reversibility was questioned. It was realized that the implication of anything ever being fully reversible was a myth which has generated the terms removability and retreatability. Removability, or the ability to remove a material used in conservation treatments, can be discussed instead of the illusion of reversibility. The term is more grounded as it recognizes that a materials possible effect on an object may not disappear with removal. Retreatability is simply the aim for treatments to not be obstacles for future treatments (Muñoz-Viñas, 2005, p.187). Though the terms are losing ground, they are still integrated in the theory and applied to conservation practice. Yet for the conservation of contemporary art these terms along with the traditional concept of ethics and authenticity are not only difficult to apply but it may lead to the compromise of an object's meaning and integrity.

2.2. Conservation theory of contemporary art

In the last two decades conservation of contemporary art has grown to become an independent specialization. It is established that conserving contemporary art using existing standards and guidelines were not always applicable. Conservators along with art historians, curators, philosophers and scientific researchers began researching ethics and practise of conserving contemporary art which led to focus groups such as INCCA and ICOM-CC/MMCA (Beerkens, 2016, p.12). Through the research project *Modern art: Who cares?* an open decision-making model was developed to assist conservators with the task of weighing aesthetical results against ethical restrictions and also include aspects such historicity, functionality and limitations in time, finances and resources (Beerkens, 2016, p.13).

The main focus in the established theoretical framework is on materiality. The need to respect and to preserve an object's original material has been brought up by authors such as Clavir, Villers and Muñoz-Viñas, (Van de Vall, 2015a, p.84). Though philosopher Renée van de Vall (2015) suggests that there are two other frameworks, or paradigms, where the focus does not lay on materiality. The performance paradigm emphasises that the core of the work is the concept which should be performed based on instructions from the artist and thus preserving the features that define the work's identity. The other paradigm is the 'processual paradigm' in which the process is assumed to be the core of the work and the aim of conservation is to preserve the ability to perform the artwork (Van de Vall, 2015a, p.84).

The current material focused paradigm also determines the concept of authenticity. Brushstrokes and other traces of the artist's hand were previously considered signs of authenticity, in contemporary art though, the hand of the artist may not always be visible. The artwork might even be created by an artist assistant. This has been solved by contemporary artists through certificates and editions as signs of authenticity (Laurenson, 2006, pp.3-4).

The philosopher Nelson Goodman (1906-1998) described art as either autographic and forgeable or allographic and non-forgeable, though he did not have conservation in mind; his

categorizing of art has been used to discuss the authenticity of reinstalling installation art. Autographic art are objects like paintings and sculptures, they are made in one step, meaning that once the artist has created them, the process is over. Autographic artworks are thus forged when remade by someone other than the artist. Allographic art are things like musical or theatrical works that are performed based on music scores or scripts. Creating the art in this case is merely the first stage in a two-stage process, next the art needs to be performed to be completed. If the score or script is followed, then the art is authentic and original no matter when or where it is performed and as such is not a forgery. Performance art and installation art can be compared to a music score, the museum employees follow instructions from the artist to reinstall an installation which is then experienced by the visitors. The employees taking the place of the artist is not forgery as they are merely finishing the second stage of the process. Reinstallation is thus no more a creating process than the performance of a play or the hanging of a painting, meaning that the artwork is indeed authentic. It is thus proposed that authenticity is not bound to an installations' material but to its defining properties, the artist instructions and documentation of the work. The concept of authenticity depends on the framework, if the focus of the framework lays on materiality, then so does the notion of authenticity. If the framework were to shift its focus from the material, then the concepts of authenticity, change and loss is likely to change along with it (Laurenson, 2006, pp.4-5). This concept has gained traction within the conservation of contemporary art since it was first introduced in the beginning of the 21st century (van de Vall, 2015b, p.290).

The focus on reversibility and not intervening more than necessary with original material (minimal intervention) do not leave room for the complexity of contemporary artworks (van de Vall, 2015b, p.287). Contemporary artists do not restrict themselves to traditional material, nor is every material in a work of art necessarily meant to be permanent. Some materials may be of temporary function and later discarded and replaced, at other times the deterioration of the material may be a key aspect of the artwork. The task of preserving artworks of ephemeral nature or made of materials with poor quality pushes conservators to reconstruct deteriorated pieces as a last resource to preserve the work. Naturally it is more difficult, practically and ethically, to reconstruct a piece or object from an artwork that was made by the artist or otherwise handmade compared to anything bought, scavenged or made by an assistant or industry (Beerkens, 2016, p.15). The preservation of an artwork can attempt to align with the concept of the work though. If a bottle in a readymade artwork becomes deteriorated it could be substituted rather than conserved. One might go so far as to suggest that if the bottle was found by the artist in a dumpster, then so should the substitute bottle (van de Vall, 2015b, p.287).

As art has become more ephemeral and concept-based the documentation of artworks is becoming increasingly more central to the conservation field. (Gordon, 2013, p.8). Gathering documentation from the creation and acquisition of an artwork such as text, images and instructions from the artist is an invaluable asset for future re-installations is a better source of information than the works physical material (Wharton & Molotch, 2009, p.216). To document an artwork, it requires an understanding not just of the materials used but also why they were chosen. Was it due to qualities, values, price or symbolic meaning, did they convey the concept of the artwork? (Gordon, 2013, p.8). Artists attribute individual qualities to materials, techniques and media, often those which would not necessarily be considered by others to have value. When a contemporary artwork is acquired by a museum the meaning behind the artwork is not always known to the institution, it then becomes the conservators' task to decipher which parts are more meaningful in order to plan for its stewardship (Hummelen & Scholte, 2004, p.208). Material can be described as either 'structure' or 'signifier' to determine its importance to the artwork. Ascribing a material as signifier is to

say that there is more to it being chosen than simply as structure. The metaphorical significance of the material relates directly to what the artist intends to communicate through the artwork. Ascribing a material as structure means that there is no significant value or meaning in the material itself, it is merely a carrier of the artwork's meaning, like the paper that a letter is written on (Gordon, 2013, p.2). Though the terms may help to plan for an artwork's future treatments and longevity they must be used with caution on a case-by-case basis. Not only does binary language simplify and generalize complex artworks (Gordon, 2013, p.3) but there is also the possibility that as time passes the material gains new unexpected meanings and values in the eyes of the artist (Gordon, 2013, p.8).

Interviews with artists are used as a tool to gather necessary information directly from the artist. By approaching an artist to discuss meaning, deterioration and conservation the qualities of an artwork can come into light, (Hummelen & Scholte, 2004, p.208) as well as the artist's intention.

The term artist intention is common in contemporary art when the artist is alive, or when the intention of a deceased artist is known. When using the term, much focus of the goal of conservation is aimed at preserving the artwork as the artist originally intended it to be seen. Concerns have been raised for the risk of the intention overshadowing other values in an artwork or risk of them being lost (Rivenc et al. 2017, p.2). It could also be argued that an artist's intentions does not reflect the finished product due to changes or inability to achieve the intentions (Wharton, 2015, p.1). Despite being a debated the term remains in the practice and is sometimes seen as an authoritative aspect within interpretation and decision-making and is used to some extent as a guide to take correct actions when conserving works by the artist (Van Saaze, 2013, pp. 52-54).

Lastly it must be noted that contemporary art goes beyond that of installation and performance, there are also works which are either partially or entirely audio and or visual media (e.g. digital art). Though there are a number of terms and subcategories for works of that nature, the term time-based will be used in this thesis due to it simply implying that the electronic components will inevitably become outdated. The preservation of the time-based heritage is a multi-disciplinary technological activity that requires collaboration with specialists (García & Vilar, 2007, p.10) and deep theoretical reflection (García & Vilar, 2007, p.6). While traditional art is bound to its material time-based works can be separated from the media they were made in or the electronics which they were originally displayed through (Laurenson, 2011, p.35).

3. PREVIOUS RESEARCH

3.1. Research on conservation of contemporary art

The conservation of contemporary art has been researched for decades, one significant research project that has helped raise awareness and developed the field began in 1993 by a committee of conservators and curators from six museums of modern and contemporary art in the Netherlands. They set up the *Conservation of Modern Art* project with the aim of finding a conservation approach that took into consideration the complexity of contemporary art. Ten artworks were studied which were divided into groups: plastics, monochromes, kinetic art and mixed media. The research was divided into a theoretical group and a practical group, both with a working group composed of conservators, curators, conservation scientists and other experts (Sillé, 2005, pp.14-15). The project gave rise to an understanding of the problems that the conservation of contemporary art poses which sparked national and international

communication between museums. Through media coverage the public's perception of contemporary art was also shifted and a general understanding of its need for conservation grew (Sillé, 2005, p.17).

It was concluded, amongst other things, that documentation of the material and techniques used by artists as well as their implications should be an integral part of preservation and that interviewing artists is key to gaining that knowledge (Sillé, 2005, p.18). As an outcome of the project, they also developed a decision-making model (Sillé, 2005, p.17). Through the efforts of the research project the international symposium *Modern art: Who cares?* was organised in Amsterdam 1997. The book *Modern art: Who cares? An interdisciplinary research project and an international symposium on the conservation of modern and contemporary art* contains contributions from the symposium (Hummelen & Sillé, 2005, p.10).

3.2. Research on artist interview

Interviewing an artist has become a common tool for the conservation of contemporary art over the last 20 years (Rivenc et al. 2017, p.2). The method of collecting information directly from the artists themselves have evolved from questionnaires to one-on-one dialogues that allows for the artists to explore and share their personal interest in safeguarding the authenticity of their creation (Chiantore & Rava, 2012, p.189). There have been several ground-breaking research projects examining the practise of artist participation. The project *Modern Art: Who cares?*, mentioned above, examined the collaboration between artist and conservator when preserving contemporary art (Wielocha, 2017 p.31), and the video series *The artist dialogues*, conducted interviews focusing of artist's aesthetic aims, their materials, creating processes and method as well as their thoughts on longevity, aging and conservation (Rivenc et al. 2017, p.3).

The objective of interviewing artists is to get insight into their views of the conservation and longevity of their art but also the meanings and values that they hold and the process behind their making. By elucidating the artist view on the future of their creation it prevents misinterpretation and alteration to the meanings and values (Wielocha, 2017, p.39). It allows for the artist to participate and contemplate conservation as well as, if they so wish, their own part in it (Stigter, 2012, p.75). For some institutions such as the time-based media departments of Tate and Guggenheim it is standard practice to interview the artist as soon as possible after an acquisition. Perhaps it is more common in the case of art that is based on technology as the time for consultation feels urgent due to the short lifespan of electronics. Though it can be argued that this should be custom for all contemporary art as many other materials which are used by artists are rapidly deteriorating (Wielocha, 2017, p.40). When consulting artists the term "artist intention" is often central. The term is ambiguous but is used to refer to the meanings and ideas of an artwork and the creative process behind it as well as the artists wishes for the conservation and longevity of their work. Concerns have been raised for the risk of the intention overshadowing other values in an artwork or risk of them being lost (Rivenc et al. 2017, p.2). It could also be argued that an artist's intentions do not reflect the finished product due to changes or inability to achieve the intentions (Wharton, 2015, p. 1).

3.3. Research on plastics

Yvonne Shashoua is a key author within the field of plastics conservation. She has written a number of papers and books both independently and co-authored and have been cited in many papers involving plastics, rubber, cold storage and anoxic storage. Several literatures by

Shashoua have been of great value to this thesis, such as her research on adsorbers and oxygen-free storage on plastics. Though especially useful was the book *Conservation of Plastics: Materials science, degradation and preservation* which contain information on plastics and its deterioration as well as her research on cold storage. As such, Shashoua is a key author used in this thesis for the subject of plastics and rubber.

4. METHOD

The following methods were used in order to gain better understanding of *The Choirproject*.

4.1. Research on the artist

Research was done about *The Choirproject*, the artist and her body of work. This was done in preparation for the interview as well as examination and documentation of the artwork. Information was gathered by viewing recorded interviews with the artist, reading articles about her exhibitions and motivations to grants she has been given as well as visiting her own webpage where she showcases her art.

4.2. Literature review

The literature review was focused on written sources about the concepts of conservation of contemporary art, deterioration of the materials the artwork is made of and preventive conservation of plastic and the other materials. The deterioration and preventive conservation of materials present in *The Choirproject* was essential to better understand the artworks needs in terms of conservation and preservation.

4.3. Examination and documentation of the artwork

The artwork was documented photographically to get pictures of the current state of the figures. The figures were examined in order to determine their materials and construction as well as condition to understand the artworks needs when discussing possible future storage. The examination also enabled the writing of condition reports for the individual figures.

4.4. Interview with artist Tilda Lovell

The interview was held in Swedish through Zoom the 7th of May 2021. With the artist's permission the conversation was recorded and transcribed, the full transcription in Swedish can be found in Appendix 1. The questions were categorized into the artwork and its meanings, creation and materials, deterioration, conservation, and video. The purpose of the interview was to understand the meaning and values of the artwork as well as the artist's ideas and wishes for its longevity, deterioration of the materials and conservation of the piece. In the context of a museum, the interview can be utilized by several professions aside from conservators.

As a critique to the interview, it must be pointed out that it took place 16 years after the creation of the artwork. In this time Lovell might have changed opinions or have trouble recalling original thoughts, intentions or actions. If the interview had been held in 2005 or a short period after, the answers might have been different.

4.5. Informants

The information and pictures that the museum had available of the artwork as well as a list of materials provided by the artist was given by one of the conservators at the Gothenburg Museum of Arts. Through email exchange further information was provided by the same conservator about acquisition, exhibition, future plans, climate conditions in the storage area, and the storing of the rubber balloons.

4.6. Analysis

In order to determine whether the weather balloon, the most sensitive material of the artwork, is made of natural rubber or synthetic rubber analysis was performed with Fourier Transform Infrared spectroscopy (FTIR). Both the original balloon from 2005 and the replacement balloon from 2015 were examined on the inside and outside as well as on the muzzle. The outside surface and muzzle of the original balloon were also examined through microscopy.

4.6.1 Method of analysis

Fourier-transform infrared spectroscopy (FTIR) is an analytical technique based on the vibrations of the atoms which gives a spectrum of the molecular absorption or transmission of a sample as it is exposed to infrared radiation. The infrared radiation is passed through a compound and becomes partially absorbed by the molecules which vibrate at a particular frequency. Each molecular compound produces a unique spectrum that functions as a fingerprint to identity the material. The method can be used on solids, liquids and gases (Stephens & Herrmann, 2021).

4.6.2 Results

The results of the FTIR analysis were inconclusive. No definite match could be found but signs point to the balloon being made of synthetic rubber. The spectrums were compared to spectrums for rubber available at IRUG and run through FTIR search.com which suggested polyvinyl butyral or triethyl phosphate, though they were not perfect matches. Polyvinyl butyral is a resin that is mostly applied to products that require optical clarity and toughness such as laminated safety glass for car windshields (Hallensleben, 2000, p.614) and thus cannot be a match for the balloon. Triethyl phosphate is used as an industrial catalyst, polymer resin modifier and a plasticizer. On a smaller scale it is also used as a strength agent for rubber and plastic amongst other things (Wikipedia 2021a).
The FTIR spectra can be found in Appendix 3.

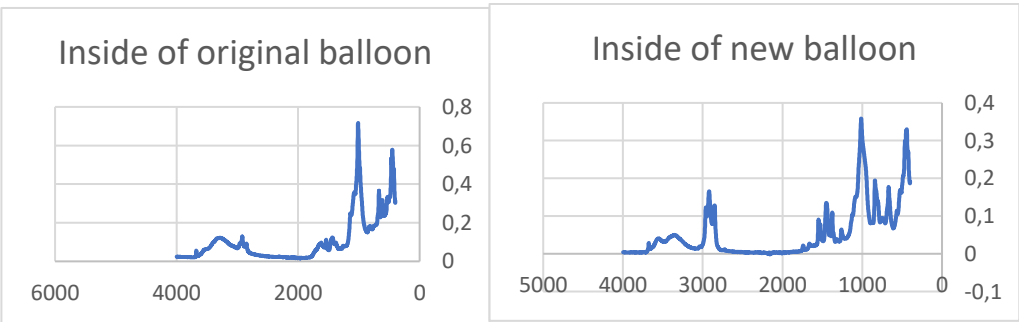

Figure 1. Spectrums from FTIR analysis of the inside of the original and new balloon.

Microscopy on the muzzle of the original balloon found it to be covered in small cracks. The surface on the dark spots however showed no signs of cracks.

Figure 2: The dark spot which was examined through microscopy is circled in black.

Figure 3: Dark patch on the original balloon seen through microscope.

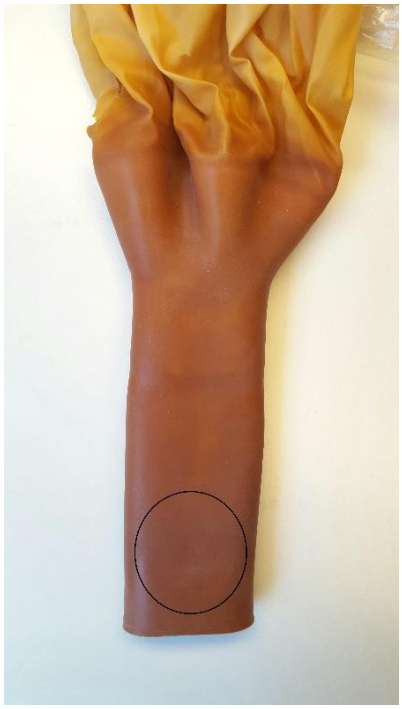

Figure 4: The part of the muzzle which was examined through microscopy is circled in black.

Figure 5: Cracks on the surface of the muzzle seen through microscope.

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5. THE CHOIRPROJECT

5.1. The artist

Tilda Lovell (1972) was born in Mölndal, Sweden and after working in Berlin for many years she is now based in Hälsingland and Stockholm, Sweden. Her artistic education started at Hovedskous in 1996 where she studied sculpting and in 2003 she received a masters in the free arts at the Royal Academy of Arts in Stockholm. She has received several scholarships and awards such as Bonnier Dahlin, Ragnar von Holten and Bernadotte Art Awards. She is represented at the Gothenburg Museum of Art, Borås Art Museum, Malmö Art Museum and Statens konstråd. She has collaborated with Lars Bohman Gallery since 2004, now known as Galerie Forsblom (Norrtälje kommun, 2017).

Lovell works with a number of materials and techniques such as sculpture, drawing, installation, animation and video. She creates worlds with intricate landscapes, often with miniature sculptures, that are inhabited by wonderous hybrid creatures, metamorphoses of nature, animal and human (Michaëlsson, 2017). A great source of inspiration is the surreal and grotesque world of Hieronymus Bosch that dives into the darkness and the human subconscious**.** Bosch entered Lovells life at a time where she had lost touch with her own visual world, maybe from the need to distance herself from death after a tragedy in her life. She felt a recognition in that people in Bosch's art weren't merely people and animals weren't merely animals but rather hybrids. She felt drawn to the surrealism and felt as if Bosch played with scales and material even though it was two-dimensional (Ljung, 2017).

Yet, maybe the most prominent inspiration, as one can tell by viewing Lovells art, is nature. Much of the material for her sculptures is gathered from visits to the forest such as bones, sculls, branches and bark. Even pellet, the undigested parts from the food of birds of prey that have been regurgitated are dissected and the small bones and hair is stored for future projects. The use of skeletal remains is multi-layered. Not only does Lovell see a beauty in the shapes of bones and a desire to make use of that which is discarded and undesired but there is also a wish to understand the previous life of the animal, how it died and how the bones ended up where she found them. Despite the use of dead materials, that doesn't necessarily entail death in the artworks. Lovell believes that everyone can relate to the bones in one way or another, regardless of whether it be the presence or absence of death (Ljung, 2017).

After years of the forest being the primary focus in her art, Lovell began exploring the sea. The unknown beneath the surface compels her ever since realizing that seashells are remnants of the living just the same as bones. In the exhibition *The Queen Conch* sound, light, animation and sculptures create a wondrous underwater scene with miniature creatures and a self-portrait covered in seashells and corals (Michaëlsson, 2017). For the creation of the sculpture *Oraklet*, which is situated in the harbour city of Gothenburg, seashells, fish, octopus, oysters, starfish and shellfish was used to construct the figure which was then cast in bronze (Olsson, 2016).

In an interview with Sveriges Radio P1 (Sweden's radio) Lovell contemplates if her art originates in alienation and seeking refuge and affinity in nature, something that the artist herself experienced growing up (Ljung, 2017).

5.2. The artwork

The Choirproject (Körprojektet) is an animation and installation of mixed media made in 2005 by Tilda Lovell and currently situated in the Gothenburg Museum of Art. The piece consists of nine figures of composite materials and a video. The main material in the figures are primarily bones from animals, other materials include rubber, plastic, textile, human hair, fake fur, feathers, paper clay, expanded polystyrene, vax and metal etc.

The figures are *Babydoll* (figure 6 character 5), made with the body of a plastic doll and a roe deer skull with brown human hair. *Bonecreeper*(figure 6 character 1), made of bone with paws of paintbrushes. *Deer dear* (figure 6 character 6), covered in brown fur with two heads of roe deer skulls and a pair of plastic eyes above the hindlegs. *Loverboy* (figure 6 character 8), made of bone and EPS with eyes from a plastic doll and a wax nose. *Mr. Sadman* (figure 6 character 7), made of bone, wearing a black tailcoat, shoes and gloves and with a tidy combed moustache and hair. *Rosa* (figure 6 character 9), a small and of wax with blonde dolls hair. *Crack* (figure 6 character 2), a bird of bones with feathers as wings and one leg wearing a white boot. *Hole* (figure 6 character 4), a second bird of bones with feathers as wings, wearing cowboy boots and glasses. And *At sea* (Till havs) (figure 6 character 3), with the head of a horse pelvis with shark jaws and a weather balloon as a cape. Condition reports on each figure with full description and pictures can be found in appendix 2.

The video is a 13 minutes long stop motion animation depicting the figures singing and dancing. It is a AVI file which is meant to be displayed on a screen with 4:3 resolution. Animation, voice, song, texts and clarinet playing is done by the artist with assistance and trumpet played by Karin Drake. The video begins with the artist in frame in front of the figures, speaking backwards, introducing the artwork and playing trumpet. The figures then take turns singing, in the artist's distorted voice, *Äppelmelodin* by Lars Olof "Lollo" Asplund and the poem *Inte ens en grå liten fågel* by Nils Ferlin. They also sing songs written by the Lovell and songs inspired by *Rock around the clock* by Max C. Freedman & James E. Myers, *Be-bop-a-lula* by Gene Vincent and the poem *Till havs* written by Jonatan Reuter and sung by opera singer Jussi Björling. The song ends, according to the description on the artist website, with a sing-along to a Finnish folksong. The video that has been viewed by the author though cuts off before the folksong (Lovell, n.d.).

Figure 6: Photograph: Marianne Gråhn/Sveriges Radio. The Choirproject exhibited at the Gothenburg Museum of art in 2011. The animation is depicted on a screen behind the figures. The characters are Bonecreeper (1), Crack (2), At sea (3), Hole (4), Babydoll (5), Dear deer (6), Mr. Sadman (7), Loverboy (8) and Rosa (9).

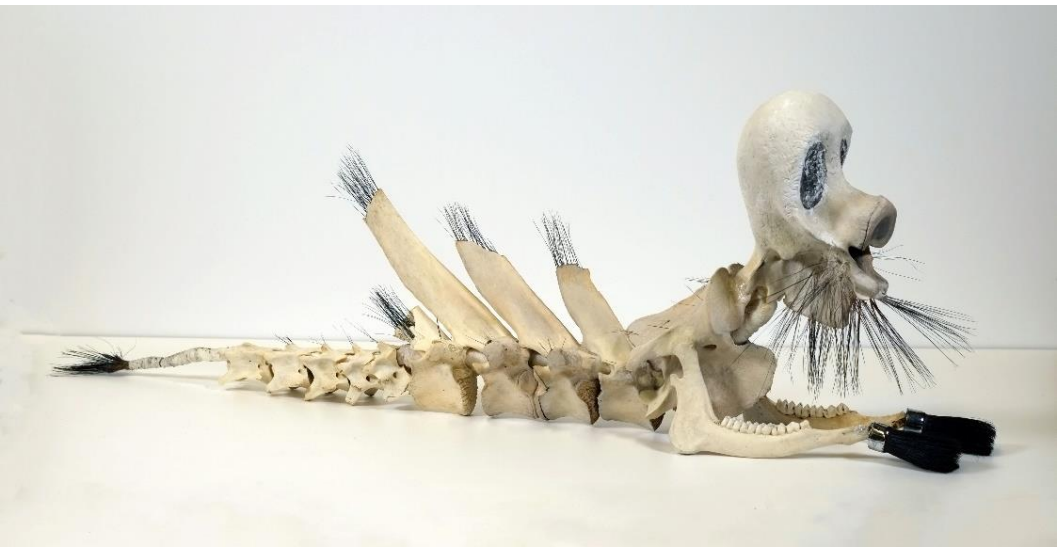

Figure 7: The character Bonecreeper (1) seen from the side.

Figure 8: Photograph: Martin Olsson. The charcters from left to right are Dear deer (6), Hole (4), Mr. Sadman (7) and Babydoll (5). Parts of Rosa (9) and Loverboy (8) can be seen.

Figure 9: Photograph: Camilla Hammarström
The figure Rosa (9) seen hanging in a exhibition.

Figure 10: The character At sea (3) with the new balloon.

5.2.1. Meanings and creative process

The artwork is described by Tilda Lovell in an interview (2021-05-07) as an animation of a group of individuals singing about their lives. The figures that Lovell calls props would not be able to be exhibited without the video as they would lose their context. When asked if there is a certain tail or feeling that Lovell hopes that The Choirproject conveys the reply was that there are rarely intentions for any messages, that the focus is rather on the creative process. Something drives the need to create. Yet there are many stories in the piece. The figures tell of what it's like to be alive, to exist, maybe even to die and about their creation as living beings. The figures were initially intended to sing together but were given individual songs as they all had something to say (ibid.).

The piece is given an existential aspect from the process of recreating a being that has previously lived and died, to take them and remake them into a new individual, a new identity, and having them tell the tale through song. Like the characters *Bonecreeper* and *Dear deer* who sings of their components. Or the character *At sea* which has jaws from a shark, giving it a connection to the sea and thus sings of seafaring. In the process Lovell would find a bone and be reminded of a person or voice. The origin of the bones determined the character of the sculpture and the songs were then created to resonate with the appearance of the figures. The artwork is a reflection, not just of the materials used, but of the process-based way in which Lovell works. The way in which the figures were created from the smallest components like the powder of plaster of Paris and combined with material loaded with existential meaning such as bone (Interview 2021-05-07).

The artist also revealed that the piece is about gender roles or representations of gender. There is a queerness to the way in which Lovell uses her own distorted voice to portray both men and women and tell their stories. Each figure has their own twist. The character *Loverboy*, a feminine man that sings of his love for the artist while batting his long eyelashes, is inspired by an acquaintance. The deepness yet softness of the man's voice fascinated Lovell and part of the process was to find a way to change her own voice into the mans. The character *Hole* sings of being unfaithful with another girl and being caught. The character Rosa is the split opened and exposed body of a woman who sings of being used for pleasure and that her head

is empty. The figure is a depressing picture of women as victims. Somewhat hesitantly or unsure the artist called it a feminist statement (Interview 2021-05-07).

5.3. Deterioration and materials

The museum needs to store this artwork and given its complexity it is essential to examine the deterioration and needs of the individual materials are presented as well as previous and current climate conditions that the artwork is stored in and the artist's view on deterioration.

5.3.1. Climate conditions

Since 2008 the artwork has been stored in a climate-controlled area with RH between 40-60% RH and around 20ºC. Prior to 2008 it was stored in a temporary storage room with no control over relative humidity and with fluctuations in the temperature between the seasons. The balloons are stored in a fridge inside plastics bags that are enclosed in a plastic box with a lid. In 2011 the piece was exhibited for a period of six months under conditions with high lux levels. Despite the windows facing north the light levels were measured to be between 300-1000 lux (Informant 1).

5.3.2. Documentation

The Gothenburg Museum of Art has sparse documentation of the artwork, presumably from when the piece was acquired in 2005. Each figure has one picture except for the characters *Crack* and *Hole* which share the same picture of them both. Further documentation was done on the deterioration of the character *At sea* (*Till havs*) from 2008, 2012 and 2015.

5.3.3. Risks

Due to the diversity of the materials, there are several different needs which cannot all be met. Some materials deteriorate faster than others which is apparent as some parts are showing signs of deterioration, or in the case of the weather balloon it is too damaged to be used. The primary risk is the continued rapid deterioration of the rubbers and plastics. As plastics deteriorate, depending on the type, they can produce gaseous products that harms other organic materials and corrode metals. The video is in risk of being unable to be displayed due to the format becoming outdated as technology progresses. And as with any organic materials, there is also a risk of pest feeding on or otherwise harming the artwork.

To protect the artwork from attacks from pests some steps of IPM can be taken.

Step 1: Routine inspect of the storage area for pests or signs of them such as droppings or skin (Deacy-Quinn, n.d, p.4). Textiles, paper, wood, leather and other organic materials are sources of food and therefore highly vulnerable. Annual inspection may be sufficient in a well-organized, clutter-free, and dry storage (Deacy-Quinn, n.d, p.4). However, if there is an active insect problem it would be advised to inspect at more often. Areas with food can be inspected weekly and once a year the whole building would benefit from being inspected from top to bottom (Deacy-Quinn, n.d, p.5).

Step 2: Monitoring the insect population with traps and pheromone lures. Keeping detailed records of the type, number and location of caught insects helps track the population over time. In addition, floor diagrams should be kept with the locations of each trap. Traps can be checked at least once a month for insects. Traps for mice and rats however should only be

used if it is known to be a rodent problem and these should then be checked daily (Deacy-Quinn, n.d, pp.7-8).

Step 3: Sanitation. With furrow cleaning the building becomes inhospitable to insects and the population is decreased by 80% (Deacy-Quinn, n.d, p.12). Using a HEPA filter on a vacuum cleaner can remove up to 99.97% of dust, frass, droppings, mold and other insect debris and potential food sources (Deacy-Quinn, n.d, p.18).

Step 4: Exclusion. Routine, proactive maintenance of the building such as filling of gaps and cracks prevent pests from entering (Deacy-Quinn, n.d, p.13).

Though, the IPM must be based on the data and policy of the Gothenburg Museum of Art as they are better aware of the threats to their collections and what routines are effective for them.

5.3.4. Materials

Plastics

Plastics can be found in several figures such as the eyes of *Loverboy*, the body, eyes and teeth of *Babydoll*, the eyes on *Dear deer's* body and the head and leg of *Rosa* as well as fishing line in *Rosas's* neck. It is not known what specific types of plastics the artwork is made off, so the information given is about plastics in general.

Plastics are a wide range of synthetic or semi-synthetic materials that are based on polymers which have been modified with additives to gain desired chemical and physical properties (Shashoua, 2008 p.1). These additives can be stabilizers, plasticizers, UV-absorbers, antioxidants, pigments, and fillers (Shashoua 2008, pp.56-59). Polymers are larger molecule that are comprised of a multitude of smaller molecules joined together (Shashoua, 2008 p.1). Semi-synthetic polymers were first produced between the end of the 19th century and beginning of the 20th century by chemically treating natural polymers (Shashoua, 2008 p.22). The first fully-synthetic polymer known as Bakelite was produced in 1909 by allowing the chemicals phenol and formaldehyde react with each other (Shashoua, 2008 p. 40). Polymers can be categorised into the three main groups thermoplastic, thermoset and elastomer. Thermoplastics, for example polystyrene, become pliable upon heating and solidifies when cooled. The plastics are capable of being heated and reshaped multiple times. Thermosets, such as epoxy, are normally stiffer than thermoplastics and are unable to be reshaped. Elastomer is an umbrella term for rubber and thermoplastic elastomers (TPE) which are thermoplastic materials with the same elastic properties as rubber (Pettersson, 1999, pp 239-241).

Compared to traditional heritage objects and art that are collected by museum, plastics have a short life expectancy (Shashoua, 2008 p.ix) Degradation is often apparent within 5–25 years after entering the collection (Shashoua, 2008, p.152). Differences in type of polymers or additives between plastics means that they are not affected by degradation factors in the same way (Shashoua, 2008, p.151). Known as the problem plastics, cellulose acetate, cellulose nitrate, plasticized PVC and polyurethane foam are extra vulnerable to degradation (Shashoua, 2008, p.151). When these deteriorate, they produce off-gases that degrade other organic materials and corrode metals. Plastics which produce gaseous products are called malignant plastics while those who do not are called benign plastics (Shashoua 2008, p.177).

Plastics degrade due to physical, chemical and biological factors. Physical degradation such as scratched on the surface affects the reflectance and causes a matt appearance. Scratches also trap dirt and dust which absorbs moisture and pollutants, the microclimates that develop then have the potential to cause chemical degradation. Plastics are affected by heat and cold. When exposed to high heat the molecular movement in plastics increases, making them more flexible which can cause them to distort. This happens at temperatures above the plastics glass transition temperature (Tg). Below the Tg plastics become hard and brittle due to an inability of molecular movement. When plastics are cooled, they also shrink considerably which can cause stress and harm in composite objects. Tg is reached at different temperatures depending on the particular plastic. When a plastic reaches the end of its commercial lifespan additives start migrating or evaporate. Migrating plasticisers makes the surface sticky, causing dirt and dust to stick to the surface and absorb moisture and pollutants that, as mentioned above, causes chemical degradation (Shashoua, 2008, pp.153-159).

Chemical degradation causes structural changes in polymers which can be divided into chain scission, crosslinking, development of chromophores and development of polar groups. Chain scission is when polymers chains are broken into shorter chains which is the most common structural change. Crosslinking causes increased stiffness and brittleness by joining separate polymer chains in linear plastics. Development of chromophoric groups causes changes in colour both in coloured and transparent plastics. Development of polar groups changes the chemical reactivity of polymers and may also affect solubility (Shashoua, 2008, pp.164-165).

Chemical degradation occurs due to reactions with several factors such as light, heat, oxygen, metal and water. Light, especially UV light, is the most damaging chemical factor, it causes chemical changes in polymers and fade dyes and colorants (Shashoua, 2008, p.166). Thermolysis is degradation induced by heat that causes depolymerisation. Polymer chains are broken into monomers, which causes loss in strength and toughness. Oxygen is always present in the environment, plastics and their additives can either react directly with oxygen, called autoxidation, or with material derived from oxygen such as ozone. Light and heat accelerate oxidation, though it can happen in their absence as well (Shashoua, 2008, pp.168-171). Many metals ions catalyse oxidation, traces of metal are present in plastics from manufacturing. Hydrolysis is the reaction between plastic and water which breaks the polymer chain and causes a loss in mechanical properties. Some plastics are more susceptible to hydrolysis than others, cellulose based plastics are the most vulnerable while others such as polyethylene and polypropylene are hydrophobic and not likely to react with water (Shashoua, 2008, p.175).

Environmental conditions designed for fragile organic materials have traditionally been applied to plastics i.e., stable RH around 55%, 18 °C, 50–300 lux and elimination of UV radiation. Plastics also require good air ventilation. However, since different plastics react differently to the environment the conditions should be adjusted according to the plastic type. Plastics that are susceptible to hydrolysis should be stored in dryer conditions of around 30% while plastics that are plasticized by water become dry and might crack below 40% (Shashoua, 2008, p.195). Deterioration can be mitigated by storing plastics in low temperatures or by removing oxygen, these storage alternatives will be discussed in depth later on in the thesis.

Figure 11: The character *Babydoll* is shown to have several components of plastic such as body, eyes and teeth.

Figure 12: A plastic doll leg is attached on the lower part of the figure *Rosa*.

Figure 13: The eyes of the character *Loverboy* are plastic from a boll.

Rubber

Rubber can be found in the teeth of the character *Dear deer* as well as the gloves and balloon on the character *At sea* (*Till havs*) which are latex. Much focus in this thesis is put on the balloon, yet it is not entirely clear whether the balloon is natural or synthetic, though it can be presumed to be synthetic. Due to the uncertainty, the following is information on both natural and synthetic rubber.

Natural rubber is obtained from the latex of plants, mainly the rubber tree (Hevea brasiliensis), it is an aqueous dispersion that coagulates in contact with air (Hacke et al. 2014, p.179). The oldest use of natural rubber to have been documented is from around 1500 BC by Mesoamericans (Grieve, 2008, p.141). In the mid-1800s Charles Goodyear and Thomas Hancock discovered a curing method using sulphur. A small percentage allowed for the rubber to maintain its flexibility over a wide range of temperatures and made it resistant to solvents. A high percentage of sulphur produced hard ebonite or vulcanite (Shashoua, 2008 pp. 21-22).

When manufacturing objects from natural rubber acetic acid or formic acid is added to the coagulated latex which is then formed into sheets to make handling and transportation easier. The sheets are then crushed and mixed with additives such as fillers, colourants, lubricants, softeners surfactants, protective agents and vulcanising agents, usually sulphur. After being mended into the desired shape the latex is cured which causes the vulcanisation agents to

react with the rubber polymer (cis-1,4-polyisoprene) which forms cross-links between polymer chains. Vulcanisation increasing its tensile strength and can also alter the elasticity, stickiness, resistance to solvents and high or low temperatures (Hacke et al. 2014, pp.179-180).

The primary deterioration of rubbers, both natural and synthetic, is oxidation which leads to embrittlement and the formation of cracks (Hacke et al. 2014, p.182). Oxidation is caused by a reaction between the rubber and atmospheric oxygen and is accelerated by increase in temperature, the presents of metallic ions and exposure to light, humidity though is not believed to play a major role. Despite an absence of light rubbers stored at ambient temperatures experience 'shelfageing' due to being exposed to oxygen. Depending on the rubbers formulation the reaction causes the rubber to either harden or soften. Rubber also reacts with ozone to form brittle ozonides on the surface, if the rubber becomes stretch from handling the surface is disturbed which exposes unsaturated molecules and the reaction start over (Shashoua & Skals, 2004, p. 60). Oxidation of rubber causes an increase in hydroxyl, carbonyl and hydroperoxide groups, as well as loss of unsaturation in the cis-1,4-polyiso-prene polymer chains. Emissions from deterioration include acetic acid, propionic acid, isobutyric acid, butyric acid, isovaleric acid and valeric acid (Hacke et al. 2014, p.182).

Figure 14: Depiction of a newer rubber balloon showing a light cream colour which is believed to be close to the original colour.

Figure 15: Details on deterioration of the original rubber balloon. Left depicts dark spots on light area and a yellow colour on the surrounding area. Right depicts hard brittle flakes in various colours that have detached from the balloon.

Any rubber object made after the 19th century is likely not pure rubber and often even synthetic (Blank, 1988, p.53). The following is a collection of a few synthetic rubbers.

The rubber butadiene was created in Germany in 1910 (Blank, 1988, p.59), later in the 1930s they developed the butadiene-styrene copolymer named Buna S and the butadiene-acrylonitrile copolymer Buna N. Butadiene acrylonitrile rubber is also called nitrile rubbers and have a similar compound to natural rubber. Depending on the ratio of copolymers the rubbers can range from quite stiff but oil resistant to flexible and soft but swells in contact with oil. They often contain a large number of plasticisers. After the development of the copolymers the production of synthetic rubber grew and made up close to 90% of the rubber production by 1945 (Blank, 1988, pp.60-61).

Butyl rubbers have properties very similar to those of natural rubber, though it is not as resilient. It is quite soft and remains flexible at low temperatures. The rubber is resistant to ozone, oil and chemical deterioration and has low gas permeability which makes it commonly used for inner tubes. Butyl rubber can also be used as additives to other rubbers. Isoprene, made in the 1950s, is a more flexible man made equivalent to natural rubber (Blank, 1988, p.61).

Polyvinyl alcohol (PVA) has been used in smaller quantities to make rubber-like materials. It is impermeable to gases and liquids. Ethyl cellulose can be heavily plasticised to make a rubber that is more chemically resistant than natural rubber. Polyvinyl chloride (PVC), although technically not a rubber, can be heavily plasticised to make a rubbery product. Ethylene propylene rubbers are light in colour and lack the typical rubbery smell due to a lack of double bonds along the chain which makes them unable to be vulcanized. They have been in production since the 1950s and are used for weather stripping and electronics (Blank, 1988, p.62). Polyurethane rubbers were developed in the early 1940s. They can be used as a basis for thermoplastic elastomers or be made into polyurethane foam which is widely used as padding. They are resistant to tare, abrasion, oil and ozone (Blank, 1988, p.63).

Figure 16: The teeth in both lower jaws
in the character *Dear deer* are rubber.

Paper

Paper has been used in the form of papier- mâché on the feet and body of the character *Dear deer*. It has also been used in the form of paper clay on *Babydoll*, Bonecreeper, *Loverboy* and *Mr. Sadman* according to a list over materials provided by the artist to the museum. However, it is not clearly visible in the figures, thus it has been a guesswork locating the material. It is believed to be covering *Babydolls* head and possibly be present on parts of *Bonecreepers* head and on the left shoulder blade in *Mr. Sadman*, however these are speculations.

Paper is made of fibrous plant material such as cotton, linen or wood, all of which contain the natural polymer cellulose (Guild, 2018). Before the 1840s paper was made of plant fibres such as cotton or hemp. As the production of machine-made paper in the Western world increased the fibre was replaced by wood pulp and additives became common to give the paper desired properties. The additives however are acidic and makes the paper susceptible to yellowing and embrittlement as time passes (CCI, 2018). Even though the short fibres from wood pulp do not produce as high-quality paper as other longer plant fibres it is possible today to make paper with long lifespan with the use of highly processed chemical wood pulp and often also an alkaline material such as calcium carbonate. Aside from the length of the fibres, other factors that affect the quality and lifespan of paper are method of manufacture and the fillers and additives used (Guild, 2018). Newspaper in particular has a high percentage of acidic ground wood pulp and lack protective alkaline buffers which gives it a low quality, makes it yellow quickly and gives it a short lifespan (CCI, 2018).

When paper deteriorates, chain scission causes the fibres to becomes shorter, as this happens, paper loose physical strength and may become discoloured. Therefore, paper made with wood pulp, that has short fibres, deteriorates faster than high quality paper made from long fibres such as cotton. Exposure to heat increase the rate of chemical reactions in the paper such as oxidation and hydrolysis which lead to degradation of paper. Cooler temperatures or cold storage considerably reduces the rate of chemical degradation and is especially advisable for acidic papers such as newspaper. If the lifespan of newspaper is 50 years at 25°C it becomes 100 years at 20°C. If the temperature were to be lowered further to 10°C or -15°C the lifespan would reach 500 and 5000 years respectively. Light levels must be kept low, around 50lux, and only for limited amounts of time as light fades colours and make the paper fragile (Guild, 2018).

In fluctuating RH paper swell and shrink as it absorbs and desorbs water vapour. The dimensional change may cause damages in paper that is attached to other material that restricts the movement. At high RH, ripples in paper can develop and the degradation of chemically unstable papers is accelerated. Damp environments also benefit the growth of mould or activates mould that has been dormant. Mould consumes organic material by breaking it down with an acidic secretion which can cause the paper to become limp and pulpy and or get discolorations. Keeping low levels of RH is most important to acidic paper, such as newsprints. Preferably acidic paper should be stored at 20°C and 30% RH, as it doubles the lifespan compared to the same temperature at 50% RH (Guild, 2018).

Along with high humidity comes the risk of pests such as long-tailed silverfish, cockroaches and booklice. Booklice, which are found in warm and moist environments, feed primarily on mould but the paper can become stained from their excretions (CCI, 2018). After moulting, the skin that is left can sustain other insects such as silverfish. To combat booklice the RH should be lowered and if possible, objects should be treated with high or low temperatures (Åkerlund, 1999, p.315). The most common cockroach in Scandinavia is the German beetle, blatella germanica. It lays capsules of eggs that are placed anywhere in the building whereas the American cockroach places the capsules hidden areas close to a food source. The capsule around the eggs gives them protection and makes treatment difficult and forces several treatment attempts by professionals (Åkerlund, 1999, p.312). Although seen during the day, long-tailed silverfish are nocturnal creatures that keep to shaded areas in lit rooms (Aak et al., 2019, p. 17-18). Compared to many other insects the long-tailed silverfish is much more resilient to lower RH which is why they are such a widespread problem in Swedish museums. Yet, to survive for longer periods they need the environment to have about 55% RH. At 50% their lifespan is around a month and only a few weeks at 45%. They thrive in temperatures of

20-26 ºC and below 20 ºC the development to adulthood becomes slower, at 16 ºC the development is completely halted. Although the nymphs die at 10ºC, the adults are caple of surviving at 0 ºC. They are more sensitive to higher temperatures, as the temperatures reaches 35-40 ºC the mortality increase and above 40ºC they can no longer survive (Aak et al. 2019, p. 18). Another form of pest that poses a threat to paper objects is rodents that both consume paper and use it as nesting material. Their urine and fecal matter is also damaging (Guild, 2018).

Figure 17: The feet of the character *Dear deer* are covered in yellowing paper.

Figure 18: the underlaying newspaper is visible From the left side of the character *Dear deer*.

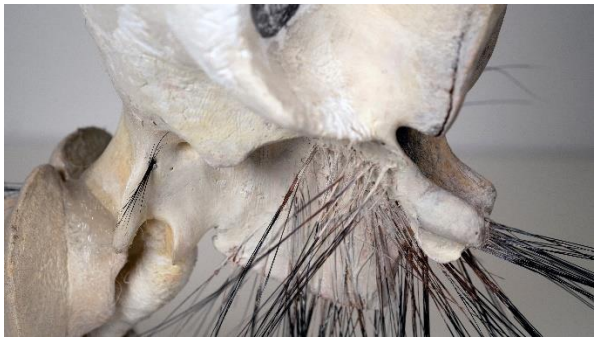

Figure 19: Paper clay may be found on the lower parts of the character *Bonecreeper's* head as it differs from the rest in colour.

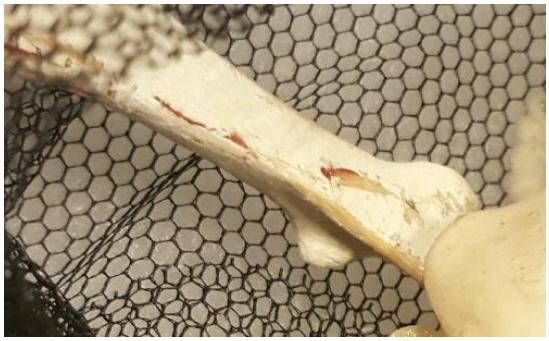

Figure 20: The left shoulder blade on the Character *Mr. Sadman* is possibly made of or paper clay as the surface does not resemble bone.

Wood

Wood can be found in the legs of the character *At sea*, the lower legs of *Mr.Sadman*, the spine and tail of *Bonecreeper*, the arm of *Loverboy* (believed to be bamboo) and in small pieces on the backs of *Hole* and *Crack*. It was not possible at the time to identify whether any of the pieces are hard or softwood.

Wood is divided into two categories, hardwood and softwood. The structure of hardwood is more complex than that of softwood, the greatest anatomical difference is the resin canals in softwood and the vessel elements in hardwood. Each wood within both categories differs physically and mechanically due to having their own anatomy. Despite such differences the cell is essentially the same, there are cell walls and a central opening, termed lumen, where water is transported. The cell wall consists of several layers which give the wood its strength and each cell is adhered together by a thin film termed the middle lamella. The structural polymers of wood are cellulose, hemicellulose, lignin and extractives. Cellulose makes up approximately half the mass in both hard-and- softwood (Björdal, 1999, pp.115-116).

Wood requires stable humidity. When used in manufacturing the wood has been dried out to a point where only 20-30% moisture remains within the walls of the cells. This is called fibre saturation (Björdal, 1999, p.117). In conditions with low humidity, about 30% (Hedlund, 1999, p.212), the moisture from the cell walls evaporates causing the wood to shrink. (Björdal, 1999, p.125). Due to wood being anisotropic the most shrinkage happens tangentially and the least happens in the direction of the fibres (Björdal, 1999, p.117). Fluctuation in RH will eventually warp and crack the wood (Björdal, 1999, p.125). If the relative humidity is allowed to rise towards 75% the moisture content in the wood reaches over 28%. Such high levels risk causing the development of mould (Francén, 1999, p.224) and fungi (Björdal, 1999, p.120). A suitable and stable climate would be with a minimum of 40 % RH and a maximum of 55 % RH. The fluctuation in temperature and RH should not exceed 10–18ºC and ±5 % within the span of 24-hours (Francén,1999, p.232). Light must also be limited. If wood is exposed to high levels of UV radiation it causes catalyzation of chemical deterioration processes (Björdal, 1999, p.126). For most sensitive materials it is advised to not exceed 150lux (Hedlund 1999, p.216), therefore it should be considered an acceptable lux level for wood as well.

Wood is a poor source of nutrients and few insects are able to break down the cellulose. To get around this some insects have microorganisms in their intestines while others only eat wood that is attacked by fungi. The most occurring insect attack on wood is from the common furniture beetle, also known as common borer beetle or strimmig trägnarare in Swedish. The larva bore tunnels in the wood for 2-3 years, once the adults emerge from the wood, they no longer consume it and instead reproduce (Åkerlund, 1999, p.316). A sign of the presence of this beetle is small holes in the wood that the adults exit from and dust below the hole (Hutton, 2019). The hylotrupes (husbock) can live inside and consume the wood for 3-5 or even upwards of 10 years before emerging (Insectes du Patriomine Culturel 2016). Lyctidae or net-winged beetles (splintbagge) and bostrichiade commonly called auger beetles, false powderpost beetles and horned powder beetles (träborrare) are both beetle families that primarily attack hardwood (Åkerlund, 1999, pp.318-319). Carpenter ants (hästmyra) do not use wood as a source of wood but does cause harm as it makes nests inside it. In order to stop the infestation the queen must be killed, or ells new colonies will emerge (Åkerlund, 1999, p.320). Lastly the hadrobregmus per-tinax (envis trägnagare) occurs in decaying wood and should therefore not be a great threat to wood objects that are not decaying. Like the common furniture beetle, it leaves exit holes in the wood and dust (Åkerlund, 1999, p.317).

To kill of insects, small objects can be treated with high or low temperatures or anoxic environments. For large objects or composite objects that cannot be treated with high or low temperatures, the dust can be removed in order to monitor if the infestation is active. Sticky tape and other traps can be used to map out the occurrence of insects (Åkerlund, 1999, p.316-317). Generally, the best preventive measurement is to keep the RH at under 60% to avoid creating humid environments that promote insect activity.

Figure 21: The tail and spine of the character *Bonecreeper* is presumed to be of a wooden stick wrapped in gauze.

Figure 22: The lower legs of the character *Mr.Sadman* are of painted wood.

Figure 23: The legs of the character *At sea* (*Till havs*) are wooden.

Bone & antler

Bone is the main material is the artwork and can be found in every character except for *Rosa*. The characters *Mr. Sadman* and *Dear deer* also have antlers.

Bone and antler are composed of one organic and one inorganic component. Oseein, the organic component, is primarily made of collagen. The collagen's ability to absorb makes the materials hydroscopic. The inorganic compound, bone mineral, is predominantly formed from carbonated hydroxyapatite, which gives bone its compressive strength and hardness. The proportion of collagen, hydroxyapatite and water, which is also a component, varies between bone and antler. Depending on the proportion the materials have specific qualities. The primary difference between bone and antler is the structural composition (Christensson,1999 p.165).

Bone consists of cortical bone, which forms the hard exterior, and the porous internal tissue called the cancellous bone. Cortical bone is constructed by columns called osteon. In each column is a central canal called the haversian canal which is surrounded by multiple layers of

osteoblasts and osteocytes (Steele & Bramblett,1988 p.10). The haversian canals run along the longitudinal direction and are transversely connected by volkmann's canals, forming a network between the osteons (Singh, 2015 p.75). Cancellous bone is less dense than cortical bone, with an open structure and consists of a network of arched beams and thin plates. It is primarily found in the ribs, pelvis, skull, at the ends of long bones and in the interior of vertebrae (Christensson,1999 p.167).

Antler is made of two components: the dense exterior, peripheral cortex, and the central internal tissue, spongiosa (Landete-Castillejos et al. 2019 p.7). Antler is denser and heavier than bone and generally has a dark surface with raised bumps and protrusions (Stone,2010). Despite being denser than bone the higher level of collagen makes antler more flexible (Christensson,1999 p.168).

Ideally bone and antler should be stored at a temperature under 25 °C and an RH in the range of 45–55 % (Stone, 2010). The fluctuation in temperature and RH should not exceed 4 °C and/or 5 % within the span of 24-hours (Godfrey, n.d.). Due to bone and antler being anisotropic materials the length shrinks, and the width swells when exposed to fluctuating RH. Large fluctuations eventually lead to the materials becoming warped or cracked. In bone the cracking runs along the haversian canal and in antler the crack follows the direction of the fibers (Christensson,1999, p.174).

Bone and antler must not be exposed to high levels of light as it causes both direct and indirect damage to the materials. Light levels for bone and antler should be kept under 150 lux and ultraviolet radiation restricted to 75 µW/lm (Stone, 2010). High levels of light accelerate the deterioration process through bleaching the surface and breakdown of the outer collagen. When the surface becomes damaged dust and dirt begins to accumulate. The dirt gives sustenance to microorganisms and attracts insects such as carpet beetles which attack the bone. Dust, dirt and fat can also damage bone and antler by catalyzing the deterioration process. Sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) combined with oxygen and moisture forms acids that break down the inorganic compound hydroxyapatite in the bone (Christensson,1999, pp. 175-176). The organic compound collagen can be damaged by alkaline reagents. A considerable loss of collagen leads to the protein matrix becoming soft and crumbly (Godfrey, n.d.).

The porosity of the materials makes them susceptible to staining if they are in contact with corroding metals such as copper and iron (Godfrey, n.d.). To ensure protection bone and antler should be stored in enclosed boxes or drawers to avoid contact with dust and light as well as buffer against sudden changes in temperature (Stone, 2010). However, bone and antlers must never be stored in sealed plastic bags due to risk of condensation that would lead to mold growth (Christensson,1999, p.174).

Feathers

The characters *Crack* and *Hole* both have wings of feathers.

There are numerous types of feathers covering a bird's body, two basic types of feathers are pennaceous and plumulaceous (Dignard & Mason, 2018). Pennaceous feathers also termed contour feathers are long and consist of a hollow shaft. The base of the shaft is a spongy core termed calamus which is mostly inside the feather follicle, the rest of the shaft is solid and termed rachis. Along both sides of the rachis runs the vane consisting of individual barbs that interlock away from the body, producing a flat and firm vane, and a fluffy noninterlocking

vane close to the body (Hudon, 2005, p.130). Feathers without barbules and hooklets are called plumaceous, the most common plumulaceous feather is down feathers (CCI). The non-interlocking barbs does not form a vane as in a contour feather, instead it has a light airy shape (Hudon, 2005, p.132).

The natural pigments in feathers, generally, have a moderate to highly sensitivity to light while dyes, synthetic as well as natural, are considered to be highly sensitive to light with the exception of natural browns. Light can affect the iridescent structural colours in feathers due to the iridescence being associated with melanin granules. For natural brown feathers that have not been dyed lux levels of 150 is suitable. However, even 50 lux may fade dye in the span of a few years. Light levels should be limited and not expand over long periods of time. Keratinous materials are not very sensitive to humidity however, humidity and higher temperatures attract insects and above 65% mould begins to grow. Feathers are susceptible to insect infestation, in particular from dermestids and clothes moths. The risk increases for stained or dirty feathers. Dust, soiling and oily deposits also poses a threat by sticking in the complex structure of the barbs, the presence of dirt at higher RH causes abrasion and the removal can be difficult and cause physical damage (Dignard & Mason, 2018).

Figure 24: The character *Crack* has a feather on the back of the body.

Figure 25: The character *Holes* left wing consisting of two brown feathers. .

Leather

The only leather present in the artwork can be found in the form of a shoe which is worn by the character *Crack*.

Leather is produced from the skin of vertebrates, whether it be mammal, reptile, bird, fish or amphibian (Thomson, 2006, p.3). Before skin becomes leather, it must be tanned, the process stabilizes the collagen and gives leather its properties. By tanning the leather becomes soft and flexible with resistance to wear and tear as well as water. Without the tanning skin, or raw hide, is dried to become hard and translucent. The material can be stable as with the case of parchment but will nonetheless putrefy if it becomes wet (Thomson, 2006, p.1). Some common types of tanning are vegetable tanning which uses tannin-rich vegetable matter, mineral tanning which uses mineral salts, such as chrome and zirconium salts (CCI, 2019), oil tanning that uses unsaturated oil and aldehyde tanning that uses glutaraldehyde or oxazolidine compounds (Covington, 2006, pp.30-31).

Like many other organic materials, a suitable RH is around 50 –55% (Angus, Kite, Sturge, 2016, p.120). Above 65% there is risk of mould growth that stains the leather (Angus et al. 2016, p.115). Visually the mould appears as a thin gray, green or white powdery deposit or as black dots. Higher RH also attracts pests, some insects, like dermestids, eat leather while others want the oils in the leather (CCI, 2019). Below 40%, the leather may lose some flexibility, thus become prone to cracking and tearing. Leather can accommodate to seasonal

changes in RH, but extreme fluctuation causes stress and damage as the material expands and contracts. If leather is mounted or part of a composite object, the change in size can damage the leather and or other materials present in the object (Angus et al. 2016, p.115). As for temperature, it is advisable to keep it at around 18°C (Angus et al. 2016, p.120). Another agent of deterioration to consider is light. All forms of radiation are damaging, especially to leather with any form of dyes which get bleached. To avoid harming the material, lux ought to be no more than 50. Higher levels are acceptable only if it is during short periods of time. The most hazardous radiation comes from direct sunlight, the leather rapidly absorbs the heat and sensitive lathers can become burnt from extensive exposure. When deciding on lighting it should be taken into account that spotlights can cause burning from localized hot spots (Angus et al. 2016, p.116).

Storing leather differs from some other materials. Acid-free products are standard when storing museum collections, leather however is acidic by nature which renders the acid-free materials less effective. It is nonetheless worth using if the leather is stored with other materials that are acid-sensitive such as paper or textile (Angus et al. 2016, p.116). In composite objects with leather and metals the materials cause deterioration of each other. Copper and copper alloys react with the oils in leather and develop the green waxy corrosion product copper stearate where the leather and metal meet. Iron and iron alloys corrode in contact with the acidic leather which in turn makes the leather weak and brittle (CCI, 2019).

Figure 26: The character *Crack* wears a white leather shoe.

Textile

Textile of different kind have been used in several characters. *Mr. Sadman* wears a tailcoat of tulle and has hands made of an unknown fabric. A netlike fabric can be seen under the fur on *Dear deer*. The spine of *Loverboy* wrapped in plain weave fabric. Though the primary textile is gauze which can be found in small pieces on the front of *Crack*, wrapped around the spine and tail in *Bonecreeper*, around the edges of the pelvis in *At sea* (*Till havs*) and on the back, thighs and joints of *Loverboy*.

Textiles can be made of fibres that are either natural, regenerated or synthetic. Natural fibres are derived from already existing fibres in nature and are divided into three groups. Cellulose fibres, such as cotton, protein fibres, such as wool and mineral fibres such as metal (Ludwall, 1999, pp. 129-130). Regenerated fibres are modified natural polymer fibres that are made from polymers in nature such as protein or cellulose. The polymers are treated with chemicals into liquids and regenerated into fibres (Ludwall, 1999, p.134). Synthetic fibres started being produced in the 19th century. The fibres are created from chemicals, some common synthetic fibres are nylon, polyester and acrylic. The raw material and manufacturing process gives

fibres different properties, for example, acrylic has a good resistance to light whereas nylon is more light-sensitive (Dancause et al. 2018).

Gauze and tulle are both textiles that are found in the artwork. Gauze is a thin loosely woven fabric and is generally made of cotton (Emery,1966, p.180). Tulle is a fine stiff netting that can be made of a number of natural or synthetic fibres such as silk, nylon and rayon but most commonly polyester (Nordisk familjebok, 1952, p.531).

Textiles can tolerate a wide range of RH conditions, between 40-60% (Ludwall, 1999, p.140). Below 40% RH textiles become increasingly brittle and in damp conditions natural textiles absorb moisture, causing the fibres to swell. This causes the piece of fabric to contract and shrink, especially if it is the warp that is swelling. The swelling is more extensive in loosely weaved fabrics since there is room for more movement. As RH decreases the moisture is released from the fibres. Although textiles can handle being stored at 20°C, their lifespan will be shortened significantly if the temperature rises to 30°C. Ultimately, storing fabric at 5°C and lower reduces chemical deterioration and prolongs their life. Light harms textiles by fading colours and weakening fibres, UV radiation and visible radiation even have the potential to cause photochemical damage. The damage depends on the intensity of the light, the proportion of UV radiation, and the length of exposure. The UV radiation in daylight, sunlight, and some electric light sources is a major cause of yellowing and weakening of fibres. Along with light, UV also causes fading or change in colour of many textile dyes, including natural and synthetic dyes. Textiles should not be exposed to UV radiation and textiles with sensitive colourants should only be exposed to 50 lux at limited periods (CCI, 2013).

Clothes moth and the carpet beetle are the biggest threat to textiles. They consume keratinous protein fibre, primarily wool, but will attack silk, cotton and synthetics if they are soiled or in the way of a food source Moths not only eat wool but also use the fibres to build tubes that the larva is placed in. Aside from spotting the insect in any of its developmental phases, their presence can be noticed by their casings or webbing. The carpenter beetle larva stays in the dark whereas the adults are drawn to light, the adults are therefore easier to spot but by then a new generation has already been born. They can be treated either with anoxic environments or with high or low temperatures (Åkerman, 1999, pp.311-312).

Figure 27: Gauze is wrapped around the edges of the pelvis in the character *At sea*.

Figure 28: The front of the character *Crack* have small pieces of gauze.

Figure 29: A joint in the character *Loverboy* is covered in gauze.

Hair

The characters *Babydoll* and *Mr. Sadman* has human hair on their heads.

Human hair is made of the protein keratin (Mills & White, 1999, p.86). It is a sensitive material that becomes fragile with age and is susceptible to temperature, RH and light. Exposure to UV-radiation for example causes discoloration. A problem with hair, especially when the strands are loosely attached is triboelectric effect that causes the hair to become electrically charged and attach to unwanted surfaces. Hair is prone to attack from insects such as moths and dermestids (Pirotte, 2017).

Wax

The body of *Rosa* and *Loverboy's* nose are made of Tussaud wax. Modelling wax has been used on joints in *Rosa's* body and on the jaws on *Loverboy*.

The term wax is used as an umbrella term for materials with waxy characteristics such as low melting point and a waxy feel. Waxes contain long chain hydrocarbons, acids, alcohols and esters or a mixture of them. Natural waxes are produced by animals or plants. (Mills & White, 2012, p.41).

Wax has a high plasticity, though its melting point is around 60-64 °C it becomes sticky at 40 °C and softens at 30. Heat can thus cause irreversible changes. If the temperatures decrease rapidly the wax shrinks and becomes fragile and prone to breaking from handling or other mechanical stress. (Ortiz & Boró, 2012, p.219). Temperatures should be between 15- 20 °C and as stable as possible (Ortiz & Boró, 2012, p.226).

The level of humidity is not a major concern for wax in of itself due to the material being hydro repellent, through aqueous alkali can cause saponification, the process of fat, oils or lipids to convert into soap and alcohol (Ortiz & Boró, 2012, p.219). In the cases of there being a wooden support in a wax object, fluctuations in humidity causes shrinking and swelling of the support which causes stress to the wax (Ortiz & Boró, 2012, p.219). As for any organic material high RH promote the growth of mould, fungal attacks cause flaking of wax and a whitening of the colours (Ortiz & Boró, 2012, p.219). Dust and dirt are prone to collecting on wax surfaces, especially if they lack a final protective film. The particles can attract insects and absorb humidity, leading to mould growth (Ortiz & Boró, 2012, p.221).

Radiation causes deterioration through photochemical effect and thermal effect. Photochemical effect is when molecules in a material is provided with enough energy to cause a chemical reaction. Thermal effect has the potential to affects the form and speed of photochemical deterioration. IR and UV cause discolouration and the damage is often localized, especially on the surface (Ortiz & Boró, 2012, pp.220-221). Light levels should be kept below 200 lux, preferably even below 150 lux (Ortiz & Boró, 2012, p.229).

Figure 30: The nose on the character *Loverboy* is of Tussaud wax and on the front of the jaws is modelling wax.

Metal

Metal have been used in various forms such as steel wire inside the body of *Babydoll*, chicken wire in the body of *Dear deer*, loops in the legs of *Crack* and *Hole* and pipe cleaners in the neck of *Mr. Sadman* to name a few.

Metal is a material with metallic properties, this also includes alloys which are mixtures of several metals (Selwyn, 2004, p.5). Every metal has unique properties and the exact metals that were used to create the artwork are not known. However much of it is steel wire and chicken wire which are both iron alloys.

Metals react to their environment, especially oxygen and forms a protective oxide layer on the surface that prevents further deterioration, but only if the layer is stable and evenly distributed (Fjæstad & Norlander 1999, p.71). Patina as it is called can be appreciated for its visual appearance and protective qualities (Selwyn, 2004, p.19). In contrast to a patina that is passive there is also active corrosion that consumes the metal and is loosely attached to the surface with a flaky or powdery appearance (Selwyn, 2004, p.24). Active corrosion occurs when metal is exposed to water or aggressive elements such as salts. The development of orange corrosion products on wetted iron is commonly known as “flash corrosion” or “flash rusting”. When this develops on already corroded surfaces, the removal of the new layer may be sufficient cleaning, but a shiny surface may become pitted and darkened after the development and removal of corrosion products. Typical corrosion products on iron are black, red, orange, yellow and brown, stable corrosion products vary from blue-black and red-brown. During active iron corrosion the products can flake off from the surface and leave pits and depressions with orange spots (Selwyn, 2021). In dry environments the development of rust on iron is slow, but with higher humidity the rate increases and the corrosion becomes rapid. The formation of rust is accelerated by the presence of water-soluble salts, especially those containing chloride or sulphate ions. These can originate from pollution or sea spray. An even surface of rust can give some protection, an uneven surface however allows for water and air to get into contact with the metal surface and continue the corrosion. (Logan, 2007a).

Due to humidity’s role in corrosion, metal should be stored in as dry conditions as possible, though, in the case of composite objects compromises must be made. Stable metals with no signs of corrosion can tolerate 35- 55% RH. Iron, unless it has been exposed to salts, can be stored at 50%, above 60% rusts develop. Actively corroding metal should ideally be stored

below 35% RH to inhibit further corrosion. When the metal is the lone material in an object it would also be advised to store it separately away from other objects due to the corrosion products spreading to the surrounding and causes problems with dust, chloride and staining (Logan, 2007b).

Figure 32: Metal loop and steel wire in the leg of the character *Cracks*.

Figure 32: Pipe cleaner and steel wire in the neck of the character *Mr. Sadman*.

Figure 33: Corroded pipe cleaners on the back of the character *Crack*.

Figure 34: The steel wire wrapped around the leg of the character Loverboy is corroded.

Plaster of Paris

Plaster of Paris has presumably been used to form the heads of the characters *Bonecreeper* and *Mr. Sadman*.

Plaster of Paris is made of calcium sulphate ($CaSO_4 \cdot 2H_2O$). The product is very reactive and by reintroducing water into the crystal structure it causes the plaster to crystallize and harden. The reaction is exothermic which releases heat and increases the volume somewhat (Barclay, 2007). The material is soft and brittle and is easily damaged by abrasion. To give support some objects made with plaster of Paris have an armature of wood or metal or a backing of hessian (V&A, 2016).

Moisture and high humidity are detrimental to plaster of Paris. The plaster itself is slightly water-soluble but the armature is also vulnerable to high and fluctuating relative humidity. Wooden armatures will expand and contract along with the shifting humidity whereas metal armatures corrode and expand causing breakage of the plaster (V&A, 2016). The porous

nature of plaster lets surface dirt and salts present in moisture be transported into the pores (Hansson, 1999, p.107). As salts in the pores crystalize and expand it can cause stress and damage within the material. Crystallization and hydration occur at individual relative humidity levels for different salts, however salts are often mixtures which makes it difficult to determine a suitable humidity (Price & Brimblecombe, 1994, p.90).

Figure 35: The head of the character *Bonecreeper* is partly made of Plaster of Paris.

Figure 36: A line can be seen between the bone and plaster of Paris on the character *Mr. Sadman*s head.

Expanded polystyrene (EPS)

EPS Is found on the thighs on *Loverboy*, inside *Mr. Sadmans* left shoe, underneath the papier-mâché on *Dear deers* feet and presumably inside the spine of *Bonecreeper*.

Expanded polystyrene (EPS) is a rigid closed-cell foam, usually white. The material has many areas of application but is commonly known for its use as insulation in construction and cushioning in packages. EPS is manufactured by allowing styrene monomers to undergo free-radical addition polymerization, creating small polystyrene beads. Pentane is added and the beads are exposed to heat, causing them to expand. The material is relatively chemically inert but must not be exposed to organic solvents, chlorinated solvents, and aromatic hydrocarbon solvents which dissolve EPS (Howard, 1993, p.3). Light exposure should be kept low as prolonged exposure to UV-radiation leads to deterioration (Wikipedia, 2021b).

Figure 37: Detail of the left foot of the character *Dear deer* where EPS is visible through the papier-mâché.

Figure 38: The EPS inside the left shoe of *Mr. Sadman* is seen through the wooden sticks.

Glass

The eyes of Hole and Crack are of glass as well as the glasses on Hole which are of mirror glass.

Glass is made of three types of ingredients: network formers, fluxes and stabilizers. The main ingredient is silica, which is the network former, fluxes are used to lower the melting temperature and are alkalis or lead. The stabilizers which are often lime prevents the glass from dissolving (Koob et al. 2018, p.146).

There are two basic mechanisms of the deterioration of glass that are both brought on by the amount of moisture in the environment. The first is known as leaching which is an iron exchange brought on by high levels of relative humidity. The moisture in the surroundings causes the alkali ions to leach and be replaced by hydrogen and/or hydronium ions. A layer develops on the surface that is rich in silica and may contain up to 20% water. When the layer becomes dehydrated at below 40% RH, hairline cracks develop, this is known as crizzling (Koob et al. 2018, p.146). Although crizzling is primarily associated with glass produced between the 17th and 19th century it does occur with newer glass (Brill, 1975, p.121). Stable glass can safely be stored between 40–50% RH whereas glasses with signs of deterioration is more suitably stored at 40–42% RH (Koob et al. 2018, p.147).

Figure 39: The figure Holes eyes can be seen to be of clear glass whereas the glasses are of mirror glass.

Ceramics

The only character containing ceramic is *Hole* which has ceramic shoes.

Ceramics are clay that generally has been fired to some degree. The clay body consists of clay minerals, temper, and impurities. Temper is a material that allows gases to escape during firing and reduces shrinkage. The material can be quartz sand, chert, volcanic ash or grog which is fired ceramics that have been crushed. The hardness and porosity of clay depend on the temperatures it has been fired at which in turn is determined by the type of clay. In Europe the most common finish on ceramics are glazes which are either decorative or function as a seal on the ceramics surface. Glazes are composed of silica and fluxes which lowers the silicas melting point to allow it to adhere to the clay when fired. Some common fluxes are sodium, potassium, calcium, and lead. Ceramics that have been fired at high temperatures

have a hard glaze that is securely attached. Ceramics that are fired at low temperatures or unevenly fired has a poorly attached glaze that can flake off. Porcelain is fired at the highest temperature of all ceramics and is non-porous with a glaze with similar composition to the clay. Stoneware is fired at almost as high temperatures and is also non-porous with glazes that are often formed from the clay itself. Stoneware glazes of salt or ash have the texture of an orange peel. The most common glazes on pre-19th-century European ceramics are lead glazes which melts at lower temperatures than salt and ash glazes. They are softer than glazes used on porcelain or stoneware and their stability depends on the ratio of lead and silica. Overglaze decoration such as paint are sensitive to physical damage (Logan & Grant, 2018).

The largest threat to ceramics is physical forces, and though RH is not a great concern for fired ceramics there are risks of mould growing on any soil or oil on the ceramics surface at RH over 65%. Objects that have been exposed to salts risk damage from the crystallization and expansion of salts inside the pores (Logan & Grant, 2018). Crystallization and hydration occur at individual relative humidifies for different salts, however salts are often mixtures which makes it difficult to determine a suitable humidity (Price & Brimblecombe, 1994, p.90). The most common soluble salts are chlorides which can be transported in air in coastal areas. To avoid damage from the cycle of deliquesce and crystallization RH should be kept stable at round 50% (Logan & Grant, 2018).

Figure 40: One of the ceramic shoes belonging to the figure Hole.

5.3.5. Artist view on deterioration and conservation

When asked about her view on aging and deterioration Lovell (2021-05-07) answered that she feels conflicted. There is a wish to allow deterioration, yet she fears for her artworks becoming less desirable. She believes that there is a fear of and repulsion with deterioration. Like death, change is something that we wish to not be reminded of, we wish for permanence. In 2005 when The Choirproject was created, Lovell had no thoughts on deterioration or longevity and did not consider that materials do not necessarily last for a long time. Nowadays she has more understanding of deterioration and sometimes uses the ephemeral nature of materials intentionally. She experiences a freedom from the ephemeral materials and says that when she uses such materials the joy of creation and the freedom outweigh the risk

of the artwork not being purchased. Yet there is still a wish for the artworks to live on and stay unchanged which leads her to explore more durable materials (ibid.).

Deterioration depending on its nature and form may affect the meaning of the artwork. Lovell tells of an artwork made in wax which previously had a yellow colour but turned orange with time. She expressed distress with the unexpected result of aging and a wish for the piece to regain its original appearance. But besides the complete vanishing of materials Lovell seems to draw no clear line where deterioration has gone too far and believe that deterioration, to some degree, is not a problem. Deterioration might even be visually appreciated, like a balloon becoming tattered for example. Though the structural integrity must not be compromised for the risk of pieces falling off. In the case of The Choirproject she believes that determining where to draw the line is up to the Gothenburg Museum of Art (2021-05-07).

Lovell was asked to express her opinion on conservation to which she said that if a material becomes very deteriorated or otherwise changes in a dramatic manner due to aging that she wishes to be contacted with treatment alternatives. If materials are in need of replacement, and she herself is not present or a part of the decision-making, the most important aspect is that the new material is as visually similar to the original as possible. Lastly her wish is for The Choirproject to not be forgotten due to deterioration and that she can be involved to give a helping hand (2021-05-07).

6. STORING OPTIONS FOR RUBBER

Degradation of plastics cannot be prevented, stopped or reversed once it has begun, it can however be inhibited or slowed through preventive conservation. Preventive action includes reducing or removing degradation inducing factors such as light, oxygen, acids, humidity and heat or any emissions from the plastic which accelerate degradation (Shashoua, 2008, p.193). Plastics and rubber can also be placed in special storage conditions such as low to freezing temperatures or oxygen-free, also called anoxic, enclosures. As mentioned previously the original and new rubber balloon belonging to the character *At sea* are stored in cold conditions to mitigate deterioration. Yet the original balloon is heavily deteriorated, and the new balloon is showing signs of migrating plasticisers and acidic odour.

6.1. Cold storage

It is a well-known notion that the lifetime of most museum objects is lengthened by lowering the temperature (Michalski, 2002, p.70). By reducing the temperature by 5-10°C the speed of the most common chemical degradation reactions, oxidation and hydrolysis, can be cut by half. Storing plastic objects at low temperatures is a simple and cost-efficient alternative, it can also inhibit some physical degradation processes such as migration of plasticisers. Storage at freezer temperature (20°C) has also been studied and is suggested as an effective way to slow down deterioration. When plastics are exposed to low temperatures, they undergo changes that can be either reversible or permanent. Reversible changes include tensile and dimensional changes. Shrinkage is significant and unavoidable but is reversed one the plastic is returned to ambient temperature. Permanent changes include increased crystallization and mechanical failure (Shashoua, 2008, p.203).

Depending on the dimensions of an object, low temperature storage can be a suitable alternative. The risk of harm from low temperature is affected by the thickness of the plastic object that will be stored. Plastics that are less than 1 cm thick, regardless of deterioration, there is no significant risk of physical changes or damage caused by condensation during the

cooling process. If it is thicker than 1 cm though, it will take longer for the core to reach the temperature of the environment than it does for the surface of the object which leads to condensation. For objects which contain moisture it must also be taken into consideration that the change in temperature upon cooling and then when brought back into ambient temperatures affects the humidity (Shashoua, 2008, p.204). Another aspect that affects how a plastic behaves in cold environments is the Tg. A plastic is soft and flexible when the surrounding is above its Tg due to there being enough energy for the molecule to move which increases the free volume. Below the Tg the free space is too small to allow movement, the plastic enters a glassy state and becomes hard and brittle. Most plastic museum objects are in a stiff and glassy state at room temperature, though there is the exception of polyethylene, polypropylene, synthetic rubbers and plasticized PVC. These flexible, rubbery plastics become glassy when stored in the cold, making them sensitive to handling with the risk of irreversible damage (Shashoua, 2008, p.205).

6.2. Anoxic storage

6.2.1. Adsorbers and impermeable films

Adsorbers, also called scavengers, slows down the deterioration rate of plastics by minimizing factors which either initiating degradation or causes autocatalysis (Shashoua, 2008 p. 196). One of the most common products used by museum professionals to make anoxic storage environments are the barrier film Escal and the scavenger Ageless.

Escal is a barrier film that is impermeable to moisture and oxygen when sealed. In combination with oxygen scavengers it can be used to create an anoxic storage environment (International conservation by design**,** 2021). Escal can be heat sealed with a sealer or with a clip. Heat sealing is somewhat difficult as the bag must be completely flat or the seal will be inadequate. An easier alternative is a clip that can maintain a fully sealed condition for 4 years. After being opened and closed several times though its effectiveness is reduced and a clip that has been used on a thick film for a longer time becomes too stretched to be used on thin films (Mitsubishi gas chemical, n.d. p.10).

To remove the presence of oxygen from the closed bag oxygen adsorber, or scavenger, can be used such as an RP System® or Ageless®. The RP System comes in two types, the A-type that removes oxygen and also significantly lowers the RH, and the K-Type that removes oxygen and corrosive gas without affecting the RH and thus pose no risk of creating a microclimate that is too dry. Ageless absorbs oxygen through a chemical reaction between the oxygen and fine iron powder within the scavenger that oxidate (Child, 2002, p.174). The reaction is exothermic which increases the temperature of the package surface, due to this the Ageless must never be in direct physical contact with a museum object. The rise in temperature slightly raises the RH, objects that are sensitive to even slight changes in humidity should therefore not be stored in closed systems with Ageless unless there is also something controlling the RH (Grattan & Gilberg, 1994, p.212).

Oxygen makes up about 20% of the atmosphere, as the oxygen is absorbed in a closed system the internal pressure decreases. If the system is made of rigid materials such as a box it will become deformed and allow for oxygen to enter through openings. A flexible system such as a bag shrinks, as such the system must be made big enough to allow shrinkage without harming the museum object (Child, 2002, p.175).

To monitor the oxygen levels, Ageless® eye can be placed in the bag. The indicator shows the presence of oxygen by a change in colour, at levels of 0,3% oxygen or lower the tablet is pink and as the levels rises above 0,5% the colour becomes blue or purple. Though, with time the tablets colour fade, making it unsuitable for very long periods of storage (Child, 2002, p.174), and at lower temperatures the colour change slows down (Carrió & Stevenson, 2002, p. 33).

Zeolite 4Å, activated carbon, silica gel, Corrosion Intercept® and archival cardboard are all commonly used adsorbers that slows down degradation by adsorbing water vapour or acetic acid and creates and controls micro-environments (Shashoua et al. 2014, p.1). Zeolites are hydrated microporous aluminosilicate minerals. The adsorbent contains positively charged ions of alkali and alkaline earth metals. Silica gel is used to control humidity by adsorbing water vapour, it can also adsorb formaldehyde and acetic acid. When heated the bonds which hold the adsorbates break and the dried silica can be reused. Activated carbon or is used to adsorb nitrogen oxide emitted from cellulose nitrate to prevent it from participating in hydrolytic breakdown. Due to being non-polar it has high affinity for organic molecules and a low affinity for water. Corrosion Intercept, though originally intended for metal, is used to inhibit deterioration of cellulose acetate. It comprises finely divided copper in a polyethylene matrix which reacts with the pollutants. Archival quality cardboard is usually made to make boxes for storage of objects, despite not being generally seen as an adsorbent, archival quality cardboard is commonly used as such. The cardboard contains at least 2% calcium carbonate, has a pH value of between 7.5 –10, and is free of lignin (Shashoua et al. 2014, p.2). When the adsorbers were examined to determine their effectiveness on slowing down the deterioration of cellulose acetate it was found that archival cardboard was more effective at adsorbing acetic acid than the other adsorbents which adsorbs plasticisers rather than acetic acid (Shashoua et al. 2014, p.7).

MicroChamber® General Purpose Black/White Paper was tested for the anoxic storage of rubberised garments at the British Museum Textile Centre. MicroChamber® General Purpose Black/White Paper is an acid- and lignin-free laminated paper with activated carbon, zeolite and an alkaline buffer (Hacke et al. 2014, p.187). Tests showed that anoxic storage without the MicroChamber® paper reduced deterioration and the smell of degradation, though in combination with the MicroChamber® paper the deterioration and emissions of VOCs decreased drastically (Hacke et al. 2014, p.188). Little has been written about the product and it is hesitantly recommended by some due to speculations of acids being released once the zeolite and activated charcoal becomes saturated (Hacke et al. 2014, p.187).

6.2.2. Research on anoxic storage

The literature that was found is exclusively on natural rubber. Though natural and synthetic rubber differ and may not always react in the same manner, the literature should be applicable to the balloon that is presumably synthetic.

Anoxic storage has been investigated numerous times and is generally believed to be effective and beneficial (Clavir, 1982; Shashoua, 1992; Shashoua & Thomsen, 1993; Burke, 1996; Shashoua, 1999; Shashoua, 2006; McPhail et al., 2003; Hacke et al. 2014).

Between 1991–1995 the British Museum investigated the long-term anoxic storage of ethnographic objects containing rubber. The objects were sealed in Cryovac BDF-200, a thin, transparent, multi-layered, co-extruded polyalkene oxygen barrier film together with the oxygen absorbent Ageless Z. The conclusion that anoxic environments were successful in

inhibiting degradation was presented at the ICOM Committee for Conservation 12th Triennial meeting in Lyon 1999 (Dyer et al. 2011, p.1). The results have since been used amongst other when deciding on new storage for 31 waterproofed military uniforms from 1880-196 at the Danish Defence (Shashoua & Skals, 2004, p.57).

In 2011 most of the bags from the field trial at the British Museum were found to still be enclosed which led to a re-examination of the objects (Dyer et al. 2011, pp.1-2). Each unopened bag contained emissions from the degradation of the rubber such as Acetic acid. Many also contained carbon disulphide and benzothiazole. Despite there being no signs of holes or failed seams in the bags, oxygen content and humidity within the bags was measured to be similar to ambient (~20.6 percent) and the pH was between 5–6 due to acidic volatiles (Dyer et al. 2011, p.6). The measurements were no surprise seeing as Ageless® is believed to last for 5 years and no replacement of the adsorbent had been done during the 15 years (Dyer et al. 2011, p.8). The rubber had signs of oxidation (Dyer et al. 2011, p.6), though the degradation was worse in objects where the enclosures had at one point been opened. The authors therefore determine that despite the anoxic conditions not lasting it had a positive effect on the deterioration and is thus recommended for storing plastics (Dyer et al. 2011, p. 10).

7. DISCUSSION AND CONCLUSION

7.1. Storing the figures

The complexity of the artwork and the different needs of the materials complicates decision-making. As an aid, the decision-making model created through the research project *Modern art: Who cares?* is used to discuss alternatives. The first step in the model is collecting all available information on the artwork and artist as well as examination which has been done through the making of this thesis. From the information, the condition and meanings of the artwork is established. Then the discrepancy is determined, conservation options are examined and the ethical, financial, logistical etc aspects of the options are weighed against each other and a decision is made (Beerkens, 2016, p.13).

Though the following discussion is not as lineal as the decision-making model it takes the steps into account. The materials present in the artwork have been identified, their needs have been researched and presented and the condition of the artwork established as well as documented through condition reports. Some main materials are bone, metal, plastic, wax and fabric, though the first three were determined to be the most problematic.

The artwork is stored in a climate-controlled area with RH between 40-60% RH and around 20ºC. Metal that is not actively corroding, although preferably kept in dry environments, can be stored between 35- 55% RH which is a wide range that could be suitable for many other materials in the piece. Through examination, active corrosion was discovered in components in the figures *Loverboy*, *Hole* and *Crack*, and unless these components are stored at under 35% RH the corrosion will continue. Corrosion of metals resulting in voluminous corrosion products that can damage other materials and stain their surface. It is therefore a common suggestion to store corroding metal separate or even in plastic bags (Logan, 2007b). As The Choirproject is made of composite materials and the metal is structural it is unable to be removed. These three figures are currently stored together in a box with the character Mr. Sadman, and though it is not possible to remove the metal from the figures they themselves can be separated from Mr. Sadman to prevent it from being damage by the corrosion

products. Seeing as time, finances and storage space is tight, as is the case in most museums, the most efficient option would be to make a separate box for Mr. Sadman while leaving the other figures together.

As stated, the metal wire and pipe cleaners in the characters *Loverboy*, *Hole* and *Crack* gives structural integrity to some parts. *Loverboy* has corroded steel wire wrapped around its legs that has stained the gauze underneath. In the cases of the *Crack* and *Hole* the metal pipe cleaners carry much of the structural integrity as they act both as necks and to keep the feathers attached to the bodies. Due to the porosity of bone, there is a risk of the corrosion staining the back of the figure's heads and breast bones (Godfrey, n.d.). If the corrosion is allowed to go on it will eventually consume the metal until only fragile corrosion products remain and the point will be reached where the structural integrity of the figures is compromised. Yet if the RH is lowered even below 45% the structural integrity is again at risk as the major component of the artwork, bone, is susceptible to cracking in dry conditions (Stone, 2010). Though it was stated in an interview with the artist that despite there being a wish to allow deterioration and not necessarily viewing it as a problem, even aesthetically pleasing in some circumstances, it is not acceptable to allow complete failure of the structure or the disappearance of material.

The needs of the rest of the materials in the artwork must also be compared to each other. Several characters have plastic components, though it is not known what type of plastic it is. Since plastic is a diverse material that reacts differently to the environment depending on the type of plastic it is not possible to determine an ideal condition. Types that are susceptible to hydrolysis require dry conditions of around 30% RH while types that are plasticized by water must be kept above 40% to avoid them becoming dry and crack. A more general humidity that is suggested is 55% with a temperature of 18 °C (Shashoua, 2008, p.195). The deterioration of the plastic parts could result in or contribute to deterioration of the other materials present in the artwork depending on whether it is benign or malignant plastics. Cellulose nitrate, cellulose acetate, plasticized PVC and polyurethane foams are all malignant and give off VOCs that harm other organic materials and corrode metal (Shashoua 2008, p.177). The character *Babydoll* is largely composed of a plastic doll. The deterioration of the body could in theory be mitigated by storing the figure in either cold or oxygen-free environments. Though the bones must not be placed in bags due to the risk of condensation and mould growth (Christensson,1999, p.174), not to mention the risk of the VOCs increasing the speed of corrosion developing of the presently stable metal. The price and space needed to store the figure in either environment assumably make the options unfeasible.

Despite mitigation of the plastics deterioration likely not being possible, *Babydoll* can be stored in a separate box to protect *Rosa* and *Bonecreeper* which it currently shares a box with. However, making new boxes for *Babydoll*, and *Mr. Sadman* (to separate it from *Loverboy*, *Hole* and *Crack*) would take much space in the storage area if their current boxes are not replaced with smaller ones. Making boxes require both time and finances, though premade ones can be bought to save time and if deemed clean enough the old ones can be reused for other object to save material and money in the future.

Glass and textiles can be stored under 50% RH (Koob et al. 2018, p.147; Ludwall, 1999, p.140), however, for some of the other less major material in the artwork such as acrylic paint and leather the risk of damage increases below 50% RH. Paint layers become more brittle and below 35% the risk of cracks and loss increase, it also becomes more sensitive to mechanical stress from handling. (Daly Hartin & Baker, 2018). Leather loses some flexibility below 40%, making it prone to cracking and tearing (Angus et al., 2016, p.115) though, as the leather boot

is not a moving part it should not be considered a concern. While the lifespan, of, paper would be greatly increased by storing it below 20°C it can still be kept at this temperature and 50% RH (CCI, 1995), as can the wax (Ortiz & Boró, 2012, p.226).

The risks and advantages of different conditions that the figures can be stored in must be weighed against each other and values must be applied to the materials to conclude which is to be prioritised. In an interview with the artist Tilda Lovell the answer to the question of whether some materials are more important than others was initially no. Then it was stated that bones and skulls convey something about "existence" and inhabit a meaning that the other materials lack. Much focus was put on the bones and the meanings they inhabit. It was also stated that mass-produced materials can be replaced without problem as long as the new and original material look alike or even that deterioration is such materials can be aesthetically pleasing. After the interview it seems as though the animal bones in the artwork are what could be called *material as signifier*. Though, the other materials are not assigned as merely *structural*, i.e., that they have no meaning or significance, as this was not discussed and would be a rash interpretation (Gordon, 2013, p.2).

To circle back to the figures *Hole* and *Crack* and the corroding pipe cleaners it is clear that the needs of the metal and the bone conflict with one another. It can be interpreted that if needed the pipe cleaners which are mass-produced may be replaced whereas the bones would be much more difficult to replace and carries integral values and significance. The emphasis that was put on the bones and their meaning does suggest that they ought to be prioritized when deciding on environmental conditions for storing The Choirproject.

Despite giving the museum the right to determine an acceptable and unacceptable degree of deterioration for themselves, it would no doubt be beneficial to further question Lovell on the subject. It was made apparent through the interview, and the information that it gave, that dialogues with artist are priceless. Lovell has made it clear that she desires for The Choirproject not to be forgotten due to deterioration and that she wishes to be contacted and given the chance to aid in the conservation of the piece. Oftentimes the intention of an artist is not apparent (Hermens, 2005, p.398) and it then becomes the conservators' task to decipher meanings and values to plan for an artwork's stewardship (Hummelen & Scholte, 2004, p.208). Though why would a conservator not form a relation with the artist rather than taking the role of an interpreter? By involving the artist, it establishes an understanding of the intentions and ensure that the artwork is treated or allowed to age in accordance with those intentions (Sturman, 2005, p.394).

7.2. Storing the weather balloon

Anoxic environments are used to eliminate any exposure to oxygen to evade oxidation, the primary cause for deterioration of rubber (Hacke et al. 2014, p.182). Though it has several drawbacks. Much space is required in the storage area due to the bag needing to be larger than the object to avoid damage from the decreasing internal pressure when the oxygen is removed (Child, 2002, p.175). Sealing the bag is difficult as the least bit of unevenness in the seal gives access for oxygen to enter the bag (Lønnve, 2003, p.12) and the seal needs to be at least 1 cm wide or if its thinner there should be two parallel ones (Lønnve, 2003, p.11). It may even be advisable to seal the bag containing an object in yet another bag to avoid the risk of leaking (Dyer et al. 2011, p.6). On top of the difficulties, the materials are not cheap (Lønnve, 2003, p.12). Though as the balloon is not a large object and can be folded the issue of space efficiency should not be a big concern and the sealing can be done with a portable heat sealer rather than a larger model, or preferably with the much easier alternative which is a clip. After

being opened and closed several times the clip loses its effectiveness (Mitsubishi gas chemical, n.d. p.10), however, as there are no plans of exhibiting the artwork in the near future, the only time the bag will be opened is to replace the adsorbents. The clip can thus be used for many years. When a heat-sealed bag has been opened it must either be big enough to make room for a new seal or a new bag must be bought. A larger bag takes up more space and requires more adsorbers, using a reusable clip is thus not only easy but also cost efficient and saves space in the storage area.

The new balloon is currently stored in a fridge inside a plastic bag in a closed plastic box. Rubber is safely stored at 9ºC (Blank, 1988, p.82), while fridges usually have a temperature below 8ºC, around 4-5 ºC that should presumably be an acceptable temperature. Being stored in the fridge has surely decreased the deterioration of the balloon seeing as a 5-10ºC drop in temperature halves the speed of oxidation and hydrolysis and inhibits migration of plasticisers (Shashoua, 2008, p.203). However, there are several risks that arise from low temperatures such as great shrinkage and increased brittleness, though as the balloon is not a composite object and will likely not be handled much the main concern is development of condensation. As long as the object is less than 1cm thick, which the balloon is, there should be no risk of condensation (Shashoua, 2008, p.204), yet the original balloon developed condensation after being removed from the fridge for analysis. The balloon had been folded which might have caused the exterior layer and inner layers to reach cold and then ambient temperatures at different rates, leading to condensation. If this is the case, then the balloon must be stored flat to avoid condensation which due to its sheer size is not possible in a fridge. In 2024 the artwork is planned to move to a new storage facility with a cold room available which is around 5ºC. The room will primarily be made with photographs in mind, and it cannot be taken for granted that there would be room to spread out the balloon.

Cold storage is seemingly not as commonly used for storing rubber as oxygen-free alternatives and the research and documented use of it on rubber is lacking. Since the field trial at the British Museum between 1991–1995 when anoxic storage was tested and the re-examination in 2011 the use of storing plastics and rubber in oxygen free environments seem to have become practice. The results from the re-examination showed that despite the adsorbers not being replaced and oxygen entering the bags the enclosure had a mitigating effect on the deterioration. The lack in experience and knowledge of storing rubber in cold or freezing temperatures and the proven effectiveness of anoxic environments suggests that the most suitable option for storing the new balloon would be to make an oxygen-free enclosure.

To make a suitable anoxic storage for the balloon the widely used barrier film Escal is advised. Though it may be more expensive than Cryovac BDF-200 which was used for the field trial in the British Museum, which seems to be preferred for projects with tight budgets, it has lower permeability and is more tear-resistant (Shashoua & Skals, 2004, p.61). To remove oxygen from the bag suitable adsorbers (e.g. oxygen scavengers) are needed. Common adsorbers such as Zeolite 4Å, activated carbon, silica gel and Corrosion Intercept have been found to not only be less effective than previously believed, but also to adsorb plasticisers, making them unsuitable (Shashoua et al. 2014, p.7). And the MicroChamber® General Purpose Black/White Paper, which has been shown to decrease emissions of VOCs, even poses a risk of becoming a source of VOCs upon saturation (Hacke et al. 2014, p.187). Ageless oxygen adsorber is maybe the most typically used adsorbent in combination with Escal. Though the reaction when oxygen is adsorbed is exothermic which both makes the Ageless package hot and raises the RH while the RP System Type-K is humidity neutral (Grattan & Gilberg, 1994, p.212). In order to avoid any risks of deterioration due to humidity RP System Type-K is to be the preferred adsorbent. To ensure that the bag is free from

oxygen after sealing, and to determine the need for replacing adsorbers in the future, the oxygen indicator Ageless eye can be placed in the bag.

7.3. Conclusion

By using the decision-making model developed during the research project *Modern art: Who cares?* the meaning and condition of the artwork as well as limitations in finances and space were considered and weighed against each other. The most important aspect however was the artist's intention, the alternatives could only be properly considered after interviewing the artist. Lovell explained in an interview that there is no meaning or message behind the artwork and that focus lays on the process of creation. The focus which was put on the bones by the artist in the interview and the meaning that they were told to convey implies that bone was not merely used in structural purpose but is in fact the *signifying* material. The importance of the bones thus suggests that despite the diversity of materials, the needs of the bones should be a major aspect in the decision on which environmental conditions to store the figures in. Ultimately, to make a suitable climate for the bones the RH should be between 45–55 % and the temperature be kept under 25 °C. Though the metal must not be allowed to fully be consumed by the corrosion and risk the figures falling apart as this was expressed by Lovell to be the only truly unacceptable consequence of deterioration of The Choirproject. The other materials are not signifying material and are also unable to be separated to be given their own ideal conditions. Considering this they have been deemed to be safe staying in the environ that the artwork is being stored in and have been since 2008.

To protect the figure *Mr. Sadman* from corrosion products that can spread from the metal in *Loverboy*, *Crack* and *Hole*, it could be given a separate box. A separate box could also be made for *Babydoll* in the case of the figure's body giving off VOCs. To save space, the collective boxes that these figures are stored in at the moment should be replaced with smaller ones. Depending on whether the museum deems the conservators time or finances to be most restrictive, the boxes can be bought premade which saves time but is surely more expensive.

As for the rubber balloon, there is an extended research on and experience with storing rubber in anoxic environments within the field of conservation. And although low temperatures have an inhibiting effect on the deterioration of rubber it is not well enough explored in comparison. It is therefore a more suitable option to create an oxygen-free enclosure. The enclosure ought to be made in the barrier film Escal. Despite being more expensive than other options such as Cryovac BDF-200 which has been used in a field trial from the 1990s it is stated to have lower permeability and be more resistant to tearing. To simplify the sealing a clip can be used rather than heat-sealing. As Ageless® raises the RH in an enclosure and several other common adsorbers have been proven to adsorb plasticisers the most suitable option is the RP System Type-K. The Type-K adsorbs oxygen while being humidity neutral. To monitor the oxygen levels the indicator Ageless® eye should be placed in the bag.

It is the authors hope that this document can be used as a reference of the materials current condition when monitoring developments in deterioration of the artwork in the future as well as be a guide to the artist intent and wishes for the artwork's longevity. Though, the importance of forming a relation to the artist and upholding a dialogue must be emphasised seeing as it is unmistakably a crucial tool to gain key information on the artwork. In order to avoid The Choirproject fading from memory and ensuring that the original intent will be respected, the artist should be allowed the role of an active participant it the artworks safeguarding.

8. SUMMARY

The Choirproject is a mixed media artwork of an animation and nine sculptures in various materials such as metal, bone and a rubber balloon. The piece was created in 2005 by artist Tilda Lovell and bought the same year by the Gothenburg Museum of Art.

The study has used a combination of literature review, documentation, analysis and artist interview to examine the artwork. The literature review was used to determine the ways in which the materials in the artwork are composed, their deterioration processes and what conditions pose threats to them. Several paradigms in conservation theory were discovered and used to discuss how to weigh values in the artwork against each other. The review also allowed for assessing the success in case studies where rubber was stored in anoxic and cold environments as well as the effectiveness of different adsorbers and barrier films. FTIR analysis was done to identify the rubber balloon as either natural or synthetic. Though the results were inconclusive it is reasonable to believe that it is synthetic. By interviewing the artist, values, interpretations and the process of creating the artwork was elucidated and an insight was given into the artist's opinion on deterioration and conservation. Through documentation of the figure’s corrosion of metal pieces on a number of figures was found.

In the discussion the climate conditions needed for corroding metal and other materials was compared to the environmental needs of bone as well as the sufficiency of inhibiting the deterioration of rubber with anoxic or low temperature environments. The study concluded that bone is a signifying material and thus must be prioritised when deciding on climate conditions for the storing of the figures. The artwork should thus be stored at 45–55 % RH and below 25 °C. It was also concluded that, due to lack of knowledge about cold storage in comparison to the experience of anoxic storage within the conservation field, it is most suitable to store the balloon in an oxygen-free enclosure. Suitable materials are Escal barrier film, a humidity neutral oxygen adsorber such as RP System K type and the oxygen indicator Ageless® eye. Further research is needed to identify the type of wax and plastics used in the artwork in order to determine their exact needs for preventive and remedial conservation. It is also required to research preservation of time-based art to tackle the threat of the video becoming outdated and unable to be exhibited.

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Figure 6 and frontpage picture: Marianne Gråhn/Sveriges Radio. (2011). Körprojektet av Tilda Lovell [photo]. In Kvinnor i nytt ljus på Göteborgs konstmuseum. Sveriges radio. https://sverigesradio.se/sida/artikel.aspx?programid=83&artikel=4445828

Figure 8: Olsson, M. (2008). Från pressmeddelandet: Tilda Lovell, Körprojektet [photo]. Alingsåsiana [blogg]. http://alingsasiana.blogspot.com/2008/07/tilda-lovell-i-kanontornet-i-grfsns.html

Figure 9: Hammarström, C. (2005). Ur “Körprojektet” [photo]. In Skeletten sjunger. Aftonbladet.

Appendix 1. Transcription of interview with Tilda Lovell

Zoom möte 21-05-07 (46.43 min)

Närvarande: Lee Andersson och Tilda Lovell

Vissa utfyllnadsord och långa stakningar har uteslutits från transkriberingen samt ett parti som var ohörbart pga. dålig uppkoppling.

Lee Andersson: Jag tänkte att du kunde få börja med att Beskriva Körprojektet.

Tilda Lovell: Ja, det är en. En animation som är tror ja är tio minuter lång, som föreställer en grupp med gestalter som dockor eller skulpturer av olika material som framträder liksom och sjunger olika sånger som berätta lite om deras liv, och deras liv kan ju vara allt från. Det handlar väldigt mycket om deras egen tillblivelse som skulpturer och som väsen. Och sen verket som Göteborg har, har hela rekvisitan också, så då är det alla gestalterna från filmen som är en del av verket. Man kan ju visa filmer för sig också, men det här är ju hela installationen så att säga.

LA: Så vad handlar konstverket om? Finns det någon särskild berättelse eller känsla som du hoppas att det förmedlar?

TL: Jag brukar sällan tänka så med mina verk att jag ska förmedla någonting speciellt, utan det är en process som pågår, där jag av någon anledning av massa olika anledningar har lust eller drivs till att göra någonting. En sak föder en annan hela tiden när jag varit väldigt mycket, mycket så med det här verket. Sedan finns det en massa berättelser i (verket) och massa anledningar till att jag gör de gestalterna. Samtidigt så finns det massa anledningar. Samtidigt så är det bara vad som blev. Det är mycket som utgår från det undermedvetna, men det kan man ju tolka, analysera. Men om man lyssnar på vad de berättar så berättar de ju ganska mycket om hur det är att existera och hur det är att leva, och hur det är att dö kanske? Eller det var på något sätt min tanke om det. Det är genom deras röster. Och för mig har det varit- ja men en sak som jag minns att jag upplevde när gjorde det verket var att jag gillade kanske mycket att det var så dynamiskt att göra det. Jag fick vara allt. Jag fick vara kostymör, jag fick vara regissör, jag fick göra låtar, jag fick sjunga, jag fick spela instrument. Jag fick styra en hel liten teater. Och det blev inte alls vad jag hade tänkt. Jag hade tänkt att de skulle sjunga tillsammans, men de kom nästan inte dit mer än till sista låten, för att alla hade liksom någonting att säga själva.

LA: Vad är den viktigaste aspekten med verket?

TL: Vad menar du med det?

LA: Jag tänker, är det. Nu sa du att det inte är kanske direkt någon berättelse som ska förmedlas men jag tänker, är det kanske det materiella som är det viktigaste med verket, är det skapande processen eller någonting helt annat kanske.

TL: Svår fråga. Det är nog helheten som jag just pratat om att det kändes som att det var så kul att både göra skulpturerna är som var väldigt processartade med olika laddade typer av material. Och sen låta dem komma till liv i en animation. Det är så magiskt varje gång någonting börjar röra sig, både att både göra dem ifrån sina minsta beståndsdelar, som ett vitt

pulver som gips ihop med en gammal benbit som man har hittat någonstans. Och ja, det är nog det blandade. Fast skulpturerna tänker jag skulle inte fungera utan filmen. Så att filmen är- den är viktig. Sen blev det en bonus att jag kunde också ställa ut är alla gestalterna.

LA: Var det meningen från början att verket skulle bara vara en video?

TL: Nej det var det nog inte. Jag hade ganska mycket plats i ett galleri där jag hade fått en utställning, så jag hade nog tänkt att ha med dem, men jag kommer faktiskt inte riktigt ihåg, jag är inte hundra procent säker. Men jag tror det. Men det blir intressant en sådan här fråga som vi kommit till lite senare materialval och sådant.

LA: Ja precis. Du har ju använt mycket ben från djur. Är det viktigt vilka djur de kommer ifrån eller handlar det mer om uttrycket som ben ger?

TL: Det är bra frågor. Ja, det är viktigt vilka djur det kommer från. Fast inte så att ja tänker att det måste vara ett speciellt djur utan- men jag utgår ifrån det djuret som benet är ifrån. Ibland. Det är inte alltid viktigt. Ibland är det bara formen eller att det är ett stort ben som är häftigt. Det är mer en personlig historia, att om jag har ett hästbäcken- jag hittade det samt till exempel på Island, när vi var med Konsthögskolan på resa där så bodde vi ute i naturen. Det fanns nästan inga djur på Island, det var så himla konstigt där. Jätte levande natur, jag var väldigt intresserad av naturen, men djuren var borta, men det pyrde- det levde överallt i olika stenar av mossor och lavar. Men i alla fall då hittade jag i alla fall några ben där och bland annat ett häst ben som- boskap hittade jag, boskaps ben. Men det var mest att det var så himla- det var så, när man hittat - det blir som en trofé, eller inte en trofé men en- en skatt. När den är helt ren och, jag vet inte hur ren den var men, den var i alla fall inte illaluktande på något sätt. Och att jag kunde ta hem den i min resväska, det var lite kul, det tar så mycket plats i min väska och får man lov att göra så här, spännande. Men sedan så blev den en del av ett djur som inte alls har med häst att göra. För visst är det nära stora *Till havs* figuren som har den? Så där har den ingenting med hästen göra, men däremot *Till havs*- att *Till havs* har en ett haj gap, de har med- då tänker jag att det har med havet att göra, så jag blandar helt vilt liksom. Ibland hittar jag på att det är ett visst ben och så är det ett annat. Om jag hade velat att det skulle vara ett älg ben så hade jag sagt att det var ett älg bäcken kanske.

LA: Okej, för du gav museet en lista över material och där står det till exempel hästbäcken och skulderblad från älg. Så då undrade jag hur du visste var det kom ifrån men då kanske du inte är helt säker?

TL: Jo, dem här är jag helt säker på.

LA: Men hur kunde du veta det?

TL: Ja, kanske inte var lite sådär på Island- att på Island finns inga älgar. Det var ett stort bäcken. På Island finns inga älgar, så det måste varit kanske en ko eller häst och så kanske jag googla eller frågan om, eller så fanns det inte ens ko på Island. Jo det måste ha funnits, men så är det ju liksom. Jag frågar och googlar och kollar vad det kan vara. Jag är ganska intresserad, så jag kollar skillnaden på ett bäcken från en räv och en grävling, till exempel i böcker eller på internet.

LA: Så du gör så med alla ben du hittar då?

TL: Nej inte riktigt alla men ibland. Ibland, gissar jag, har jag lärt mig en del också, om det är väldigt lätt till exempel så är det ofta en fågel för dem om man stora porösa delar i benet så ska dem ska kunna flyga. Ett svan ben- vissa fåglar i alla fall- så svanar till exempel hade jätte

lätta ben, då lärde jag mig det när jag fick reda på och- ja- beroende på var man hittar dem och hur en skalle ser ut som de här två som sjunger. Det tror jag var ejdrar. Ser då ser man att näsbenet är lite rakare på ejdrar, så kanske det är spetsigare på en skrake eller så där. Och sedan spelar det ingen roll mer än- att i det här fallet kanske mer än att de är fåglar.

LA: Är det viktigt för verkes integritet att de här materialet förblir original?

TL: Ja. Det är en sådan sak som jag funderar lite på. Jag är lite osäker på vad jag tycker. På ett till det rent spontant sätt, så ja, då vill jag var den här schamanen som får ut någonting av- det finns en laddning i själva benet. Och sen så vet jag inte egentligen hur mycket av laddningen som ligger där i, eller att det finns en sådan direkthet- att jag bara kan ta ett ben och bara föra in den, göra ganska snabbt. Istället för att gå in i en process där jag ska ta form på benet, då blir ett helt annat förhållningssätt till det här materialet. Man måste ta form när man gjuta det i ett annat material och så måste jag patinera det materialet så att det ser ut som ett ben. Det blir en resa som är bort från naturen istället för att använda den direkt. Så ja det finns det i mitt eget direkta skapande, men jag har också funderat en del på det här för det är ju- jag tror att de många konstsamlare som kanske inte är så bekväma med att köpa konst som innehåller ben och naturmaterial som kan förgås och sådär. Ibland om man vill att det ska- ja -så jag funderar på det om jag skulle göra- jobba mer så. Och ibland gör jag det, men det tar mycket längre tid och som sagt vad, man kom en liten bort från det här direkta. Men det är ju smart, tänker jag, att göra så. Men jag är inne på att tänka och prova det lite mer, men jag har inte gjort det så mycket.

LA: Men om vi utgår från hela verket med alla dess material, är det viktigt att alla material förblir original i framtiden?

TL: Det beror på vem som skulle göra om det. Om man skulle ha en jätteduktig konservator som skulle byta ut ett ben och göra allt det där jobbet, lägga ner massa timmar på att ta benet, gjuta av det benet, gjuta det i ett annat material och patinerade så att det ser ut som det gamla benet så skulle det inte göra mig någonting faktiskt. Fast då skulle man vara- då skulle det verkligen behöva se ut som att det var ett riktigt ben.

LA: Och om konservatorn bytte ut det med ett äkta ben, vore det mer okej?

TL: Ja ett äkta ben som var i lite bättre skick då eller? Har de- är dem dåliga eller?

LA: Nej, jag bara tänkte att det är bra att veta i framtiden om någonting händer med något material som helst.

TL: Absolut, om det- de skulle kännas mer- det skulle kännas bättre. Det ska kännas som att det är lättare blev likt då. Och jag tänker nog på att jag vill åt den här illusionen om att det är riktiga ben ändå för det mesta. Och den där väder ballongen till exempel, den har redan hon redan bytt ut en gång, i latex. Så det spelar ingen roll för det är massproducerade saker, så det gör ingenting. Om man skulle behöva byta ut det så- så det är inte så att det är just den här väderballongen som jag hade i min källare i fem år, som jag fick av den killen. Den var viktig. Det spelar ingen när den ser likadan ut.

LA: Så jag hade ju faktiskt en fråga som handlar om att byta ut material i framtiden på grund utav nedbrytning. Så då var frågan, om det viktigaste är att det nya materialet är så likt original materialet som möjligt eller om det är någon annan aspekt eller någonting som är viktigare?

TL: Ja det är en svår fråga, jag skulle kunna säga det- ja, nu ja det viktigaste är att det är likt, och sedan när vi väl står där då skulle jag kunna säga nämen det här ser mycket bättre ut. Den som inte alls är lik fast det är ett- ja vi säger ett helt annat ben från ett helt annat djur eller en-

ja. Det är svårt, det känns som att man vill vara med i framtiden. Fast ändå inte. Jag skulle säga att om inte jag är där så skulle säga att det viktigast är att det är likt.

LA: Så finns det något eller några specifika material i verket som är viktigare än andra?

TL: Nej, jag tror inte det. På något sätt- viktigare i vilken aspekt då?

LA: Jag tänker kanske om det är några material som förmedlar en känsla eller någonting bättre än andra?

TL: Ja, jo det skulle- då skulle det väl finnas- tänker jag, ben är ju ett sådant material. Ben och skallar och så tycker jag har någonting som förmedlar någonting om existensen mer än allt annat.

LA: Skulle du kunna beskriva själva processen av att skapa Körprojektet?

TL: Det var så länge sedan, men det är ett verk som jag kommer ihåg ändå. Allting går liksom- det är liksom inte en rak följd, utan det går verkligen så här, om vart annat. Jag hade- jag kan säga var några punkter så kan du skriva ihop det sen. Men jag hade hjälp av min tjej som jag hade då, som hon hjälpte mig jättemycket, både när jag behövde gjuta av den kroppsdel så ställde hon alltid upp. Hon är med i massa skulptur som jag har gjort, och här var hon en sån som höll i trådarna, det är trådar på en del skulpturer, fiskelinor så att de kan röra sig. Men det var nästan omöjligt att vara själv, i alla fall på den tiden. Det ingen sådan här bluetooth fjärrkontroll då till den kameran. Så vi var två i perioder, väldigt intensivt jobb och animera, alltid såhär att man- för det var inte kopplat till en dator eller någonting så man ser ju- man göra någonting som så intensivt i 50 minuter och sen så får man titta på hur den där sekunden blev. Sen så- ja men bit för bit så- djur för djur så dök de upp, nu var det den och nu blev det den här, och hade nog inte bestämt alla som skulle vara med från början, utan det var något som växte fram i tiden. Jag kommer inte riktigt ihåg vilka jag börja med, men det var som- en skapas i balans till någon annan, till exempel om jag hade gjort den här- att man har gjort- att det blir ett gäng där folk är lite olika, den här tunna tyll klädda gestalten med bockskägget, är det Nils Ferlin han sjunger? Den här dikten. Efter den så blev det kanske någon som har mera köttig och äcklig på ett annat sätt. Den började väl med skelett och så med tiden Den började väl med spelet och såg med tiden så är- vad ska ni ha för kläder? Ja men kläder så att man ser genom till skelettet, så blir det tyll. ja men det blir lite så här queer något sätt. Jag tycker att verket är ganska queer egentligen. Det har inte blivit så mycket uppmärksammat som det, ändå har jag umgåtts mycket i sådana cirklar och varit med på olika festivaler och sådant med andra filmer jag gjort. Men den här har inte blivit riktigt sedd så, det tycker jag är lite konstigt. Lite smaltänkt, för jag tänkte att de är ganska- det finns någon liten twist i allihopa tror jag, det handlar ganska mycket om könsroller, eller att- ja- olika representationer av män och kvinnor, och jag också använder min röst som som att jag blir både bäbis och man och sådär. Det var en del i min sådan historia också, det här verket under den tiden som jag kom ut, kan man säga. Men mycket kring det där. Men det är väl bara ett i uppsättande av olika ben och sen så när gestalten finns så börjar den röra sig och då kommer jag på att- hur sången ska vara utifrån hur kroppen ser ut. Har du några frågor? Jag känner att jag kan prata om allt här nu.

LA: Ja nej men det är jätteintressant att höra och helt ärligt, jag blir jättenyfiken på att du sa att verket är queer. Jag skulle jättegärna höra mer om det om du vill prata om det.

TL: Ja, men jag tycker att. Att- men bara det att det är min röst som gestaltar till exempel den här är *Loverboy* till exempel, den som går med en pinne. Att det är min röst. Den är inspirerad av en skånsk kille som jag känner som jag tycker att han har en sådan mörk röst men ändå

väldigt så här lite mjuk med lite töntig samtidigt som den är fascinerande, den är fin. Så att bara försöka hitta den där rösten i den där apparaten och sen prata om att den är- att det är en väldigt feminin man som på något sätt, tänker jag då- jag vet inte riktigt-andra kanske inte alls uppfattar det här som jag, som har varit en stor och viktig del för mig. Och i sångerna i texterna också. Och när man hör fåglarna som sjunger, den ena fågeln sjunger att den- ja i texten som var den ihop med en viss fågel och sen så träffade den en annan fågel och var otrogen mot den fågeln och den- den sjöng att det var olika tjejer. Jag måste liksom gå tillbaka i minnena och försöka gestalten dem här. Och den här är figuren som är gjord av madame Tussauds vax som snurrar omkring. Den är en docka- den är mer en- den sjunger om att- det är mer en uppläkt kvinnokropp, som inte är någonting annat än en kropp, den är mer kanske en feministisk kommentar eller hur man ska säga- den talar om hur det är att kvinna eller en syn på kvinnan som- ”Jag är varm jag är kall, bered mig till din njutning, öppna mig, gå på tå, se mitt huvud tomt som få”. Att det är en deppig bild av en kvinna. Ett offer på något sätt. Men det finns lite- alla har inte tragiska historier. Alla är trasiga också och talar väl mycket om den- om de sidorna, om svårigheten att leva eller vara. Att göra rätt eller göra- ja, det kanske är därför de inte kunde jobba tillsammans eller också för att de var så- de kunde det till slut, men det var svårt att få ihop dem.

LA: Vi skulle kunna gå vidare till nedbrytning och konservering.

TL: Ja.

LA: Alla material bryts ned med tiden och vissa är känsligare än andra. Är det viktigt att konstverket förblir visuellt det samma eller accepterar du att det åldras`?

TL: Precis, det där tänker jag jätte ofta på. Där känner jag att det är lite konflikter, att jag inte riktigt alltid tar ställning, för hade jag har bara varit själv hela världen, så tror jag att jag gärna hade velat att verket skulle åldras precis som allt annat gör. Och att om jag använder sådana material så är det en del lag av det egentligen. Fast sen så hamnar man i gallerivärlden och konstvärlden där saker ska säljas och representeras. Och de flesta är väl så att- köper man ett verks så vill man ha det verket så att det ser likadant ut om 20 år, så jag kan sälja det vidare om jag vill eller ta upp det från min källare och titta på det igen. Eller jag vet inte. Det är någonting äckligt med nedbrytningen, man vill inte bli påmind om den heller tror jag att många tänker. I alla fall, vi rädda för döden och förändring och sådant, det blir en symbol för någonting som är vackert och fortsätter att vara det. Så där är jag lite mitt emellan. Det här verket gjorde jag ganska snart efter att jag slutat skolan, tror jag. Och då tänkte jag nog inte på att en latexballong skulle gå sönder. Jag har gjort mycket grejer i latex men jag- idag håller på med latex, jättemycket latex så jag- just i dag alltså, på morgonen. Så jag håller fortfarande på med det men nu gör jag det med en medvetenhet om att nu vill jag göra det här, nu vill jag hälla latex över den här stora skulpturen för att jag vill att den ska åldras. Och jag älskar latex, för det är så himla lätt att jobba med och det är ett naturmaterial som går bra ihop med saker och det förändras och jag vill se att det förändras. Men då är ett beslut som jag taget, nu skickade jag i det här verket, nu skiter jag i att det här verket ska se likadant jämt ut, utan nu tar jag det till en process. Jag tycker det är intressant att tänka på sådant, jag vill inte vara bunden till att -men det behöver inte alltid vara så, för det man gör är också en del av- jag vill också kunna göra verk som kan säljas. Men ibland så kan det ju bli att man - det blir en växelverkan i hur jag jobbar. Ibland så gillar jag det här snabba jobbet, att jobba på teater till exempel där man gör rekvisita och gör masker och saker som ändå ska kasseras sedan som kan vara i de här snabba materialen som är förgängliga och snabba. Det finns någon lags frigörelse i det och det finns en konflikt i det till konstvärlden, tycker jag. Jag gillar egentligen att jobba så, men jag lär mig också hela tiden att jobba i hållbarare material för att det är roligt att kunna ha dem kvar, att

inte förändras också jämt. Så det är både och. Ibland är det viktigt, och ibland är det inte viktigt, jag tycker att det är viktigt att tillåta mig själv att göra det. Jag tvekade väldigt mycket den här gången om jag skulle göra det fast jag hade bestämt att jag skulle göra det så blir så feg för att nu kommer jag aldrig kunna sälja det här verket kanske. Ja men då är lusten är viktigare än det då.

LA: Det här verket är ju redan köpt av konstmuseet, så du behöver oroa dig för att det ska vara säljbart. Så hur känner du inför att just det här verket åldras?

TL: Kul. Väldigt, väldigt kul att dem köpte det verket. Och ibland tänker jag på det verket, och hoppas att det inte har gått några djur i det som förstör Rembrandt målningarna i rummet bredvid. Jag tänker på det ibland, om jag har gjort någonting dumt.

LA: Jaha nej.

TL: Det är ju deras ansvar. Jag tror att det är lite olika till hur man förhåller sig till det. Jag vet inte riktigt. Men jag blir jätteglad för att ni hör av er och jag hoppas att de ska höra av sig och att det inte bara blir bortglömt och kasserat eller någonting utan att det fortsätter att få leva genom att, är det något problem så hör man av sig så kommer jag kunna hjälpa till.

LA: Förändras verkets mening på något sätt av att materialet åldras och bryts ned?

TL: Ja det kan det göra. Det kan det göra beroende på hur, hur det ser ut. Det kan ju vara ganska roligt med en ballong som är helt trasig och hänger i trasor, men den kan ju se- om ett ben bara helt försvinner så kan det förändra meningen. Så det är en avvägning hur man tycker att- var gränsen går på något sätt. Om det helt försvinner, då blir det lite- ja var går gränsen för det? Men det vet inte jag, men det finns väl någon gräns. Ibland kan jag tänka så här att men jag har jobbat med latex och sålt någonting- eller vax. Gult vax. Det var en människa som hade ganska gul färg och den såg fortfarande ut som en människa som var kanske nydöd eller levande, mittemellan eller någonting, som jag sedan fick se på bild och då var den helt jävla orange. Och då kände jag att det här skulle jag kanske vilja restaurera genom att måla den fint så att den fick tillbaka sin ursprungsfärg, för det visste inte jag då. Så det kan vara lite olika. Men till en viss grad så tycker jag att det inte gör någonting, att det inte är det viktigaste och att det finns- kan finnas någonting fint i det också, till viss grad. Men inte om repen går sönder och alla delar ramlar loss. Ja du fattar.

LA: Ja. Men om ett material blir väldigt illa nedbrutet eller förändras dramatiskt, hur skulle du vilja att det åtgärdas?

TL: Jag skulle nog gärna vilja att dem tog kontakt med mig med förslag på åtgärden.

LA: När du skapade det här verket, hur länge tänkte du eller hoppades att det skulle leva?

TL: För alltid. Jag tänkte inte så mycket på det då. För alltid, nej jag vet inte. Inte för alltid men så länge jag kunde tänka mig, det var ingen sådan tanke direkt. Jag vet ju att om man tänker efter så vet jag ju att brons håller i flera hundra år och det gör kanske inte allt, men jag tänkte inte då på att det skulle brytas ned. Inte ens väderballongen tänkte jag då.

LA: Då hade jag några frågor om videon. Vi har redan berört den lite, men då undrar jag hur viktig videon är för verket och vilken relation videon och figurerna har till varandra?

TL: Ja att videon är ursprungstanken med det här verket, att göra en film med de här gestalterna. Sen under processens gång insåg jag kunde- att det också blev skulpturer som jag kunde

använda och ställa ut. Och då arbetade jag på skulpturerna så att dem kunde fungera som entiteter och stå själva och kanske fästa några delar som tidigare hade rört sig.

LA: Så jag bara undrar vilket format videon är?

TL: Ja precis men den frågan läste jag- eller det. Jag tror att den är på en DVD. Och att det är 4:3. I bildstorlek alltså. Jag tror att det är en AVI fil, som jag inte vet om de har på minnessticka också eller om den bara är bränd på DVD. Men jag har originalfilmen kvar om det skulle vara så att den är förstörd eller någonting men jag hoppas att dem har fått den digitalt också. Och att det är 4:3 man använder så, som en TV, inte so men widescreen film, 16:9. Och att den är i- alltså att om man visar den ihop med skulpturerna så ska den visas stor. Helst på väggen så att filmen inte blir jätteliten. Men det kan också vara en mindre skärm. Och ljudet är viktigt då också.

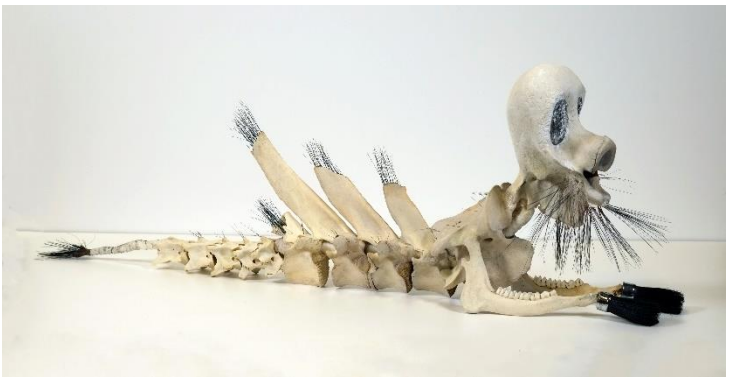
LA: Skulle videon- skulle den kunna ställas ut separat från figurerna, är det en helhet, dem och videon ihop?

TL: Nä det skulle den kunna göra och det har jag gjort flera gånger också. Ställt ut videon separat. Jag har bara sålt den i ett ex, och det skrev jag skulle vara ett unikt ex vilket var lite- ja. Men det gjorde jag då och då var det- säljer bara en video och ihop med den här skulpturgruppen så dem är dem ända som har köpt den, Göteborg. Men sen har jag visat den på olika ställen på mindre – jättestora projektioner och mindre TV skärmar och så.

LA: Ja, det var alla mina frågor. Känner du att du har fått säga allt som du ville ha sagt?

TL: Jag skulle kunna säga en sak till som jag inte riktigt vet om man uppfattar, men som jag antar att man uppfattar men som ändå är viktigt för mig. Det här med innehållet i texterna som jag tycker är- att- jag vet inte riktigt hur jag ska formulera det men att det ofta handlar om just- att det handlar om själva materialen. När dem sjunger, en del av dem pratar bara om sin tillblivelse, att- och att det refererar mycket till hur jag jobbar, att det är så processartat arbete. Och att jag utgår mycket från materialen som vi har pratat om, att jag hittar ett ben som kan få mig att tänka på en person som har en viss röst eller att- ibland att det finns sådana element i min process men att det de sjunger om ofta handlar om själva tillblivelsen av sig själva. Som ger den här existentiella biten som också finns i användandet av ben, att återskapa någon gestalt som tidigare har levt som har dött som jag tar upp och skapar en ny identitet av och att den pratar om hur den är gjord. Som den här kravlande figuren som har borstar till armar, den pratar om vad den är gjord av. Och även de här två rådjuren som sitter ihop, de sjunger ” I am one and I am one, we are one together, rubber feet, paper teeth, made of bone and leather”. Ja, jag vet inte riktigt vad jag vill säga med det men det känns som att det hör ihop med både existensen och materialen, när vi ändå pratar om material.

Appendix 2. Condition reports



nvNr: Sk 821 a

Titel: Bonecreeper

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Roe deer, moose and sheep vertebra, acrylic paint, plaster of Paris, expanded polystyrene (EPS), paper clay (das), gauze, steel wire, wood glue, glue from glue gun, graphite, paint brushes, wooden stick.

Age: 2005

Dimensions: H: 27cm B: 17cm D: 77cm

Description.

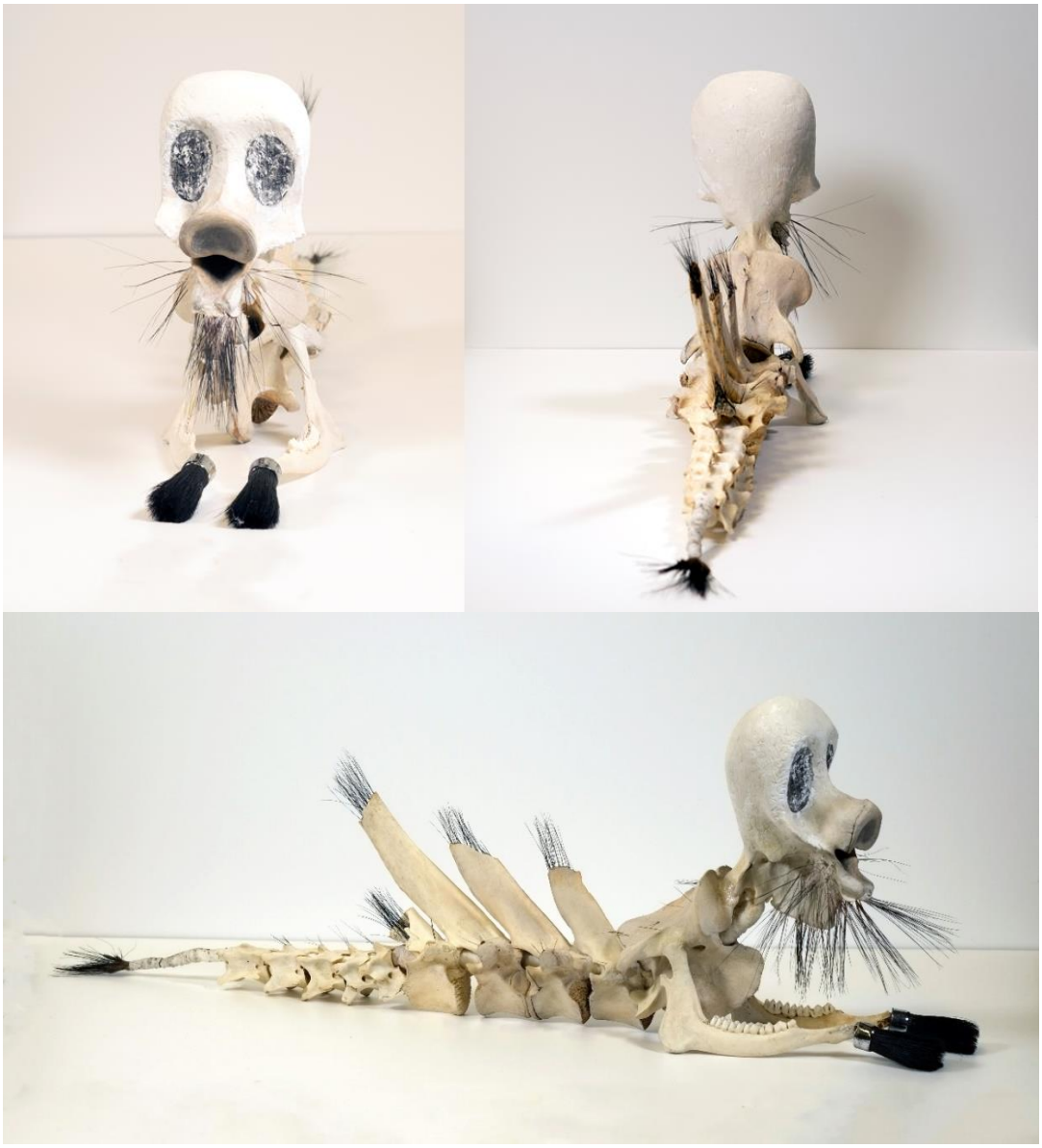
The figure is long and made of bones with frontal appendages with paws of paintbrushes. The body is made of vertebrae with high spinus process with bristles on top. The body ends in a tail with a bundle of bristles. The head has few features with black eyes and a beard of dark bristles. The head could possibly be sculpted with plaster of Paris with the snout being a moose vertebra. The large black eyes are drawn with graphite and the snout and inside of the mouth are also darkened with graphite. Beneath the mouth is a flat bone pointing downwards, it could possibly the “spinous process” of a vertebra. On the bone are long rough black bristles.

The upper body underneath the head is possibly another vertebra, it is attached to the head with glue from a glue gun. On each side is an appendage consisting of a large lower with teeth. At the ends are the ferrule and tuft from paint brushes, resembling paws. The ferrules are metallic, possibly nickel-plated steel, the tufts are black, likely synthetic. The brushes are attached with steel wire and glue. The elongated body consists of vertebrae from roe deer, moose and sheep. There are four thoracic vertebrae with tall spinus process that point upward with bristles at the top and five cervical vertebrae. From the head and along the inside of the body is a spine of unknown material, possibly a wooden stick and EPS wrapped in gauze. Where the vertebrae end the spine acts as a tail with a tip of a bundle of bristles.

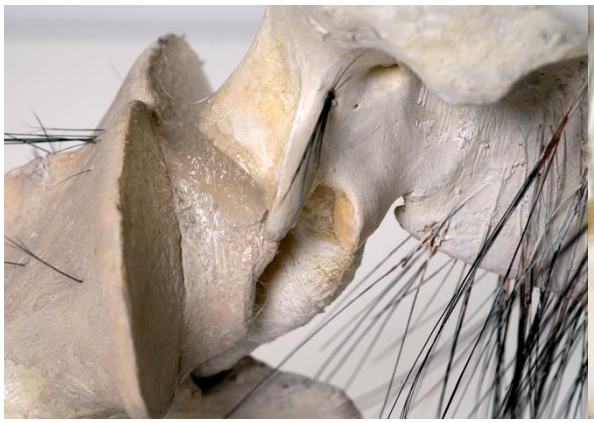
Condition assessment

The figures condition is stable. No alarming sign of deterioration can be seen, though where the jaws are attached to the body there as thin cracks that can lead to detachment from the

body in the future as well as for the glue joint between the head and body. The gauze in the tail is dirty.



The character Bonecreeper seen from the front, back and right.



The head and body are attached with glue.

The paintbrushes are attached with wire and glue.

nvNr: Sk 821 b

Titel: Babydoll

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Plastic doll, roe deer skull, plastic eyes, acrylic paint, glue from glue gun, steel wire, rubber foam, human hair, paper clay (das).

Age: 2005

Dimensions: H: 27cm B: 19cm D: 15cm

Description

The figure has the body of a doll and head of an animal skull with human hair. The figures body is a pinkish plastic doll shapes as a baby, the head is a roe deer skull covered in paper clay and painted paint to match the body's colour, assumingly with acrylic paint. The snout is bulbous with small nostrils. The skeletal structure appearance around the eyes. The eyes are plastic with green- blue colour, the sides are painted the same colour as the face. Next to the eyes are small, round ears presumably originally belonging to the body, these are attached with steel wire penetrating the ear close to the tragus and entering the eye socket.

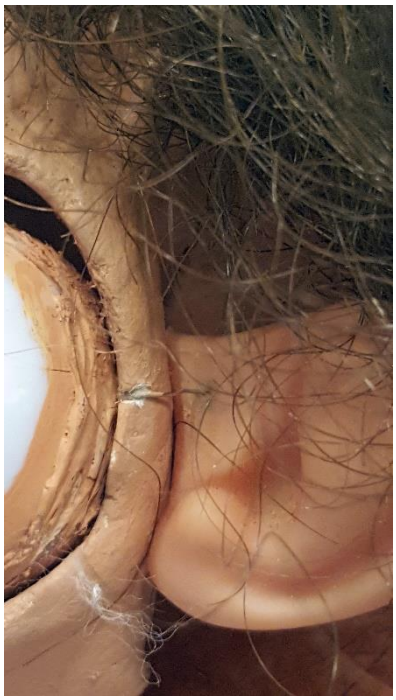
The inside of the mouth is painted in the same colour as the face, there is a tongue of pink foam rubber, possibly from a paint roller, there seem to be a metal piece glued to the underside. Beige foam rubber covers the underside of the lower jaw. The upper row of teeth is presumably from the roe deer skull with frontal teeth made of unknown material. The bottom row of is plastic or rubber with large sharp canines. Atop of the head is a set of wavy brown human hair. It is unknown exactly how it is attached but a net like fabric underneath can be seen. The head seams attached to the inside of the body with a frame of steel wire and glue.

The legs are attached to each other with steel wire that runs between the inside of the thighs and under the butt. Glue, possibly from a glue gun, can be found in large amounts both on the underside of the thighs and in the groin.

Condition assessment

Overall, the condition is fairly stable though strands of hair are detaching from the head and the steel wire enters the plastic ears there are grey discolouration. Small amounts of paint are missing from each steel wire.

The character Babydoll as seen from the front, back, right and left.



There is grey discolouration of the plastic ear from the steel wire.

Dear deer

nvNr: Sk 821 c

Titel: Dear deer

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Fake fur, newspaper papier-mâché, chicken wire, rubber, roe deer skulls, wood glue, fabric, steel wire, plastic eyes, glue from glue gun, acrylic paint, water colour, expanded polystyrene (EPS).

Age: 2005

Dimensions: H: 53cm B: 50cm D: 40cm

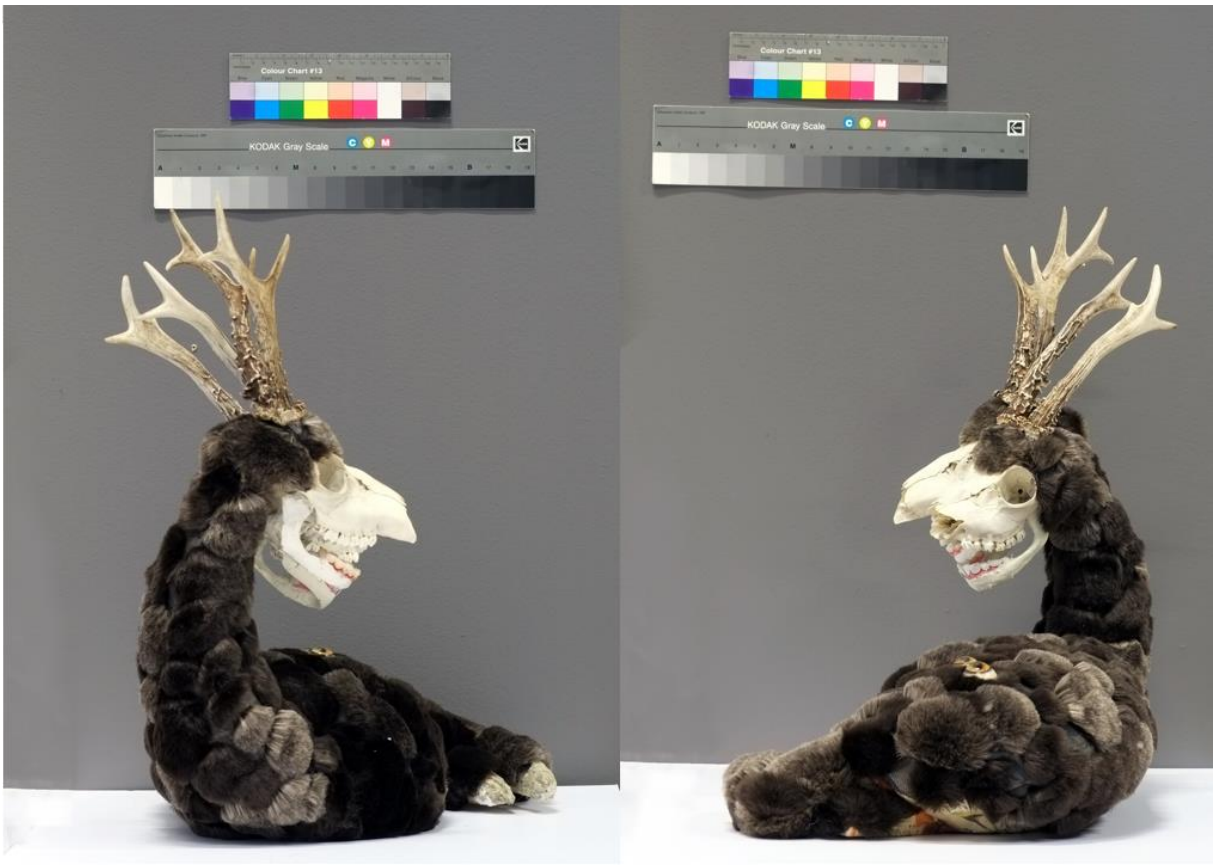
Description

The figure is constructed of chicken wire and papier-mâché of newspaper covered in fake broen fur. It is laying down with the hindlegs bent against the body. There are no frontal legs. It has a tall, raised neck that ends in two roe deer skulls with antlers, the right head is slightly higher than the left. The antlers on the right head has three points and the left head has two points. The fur is applied in circular patches in 2-3 brown nuances. There are several open areas between the fur where an underlaying black, netlike fabric and newspaper can be seen. On the figures lower back is a pair of yellow eyes with hints of brown and black horizontal pupils. The legs end in a set of feet of expanded polystyrene (EPS) covered in a rough and uneven layer of papier-mâché. The EPS is visible in small areas. The faces are skulls from roe deer with empty eye sockets. The upper rows of teeth in both heads are from the skulls whereas the lower rows are white rubber teeth with pink gums. The rubber teeth in the left head seems painted with white paint. The lower jaws are possibly made of a white plain weave fabric covered in papier-mâché and painted white. Both lower jaws are penetrated by four pieces of steel wire in front of the teeth.

Condition assessment

The figure is in a stable condition with no clear signs of deterioration other than yellowing of the newspaper.

The character Deer dear seen from the front and back.



The character Deer dear seen from the right and left side.

The paper on the feet is yellowed.

In the lower jaws are pieces of steel wire inserted.

nvNr: Sk 821 d

Titel: Crack

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Bird skeleton, feathers, wooden glue, steel wire, gauze, leather shoe, pipe cleaner, glass eyes.

Age: 2005

Dimensions: H: 16cm B: 23cm D: 29cm

Description

The figure is a bird made of a bird skull, the breastbone from a bird and a leg made of small bones wearing a white shoe. On each side of the body and on the lower back are brown and white feathers. The skull has a long and flat beak, in the eye sockets are small white glass eyes with round pupils. Connecting the head to the body is a thin neck of two white pipe cleaners that are tied together with white thread. The pipe cleaners go down the length of the back of the body that consists of a bird's breast bones.

On the right side of the back of the body are two more pipe cleaners underneath white tape. On each side of the lower back are thin vertical pieces of wood beneath white tape. On the front of the body are small pieces of gauze and white tape. A vertical crack runs along the length of the body on the right side. On each of the characters shoulders is a feather. The feathers are brown and runs down to approximately the figures knees. The feathers are inserted onto pipe cleaners that are attached to the back of the body. The figures right wing is dishevelled and brown with one side of the upper half of the vane being white. The figures left wing is dark brown on one side of the vane and light brown on the other and has a white tip. Inserted onto the pipe cleaners that make up the spine is a tail of a dishevelled brown feather that is white at the bottom.

On the characters right side of the lower body is a leg made of two-three bones joint together, on the foot is a small white leather boot with lacing of red thread. The sole is brown with small nails and what seems like white blu tak (häftmassa in Swedish), a synthetic rubber compound that is commonly used as a pressure-sensitive adhesive. On the right side of the shoe is remnants of a word or name in blue ink. A small piece of gauze is wrapped around a part of the upper leg. The knee joint is connected with steel wire and a metal loop.

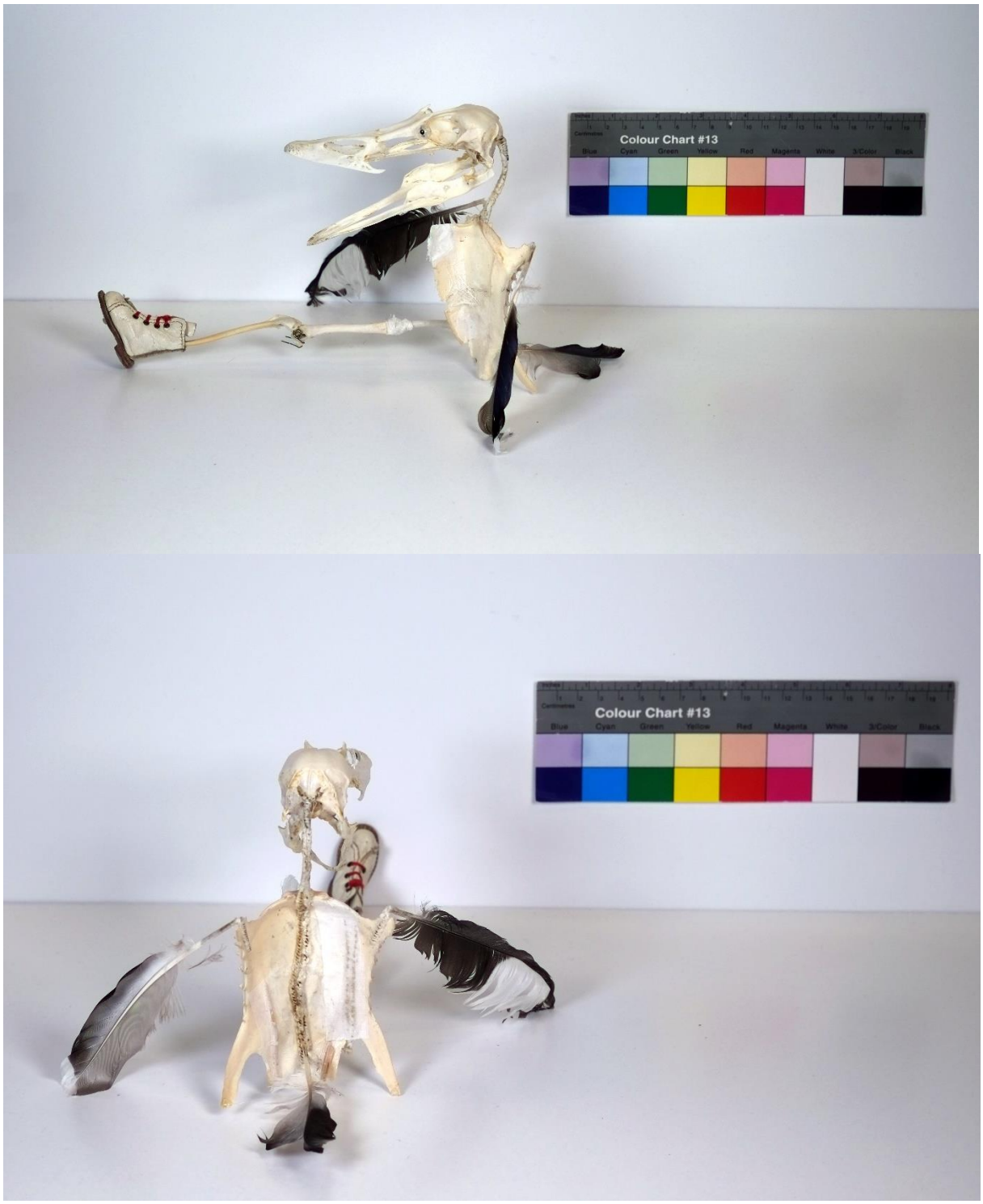
Condition assessment

All pipe cleaners are corroded, one of the pipe cleaners that makes up the spine is especially orange and has lost much of the bristles. The feathers are deteriorated to different degrees. The feather on the figures left has thin tares in the vane where the interlocking has opened up, the barbs on the edge of the light brown side are detached from the interlocking and the bottom of the vane the barbs are raged and completely separated from each other. The feather on the figures right side is heavily deteriorated and ragged with large gaps in the vane that separate the barbs into clusters and a portion of the lower part of the vane missing. The shaft of the tailfeather is broken and there is dirt in the fluffy part of the vane closest to the body. Some barbs in the lower part of the vane are bent and there are large gaps in the interlocking. A large part of the upper vane is missing on one side.

The character Crack seen from the front.

The shaft of the tailfeather is broken, parts of the upper vane is missing and the vane close to the body is dirty.

The pipe cleaners on the back are orange from corrosion.



The character Crack seen from the left side and from the back.

nvNr: Sk 821 e

Titel: Hole

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Bird skeleton, feathers, wooden glue, steel wire, gauze, ceramic, pipe cleaner, glass.

Age: 2005

Dimensions: H: 33cm B: 15cm D: 14cm

Description

The figure is a bird made of a bird skull with glasses of mirror glass, the breastbone from a bird and legs made of small bones wearing a cowboy boots. On each side of the body is a pair of brown feathers. The bird skull has a long and flat beak, in the eye sockets are small white glass eyes with almond shaped pupils. Above the eyes are a pair of rectangular glasses of mirror glass and steel wire. Connecting the head to the body is a thin neck of two white pipe cleaners that are tied together with white thread. The pipe cleaners separate into two at the back of the breastbone. Two more pieces of pipe cleaner are attached to the sides of the back with white tape and at the bottom centre of the back is a thin vertical wooden stick. Covering the breastbone are several small circular holes. There is a crack along the figures outer right side and missing material in the breastbone beneath the crack. On each of the characters shoulders are two feathers attached to pipe cleaners. The vane on one side is dark brown while the other is a light reddish brown on all feathers. The feathers on the figures left side are dishevelled. The legs are two bones that are connected with glue, steel wire and thread. The cowboy boots are shiny black ceramic with painted orange patterns and rim.

Condition assessment

The feathers are deteriorated with small holes and large gaps in the vane and bent barbs.

The legs are stuck in a bent position, unable to be straightened.

The character Hole seen from the front and back.

The character Hole seen from the right side. On the right is photo documentation by the Gothenburg Museum of Art, presumably from 2005. The character was at that time able to stand up.

The left feathers are deteriorated with gaps in the vane and bent barbs.

The pipe cleaners are corroded.

nvNr: Sk 821 f

Titel: Mr Sadman

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Expanded polystyrene (EPS), fabric, glue from glue gun, thread, plaster of Paris, paper clay, bone, matchsticks, wood glue, acrylic paint, hare shoulder blade, roe deer antler, skull, human hair.

Age: 2005

Dimensions: H: 54cm B: 16cm D: 13cm

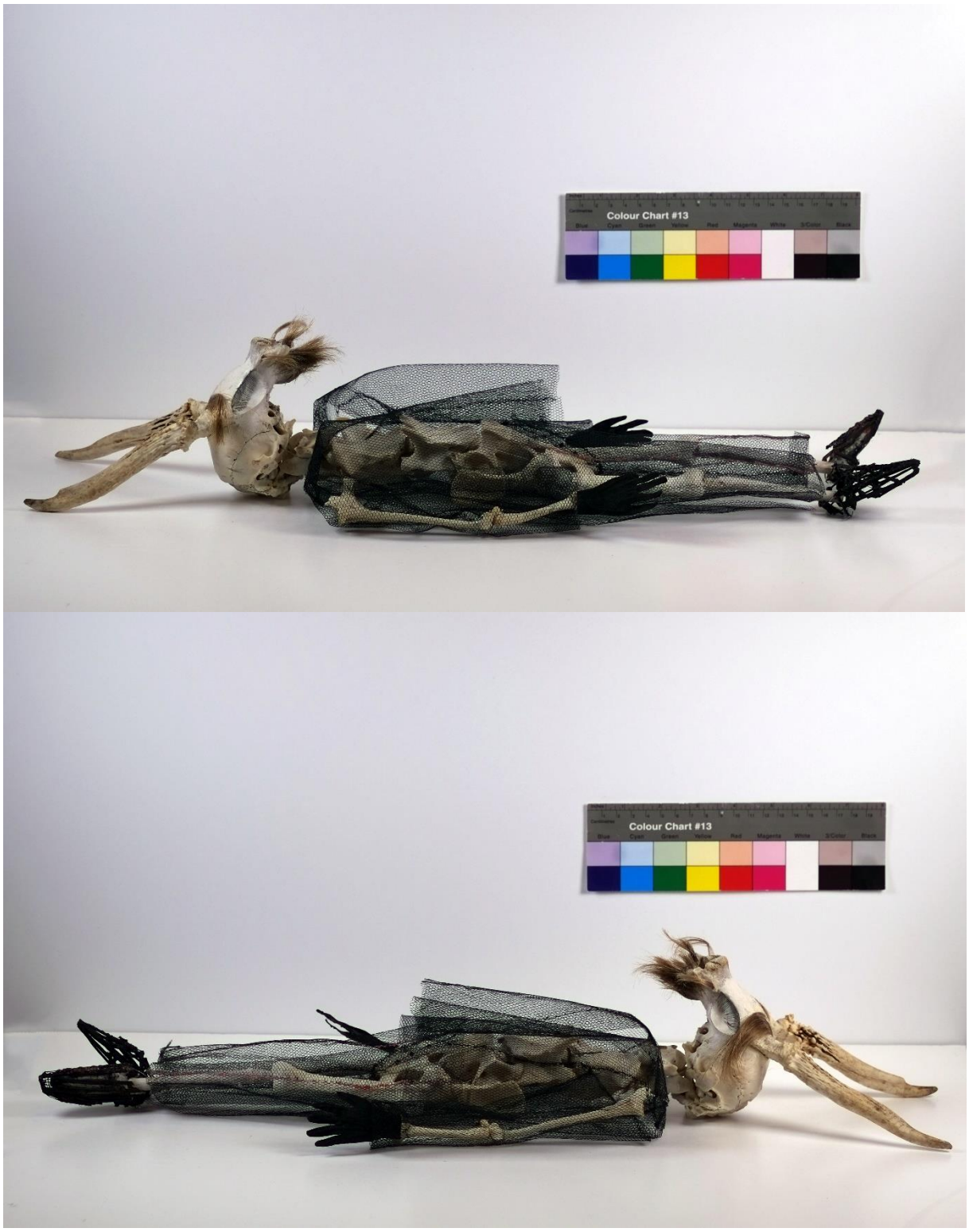
Description

The figure is made of bone, it wears a black tulle tailcoat, shoes and gloves. It has brown hair, beard and moustache and a pair of antlers. The figures head could possibly be the back part of a roe deer skull, a vertebra as the snout and plaster of Paris. The back of the head distinctly resembles a skull with a pair of antlers without points. In front of the antlers is brown human hair that has been parted in the middle. There are almond shaped indents as eye sockets with fake black eyelashes following the upper edge of the eye sockets. The snout has thin vertical nostrils and on each side is a long protrusion to which a bundle of hair is attached like a moustache. Below the snout is an open mouth, with a larger bundle of hair attached underneath as a beard.

The head is connected to the neck and spine with steel wire and white pipe cleaners. The spine is made of bone, possibly vertebrae which are held together with glue, steel wire and white thread. A pelvis is connected to the spine and legs with steel wire and white thread. The upper part of the legs is bone, and the lower part is cylindrical wooden sticks that are painted white with presumably acrylic paint. Attached to the end of the wooden sticks are shoes that are constructed with matchsticks and glue from a glue gun that is strung between the matchsticks. The shoes are painted black except for an EPS core in figures left shoe. On the left shoe are also small red patches. The shoulders are presumably shoulder blades from a hare. The arms are made of two bones that are attached to each other with steel wire. At the end of the arms are hands of black fabric in two layers. Between the layers is a skeletal structure of steel wire. The figure is wearing a tailcoat and pants of black tulle fabric, presumably synthetic fibre. The tailcoat has buttons of black thread and the pants have a thin red line on each side of glue from a glue gun.

Condition assessment

The figure is in a stable state. There are no signs of deterioration.



The character Mr. Sadman seen from the right and left side.

The bones in the arms are connected with steel wire.

The head is connected to the neck with steel wire and white pipe cleaners.

nvNr: Sk 821 g

Titel: At sea/ Till havs

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Wood, moose shoulder blade, horse pelvis, shark jaw, cotton, gauze, wood glue, glue from glue gun, latex hose, latex gloves, latex weather balloon.

Age: 2005

Dimensions: H 90 cm, W 46 cm, D 50 cm

Description

The figure has a head of a horse pelvis and sharks jaw with wooden legs that end in moose scapulas. On top of the wooden legs are gloves and draping the back of the figure is a weather balloon. The horse pelvis turned upside down with the jaws of a shark in the hollow space in the middle. The jaws are attached with glue from a glue gun. Above the upper frontal teeth is grey blu tack (häftmassa in Swedish), a synthetic rubber compound that is commonly used as a pressure-sensitive adhesive. The ends of the bottom of the pelvis are wrapped in gauze and connected to two rectangular wooden sticks, one on each side that goes down to the floor, acting as legs. At the top on each side, grasping the wooden sticks, are hands made of white latex gloves.

At the bottom of the sticks are shoulder blades from a moose, acting as feet. On the left shoulder blade is faint scribbles from a graphite pencil. The shoulder blades are glued to the sticks with glue from a glue gun as well as tied with rectangular brown latex hoses with a red interior. Draping the back of the character is a cream-coloured meteorological weather balloon in latex. The nozzle is secured into a space in the upper part of the pelvis and drapes slightly over the gloves and down to the floor.

Condition assessment

The original balloon is heavily deteriorated, the colour has become brownish yellow with brown blotches. Much of the balloon has become dry and brittle and large areas has cracked and fallen off in small pieces. The surface is covered in a white powder which is likely plasticisers or other additives that have migrated. The gloves are heavily deteriorated and have become stiff and extremely fragile. There are large cracks and loose or missing material, there are large tears where they are attached to the wooden sticks. The original white colour can be seen where the balloon has covered the gloves from exposure to light, but the fingers are a strong yellow colour. The latex hose is deteriorating with a large number of small cracks and the glue on the left wooden stick has detached from the shoulder blade, leaving the latex hose as the only thing connecting the stick and shoulder blade. It is unclear when the joint failed, but it was first documented in 2015. The gauze wrapped around the wooden sticks close to the gloves have yellow stains. The jaws have sand and possible other dirt in the rows

of teeth which can absorb moisture, no signs can be seen of detaching of the joint that keep the jaws in place. The replacement balloon which was bought in 2015 has presumably become slightly discoloured, there is a strong vinegary smell, and the surface is covered in white pounder, presumably migrated plasticisers or other additives. There are no signs of tears or cracks.

The character At sea/ Till havs seen from the front, back, right and left.

The character At sea/Till havs seen from the front without the weather balloon.

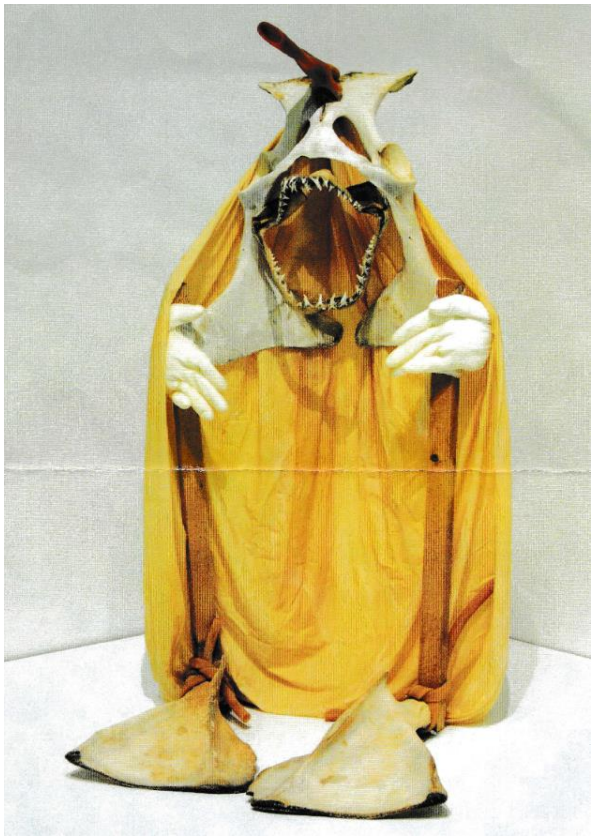
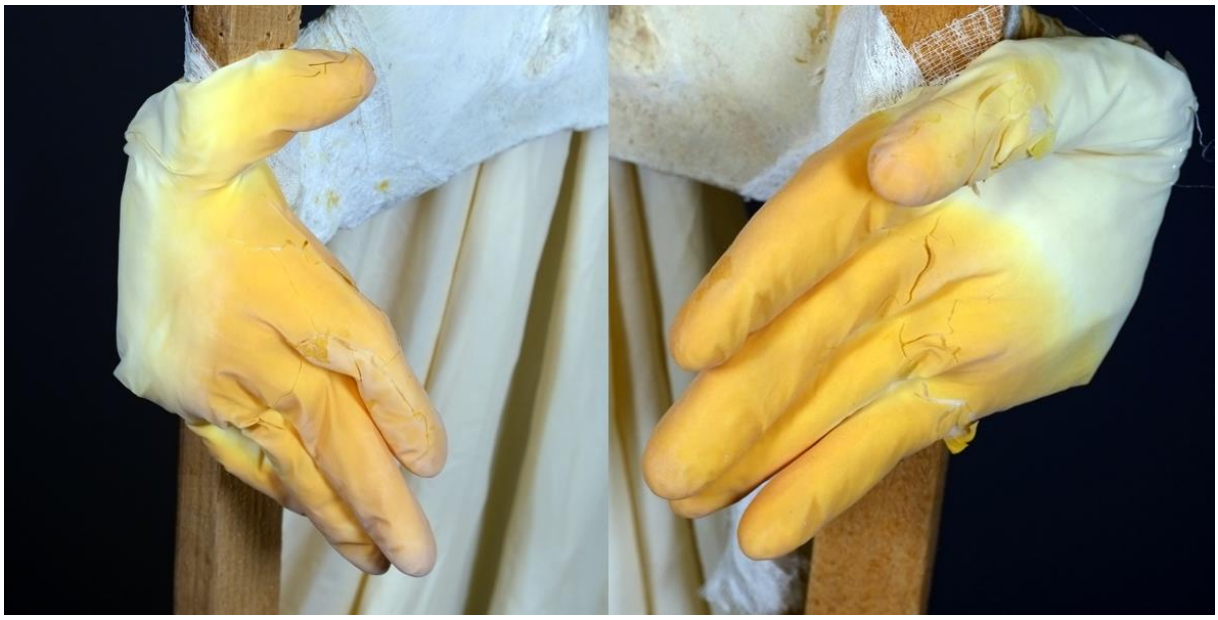


Photo documentation of the character At sea/Till havs
by the Gonthenburg Museum of Art from 2008.
The latex gloves had not jet deteriorated.



The gloves have become yellow and cracked. There is a clear line where the balloon protected the gloves from light.

Photo documentation of the character At sea/Till havs by the Gonthenburg Museum of Art from 2015. The gloves have become yellow and cracked,

The glue between the wooden stick and the moose scapula has detached from the bone.

The hoses that are tied around the wooden sticks and scapulae has developed cracks.

Photo documentation of the character At sea/Till havs by the Gonthenburg Museum of Art from 2015. The joint had opened up.

Areas of the balloon have become dry and fallen off into hard and brittle flakes leaving holes.

There are dark spots on the balloon in the areas of lighter colour.

Brittle and yellowed flakes from the original balloon.

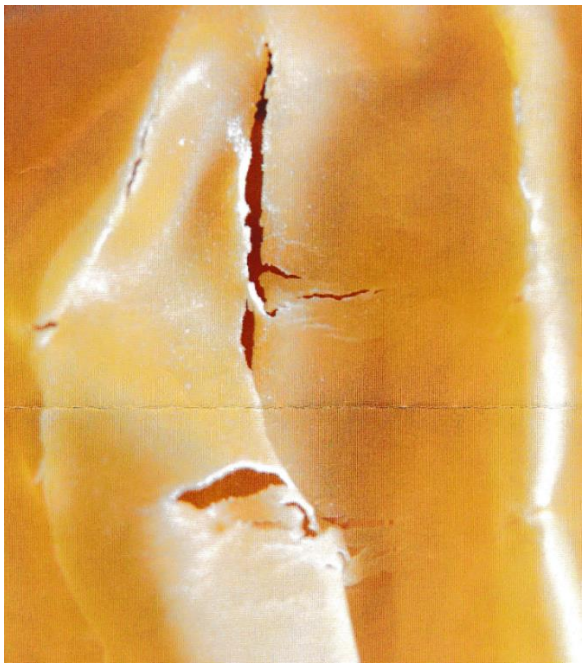


Photo documentation of the character At sea/
Till havs by the Gonthenburg museum of Art from 2012 of tears in the original rubber balloon.

Full picture of the original balloon in its current condition.

Full picture of new rubber balloon on the left. Upper right shows white three-dimensional spots in the surface. Bottom right shows discolouration.

These pictures are not of the balloon that will be used in the case of exhibition but a smaller version which was bought from the same company, approximately at the same time and is stored in the same conditions. It is thus a good reference of the possible condition that the new balloon may be in or at the very least shows the development of deterioration of rubber.

nvNr: Sk 821 h

Titel: Rosa

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Tussaudwax, modelling wax, fishing line, doll hair, plastic.

Age: 2005

Dimensions: H: 33cm B: 20cm D: 13cm

Description

The figure is rather flat and oblong and made primarily of beige wax. The face has few features, the head is made of the scalp and hair from a doll. The body is covered in three dimensional shapes and at the bottom is a small plastic leg and three life sized fingers in vax. The arms are stumps with protrusions on the bottom. The face is simplistic with a wide, open mouth with thick lips, small round eyes without pupils and a thin convex line framing the eyes and mouth. The head is made up of the scalp from a pinkish plastic doll with short, curly blonde hair, possibly from the same doll as the character *Babydoll*. The face and body are sewn together with fishing line that is covered with modelling wax. On each side of the body is an arm without a hand and with five protrusions along the underside. The shape is possibly casted jaws from some animal with sharp teeth. On the back of the body the arms are attached with modelling wax. Tubelike shapes fan-out from the centre of the body. At the bottom of the body are three cast human fingers (index, middle and ring finger), connected to the body with modelling wax. Above the fingers on the figures right side is a small plastic doll leg attached with modelling wax. Atop the head, fishing line has been attached which the figure hangs from on display.

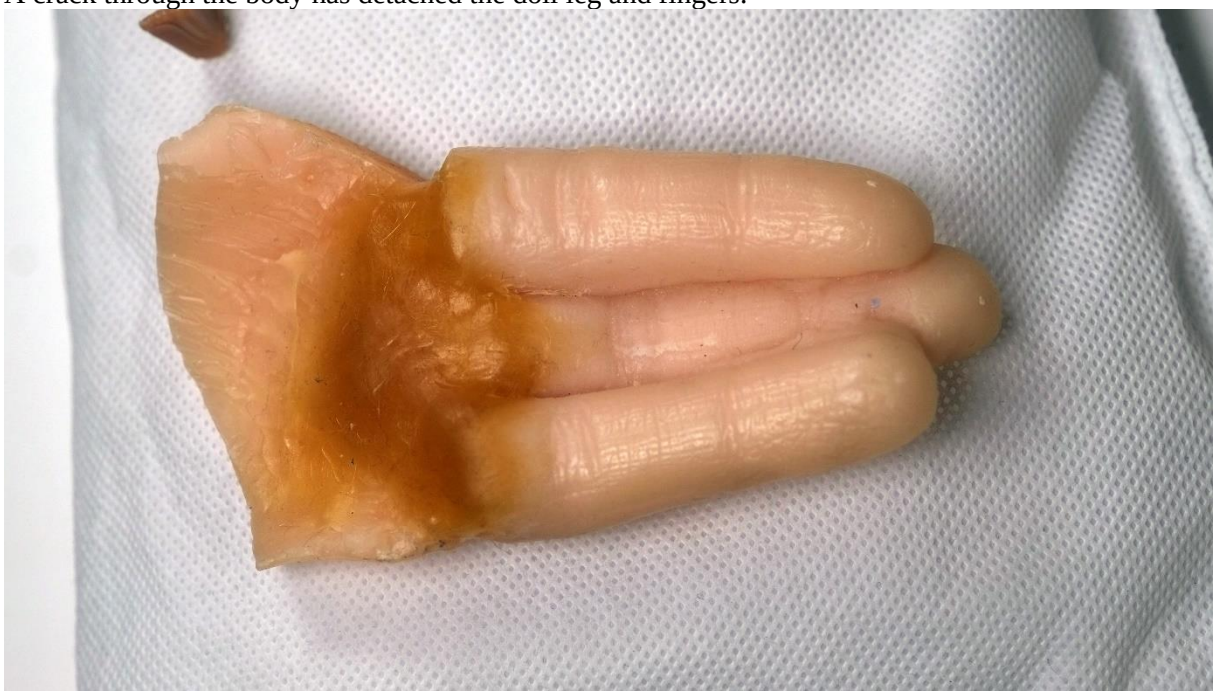
Condition assessment

The figure has severe structural damage, assumingly from poor support. In the hight of the plastic leg the figure has a horizontal crack that has completely separated the leg and fingers from the body. The joint of modelling wax in the neck has opened up almost completely, only the uttermost edge on the left side remains. The joints of the arm on the back could not be seen due to the fragile nature of the figure but they risk opening up in the future.

The character Rosa seen from the front.


The wax joint between the head and body has opened up and is kept together with fishing line.

A crack through the body has detached the doll leg and fingers.



The fingers are attached at the back with modelling wax.

nvNr: Sk 821 i

Titel: Loverboy

Object: Character from The Choirproject

Artist: Tilda Lovell

Technique: Installation, mix media

Material: Roe deer skull, paper clay (das), plaster of Paris, expanded polystyrene (EPS), bone tussaudwax, modelling wax, acrylic paint, glue from glue gun, plastic eyes from doll, wooden sticks, steel wire, wood glue, gauze, lacquer paint, bamboo stick, bird breastbone.

Age: 2005

Dimensions: H: 18cm B: 61cm D: 20cm

Description

The figure is made primarily of bone. The head is a skull, and the body is a bird's breastbone. Each leg is made of two bones joint together that are painted black at the bottom. The thighs are covered in EPS, gauze and steel wire. The nose is of wax and the eyes are from a doll. On the figures left side is a thin limb of bamboo. The head is the dirty skull from a roe deer, in the eye sockets, attached with a glue gun, are golden brown eyes from a plastic doll with surrounding plastic. The yes could possibly be from the body of the character *Babydoll*. The nose is shaped like a humans and casted in tussaudwax. There are small amounts of wax around the eyes, some of which is painted white. Around the nose seems to be a layer of white wax. Most teeth are from the skull aside from the frontal teeth. One upper tooth is possibly wax, the bottom ones are of unknown material. Above the upper frontal teeth and below the lower frontal teeth is yellow modelling vax. The lower jaw is glues to the skull with a glue gun.

Connecting the head to the body is a thin neck of unknown material, though presumably metal, wrapped in a white plain weave fabric. The neck is inserted in a cavity in the skull, either loosely attached or completely detachable. The upper body is a breastbone from a bird. The spine is attached to the back of the breastbone, it is covered with gauze. On the top left side of the breastbone a bamboo stick is attached with glue from a glue gun. The stick reaches to the floor and the lower quarter is painted white, presumably with acrylic paint. Below the breastbone are two legs, each consisting of two bones. The legs are attached to the metal spine with steel wire. The thighs are covered in pieces of expanded polystyrene (EPS), white plain weave fabric and gauze. Steel wire is wrapped around the uppermost part of the right thigh and above the joint connecting the left thigh and lower leg. The ends of the bones are painted black, presumably with lacquer paint.

Condition assessment

The steel wire wrapped around the legs is corroded which has discoloured the gauze, especially on the characters left leg. The top of the skull is dirty which might attract pests or absorb moisture. Aside from the corroding metal no deterioration was visible. Future detaching of glue joints is possible.

The steel wire wrapped around the legs are corroded and have stained the gauze.

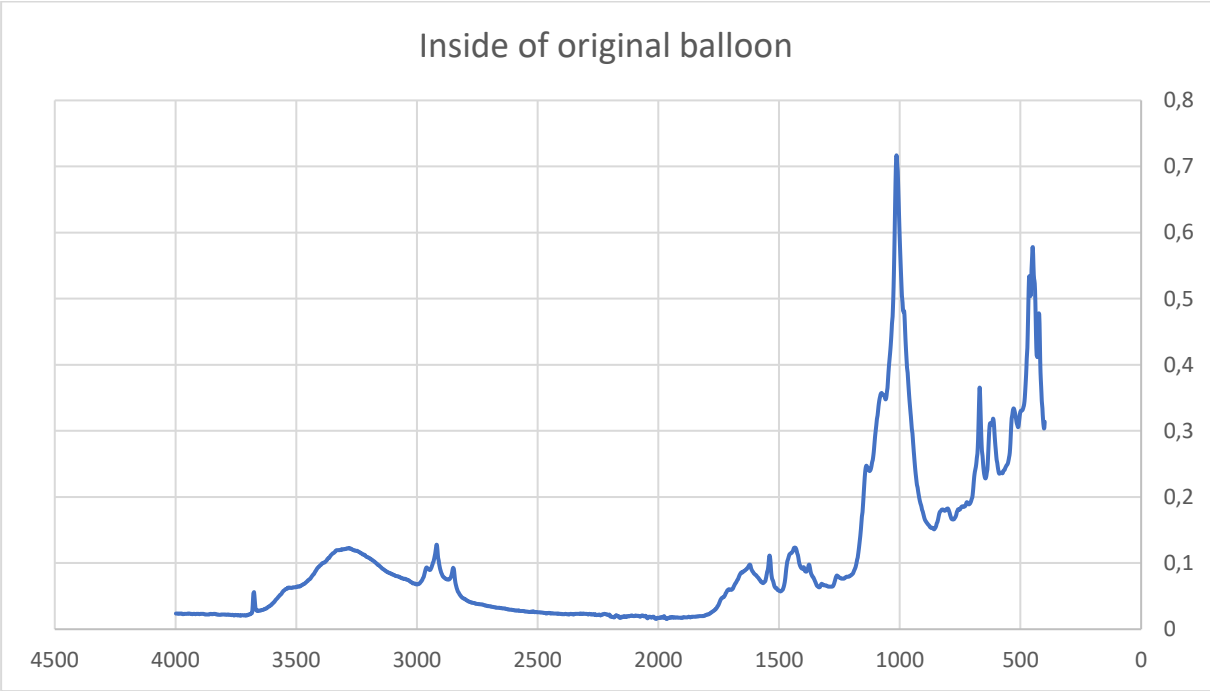
Dirt on top of the skull.

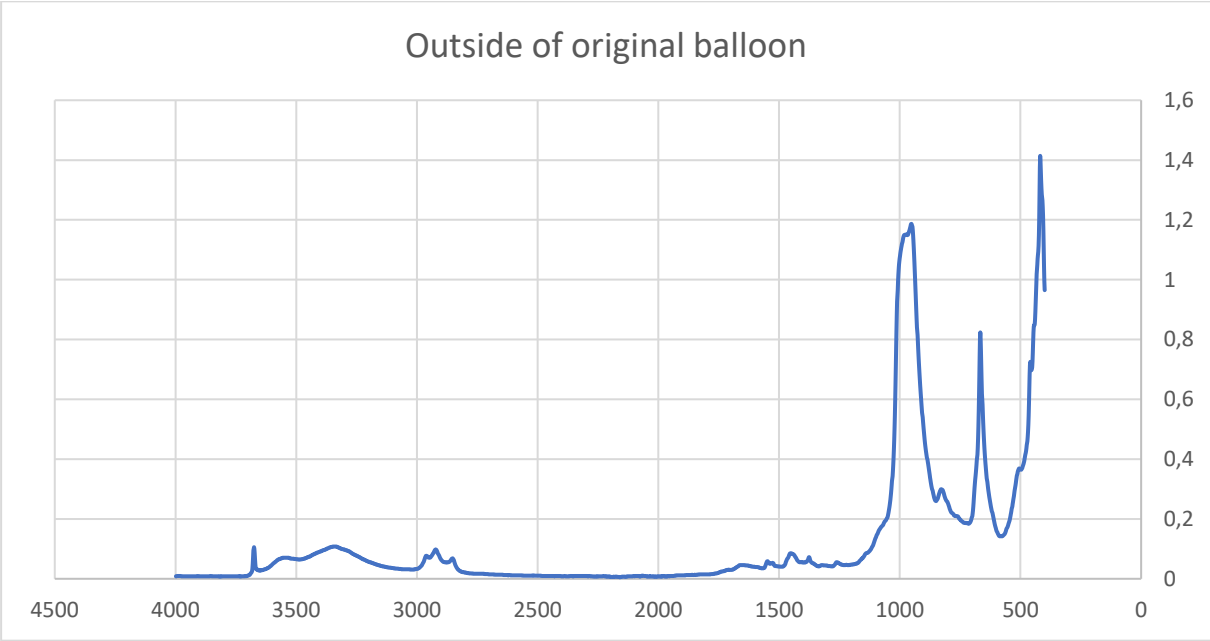
The lower jaw is attached with glue.

On the front of the jaw is yellow modelling wax.

The thighs are covered in EPS.

Appendix 3. FTIR spectrums






Muzzle of original balloon
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
4500
4000
3500
3000
2500
2000
1500
1000
500
0


Inside of new balloon
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
-0,05
4500
4000
3500
3000
2500
2000
1500
1000
500
0


Outside of new balloon
0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
-0,05
4500
4000
3500
3000
2500
2000
1500
1000
500
0


Muzzle of new balloon
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
-0,1
4500
4000
3500
3000
2500
2000
1500
1000
500
0