The Glow of Significance: Narrating Stories using Natural History Specimens

Rachel Tarn Pedder-Smith

A thesis submitted in partial fulfilment of the requirements of the Royal College of Art for the degree of Doctor of Philosophy

Royal College of Art

March 2011

Abstract

The subject of this project is natural history specimens and the exploration of their qualities in visual artwork. The first part is a 533cm watercolour painting composed of an image of at least one specimen (or part thereof) to represent each flowering plant family, of which there are 505. The *'Herbarium Specimen Painting'* was created using dried plant specimens from the herbarium collection at the Royal Botanic Gardens, Kew. The plant families are painted in systematic order following one of the recently developed DNA classification systems. The painting was produced with scientific rigor and under the constant supervision of Kew botanists. It aims not only to illustrate the chosen classification system but to explore the aesthetic beauty of herbarium specimens and celebrate many of the incredible and varied narratives contained within the Kew collection.

The second element of this thesis constructs a context for the above artwork among similar projects. Natural history institutions worldwide were contacted for information about artists using natural history collections to produce art with a strong narrative element that 'discussed' the notion of the specimen. These artists were then contacted and many interviewed. In parallel, the literature review concentrated on theories developed in the field of material culture where the human relationships between groups of objects are analysed. These theories proved fundamental and on occasion inspirational in uncovering deeper meanings and narrative possibilities.

The concluding section of this research discusses whether the findings of this project, which uses and develops material culture theory can contribute to that field of research. It analyses the possibility that specimen-based artwork can benefit science and/or help revitalise museum collections, and comments on whether institutions can improve the public communicability of the objects in their care by treating them as a potential source for new art.

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Permission to reproduce images included in this thesis has been granted by the artists, with the exception of Donald Farnsworth and Nick Knight (Figures 44, 46 and 72) where permission to reproduce has been sought.

Acknowledgments

To begin I would like to thank Jenny Edmonds and Margaret Tebbs who introduced me to RBG, Kew and the Leguminosae team all those years ago.

This project has been truly collaborative and would not have been possible without the help of many at RBG, Kew. Particular thanks go to Dick Brummitt for providing me with the classification system from *'Flowering Plants of the World'* pre-publication. For their time, help and suggestions my sincere thanks go to Bill Baker, Gemma Bramley, Gill Challen, Martin Cheek, Ruth Clark, Iain Darbyshire, Aaron Davis, Sally Dawson, Clare Drinkwell, David Goyder , Anna Haigh, Nicholas Hind, Sven Landrein, Jo Osborne, Laura Pearce, Lulu Rico, Odile Weber, Daniela Zappi and Sue Zmarzty.

I would also like to express my gratitude to Chris Mills, Fiona Ashworth and Julia Buckley of the RBG, Kew library team who have provided me with additional assistance and facilitated the display of the painting on many occasions.

I especially wish to thank my supervisor at the RCA Dan Fern for his support, for allowing a botanical illustration project to proceed and for his encouragement of the practical work while in progress. Al Rees has reassured and encouraged me throughout my time at the RCA and always impressed me with his diligence in replying to my email queries. Suzanne Keene's input and contribution to earlier manuscripts is also gratefully acknowledged.

I owe many thanks to my borther Sam Pedder-Smith for digitising half the specimens used in this project and to the RBG, Kew Herbarium specimen preparers, Petra Broddle, Nicky Nicoll and Linda Tucker who have picked up where Sam finished.

Also at RBG, Kew, Neil Brummitt and Tim Utteridge provided me with invaluable help and they were often pestered for assistance in times of difficulty. Tim in particular spent a great deal of time looking over the painting checking the images of the specimens for accuracy. My heartfelt thanks to you both also for your enthusiasm towards this project.

Gwilym Lewis and Brian Schrire from the Legume team have been wonderful friends and outstanding mentors, supplying me with ideas, specimens, suggestions and enthusiasm throughout the 11 years I have been at RBG, Kew. I continued to work in their section even though the project was not based on Legumes. Gwilym has promoted my work in every possible way and I often quip that he would make a wonderful manager. I thank Brian sincerely for the time he gave so generously to correct the final manuscript.

The Illustrations curator at RBG, Kew, Marilyn Ward has been a special support to me over the years as well as promoting my work in so many ways and I would like to thank her for her friendship, the times we have dealt with difficult situations with laughter and providing me with biscuits and sweets wherever possible.

Many thanks to my partner Michel for sustaining me via the many wonderful meals he has provided throughout this project. I would often arrive home to find him slaving away in the kitchen. We would often joke about the magic fridge and its capacity to produce my lunch every day without me putting anything in.

Finally this project would have not become a PhD without the help of Eve Lucas, my supervisor at RBG, Kew. One day in late 2005 Eve walked past my desk when I was considering submitting a proposal. We discussed my plans carefully and she helped me put together my initial proposal. Since then she has provided 24 hour support, energy, enthusiasm, ideas and scientific information. In the period I was painting we discussed the project and its potential nearly every day over tea. Our friendship has grown over this time and I wish to thank her enormously for her for considerable and multifaceted contribution to this project.

Author's Declaration

During the period of registered study in which this thesis was prepared the author has not been registered for any other academic award or qualification.
The material included in this thesis has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

R. Pedder-Smith
2011

Chapter One
Introduction and Methodology

Introduction

The primary aim of this project was to produce an artwork illustrating the most modern biological classification, in systematic order, using natural history specimens intended for science, all executed in the museum environment of the Herbarium at The Royal Botanic Gardens, Kew (RBGK). In addition this project investigates why and how a small group of artists are using scientific museum collections as visual source material to tell scientific and historical narratives. In exploring the relationships between this project, other natural history specimen art projects and object-based studies, this research contributes to the multidisciplinary field of material culture by tackling the following questions: what specifically inspires artists to use natural history artefacts; how do they respond to these particular objects and how are these objects; used to tell narratives in 'specimen based art projects'?

The '*Herbarium Specimen Painting*'

The *'Herbarium Specimen Painting'* (*'HSP'*) is a pictorial illustration of a plant classification system based on modern DNA sequence comparison, using herbarium specimens rather than living plant material as subject matter. The artwork is wholly original in these two respects. As the chosen classification system is based on recently published phylogenetic trees derived from DNA sequence data, the painting illustrates or 'narrates the story' of new scientific findings alongside the evolutionary history of plants.

The '*HSP*' and 'specimen based' art projects in the context of material culture.

Pearce (1995, p.172) believes that "objects can have about them a glow of significance, sending sparks of their own into the imagination of the beholder which kindles a desire for possession". In this project, theories developed in the field of material culture are used to explore the many ways in which specimens chosen for the *'HSP'* and other art projects have the capacity to 'glow with significance'. Material culture is an interdisciplinary field of study with origins in the disciplines of archaeology and anthropology. The principle focus of material culture studies is to consider, in detail, particular properties of objects and

to analyse the relationship between subject and object as well as how humans live their lives and create their identities in relation to these objects.

Since this field of study involves the analysis of objects so “endlessly diverse” (Tilley et al, 2008, p.3), uncharted and interdisciplinary material culture studies have been described as “relatively unbounded and unconstrained, fluid, dispersed and anarchic rather than constricted. In short, it is undisciplined rather than disciplined” (Tilley et al, 2008, p.1). Indeed any study involving the analysis of human interaction with the object/artefact world could be considered as contributing to the field of material culture.

The *‘HSP’* is concerned with the qualities of RBGK’s herbarium specimens not just as plant material but as historical documents or humanly created artefacts in their own right. This research project analyses the *‘HSP’* against key works by other artists using specimens from natural history collections, focusing on those who portray the notion and status of ‘the specimen’ in constructing a scientific or historical narrative. The study also analyses the intentions and contexts for these narrative artworks. Material culture theory allows deeper understanding of the power and significance of the specimen concept, which is then used to scrutinise the relationship between artist and item. This enables the responses and identities of artists to be interpreted in relation to the qualities of the scientific artefacts and the museum environment as a whole.

Herbarium collections

What is a herbarium?

A herbarium is a reference collection or library of dried and preserved plant specimens attached to sheets of paper or stored in boxes and organised systematically (i.e. by a recognised system of classification) into family, genus and species. Large herbarium collections have a variety of scientific functions including reference, identification and naming of plants, research into plant biodiversity and the description of new species, and biological/ecological education.

The term herbarium can be used to define a dried plant collection of any size, from a relatively small collection gathered by an amateur plant collector to huge world renowned institutions like the herbarium at RBGK, which houses over seven and a half million specimens, including approximately 350,000 type specimens (defined below p.17) (Royal Botanic Gardens, Kew, n.d.a). Large herbarium collections "draw on a myriad of people across generations of time, aiming for as many things from as many places as possible" (Stacey and Hay, 2004, p.2). This is certainly true of the collections at RBGK, but in the context of herbaria worldwide, RBGK could be considered relatively young. The oldest herbarium in the world, founded in 1569, is in Kassel, Germany. Oxford University houses the oldest herbarium in the UK, the fourth oldest in the world established in 1621. By comparison, the oldest specimen in the herbarium at RBGK was collected in 1698 and the herbarium was only founded in 1853 (although it was based on large private collections brought together before this date).

The science of naming organisms is taxonomy, and the discipline of organising and storing within a classification is systematics. The primary and most significant roles of large comprehensive herbarium collections like the one at RBGK are the naming and organising of the world's discovered plants (or global plant biodiversity). Herbaria provide evidence about the occurrence of individual plants in a particular geographical region at a specific point in time. This type of information is becoming increasingly more important as a measure of the threat of extinction to a species.

The herbarium at RBGK is not a ‘dead’ or completed collection; it is very much alive, constantly acquiring new specimens through botanists collecting plant material on expeditions and donations from other institutions. As new understanding develops the herbarium collection must adapt and be updated; because of this “herbaria are in a constant state of gentle shuffle, accommodating new genera that still turn up” (Stacey and Hay, 2004, p.26).

The individual herbarium specimen comprises dried pressed plant material attached by glue or thread to a sheet of archival quality cartridge paper or board. The dimensions of the herbarium sheet are of a standard size that differs from one herbarium another. In order to function as a scientific document, each specimen is carefully labelled. The label is normally attached to the right-hand bottom corner and contains the plant binominal[1], the collector’s name and their collection number, the geographical region where collected and the date of collection. There are sometimes supplementary details, for example information regarding the flower colour when it was alive, vernacular names and local uses. Contemporary labels will often have additional technical information such as a GPS reference.

The story of a herbarium sheet starts with a botanist on an expedition; they make the initial selection of plant material whether it is a whole plant or a part thereof. The drying and pressing of the plant occurs shortly after selection; this process determines the basic shape of the plant material that will eventually make up the herbarium sheet, therefore the “amount of care taken in the arrangement of the plant as it dries plays a large part in its ultimate utility to the taxonomist, as well as the eventual appeal as a beautiful object” (Knight and Knapp, 2001, Introduction). In contemporary herbaria, other people, specifically specimen preparers also have an impact on the aesthetics and layout of the final document as they position the plant material on the herbarium sheet. Knapp describes specimen preparers as “unsung heroes- or more usually heroines” (Knight and Knapp, 2001, Introduction). The specimen preparers job is to attach the plant material, which arrives carefully enclosed in a sheet of newspaper (normally originating from the country

[1] The present naming system for plants was developed by Linnaeus in the eighteenth century. Each species name must be unique in the particular kingdom (plant or animal) it belongs to. The name of a species is constructed from two words and is therefore termed a ‘binomial’. The first word is the genus (or generic name) which is capitalised, the second is the species (specific) name and always begins with a small letter, for example *Afzelia quanzensis.*

of plant origin) to the sheet by glue or thread. Quite often loose fragments of the specimen are collected together and put into a small packet or capsule attached to the sheet. “The end result is a herbarium specimen - a permanent record of a plant, where it grew, what it looked like alive, and who collected it when” (Knight and Knapp, 2001, Introduction). As well as their use as scientific documents, resulting sheets are often beautiful, visually balanced objects in their own right (Figure 1, p.19).

A high quality herbarium sheet should display as much visual information about the plant as possible, preferably leaves (both sides), buds, flowers (some opened up if possible) and/or fruit depending on the stage of development. Often the specimen is larger than the dimensions of the sheet, for instance some plants have very large leaves. In such cases leaves can be cut, but the result of this is a loss of information about the natural shape. A better solution is to fold the leaf a “little like origami, the ancient Japanese art of paper folding” (Knight and Knapp, 2001, Plate 14). In this way “its general shape can be still be seen - with a little imagination - and so that both sides can be examined without breaking anything” (Knight and Knapp, 2001, Plate 14).

Carpological collections

Many fruit and other bulky pieces such as bark, sections of thick stem, whole inflorescences, roots and tubers are too large, heavy or too delicate to be attached to a sheet and are carefully stored in glass or plastic topped boxes with a small label on the outside. Inside the box the main label cross references the carpological material to a corresponding herbarium sheet. The carpological collection is stored separately from the herbarium sheet but normally in close proximity.

Type specimens

Type specimens are significant and unique specimens linked to a name of a species. Species may have been described numerous times, from different parts of the world, over the last two to three centuries, so each species may have many names attached to it (one as the correct name – usually the earliest published one – and the others as synonyms, each name having its own type specimen). A “type”, as they are known, is what the author of a new name considered to be the most typical plant material that best represents the new species being described. The purpose of a type specimen is to “typify and fix a species name for all time” (Royal Botanic Gardens, Kew, n.d.b). One specimen is chosen and is

termed the holotype. There are other instances where specimens are given type status, for example an isotype is a duplicate of the holotype, i.e. part of the same collection.

Type specimens are the scientific treasures of herbaria and natural history institutions, "they represent a major and irreplaceable international asset" (Royal Botanic Gardens, Kew, n.d.b). RBGK has type specimens that date back to the eighteenth century and despite their age are still referred to by scientists for a "definitive opinion" (Fortey, 2008, p.60) and still remain "the ground truth for species in the natural world" (Fortey, 2008, p.60). When a new species is described, for instance, the type specimens of often numerous names of similar species must be examined, to be certain that the plants under study are new or not. For this reason, even though they are extremely valuable and irreplaceable, RBGK's type specimens are stored within the normal collections where they are accessible and consulted constantly. As Fortey (2008) explains, "The specimen is available for re-examination and reinterpretation. No scientist ever has the last word, much as he might like to think he has" (p.82).

The arrangement of specimens within the herbarium at RBGK

The specimens in RBGK herbarium are systematically arranged in cupboards by family, region, genus and species, so it is possible to quickly find a particular species. At the time of commencement of this project, plant families were arranged according to the nineteenth century Bentham and Hooker classification system (1862-83).[2]

The Bentham-Hooker and other historical flowering plant classifications are based on easily observable morphological similarities used to place families next to one another. These traditional systems are now considered outdated and "give contradictory and incorrect ideas about relationships" (Haston et al., 2007). Such systems are slowly being superseded by new classifications developed on the basis of shared, uniquely derived characters found, e.g. by comparing DNA sequences among plant species (e.g. Chase, et al., 1993). [3] DNA evidence has confirmed that many of the family placements within

[2] *Genera Plantarum* (1862-83) is considered to be a *"monumental work"* (Royal Botanic Gardens, Kew n.d.c) and was the result of a twenty-one year collaboration between Sir Joseph Hooker and *"Kew's principal benefactor George Bentham"* (Desmond, 2007, p.225).

[3] Herbaria worldwide are moving towards the re-organisation of their collections to comply with the new DNA-based classifications. Over the next few years the herbarium at RBGK will also be restructured using a classification (LAPG III) based the most up to date DNA phylogeny (currently APG 3) relegating the Bentham-Hooker system to history books.

conventional classifications are correct. However, there have been some major alterations in scientific understanding: for instance the family *Nelumbonaceae* (Lotus plant) was traditionally considered related to the water-lilies but has now been shown to be more closely related to the *Protea* family. The DNA of peonies has also surprisingly revealed that they appear to be related to saxifrages rather than buttercups.

Figure 1

Herbarium sheet *Nepenthes maxima*, collected by C. B. Kloss January 1918

Methodology

The concept of the *'HSP'* and the knowledge and skills required to undertake this project evolved sequentially through many years of experience and experimentation. This section examines and analyses the complex pathway by which this process developed. For many years it was suspected that there may be other artists producing similar large-scale 'specimen based' artwork using institutional natural history collections around the world as stimulus material. This section also reviews the methods used to locate these other artists and the criteria developed for their inclusion in the study.

The production of the *'HSP'* has been an extensive undertaking. The completed painting took 766 painting days of approximately seven hours per day. The *'HSP'* exhibits a total of 703 specimens from 505 plant families. At the onset it was estimated that the painting would cover five sheets of A1, paper but it soon became apparent that the artwork would spread over seven sheets.

Background to the *'Herbarium Specimen Painting'*

I first visited the Herbarium at RBGK in 1997. The herbarium environment proved so transfixing that on moving to London in 1999 to study for an MA at The Royal College of Art, the herbarium was contacted to enquire about the possibilities of producing illustrations from specimens. The initial contact, botanical illustrator Margaret Tebbs suggested that the enquiry should be put to Dr Brian Schrire, botanist in the *Leguminosae* section. An invitation to the herbarium was forthcoming and specimens from the *Leguminosae* section were put out for inspection.

This visit was truly inspirational. Laid out on a table was a fantastic array of tropical legume pods from the carpological collection, varying widely in size, structure, colour and texture. From that moment onwards these astonishing objects have proved constantly motivating. A subsequent visit to the basement storage area revealed row upon row of floor to ceiling shelves lined with all sizes of black, glass topped carpological boxes each containing extraordinary pods. This confirmed that the available material was in plentiful supply!

Working within the herbarium environment and with these specific objects has provided an awareness of the structure of the herbarium, herbarium curation and the areas of expertise of institutional staff. In parallel, a comprehensive range of painting skills and techniques has evolved, suited to capturing the dried, hard and shiny textures of herbarium specimens.

Compositional development

Early (pre-2002) paintings of herbarium specimens were of a similar, traditional format, with one species illustrated per page. The compositional structure of the *'HSP'* developed through more novel works that began at about this time. An initial composite painting with a structural pattern was undertaken in 2002 (using only carpological and seed collections) with a painting of a simple line of small seeds and twigs, *'Seed String'* (Figure 2). This compositional style developed into larger pieces using lines of carefully selected and placed seeds stretched in bands along the centre of a piece of paper. From these formative pieces evolved the use of loose 'colourful' herbarium material to create a structural pattern that visually leads the eye across the page.

Figure 2
'Seed String'

In response to these artworks Dr. Gwilym Lewis, team leader of the Herbarium *Leguminosae* section, suggested creating a painting using dried seed material stored in a jar in his office. This material is part of a small, private collection and includes interesting pieces of herbarium specimen fallen from the main sheets that cannot be accurately replaced. Early 2004 saw the commencement of a large painting on an A1 sheet of watercolour paper with the material from the jar at the centre. It soon became apparent that there was not enough material in the jar, nor the variety of colour and structure needed to fill the whole page so this led, under the direction of the *Leguminosae* team, to the addition of specimens from the main body of the legume herbarium collection.

The *'Bean Painting: Specimens from the Leguminosae Family'* (Figure 3) was completed in August 2004; it took 94 days to complete and illustrated 530 separate objects. The painting's compositional structure was constructed on a day by day basis. Although the objects were selected for the painting based on their aesthetic qualities the painting maintains scientific rigor in its detailed replication of the size and structure of the specimens. A database was produced for the specimens' details and there is a diagrammatic key for their identification.

The *'Bean painting'* and its development were instrumental precursors to the *'HSP'*. It was in the *'Bean Painting'* that pressed specimens were illustrated for the first time and where the variety of a single taxonomic group was celebrated through those specimens. This raised my profile in the herbarium and saw my acceptance by the scientific staff. Finally, the completed painting produced a compositional style ready for use at a larger scale.

Figure 3

'Bean Painting: Specimens from the Leguminosae Family'

Development of the *'HSP'* concept

As the *'Bean Painting'* was completed, it was clear that other plant families had potential for illustration, especially as a result of suggestions from other botanists. Toward late 2004 and into 2005, during some time away from the herbarium working on a solo exhibition *'Curiosities'* (2005), based more generally on natural history collections, another large scale project involving a return to the collections at RBGK was contemplated. The *'Bean Painting'* had provided a more scientific approach than previously employed but the choice of specimen was still solely based on aesthetics, to balance composition, colour and shape. A new project was sought that would pursue a more rigorous scientific approach; a large painting that would test my motivation and determination, with a theme that would in some way encompass and celebrate the whole herbarium. There was only one possible answer, to produce a large scale sequential painting containing a dried plant specimen from every flowering plant family in the compositional style of the *'Bean Painting'*. Each plant family would be represented in the painting by at least one specimen and each would display one or more diagnostic characters (the feature/s that set it apart from other families and make it uniquely identifiable).

The choice of classification systems

It was intended from the outset of the *'HSP'* that illustrated families would be painted in systematic order following a botanical classification.

Initial research into the project began in December 2005 via discussions with a range of botanists. One issue raised by everyone was that if all the flowering plant families were to be illustrated in systematic order, what classification system would the project use? The two obvious choices were the traditional Bentham-Hooker classification by which the Herbarium was (and still largely is) arranged, or a classification based on newly available DNA-based phylogenies.[4] A painting based on a traditional classification system would be regarded as scientifically outdated but could be viewed as a legacy or tribute to the traditional approach, especially in future years when herbaria all over the world have adapted to the new arrangements. Alternatively, a painting visually juxtaposing the newly developing modern sequence against specimens currently stored in the traditional system,

[4] A phylogeny represents the diversity of life as a tree of relationships. A classification system is developed from a phylogeny by constructing a linear sequence from it. Classification systems therefore suffer from a significant loss of information about complex relationships.

has a contemporary appeal. It was decided, therefore, that the *'HSP'* would depict plant families in the sequence of recently published DNA-based information (Chase, et al., 1993).

Phylogenies and therefore classification systems are in a constant state of flux as new discoveries are made and new species are described or added to DNA-based analyses. This creates ongoing debate in the scientific community about the boundaries of certain families. Although the basic structure of the new DNA phylogeny is generally agreed upon, there remain discrepancies regarding the number and make-up of families within the system.

In 2006 three slightly differing DNA-based systems were available for consideration. It was felt that the Angiosperm Phylogeny Website (http://www.mobot.org/mobot/research/apweb/) would pose problems since it is continually being updated, thus it was thought desirable to rather select a classification which was 'set' at a particular point in time. This left a) the Angiosperm Phylogeny Group II (APG II, 2003) system, containing fewer families because some were subsumed into others, and b) a more conservative list based on APG II and part-developed in RBGK for the updated *'Flowering Plants of the World'* (Heywood et al., 2007). A number of more traditional families are retained in this latter system.

The final decision was made when Dr. Richard Brummitt provided me with a pre-publication proof of the classification from *'Flowering Plants of the World'*. The context for this choice was that many staff in the Kew Herbarium were writing contributions to this book at the time and they advised me that compared with the APG II system, many more plant families were being recognised by Heywood et al. (2007). This, I felt provided a greater number and variety of plant specimens and therefore plant structures to use as raw material which would benefit both the utility and aesthetics of the painting.

Both APG II and the classification from *'Flowering Plants of the World'* present families alphabetically within orders[5], and orders alphabetically within major groups. In early 2007,

[5] An Order is the next systematic grouping up from Family.

LAPG II (Haston et al., 2007) - the first linear sequence[6] - was published, based on the APG II system. LAPG II contained updates from APG II including the movement of the orders *Caryophyllales* and *Santalales* further down the numerical sequence[7]. At that point in the project, when only the Paleodicots and some Monocots had been illustrated, it might have been thought more appropriate to transfer the HSP to this classification. There was strong evidence at the time, however, that this sequence was less than ideal because of the criteria that were used to select the optimal sequence for the arrangement of plant families (Hawthorne & Hughes, 2008)

It should be noted, however, that had the project swapped to LAGP II, identical issues would still have arisen, since just before the painting was completed, updates of APG and LAPG (APG III, 2009, LAPG, 2009) were finalised. These too have significant differences from LAPG II, and again orders of families have moved up and down the system. Since it is the nature of such classifications to change as more information becomes available, and since much more molecular work needs to be done throughout the flowering plants to under-pin an optimal arrangement for a project such as the *'HSP'*, this work is best thought of as a compromise in terms of being a 'snap-shot' of work in progress. There is nevertheless a much higher level of confidence in these newer systems that the pattern of relationships which now exists is relatively robust, meaning that future changes are unlikely to be radically different.

My growing understanding of the limits of classification systems is reflected in adaptations to the compositional structure of the painting. The original compositional concept was that the classification, through the specimens, would visually wind through the pages in a long thread upward and downward. Initially this pattern was strictly followed, but it became apparent that occasionally families with close relationships were not being illustrated next to each other due to the alphabetical arrangement of families within orders in the chosen classification system. Once this was realised, still using the classification from *'Flowering Plants of the World'* (Heywood et al., 2007), the plant orders were composed in blocks. Families were researched further to establish the evolutionary relationships between them

[6] A linear sequence attempts to place all families in a single numerical order with closely related families in close proximity. These systems are developed to organise herbaria, books and classifications in a taxonomic order but by their nature they are not able to represent spatial relationships as accurately as a phylogenetic tree.

[7] However support for the movement of these orders to their current position in LAPG II (Haston et al., 2007), APG III (2009) and LAPG III (Haston et al., 2009) "is still only moderate" (Stevens, 2001).

and positioned in the painting to illustrate these. To research relationships, I returned to the Angiosperm Phylogeny Website (http://www.mobot.org/mobot/research/apweb/) where family trees (cladograms) can be located (Figure 4); these diagrams show more complex evolutionary relationships between families.

From the middle of panel five onwards the composition has been developed in this block method to better display relationships between families. It was decided that the short list of unplaced taxa found at the end of the *'Flowering Plants of the World'* (2007) classification would be illustrated in their most likely position at the time of painting. These placements were also researched through the Angiosperm Phylogeny Website (http://www.mobot.org/mobot/research/apweb/).

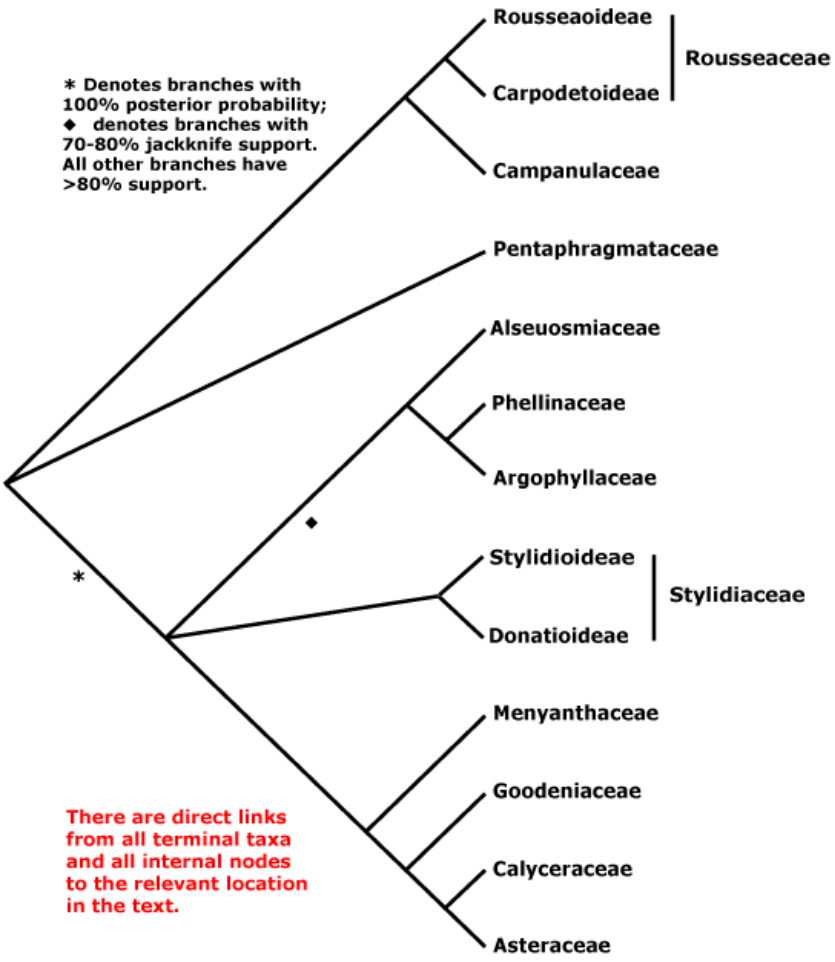

Figure 4

Cladogram showing family relationships in the order *Asterales*

***'HSP'*- finer details considered**

The question has often been asked as to why herbarium specimens were used as subject matter? In some ways, the use of living material would have made the illustration of diagnostic characters easier and the painting would perhaps have been 'brighter' and more colourful. However, live material of exotic species is frequently unavailable, especially as the project required new plant material on average every other day. A further problem would exist where a flower or other part would be required out of season. Even if it were possible to acquire live material for this project, herbarium specimens in this instance have qualities which far outweigh the living alternative. Herbarium specimens are the botanists' and taxonomists' tools, they are the actual objects that are used to create classification systems and confirm relationships between families. The *'HSP'* illustrates some of the actual specimens that have had sections removed and their DNA analysed to create the new DNA systems. In this respect this project uses the specific tools of the taxonomist to visually represent a classification system. The use of living plant material would eliminate the museum and human artefact qualities of the herbarium specimens. As I have always been fascinated and enthralled by this humanly created world where the whole known plant kingdom is organised and pigeon-holed, the project would hold little inspiration and depth without these qualities.

I have also been asked why I did not paint like for like, for example just flowers? But botanists do not just use one aspect of a plant to identify and name the species. A painting which focused on one aspect such as flowers would lack scientific integrity and would just be a botanical painting; it would not allow the sample to be identified from the page and would not fully represent morphological variation in flowering plants. Similarly I did not use photography. There is no doubt that photography has a great deal to offer a project like this and many of the artists studied in subsequent parts of this work have selected the medium for that reason. Photography allows the object to be captured in perfect detail and relatively quickly. With image altering programmes such as Adobe Photoshop it would also be possible to create composition fundamental to the project, but it would have technical drawbacks such printing an artwork of approximately six and a half meters.

I turned to watercolour since it is the medium I am most confident with, after many years of studio practice. Previous experience of illustrating specimens allowed the development of the techniques necessary to capture the textures and colours of herbarium specimens.

Watercolour paint is also the traditional medium of botanical illustration and there are some aspects of the *'HSP'* that follow traditional methods such as isolation of the object without a shadow. Painting also allows the selection and emphasis of certain elements. Furthermore, a meticulously detailed painting displays by its very nature, the passion, dedication and obsessional qualities, shared by collectors and artists.

Initially, the validity of a composition similar to the *'Bean Painting'* was questioned and the possibility of illustrating the families on separate pieces of paper considered. There are several reasons why the chosen compositional style is fundamentally important; firstly, the painting is designed to be viewed as science based artwork and not a scientific manual. Secondly, a composite composition leads the eye through the page and enables immediate appreciation of diversity, allowing for scientific comparison and clearly illustrating the plant relationship changes brought to light by DNA-based findings. It is intended that the finished painting should also have the purpose of acting as a wall planner type teaching aid. As botanists are taught to recognise characters using herbarium specimens, it makes a great deal of sense to have these representing the family from the outset. Indeed many botanists get so used to recognising features and colour in herbarium specimens that they find it easier to recognise the plant in its pressed and dried state (Zappi, pers. comm. 2009)

A decision was made at the outset to use specimens solely from the collection at RBG, Kew. This decision was made for several reasons. Firstly, it would have been impractical to move the sheets of the painting around from place to place which would have risked damaging them. Secondly, if collections from other herbaria were to be used, the issue of travel would arise and how far this would be sustainable in terms of the project. Additionally, travelling to and researching within other institutions would significantly increase the time required to complete the practical element of the project. Finally, it was considered more appropriate that the project should be concerned with specimens from a single collection and to relate to the narratives found within it.

Practical reasons prevented the use of a single, large sheet. Since the painting was executed in a museum environment rather than in a private space there was no opportunity to keep the paper clean, secure and safe from damage. The herbarium bay in which the painting was produced is a working area occupied by a variety of people from RBGK staff, visitors and cleaners. To apply paint to a large surface, the sheet of paper would need to be rolled

up on each side of a desk with the central part lying over the top, which is impractical in such an environment. The other reason to work on separate sheets is that they help to maintain motivation and give a clear impression of progress. It is intended that the seven A1 sheets will be framed together as one large piece and therefore the plant illustrations are painted over the edges of the sheet (Figure 5).

Figure 5
Painting continues over the edges of the paper

Initiation of the *'HSP'*

The painting began on May 1st 2006. Basic information about the diagnostic characters of each family was researched from *'Flowering Plants of the World'* (Heywood et al., 2007). This was sometimes found to be overly technical for a non-scientist, however there are copious illustrations to assist the reader. Another useful book was the *'Photography Atlas of Botany and Guide to Plant Identification'* (Castner, 2004) that had been developed as a teaching aid and clearly shows diagnostic characters (the particular trait which sets one family apart from another). The downside of this publication is that it is not comprehensive and smaller, more unusual families are not included.

Ideally each specimen was chosen in consultation with a botanist, normally the head of the section of the family's curatorial team, who described or affirmed the diagnostic character in simple terms. If they had no specialist knowledge due to the size of the curatorial remit, another botanist would be suggested. Some specialists had particularly good general knowledge frequently provided information. When no specialist at RBGK was able to provide such information, a reasonable sized section of a specimen or a group containing fruit, flower and leaf were illustrated in an attempt to capture the salient features by simply covering everything.

Specimen selection

In some large families definition of a single diagnostic character was impossible because it was too variable morphologically. The *Legumiosae*, for example, comprises c. 19, 400 species in three distinct sub-families. In this case at least one specimen from each sub-family was chosen and other instances an 'iconic', instantly recognisable species was selected to represent the family. The major consideration for the illustration was that, where possible, the diagnostic characteristic should be displayed. If this character was found in a large bulky fruit the search would begin in the carpological collection; however in most cases the characteristic could be seen on the herbarium sheet. Throughout the project there were several problems at this stage. Occasionally the only difference between a plant from one family and another was a small or microscopic detail such as the structure of pollen. In some cases it was a hidden detail such as the internal structure of the ovary, a characteristic obscured from view by the nature of a dried plant or the fact that the herbarium had few specimens and none of these exhibited the particular family characteristic. In these instances a larger section of the specimen or a selection of several specimens was painted; it is hoped that the specialist will be able to recognise the sample through a combination of other factors.

Depending on the size of the family there were often several specimens that exhibited the diagnostic character, so only rarely was there only one option. With several specimens to choose from it was possible to consider other criteria. The compositional structure was always a significant factor, since the specimen needed to fit sympathetically into the space and harmonise with the other specimens around it. This could be difficult when the flow of the painting reached the top or bottom of the paper, especially if the specimen was large and bulky. At the start of the project several appropriate specimens for the space were

selected and taken back to the painting but often none would ’fit’. Later, transparent paper was used to trace the space making it possible to ‘take the space’ to the specimens. While at the storage cupboards this tracing paper image of the space could be laid over the specimen to assess its fit. As well as saving time, this method was better for the specimens as fewer needed to move around the herbarium (Figure 6, p.32).

Aesthetics was a significant factor in specimen selection; if possible a specimen was selected that had retained some original colour, was clean, unbroken and had an interesting structure. The age of the specimen was also important as it was intended that the painting should contain one specimen to represent every year since the herbarium was founded in 1853. There are several well known collectors whose specimens are included in the *‘HSP’*, and on occasions damaged or less aesthetically beautiful specimens were selected because of their provenance; these specimens have interesting ‘life histories’, the significance of which will be reviewed in Chapter Two.

The painting process

Normally, several potential samples were selected and returned to the painting; this allowed a choice in structure and balance in colour when comparing them to the other specimens on the page. In the case of boxed carpological specimens, loose material was removed from the box, placed on the paper and adjusted until a pleasing position was obtained (Figure 7, p.33). Specimens on sheets are less manoeuvrable than this; these were moved around to obtain the best angle. The correct orientation of the plant was an important consideration. Once the position was established, the specimen was drawn out in the space with a thin and light pencil line. Only the outside parameters and a few simple internal details of the specimen were drawn (Figure 8, p.33). The pencil illustration and the actual specimen were measured from different angles to check that they were approximately the same size. Just before painting began, the rest of the A1 sheet was covered in paper to expose only the working area, keeping the paper clean (Figure 9, p.33). Painting always began without preliminary colour studies as I prefer to work intuitively.

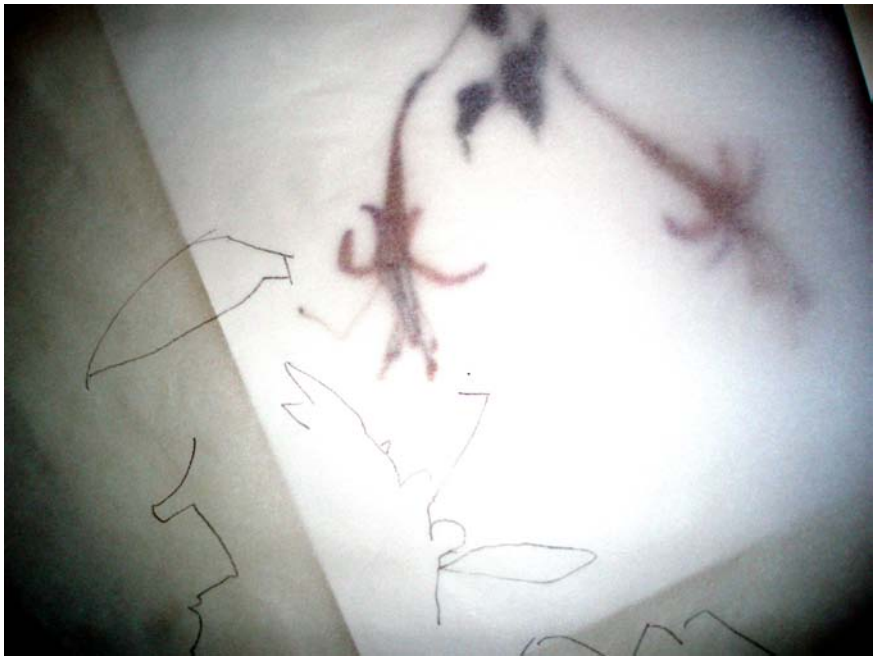

Figure 6

Tracing the space, then laying the ‘space’ over another specimen

Figure 7

Placing loose carpological material

Figure 8

Pencil drawing of specimen before painting and completed image

Figure 9

Painting covered in paper except for exposed working area

The painting has been produced on Sanders Waterford watercolour paper, 300gms HP; this is an unusual choice for a botanical illustrator because it is relatively rough, cream in colour and very absorbent. It is the perfect choice for this subject matter because the surface structure and colour adds texture to the illustrations of dead, dried material. The paper is also forgiving and allows paint to be pushed deep into the fibres. The paint was applied using a synthetic and sable mix paintbrush. Pure sable paintbrushes lose the brush point far too quickly for really detailed work and even a synthetic mix paintbrush needs replacing every few weeks. The painting was produced with three sizes of paintbrush, a size 2 for an initial wash and a ooo or oooo for the upper layers of paint and the detail. The painting method is a wash technique for the first layer and then a relatively dry brush style for the subsequent layers and detail. Because the paper allows it, colour is often pulled up off the surface to create light areas. This is done by wetting the painted paper and pushing a tissue firmly into the wet patch to absorb the some of the colour before removing it.

If paint accidentally splashed onto the paper or if a mistake was made with sizing, shape or position, the fault could be removed by scraping the surface of the paper and burnishing it afterwards. With small sections this is hardly noticeable, but in larger areas it is relatively clear because the surface of the paper is irreversibly damaged. It is the preference of the artist that the illustration should be scientifically correct even if it is necessary to damage the paper surface to correct mistakes.

The *'HSP'* has been a huge undertaking and has involved a strict schedule. Initially it was intended that fifteen families would be illustrated per month, but after the first month it became apparent that this was not possible. To keep 'on track', specimens needed to be painted quickly, approximately one per two painting days, which was possible with around fifty percent of specimens. In rare cases it could be quicker but usually the painting took longer than planned. The *Pandanus* fruit took the longest time to paint, totalling eight days.

After each specimen was completed it was recorded in a sketchbook under the family name, with a sketch of the specimen (Figure 10, p.35). Other data such as label information, the painting day number and the diagnostic character illustrated were also recorded. These sketchbooks, of which there are ten, provide an essential guide to the painting and are the basis for the production of a diagrammatic Key. All specimens used were data based (Appendix Two).

Small labels reading *'Specimen illustrated in the Herbarium Specimen Painting by Rachel Pedder-Smith 2006-2009'* were added to each sheet used. Each sheet was bar-coded, digitised (scanned at high resolution) and the image and specimen details added to the RBGK Herbarium Catalogue, available at (http://apps.kew.org/herbcat/navigator.do).

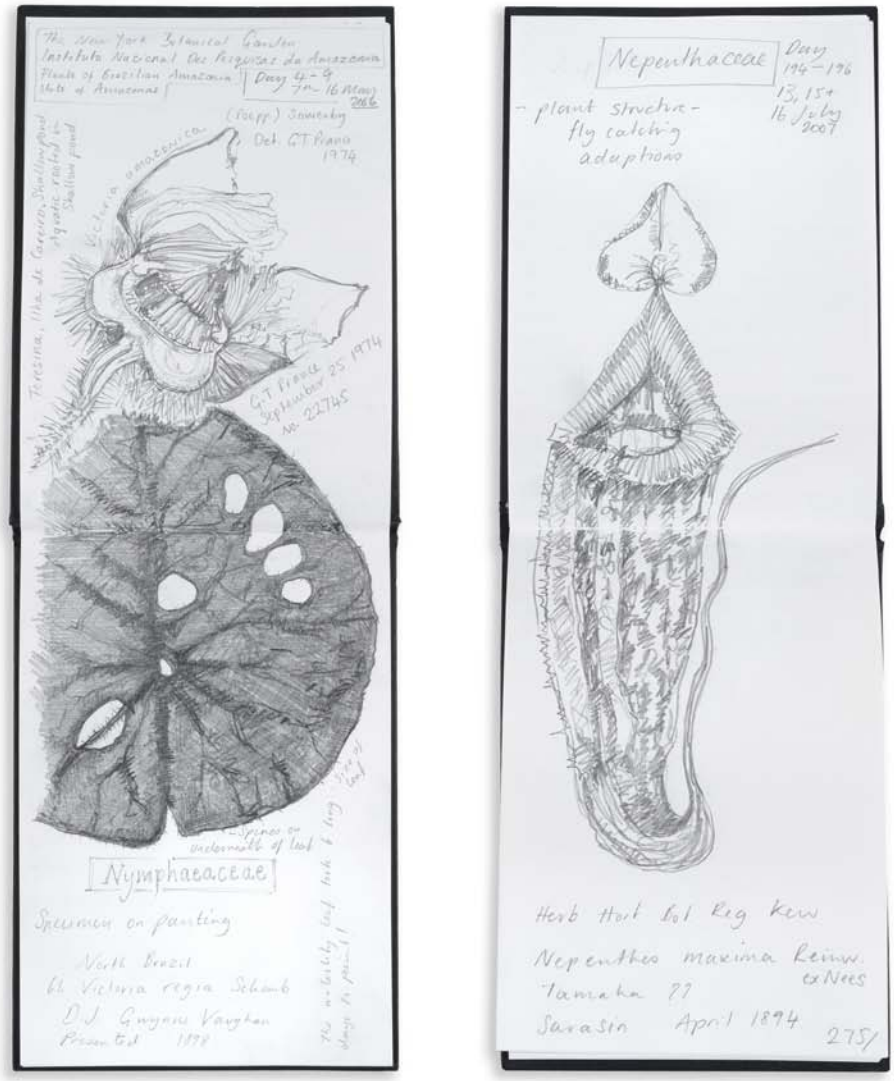

Figure 10

Examples of sketchbook pages

Problems encountered

Specimen orientation

A specimen should be mounted on the sheet in its natural orientation. However, in two cases the plant material was wrongly mounted and the specimen was painted upside down. The first error occurred early on, with the painting of the *Arum*; the spathe (a long sheath that protects the inflorescence) was illustrated in the orientation in which it was attached to the herbarium sheet. A passing botanist soon noticed the mistake. This left a difficult decision - to leave it or correct it. As part of the remit of the painting is that it should be as scientific as possible, the decision was made to correct it and the only way to do this is to paint over the top. Another Arum species with a larger and darker spathe was sought and a magnificent example was selected that completely covered the original painting. In hindsight it is felt that this second specimen and painting is in fact a better example to represent the family.

The second error occurred while illustrating *Heliconia rostrata*. *Heliconia* have complex growing patterns where some inflorescences grow upwards while others hang down. The example that was chosen was a hanging inflorescence, but attached to the sheet as if it were an upward growing one. After three days of painting and a nearly completed *Heliconia*, the mistake was exposed. This second error was far more difficult to correct than the first, the only option being to cover it with another family with some type of large structure. Luckily *Musaceae*, the banana family, was quite close in the sequence and a large bunch of bananas was found to cover the mistake. Unfortunately the bunch was not quite large enough and it has been necessary to scrape the surface of the paper to remove evidence of the previous painting. The *Heliconia* was then illustrated again (Figure 11, p.37). Subsequent to these errors, if there was any doubt about the specimen orientation, images of the living plant were more closely investigated.

a.

b.

c.

d.

e.

Figure 11

a. and b. drawing over wrongly positioned *Heliconia*

c. painting *Musa* over *Heliconia*

d. final painting of *Musa truncata* over first *Helicoina*

e. final painting of *Heliconia rostrata*

Compositional spacing

Since one sheet of the painting is worked on at a time with the others stored away for safety, it was difficult to judge the spacing between the specimens over the complete area of the painting. Ideally, specimens throughout the seven sheets should be spaced evenly; unfortunately in the summer of 2007 during an intense painting period, the images became closer and closer together. It was not until a visitor was shown all the completed sheets together that it became apparent that the composition had tightened. The gap between specimens was intentionally widened and larger sections of plants were used for the rest of that page to make up the space. From then on the whole painting was viewed from time to time to check the spatial balance.

The *'HSP'* in the context of other artworks

This project is distinguished from the work of other artists using plant collections from the RBGK herbarium in that specimens are only utilised for scientific or reference purposes, and they attempt to recreate the specimen's living state on paper, usually assisted by living material or images. As the context of the *'HSP'* is 'specimen based' art and not traditional botanical illustration, other specimen based artists were researched. Of particular interest were those who produce artwork capturing and discussing the 'status' of natural history specimens and their inherent meaning; large scale artwork projects including a narrative element were preferred.

Initially, four other artists were known to be producing artwork within British natural history collections in this way: Mark Dion, Mark Fairnington, Rob Kesseler and Nick Knight. To locate other artists active in herbaria and natural history museums worldwide, the larger of these institutions were contacted, requesting information on artists using collections. About 60 replies were received and of interest were six further artists, Brian Collier, Don Farnsworth, Fiona Hall, Fred Langford Edwards, Robyn Stacey and Areta Wilkinson, each working differently but all of whose art projects had strong narratives, were based on taxonomic concepts, and 'discussed' the specimen, collections, field work and/or the museum environment. Lyndall Phelps was discovered through an interview with the Art and Science Curator at the Natural History Museum and Robyn Stacey suggested Australian artist Greg Pryor. Toward the end of the project, Elaine Duigenan, was added to this list. Discussion of these projects can be found in Chapter Four.

It was possible to interview nine of the thirteen artists in person and some have been interviewed more than once. Four others were questioned via email and information concerning Knight was compiled from the comprehensive introduction of the book *'Flora'* (Knight and Knapp, 2001). The art and science curator at the Natural History Museum in London, Bergit Arends, was interviewed and she highlighted the potential of this type of art to positively influence the 'dusty' reputation of taxonomy and natural history collections. Relevant exhibitions and talks given by or about the study artists were attended and all publications including exhibition catalogues studied.

Chapter Two

The material culture of the natural history specimen

Material culture theory

I first became aware of material culture theory when attending a lecture at the Royal College of Art as part of the research methods course in 2007. Dr Inge Daniels then lecturer in Material and Visual Culture from the University of Oxford gave a presentation entitled 'Objects and their Multi-disciplinary Potentialities'. This presentation awakened a realisation that my art practise was more than just pure illustration and I started to consider herbarium specimens as objects, not just plant material subjects. I began to realise why it was herbarium collections and not live plant material that I had chosen to illustrate. It was not just their unusual aesthetic qualities, but their age, the identity of their collector and the ability to hold a connection to a past moment in time. In addition, I came to realise that I too was behaving like a collector felt I had a connection to the specimens that I was selecting for my visual collection.

Introduction

Material culture researches the cultural meaning of objects and the complex relationship between persons and things. Deetz's (1996) definition of material culture is "that sector of our physical environment that we modify through culturally determined behaviour" (p.35). Pearce (1994a) suggests that items termed object, thing, specimen or artefact fit into the remit of material culture because they are all names given to humanly selected lumps of the physical world to "which cultural value has been ascribed" (p.9). Pearce (1994a) comments that it is the act of human selection that plays a significant part in the process of turning a piece of the natural world into a museum piece.

In 1995 Pearce noted a lack of application of material culture theory to natural history specimens; she had no doubt that natural history specimens, as much as man-made objects, are subjects to which material culture theories apply. She commented that specimens are acquired through human selection, detached from the natural context and organised into relationships with other and sometimes different objects. Pearce (1995) suggests that

through this process of selection, re-contextualisation and classification, a natural object is turned “into a humanly defined object, that is, an artefact” (p.14).

Pearce (1994a) differentiates between material culture theory and collection studies, suggesting a clear relationship between the two object based fields. Collection studies deal with the concept of the collection, how that alters and defines the individual object and also our relationship to the ordered accumulation of objects, while material culture focuses on the specifics of the relationship and interactions between humans and physical objects.

In this chapter, aspects of material culture theory applicable to natural history specimens are considered and then related to the *‘HSP’* project. In the next chapter the concept and interpretation of a collection as a whole will be examined and analysed against the *‘HSP’*. In Chapter Four the aspects from the next two chapters that have been discussed in relation to the *‘HSP’* are used to analyse other art projects to investigate common material culture threads visible in ‘specimen based’ artwork.

The qualities of the natural history specimen

"It was spread out in the most delicate way, so as to display the beauty of its lobed leaves, and the pendent flowers. The fresh green colour of life faded to a yellowish hue, tinged with the colour of dried sherry. But the sheet had preserved the essence of the plant, much as a sepia photograph might preserve a Victorian street scene. There in immaculate copperplate script was the scientific name of the plant recorded by some long retired curator- the date of collection showed that the plant had been pressed well over a century before, 24 May 1867. These herbarium sheets were clearly as permanent as the other collections I has seen"
Richard Fortey (2008, p.23)

In this quote, where Fortey views herbarium sheets for the first time, he mentions many unique and captivating qualities of the specimen such as aesthetics, age, label information and permanence. These qualities relate to themes that will be developed in this and the following chapter.

The natural history specimen as artefact

Stacey and Hay (2004) reflect on the moment in time in which a selected example of plant material becomes severed from its origin and starts the journey to become an artefact, "One person was walking the 'slow and roundabout' walk of a plant hunter……Whatever the case, they saw something, stopped, and cut a stem, selecting one sample of that fern, that shrub, that tree to stand for the whole breed. They pressed it, dried it, and made it part of a collection" (p.2). Fortey (2008) gives a poetic account of the laying out of plant material onto the paper to make the artefact, the herbarium sheet, suggesting that "Laying out a plant for pressing is like laying out a corpse before a wake" (p.156). He comments on the aesthetic qualities of the final herbarium sheet, stating that the end product "is often rather beautiful" (Fortey, 2008, p.57). The creation of the herbarium sheet also marks a moment of time when the plant material and label information from the collector come together making the change into a scientific and comprehensive historical document.

The aesthetic appeal of a herbarium sheet is one of the primary reasons why this project was carried out using specimens rather than live plant material, and this reasoning is

echoed by other artists who have used herbarium specimens in their art projects (Chapter Four). Herbarium sheets are beautiful objects in their own right and they have provided a certain aesthetic joy when looking through them searching for the next choice of *'HSP'* specimen. In many cases there were one or two specimens so perfectly laid out that the choice was made as soon as these were seen.

Natural history specimens have a special propensity, above other objects, to symbolise a moment in time, due to the fact that there is a specific moment when their life is ended and they are removed in death from their natural environment. It could also be said that the specimen shares this significant moment in time with the perpetrator of its death, the collector. The *'HSP'* reflects the idea that a specimen is "frozen by its moment of collection" (Stacey and Hay, 2004, p.26) or has the capacity to maintain a connection to that instant in time. The collection date was often used as a selection criterion for the specimen of a particular family to ensure the painting has the capacity to depict the timeline of the formation of the herbarium.

The necessity of death in creation of the immortal specimen

Natural history specimens achieve immortal status through their death, when they are selected to stand as a representation of their species for all time. However this comes at a price; their existence as a living thing comes to an abrupt halt and their life course is altered. The plant or animal is wrenched from their life to serve another purpose, that of the human convention of taxonomy. Bal (1994) discusses the notion that the act of collecting inflicts violence and deprivation on objects. The early death and forced immortality at the hands of the collector can ignite powerful emotions in the viewer. Pearce (1995) comments that collected objects "quite frequently, carry the smell of things embalmed in darkness, poor faded ghosts which now can only see the living but not reach them" (p.25). Fortey (2008) describes specimens collected from famous exploratory voyage of the HMS Challenger from 1873-1876 "I have looked at a series of crabs sadly contemplating me from inside their glass jars, Challenger having granted them this strange immortality" (p.291). Many of the artists interviewed for this study, particularly those producing projects using animal specimens develop the theme of immortality through death further in their work this is explored in Chapter Four.

Natural history specimens are unusual in that they are non-permanent objects made permanent, so that the normal process of death and decomposition is arrested. Fortey (2008) comments, "Everything is done to make sure that the herbarium specimen does not decay like its companions in the field and forest" (p.156). Herbarium sheets are extremely durable and more stable than zoological specimens. In many respects the *'HSP'* and the other art projects represented in this study can be seen to add a supplementary layer of 'permanence' or perhaps even 'immortality' to the natural history specimens or collection they visually depict. Through the production of artwork whether it be painting, photography or some type of three dimensional medium, the specimen is visually recorded and celebrated and is therefore given an additional and different type of permanence, in art.

The 'life history' of the specimen

The concept that an object could have a 'social life' or 'life history' was first proposed by Appadurai (1986). In this volume Kopytoff (1986) suggested that when studying object biographies, similar enquires can be made about the object to those raised when writing human biographies, such as "What has been its career so far, and what do people consider to be an ideal career for such things? What are the recognized 'ages' or periods in the thing's 'life', and what are the cultural markers for them? How does the thing's use change with its age, and what happens to it when it reaches the end of its usefulness?" (p.66/7). Since then, anthropologists have developed the idea "that things can, in certain conditions, be or act like persons: they can be said to have a personality" (Hoskins, 2006, p.81). Since objects can be seen to have 'social lives' in a similar way to persons, they can also be "appropriate subjects for biographies" (Hoskins, 2006, p.81).

Here 'object biography' is developed in connection to herbarium specimens. In the following chapter where other art projects are analysed, it is further considered in respect to both plant and animal specimens.

It is possible to observe many narratives from the labels and notes attached to herbarium sheets (Figure 12, p.45); some labels have the potential to give a great deal of information about the life history and journey of the specimen. The herbarium collection at the RBGK is filled with countless individual narratives of the life of the plant and/or herbarium sheet before the pressed plant or sheet entered the collection. The labels on the herbarium sheet can provide 'additional' information including details of the environment and other

collections from where they came and how they may have ‘served’ or been ‘employed’ within the collection; for example, if the plant material has been studied for a publication, or a part has been removed for further study, a supplementary label is added to the sheet. Whenever a plant receives a different name as its taxonomy alters over time, a label signed by the author of that name change is placed on the specimen. Each label can be seen to indicate a new event or purpose in the specimen’s ‘life’. Fortey (2008) comments on the scientific and curatorial importance of these additional labels: “Many labels will include more information, especially if the specimen to hand has been mentioned or figures in a scientific paper. This is how the importance of the material is conveyed to the outside world” (p.12).

Figure 12

Indigofera astragalina one of the oldest specimens in the RBGK collection

The herbarium at RBGK, like many other collections incorporates smaller donated or purchased personal herbaria, specimens collected specifically for RBGK and duplicate specimens donated by other institutions. In every case, the information about where the artefact life began and the specimen's journey through various hands is recorded on the sheet. Spooner (1986) notes that the succession of owners of an object, and its creator or producer, can be embodied within its biography. Elsner (1994) comments on this in direct relation to a specimen label, "On those curatorial labels that celebrate an object's acquisition, a particular series of past owners, the process of an item entering its final resting place, there is not only a rhetorical pride (and a scholarly bravado) but also a kind of nostalgia" (p.155). Elsner's use of the word nostalgia is interesting, it seems to indicate the potential of an object to have a 'memory' of previous 'owners' and places where it has spent time.

Kopytoff (1986) proposes that it is possible for objects, like people, to have numerous biographies each of which can "select some aspects of the life history and discard others" (p.68). In order to reference the specimens that have been used in the *'HSP'* a further small label has been added. These specimens have taken part in this project, which can be seen as a particular chapter, or experience in their 'life histories' or the start/addition to a supplementary biography (perhaps based around recognition through the *'HSP'*). It is an honour to add this label, not only because many of the sheets are old and precious but because it formalises a relationship between the artist and object and in some loose way also connects the artist to the collector.

Although labelling is the primary form of communication on herbarium sheets, botanists have also been known to write notes in pencil on the actual sheet and there are cases where whole conversations or arguments have occurred for many years alongside the plant itself (N. Brummit, pers. comm. 2008). This 'alternative' communication technique has been noted and explored by some of the artists whose work is reviewed in the next chapter.

The positive contamination or 'personification' of an object

Belk (1994) suggests an object can gain significance by being positively 'contaminated' by a significant/famous person or collection, as if something of their being is retained in or by the innate object. Alberti (2005) echoes this point commenting that "objects accrue meaning and identity from the interaction with donors, collectors and previous owners"

(p.565). More recently Tilley (2006) discusses the concept of 'objectification'. He outlines a particularly powerful form of this being "the personification or anthropomorphic representation of people through things" (Tilley, 2006, p.63). He states that this can occur when biographies of particular persons and things become "intertwined" (Tilley, 2006, p.63). A situation forms where "the thing is the person and the person is the thing" (Tilley, 2006, p.63). For instance Van Gogh can clearly be represented by his iconic painting of sunflowers and if asked to name a painting by the artist this one would surely be suggested. Tilley further suggests that when objects become heavily personified they can become "part and parcel of the creation of the identities of persons of renown" (Tilley, 2006, p.63). Tilley also suggests that things have the ability to 'objectify' geographical places where they were made, obtained or where the raw materials were collected, in this way "the artefact can thus be a place, a landscape, a story or an event" (Tilley, 2006, p.70).

As mentioned in the introduction Pearce (1995) suggests objects can 'glow' with significance. This 'glow' could stem from the specimen's age, a celebrated collector, or a historical event, for example herbarium specimens collected on a celebrated or well-known expedition. In a similar respect, Fortey (2008) describes how the specimen provides a physical connection between persons. The permanence of the specimen, and their ability to survive for generations, facilitates the possibility of touching a specimen handled and examined by a significant collector or scientist who was alive many generations previously; he comments that this provides a "kind of tactile link" to "intellectual forebears" (Fortey, 2008, p.136).

Objects have and can be used to 'personify' and 'objectify'; however these are 'ethereal' connections. Blom (2002) describes a collection as to some extent trying to capture or preserve "fragments of a realm beyond our reach" (p.142).

Significant specimens in the '*HSP*'

Specimens that 'glow with significance' through personification and objectification have been chosen to represent a plant family to be illustrated in the *'HSP'*. Some specimens were collected by historically important collectors such as Joseph Hooker, Charles Darwin or Richard Spruce, while some specimens have connections to current members of staff. Alternatively, specimens have been included that link to a scientific theory or to a human

experience. There are too many stories and connections to outline fully but to give a brief summary and ‘flavour’, ten short stories derived from specimens are given below. In each case the specimen has been chosen directly for its ability to ‘express’ a human-based or scientific narrative.

Specimens collected by Sir Joseph Hooker, George Bentham and specimens from the herbarium of Sir William Hooker and William A. Bromfield

The collections and activities of this group of four individuals are fundamental to the founding of the Herbarium at RBGK. The specimens they collected and amassed could be considered the original ‘core’ of the current herbarium. They are thus significant in their ability to narrate the history of the herbarium and the important figures at its inception. Sir William Jackson Hooker (1785-1865) was appointed Director of the Gardens in 1840, at a time when there was no official herbarium at RBGK. Hooker, like Joseph Banks before him, made his own collection available to staff and visitors. Hooker’s private collection, “perhaps the biggest and best in private ownership at the time” (Desmond, 2007, p.186) was housed with the library in his private residence. In 1852 the herbarium and library of William A. Bromfield (1801-1851) was donated to the Gardens. This gift further highlighted the need for an official herbarium building and initiated the hunt for temporary accommodation which later became permanent and still forms part of the herbarium building to this day.

In 1824 Hooker developed a friendship with George Bentham (1800-1884) when they met in Glasgow. Bentham and Hooker maintained their friendship and exchanged duplicate plant material as their personal herbaria developed. In 1845, Bentham approving of Hooker’s developments to the Gardens, told Hooker he intended leaving his personal herbarium to RBGK in his will. However in 1854, due to his wife’s illness and the cost of the maintenance of his collections, Bentham was forced to donate his herbarium earlier than he intended. His collections were “transported in four large railway wagons” (Desmond, 2007, p.189), this “amounted to over 100,000 herbarium sheets of specimens representing 50-60,000 species” (Desmond, 2007, p.189). Bentham still had access to his specimens and spent most of his retirement working at RBGK.

The official herbarium at RBGK was founded in 1853, and from summer of 1854 it comprised the donated collections of Bromfield and Bentham, which Hooker valued at

£10,000. Hooker's personal herbarium material was stored separately but within the same building. In 1854, as he had done previously, he approached the Office of Works with an offer to sell his collection to the state, but this offer was declined. Hooker died in August 1865 and one year later his entire collection, herbaria, library, correspondence, manuscripts and portraits were purchased by the state, for the "modest valuation" (Desmond, 2007, p.194) of £7,000.
(Desmond, 2007 and Royal Botanic Gardens, Kew, n.d.c, d & e).

Sir Joseph Dalton Hooker (1817-1911) succeeded his father and became the Director of RBGK in 1865. Under Sir Joseph Hooker the herbarium continued to increase in size as a result of expeditions and donations from other botanical gardens, and a new wing was built to accommodate the specimens. Joseph Hooker retired from RBGK in 1885.

Figure 13
Oxalis sericea originally from the herbarium of William Hooker

Figure 14
Coris monspeliensis collected by George Bentham

Figure 15

Salix caprea originally from the herbarium of William Bromfield

Figure 16

a. *Protea lepidocarpon* & b. *Platanus orientalis* collected by Sir Joseph Hooker

Specimens collected by Charles Darwin

There are sections of two specimens included in the painting collected by Darwin from the Galapagos Islands, a leaf of *Passiflora tridactylites*, a passion flower plant, and a fruit from the wild tomato, *Solanum cheesmaniae*. Darwin visited the Galapagos Islands in 1835 while he was the geologist aboard the H.M.S Beagle. As a great naturalist he also collected many plants and animals and this expedition is credited with providing Darwin with the evidence for his theories on evolution where he witnessed specific adaptations in the same species of animal to fit the differing environments of the islands.

Figure 17

Passiflora tridactylites collected by Charles Darwin

Figure 18

Solanum cheesmaniae collected by Charles Darwin

Specimens collected by eminent Victorian explorers Richard Spruce, Sir John Kirk and Friedrich Martin Josef Welwitsch

There are five specimens collected by Spruce included in the *'HSP'*. Richard Spruce (1817-1892) was a celebrated natural historian and explorer, for the first time, of areas of the Amazon and Andes, where he collected extensively for RBGK. Some of his most important plants collections were of the genus *Cinchona* which produce quinine in their bark, a chemical found to be a successful treatment against malaria. The trees are endemic to the previously inaccessible areas of the eastern slopes of the Andes but Spruce successfully gathered living material from *Cinchona pubescens.* This was subsequently propagated at RBGK for plantations in India and Sri Lanka (Raby, 1996 and Royal Botanic Gardens, Kew, n.d.f). The painting contains an image of a *Cinchona* specimen collected by Spruce in 1859.

Figure 19

a. *Caryocar microcarpum* & b. *Caryocar glabrum* collected by Richard Spruce

Figure 20

Cinchona macrocalyx collected by Richard Spruce

Sir John Kirk (1832-1922) originally studied medicine but always maintained an interest in botany and was elected a Fellow of the Edinburgh Botanical Society. After serving in the Crimean war he was appointed economic botanist and chief medical officer on the Zambesi Expedition (1858-1864). This appointment was made on the recommendation of both Sir William Hooker, then director of RGGK, and John Hutton Balfour, the Queen's Botanist to Scotland (UCL, n.d.a)

The Zambesi expedition, an official exploration funded by the British Foreign Office, was led by David Livingstone (1813-1873). One of the purposes of the expedition was to survey the natural resources in the locality of the Zambezi River to identify minerals and agricultural resources for British industry (UCL, n.d.b). The expedition suffered many problems and is considered to have "failed in its major aims" (UCL, n.d.b). However, botanical specimens were collected and sent back to RBGK, one of these being *Bruguiera gymnorrhiza* which is illustrated in the *'HSP'* (Figure 21). This specimen was collected on 23rd May 1858 in Mozambique at the very start of the expedition.

Figure 21

Bruguiera gymnorrhiza collected by John Kirk

Friedrich Welwitsch (1806-1872) was an Austrian who also studied medicine but had a passion for botany and in 1839 he moved to Portugal. He became a renowned naturalist and spent several years amassing extensive collections of the flora and fauna of the country. In 1851 he was selected by the Queen of Portugal and the government for an expedition to study the vegetation of Angola. This expedition departed in 1853 (Vicente, 2003).

Welwitsch spent eight years in Angola where he collected over 5,000 plant species and 3,000 insect species, many of which were new to science (NHM n.d.). The specimen collected by Welwitsch and illustrated in the *'HSP'* is *Ptaeroxylon obliquum*, (Figure 22) which must have been collected in Angola during this period. The herbarium sheet has no collection date but it was received at RBGK in 1881.

The specimen's trajectory to RBGK is an interesting story in itself. On returning to Lisbon from Angola, Welwitsch realised he needed to visit comparable collections and consult with eminent botanists to properly analyse and name his collections. This was not possible in Portugal so Welwitsch, aided with a grant from the Portuguese government, brought his collections to London in 1863. Communication between Welwitsch and the Portuguese government broke down when he was accused of selling the Angolan collections and living in luxury. In 1866 his sponsors halted his subsistence payments. Four years later he contacted them and asked for a reinstatement but was told he should pack the specimens up and return to Portugal. He remained in London, however, where he died in 1872. Welwitsch wrote an updated Will three days before he died, bequeathing the main part of his collections to the British Museum with samples donated to other European herbaria. The Portuguese government contested this arrangement but after years of legal wrangling the British Museum was allowed to retain one set of plants and the rest were distributed between Portugal (Coimbra receiving the "top" set) and other European Herbaria including RBGK (Vicente, 2003).

Welwitsch is best known for his discovery of the remarkably long-lived *Welwitschia mirabilis* in Angola. He named the plant Tumboa but it was renamed by Sir Joseph Hooker to honour the collector. (NHM n.d.).

Figure 22

Ptaeroxylon obliquum collected by Friedrich Welwitsch

Specimens collected by or with connections to current RBGK staff

It was felt to be important to represent some of the taxonomists or collectors who currently work within the Herbarium at RBGK, many of whom have assisted in this project. For instance, one of the specimens used to illustrate the *Leguminosae* family was collected by the Head of the section Dr. G. Lewis and his wife Dr. B. Klitgaard (Figure 23). A specimen collected by Dr. E. Lucas, scientific supervisor to this project is included (Figure 24) as well as a sunflower, *Helianthus annuus* specimen (Figure 25) collected by Dr. R. Brummitt and Dr. N. Brummitt, father and son, both of whom still work at or have connections with RBGK on a day to day basis.

Figure 23

Pithecellobium excelsum collected by Dr. G. Lewis and Dr. B. Klitgaard

Figure 24

Fragraea ceilanica collected by Dr. E. Lucas

Figure 25

Helianthus annuus collected by Dr. R. Brummitt and Dr. N. Brummitt

Some plants cultivated at RBGK and analysed for DNA sequences to enable the production of DNA-based phylogenies, have also been preserved as herbarium specimens. These hold extreme importance as voucher specimens which often remain as the only proof of what actual plant was used in any study. Publications based on making claims about the properties of any plant species should include a voucher citation so researchers can go back to a herbarium and confirm that the plant is indeed the one it was said to be. Six such specimens are illustrated in the painting; two of these are shown in Plates 25-26. Determining plant relationships using DNA was pioneered by Professor Mark Chase and colleagues at RBGK in the early 1990's.

Figure 26

Paeonia cambessedesii used for DNA analysis

Figure 27

Deherainia smaragdina used for DNA analysis

Specimen chosen to represent the Orchid Family

The Orchid specimen chosen for the painting is *Angraecum sesquipedale*, a Madagascan endemic species also known as the ‘comet orchid’ as it has a 22cm nectary, presenting as a spur at the back of the flower. This species is significant because Darwin, on studying the flower in 1862, predicted it would have co-evolved with a pollinator, probably a moth with a 22cm long proboscis. Forty years later such a moth was discovered and found to be the plants’ pollinator, proving Darwin was correct many years after his death. This story is

used as an exemplar to demonstrate Darwin's theories on evolution through natural selection.

Figure 28
Angraecum sesquipedale

The oldest specimens in the herbarium at RBGK

A section of what was believed to be the oldest specimen in the herbarium was illustrated in the *'HSP'*. This specimen of the species *Indigofera astragalina*, belonging to the *Leguminosae* family, was dated 1700 and came from the Dale Herbarium, possibly Samuel Dale (1659-1739) (Figure 12, p.42). There are many labels and notes on the sheet, suggesting that in its 'life time' this specimen, originally sent from India, has been part of at least three herbarium collections including the one at RBGK. If it were to be researched in detail it would have many narratives to tell of the places it has been and the people who have handled and been influenced by it.

In October 2010 another undated specimen was noticed hidden away within an infrequently used section of the herbarium collection. The botanist who located it realised

from the writing and paper size (it was once part of a bound herbarium book) that it had the potential to be an extremely old specimen. After some research it was discovered that the species was *Acacia suma*, originally part of Petiver's Herbarium in India and was collected near Fort St. George (at Madras, or as it is now known, Chennai) by Samuel Brown between 22nd and 27th March 1696. This specimen was discovered later in the Herbarium of Sonder in Melbourne, and was presented to RBGK by J.G. Luehmann in 1899. A section of this specimen has been added to the painting.

Figure 29a
Indigofera astragalina

Figure 29b
Acacia suma

This is by no means the end of the story; it is highly possible that somewhere else in the Herbarium, hiding away in the collections are older, undated specimens that have been passed down through other herbaria and have arrived at RBGK, their final resting place, where they have been carefully stored away in the darkness and are just waiting to be discovered at some point in the future.

Specimen from an extinct species

A pod and seeds from what is presumed to be an extinct species, *Streblorrhiza speciosa*, the Phillip Glory Island Pea, from the *Leguminosae* family, are illustrated in the *'HSP'*. The specimen at RBGK is from a cultivated plant grown in Vienna from a seed collected by Ferdinand Bauer on Philip Island in 1804 (Schrire, 2007). The plant material at RBGK is significant, as specimens of this extinct species exist in only two herbaria in the world, RBGK and Vienna. The herbarium sheets housed in both herbaria contain seeds, so on

those sheets is the remote possibility of bringing a species back from the dead (there has been one previous attempt which unfortunately failed). This particular specimen has an additional narrative linking it closely to the production of the *'HSP'*. Ferdinand Bauer (1760-1826), the collector of the initial seeds, was a renowned and acclaimed Austrian botanical illustrator who worked alongside botanists such as Joseph Banks and Robert Brown.

Figure 30

Streblorrhiza speciosa

Opium poppy seed head

The painting contains an image of a seed head from *Papaver somniferum*, the opium poppy. The specimen was collected from Afghanistan in 1972 by C. Grey-Wilson and T. F. Hewer and has grooves cut down the sides from which latex was extracted to make opium. This specimen is significant because it displays clear signs of human interaction and a connection to a human event, the extraction of the drug, sometime in the 1970's. The label also states that another seed head from the same collection had been sent to the Metropolitan Police for training purposes.

Figure 31

Papaver somniferum

Coffea specimens from the Rubiaceae Family

Coffee is an economically important crop with the seeds, commonly called 'beans', being the source of commercial coffee. The seeds from specimens of two species of *Coffea* represented in the *'HSP'* have interesting narratives. The specimen of *Coffea arabica*, the main species used in the production of coffee, was collected by F.G. Meyer on the first expedition to Ethiopia to collect what would now be called genetic resources of coffee. The data from these specimens collected in 1964 are currently being used to map the variety and distribution of species in the area. The second species, *Coffea ambongensis*, is one of seven wild coffee species to be discovered and named at RBGK in recent years. This plant is native to the mountains of northern Madagascar. The species is one of two with the largest 'beans', twice the size of those from *Coffea arabica* (pers. comm. Davis 2010 and Royal Botanic Gardens, Kew, n.d.g).

Figure 32
Coffea arabica

Figure 33
Coffea ambongensis

Section of Olive leaf garland from Tutankhamun's tomb in Egypt

The painting contains one of the most exceptional pieces of plant material housed within the herbarium at RBGK. A small section of *Olea europaea* (olive) leaf garland found in Tutankhamun's tomb in Egypt. Tutankhamun died in 1327 BC at the age of eighteen. The tomb was discovered over 3,000 years later in November 1922 after many years of searching by Egyptologist Howard Carter and his team (Hepper, 1990).

Hepper (1990) suggests that floral decorations were a significant part of Egyptian culture with plant material or images of plants being found in many noble and royal tombs. Flowers and plants were placed in tombs for symbolic reasons as well their beauty. The section of olive leaf garland in the *'HSP'* would have been made from locally grown olive leaves and seems to be formed in a similar fashion to a larger garland described by botanist Newberry (details below). He suggests a papyrus strip is used, and the leaves folded over the top and pinned down with further papyrus sections (Hepper, 1990).

The botanist associated with the excavation of Tutankhamun's tomb was Professor Percy Newberry (1868-1949). He identified much of the abundant plant material found in the tomb, which is now stored at the Cairo Museum with small samples kept at RBGK. The *'HSP'* contains an *Olea europea* fruit collected by Newberry in Egypt during the 1930's while he was researching the original home of the olive tree. Since these are mounted in the same sheet as the olive leaf garland they were once erroneously considered to have also come from Tutankhamun's tomb, and exhibited as such. (Goyder pers. comm. 2011 and Schrire, pers. comm. 2011a)

Figure 34
Olive leaf garland from Tutankhamun's tomb

The significance and status of the natural history specimen

The power of the specimen

Objects should not be considered as "inert or passive" (Pearce, 1995, p.18, Gosden, 2006). Instead they should be seen as 'active agents' that have the propensity to "educate peoples senses, and thus their basic appreciation of the world" (Gosden, 2006, p.440). Further, they have the ability to shape our thoughts and identities "We engage with them in a complex inactive or behavioural dance in the course of which the weight of significance which they carry affects what we think and feel and how we act" (Pearce, 1995 p.18). Blom (2002) also comments on this engagement with objects suggesting that "by surrounding ourselves with objects we hope to immerse ourselves in what is represented by them, with what they represent to us" (p.156). It could be argued that these comments are particularly relevant to this project. Interaction with the specimens and working within such a prominent institution has shaped my life and career and I have become truly immersed within the collection, where my role is to independently illustrate the outstanding qualities of the 'collection' rather than depict plant material for scientific purposes.

Changing status and significance of the specimen

With reference to Egyptian botanical specimens, Cornish (2007), speculates that the meaning and therefore the status of an object changes "with each transaction in its chain of ownership" (p.35). Specimens can live through dramatic changes in their lives when they become more or less important to different groups of people. This not only occurs through changes of ownership but also to specimens that were once extremely important to science but have become less so as time passes. Such objects, that when collected risked lives, can become irrelevant to science but be historically significant through exhibitions that use specimens to chart the lives of important collectors. Fortey (2008) mentions two such collections: the "sad booty" (p.235) from Captain Scott's Antarctic Expedition and the Geological collection from Matthew Flinders expedition to Australia in 1801, which contains "probably the first rocks ever brought back from that continent'" and "the first blobs on a geological map" (Fortey, 2008, p.235). Nowadays with improved accessibility these rocks are easily re-collected and so the specimens are currently of more significance to historians than scientists. Fortey (2008) comments that a change in significance could still befall a specimen even today, for instance if travel to the moon became a regular

occurrence larger moon rock samples could be obtained and current, small samples would change in value and significance.

Some specimens have little scientific importance and are not lucky enough to be “steeped in history” (Fortey, 2008, p.253). Examples of this are retired zoological ‘exhibition specimens’ whose value rapidly deteriorates once removed from the museum gallery. Interestingly both Fortey and the artist Mark Fairnington discuss the Natural History Museum’s stuffed giraffes in reference to this point. Fortey (2008) commenting that, “Outside my office loomed stuffed elephants and giraffes covered in tarpaulins, dead exhibits that had once graced the main hall. They were now slightly down-at-heel and neglected, with a few bald bits, and rather sad like a disused sideshow at a fair” (p.17). After the museum purchased a former bus depot in Wandsworth, South London, the retired exhibition specimens were moved from South Kensington into this overflow space. This is where Fairnington witnessed the magnificent sight of the giraffe head and necks stacked up next to each other on a board raised from the floor. Fairnington’s responses to the retired specimens are analysed in Chapter Four.

Understanding the significance of an object

Context and previous knowledge are extremely important when viewing an object and considering its significance. Objects can have a “chameleon-like quality’ the ‘ability to take on different cultural colours while retaining the same body” (Pearce, 1995, p.127). In other words the same object will have different meanings, of greater and lesser significance, to different groups of people. Pearce (1994b), Keene (2005), Alberti (2005) and Gosden & Larson (2007) comment on the fluid nature of the meaning of objects, Keene (2005) suggesting that “The significance of objects does not reside in them, but in the mind of the viewer” (p.97). These theorists suggest that the realisation of an objects meaning in the viewer’s mind lies somewhere between the piece itself and the experiences and disposition of the viewer. Alberti (2005) comments “Visitors are not vessels waiting to be filled but autonomous agents with their own agendas” (p.569). Gosden & Larson (2007) note “even the simplest object engages with the analyst, causing them to think about a world in ways that partly derive from their own past experience and interests, but also from the nature of the object itself” (p.122). Echoing these views Keene (2005) suggests that an object alone carries few meanings but with an understanding of context or being guided by interpretation “the object can provide a vivid impression, a new experience for them as

well" (p.69). An example is a very significant and valuable object in material culture terms, a specimen collected by Darwin from the Galapagos Islands in 1851. If this specimen were to be viewed with no understanding of the Theory of Evolution it might just be relegated as an old specimen from a recognisable collector and from quite an interesting place. Appreciation of the object will probably be minimal because the specimen is faded, scrappy and incomplete, as many of Darwin's specimens are. However if the viewer is better informed, it will be apparent that the specimen was collected from the very islands and at the same time that Darwin began thinking about evolution. Appreciation for the significance and inherent meanings and narratives behind the object will thus be raised considerably. Further still, if the viewer has been to the specimen collection locality, they will have their own memories and a pictorial 'narrative' to attach to the object in an additional layer of meaning. This example describes ways that historic objects are able to carry historical meanings and narratives into the present day. Pearce (1994b) notes that the more background information the viewer has on the object, or the better the object is studied, the "more meaningful" (Pearce, 1994b, p.28) is the narrative. Pearce (1994b) also suggests that "The viewing process is selective, and the potential object is richer than any of its realisations" (p.26). She also comments that the same person can alter their own 'experience' of an object if they revisit it sometime later, because their perspectives will have changed during that time. This has been experienced during this project particularly in conjunction with the Spruce specimens. With no prior knowledge of Spruce, apart from that he was an eminent natural historian; several of his specimens were selected and illustrated. Later, a fuller understanding of his life and work was obtained (Raby, 1996), through studying sections of his letters and diaries which gave accounts of how his specimens were collected. Reconsideration of those specimens gives a completely different viewing experience. Such material is now enriched by the exploratory narratives, and there is an enhanced interest because the extra information has facilitated a more extensive connection to an extraordinary Victorian explorer.

Perspectives discussed above on 'viewing' and engagement with objects raise questions in relation to the practical work of this project. Will the painting have less meaning if the viewer has no understanding of herbaria and herbarium material? The *'HSP'* is particularly appreciated by taxonomists who understand the concept and details of the classification system that is used in the project. They also welcome and understand the use of the plant in its specimen form rather than as living material. The painting contains specimens of high

value to the herbarium, recognisable to those who work with the collections. In addition, the painting illustrates the specimen's paths to storage, showing for example, sections of fleshy leaves removed and/or other intricacies that may only be detected by an expert.

Enjoyment of the painting is not exclusive to taxonomic specialists, but the extraordinary qualities of herbarium specimens, such as the delicacy, the striking aesthetics, the unusual textures and faded colours of a herbarium sheet as well as the incredible age and relative completeness of the specimens, are all aspects that might interest a non-specialist or non-experienced viewer and therefore make the artwork just as relevant and exciting to them as well.

Conclusion

This chapter analyses the complex object that is the natural history specimen; not only the material qualities but the ethereal links they possess and emotional stirrings they can provoke. It reviews material culture theories relevant to natural history specimens with emphasis on herbarium specimens, and shows that a herbarium specimen is a multifaceted object with the capacity to reveal facts and connections and narrate stories.

In summary; the herbarium specimen becomes a cultural object, an artefact, by its selection, alteration by the human hand and its position within the human constructions of taxonomy and collection. The natural history specimen has a 'special' capacity to stand for a moment in time and achieves immortality through death by becoming a representation of its kind. Natural history specimens have 'biographies' relating to their physical journeys in space and time. They also have a particular propensity to 'objectify' and 'personify' because of the permanent link to the place where they were removed from and the collector who ended their natural history life. Herbarium specimens are particularly interesting in this respect because some or all of their life history is displayed on the herbarium sheet through information on various labels, signatures, curatorial notes and informal conversations by botanists.

The RBGK herbarium specimens are primarily a scientific resource; it has however been noticed that the scientists that work with the collections understand the capacity of the specimen to be multifaceted as described. Many of the narratives concerning collectors, historically interesting specimens and the scientific background around them were

discovered by the artist as a result of discussion with RBGK staff, but one had to be very selective given the amount of material available. Specimens chosen for and illustrated in the *'HSP'* achieve additional status and permanence- in artwork. This is a pleasing parallel to the herbarium specimen as a non-permanent object selected and made permanent by the human hand.

Background knowledge is significant in understanding or interpreting the significance of an object; an object can be understood differently by diverse people at divergent points in time. For this project, where specialised material is used (herbarium sheets), previous historical and scientific knowledge was a distinct advantage in interpreting the differences in significance of herbarium specimens. Those who view the painting with a completely fresh perspective however, may be able to pose alternative questions of it that allow them to gain more from the experience.

This chapter has also demonstrated the power and active nature of objects, in this case the herbarium specimens, to influence or shape the identity of an individual by the way they interact with them. What the specimens represent and how the outside world perceives the connection between the individual and 'their' objects or collection is demonstrated by the *'HSP'* and peoples reaction to it. The label identifying the use of a specimen formalises the relationship between artist and specimen and connects the artist to the web of people connected to the RBGK herbarium.

It is clear that powerful meanings behind assembled objects underpin not only the *'HSP'* but all other art analysed here. The depth and meaning of the *'HSP'* is difficult to explain without using material culture concepts to examine how artists have used or experienced the qualities of natural history specimens, intentionally or not. Once conscious of these theories, it is possible to identify greater meanings in objects, and to use them to explore and interpret our feelings and exploit these in art. Such works then act as vehicles to transmit those ideas, narratives and emotions to others. In order to communicate hidden material culture aspects of the *'HSP'* it is necessary that supporting literature is made available. The painting will therefore be displayed alongside an extended caption and numbered key linking to further information. These have been considered and examples can be found in Appendix One.

Chapter Three

The *'HSP'* as a collection

"Every collection is a theatre of memories" (Blom, 2002, p.191)

Introduction

Pearce (1995) provides a definition of collecting as: "the gathering together and setting aside of selected objects" (p.3). Gosden and Larson (2007) comment that every object within a collection has the capacity to gather experiences of people and places on its journey to that collection. They note that the objects' stories can become part of the institution in which they reside because their actions and interactions helped to create it, albeit in a small way" (Gosden and Larson, 2007, p.5)

In the following section the hypothesis that the *'HSP'* is as a collection in its own right is discussed. The suggestion is that the *'HSP'* is a 'visual collection' of plant images, created using herbarium specimens selected from The RBGK Herbarium collection, -with the artist acting as 'curator'. Concepts and principles from the field of collection studies are used to examine this hypothesis.

The collection

Alteration of original context and function

Baudrillard (1968) suggests that an object within a collection becomes a "pure object", "completely abstracted from its use" (p.92). Stewart (1993) describes the object in a collection as removed from its primary purpose which is now redundant and totally aesthetic. She suggests the function of a collection is not to restore the original context of the object but to create a new context. The collection cannot be a full representation of everyday life; instead it creates a "hermetic world" (Stewart, 1993, p.152).

Stewart (1993) Pearce (1995) and Blom (2002) discuss the premise that to form a coherent collection, objects must be severed from their original or natural context, be forced to give up their daily lives and purposes and become naturalised within a new context, i.e. that

created by the collector. Once in this new context, the ‘old life’ of the object, although still present, fades and the object ‘works’ toward its new context and the collection as a whole. The *“spatial whole”* (Stewart, 1993, p.153) of the collection then supersedes its individual parts or narratives (Stewart, 1993, Pearce, 1995).

These statements concerning function and context are true of the two collections involved in this research project, the herbarium collection at RBGK and the ‘visual collection’ created by the specimens chosen from it and illustrated in the *‘HSP’*. Plant material in a herbarium has been severed from its original context of the wild environment; it has lost its ‘function’ as it is no longer able to grow, reproduce, feed animals or provide shelter, ultimately becoming compost and therefore nutrition for other plants. This plant material has been collected, placed on paper, given cultural value and meaning and stored in cupboards. The result is a change in context and status from plant material to herbarium sheet, or scientific document. Each plant sample could further be considered to be ‘naturalised’ into the scientific collection due to their uniformity. All herbarium sheets are the same size, with the same type of labels, and all are stored in identical folders, creating consistency throughout the collection.

A further step from its origin, as indicated by the ‘visual collection’ created via the *‘HSP’*, is to remove the herbarium specimen from its herbarium origins. The sheets are taken or ‘severed’ from the cupboards and used for another purpose than the scientific one they were collected for. This time the context they are placed in is the painting, as a visual representation of the actual object. Their primary function has changed from natural to scientific, then again from scientific to aesthetic and narrative.

Along with this change of context two selection opportunities exist, firstly by the botanist who chooses an appropriate specimen to represent a particular species and secondly, by the artist as collector/ curator, choosing a particular specimen for the creation of the *‘HSP’*. The botanist and the artist will have different selection criteria, the botanist attempting to find representative plant material while the artist is dependent on factors determined by the criteria of the painting. Specimens must demonstrate the diagnostic characters of a particular family, should be collected by targeted collectors, and have the appropriate shape, colour, age and original collection location.

Initiation of a collection

Collections can be the result of deliberate decisions or can be started inadvertently. Belk (1994) describes intentionally created collections, suggesting that there are distinctions between "collecting and several related, but distinct consumption processes, including accumulation, possession and hording" (p.317). Belk (1994) rejects Duroust's suggestion "that collections are necessarily intentional or must involve series-completion" (p.317), but accepts that this is characteristic of some types of collection. Bal (1994) notes that in the unintentional collection it can be "virtually impossible" (P.99) to define exactly when the collecting activity began. Belk (1994) suggests that this type of collection can go unregistered on the conscious but become very apparent upon reflection; he comments "collections are 'discovered' by their creators long after the materials have been gathered" (p.318). At its inception, the concept of the *'HSP'* was an unintentional collection; it was not considered a collection in its own right since it was simply intended as an illustration of a classification. However, as the project was researched it became apparent that the themes described above were ingrained in the work.

Collection components

Collections can comprise physical objects, representations of objects or even real or imaginary events. Belk (1994) comments on the nature of subjects that can constitute a collection: "items in a collection, as we construe it, may be material objects, ideas or experiences" (p.317). Blom (2002) also discusses collections as not necessarily having to contain 'real' objects: "Imaginary collections are as important as real ones: both place on their stage memories as contained in objects" (p.184).

Fortey (2008) describes his book, *'Dry Store Number 1: The secret life of the Natural History Museum'* as a type of personal collection, a collection of memories: "This book is my own store room, a personal archive" (p.1). He reasons that "our lives are collections curated through memory. We pick up recollections and facts and store them, often half forgotten, or tucked away on shelves buried deep in the psyche" (p.1). Concluding that "the sum total of that deep archive is what makes us who we are" (p.1).

It is intended that the practical element of this project, the *'HSP'*, creates a 'visual collection' based on a scientific classification system. Under the criteria listed above, it can

be considered a ‘real’ collection despite containing images of specimens rather than physical objects.

Sacred objects

Belk (1994) describes the transformation of the object from the ordinary to the ‘sacred’ on entering a collection its location, “whether it be envelope, box or room” (p.321). This applies also to herbarium specimens since the plant material, the original object, has become ‘sacred’ and permanent by the transformation into a herbarium sheet and through this it enters the ‘sacred space’ of the herbarium collection. Through the *‘HSP’* a selected herbarium sheet will enter another ‘sacred’ state in its story when it becomes immortalised in an artwork as a ‘portrait’. The second ‘sacred’ space is the paper on which they are painted, the composition as a whole and the way the final painting is exhibited.

Experience of creating a collection

Collections can become very significant to their collectors; the enormous amount of time, effort, emotion and cost spent accumulating and arranging collections make collectors feel they have placed part of their self into that collection (Belk, 1994). Cardinal (1994), on discussing the collector and artist Schwitters and his lifetime obsession with making collages from collecting printed and discarded papers, translates an expression by Proust to suggest the whole experience of collecting. The relationship between subject and object can form “the continuous thread through which selfhood is sewn into the unfolding fabric of a lifetime’s experience” (Cardinal, 1994, p.68).

The assembly of a collection also leads to “the replacement of the narrative of history with the narrative of the individual subject- that is, the collector himself” (Stewart, 2005, p.156). A particular acquisition, object or specimen can become inextricably linked with the passage of time and memory of how the collection was created. Pearce (1995) sees collecting as a form of structuring a lifespan and that in doing so a person is able to give “tangible form and content to the experience of time passing” (p.236). In this way collections become “an outward and visible sign of what otherwise leaves no trace upon empty air” (p.236). Pearce concludes that it is “this capacity of material to carry experience which makes it so dear to us” (p.236). Baudrillard (1968) further considers this structuring of time as fundamental to the psychology of collecting, “because the organisation of the

collection itself replaces time. And no doubt this is the collection's fundamental function: the resolving of real time into a systematic dimension" (p.102).

"The capacity of collecting to give meaning to the passage of time" (Pearce, 1995, p.236) is illustrated by the experience of Dr. Richard Brummitt, an eminent plant collector. He is credited anecdotally by his son Dr. Neil Brummitt as being poor at remembering dates but always able to recount with incredible detail stories behind the collection of a particular specimen and their connections to each other, as though his collecting expeditions were marked out by particular 'finds' rather than by time. Russell (1948) comments on the ability of things and situations to reconstruct past moments in time: "when I remember a piece of music or a friend's face my state of mind resembles, with a difference, what it was when I heard the music or saw the face" (p.179). Both recollection and the alternative marking of time were experienced in the development of the *'HSP'*. A specimen, if painted on a special day has the ability to conjure up memories of that time and to symbolise the feelings experienced on that day. During this project there have also been significant moments created by the 'hunt' for an unusual plant and the sensory experience of finding it. Such instances were the opening of the cupboards, astonishment at the sight or smell of unknown sheets inside or the enjoyment of painting a particular plant. These memories are permanently and privately recalled by the visual image of the specimen. There is genuine enjoyment in sifting through memories sparked from the act of creation of the '*HSP*'. In this respect Byatt (2008) is correct when she comments "memories can be polished, like objects taken out, burnished and contemplated" (p. xii).

Collections - layers of meaning

Stewart (1993) comments that although a whole collection might end up on public view this 'visual information' will by no means give the viewer a complete understanding of the narratives and meanings within the collection: "While we can see the entire collection, we cannot possibly see each of its elements" (p.155). Pearce (1995) notes the similarity between humans and collections in that much of the significance is hidden on the inside. She also comments on the invisible memory connection and intangible conversation between collector and object. This principle is particularly true of the 'visual collection' created by the *'HSP'* Although the family or even perhaps genus and species can be identified from the visual interpretation, other dimensions such as the collector, age of the

specimen and memories associated with the finding and painting of the specimen, remain hidden.

The natural history collection as a collection of people

Gosden & Larson (2007) suggest that museums have a reputation as "static places" (p.7), a repository for objects which are shut away and left to gather dust. This is far from the truth; the museum is in fact a "dynamic entity" (Gosden and Larson, 2007, p.7), comprised of a "shifting mass of people and things" (Gosden and Larson, 2007, p.7). Institutional collections attract dedicated collectors and associates, suggesting that a museum collects 'people' as well as objects. Alberti (2005) describes the museum as "a vessel for the bundle of relationships enacted through each of the thousands of specimens on display and in store" (p.561). The traditional view is that a museum comprises a set of objects collected by a range of people (Gosden and Larson, 2007), however "it is also possible to see that the people associated with the Museum have been collected by objects" (Gosden and Larson, 2007, p.5). In the use of the phrase 'associated with the Museum' Gosden and Larson encompass all people with a connection to the collection whether directly or indirectly. For example, in the herbarium at RBGK some staff who are not collectors or scientists work on or with the collections on a daily basis, such as freelance artists and volunteers. 'Objects' can pass through many hands before finally becoming absorbed into the collection, so the web of connection extends to those collectors who have donated specimens to smaller collections which have subsequently been donated to or purchased by larger ones.

Gosden and Larson (2007) suggest that the "innumerable sets of connections between people and objects" (p.1) that make up a museum have the propensity to "extend over time and space" (p.1). They comment that a museum can be understood as an "aggregation of people and things" (p.1) that clearly stretches "beyond its immediate physical confines" (p.1). Gosden and Larson (2007) thus suggest that museums should be considered as "great compound animals" (p.34) comprising countless people, objects and buildings. Most large museums are a "collection of collections, incorporating a complex colony of collectors, many of whom gave only a single object" (Gosden and Larson, 2007, p.34). In this way the museum's identity is constructed by 'multiple authors' who in some cases are unaware of their role, or are even unwilling contributors. "It is objects that have drawn people together, helped to define their interactions, and made them relevant to the Museum" (Gosden and Larson, 2007, p.5). To develop this theme Gosden and Larson (2007) see the museum as a

"series of vast, complicated networks of people many of whom would never have come into contact…had it not been for objects" (p.5).

At RBGK, for example, John Wood is an active collector, who spends six months a year living in Bolivia, sending his specimens back to the RBGK Herbarium. His specimens are clean, retain their colour and are exquisitely prepared. While selecting material for this project, many 'Wood' specimens presented themselves as candidates, and it was often quite easy to identify them as his without even checking the label. Owing to their high quality, a total of seven of his specimens have been illustrated in the *'HSP'* and two of these are presented in Figures 35 & 36. Without ever meeting John Wood, the specimens have forged a clear connection between the artist and collector, providing a sense of 'knowing' through studying and painting the plant material he chose to select.

Figure 35

Passiflora pinnatistipula collected by John Wood

Figure 36

Aristolochia odoratissima collected by John Wood

Visibility of the specimen and the 'closed world' of the herbarium

A large institutional collection is a place where objects can and do get lost from sight, in many cases this is intentional, to provide longevity. Fortey (2008) comments "once hidden away safely in their folders, dried plants are great survivors" (p.159). Keene (2005) suggests because of the "storehouse aspect" (p.87) and the "shrouded" nature (p.88) of the behind the scenes collections within museums, such collections could be considered as the "museum's memory" (p.90). Continuing this analogy, the 'behind the scenes' collections have the capacity to slip further into the "unconsciousness of the museum when they lose their identify- their unique number that links them to their documentation" (Keene, 2005, p.88). Artists who have found mislabelled or badly curated specimens during their time working with the collections are discussed in Chapter Four.

The 'hidden' nature of herbarium collections can apply to the physical objects as well as the stories they have the propensity to narrate: "just as the stories behind the specimen sheets can drop out of sight, so the specimens themselves are, for the most part, unavailable to a general stroller, a casual observer. And so a herbarium feels not only like a cumulative garden, but a secret one as well, questions and answers tucked into its leaves" (Stacey and Hay, 2004 p. 26).

The 'out of sight' or 'unconscious' nature of the natural history store means that specimens within the collection have been placed in the cupboards for safe keeping and not viewed again. This is not to say that they will never been looked at, or gain in importance, or be thrown up in the museums consciousness at some future date. Indeed a herbarium is by no means a 'dead' or static collection; "they're [the specimens] quivering with life, the vitality, of constant change, constant movement, constant addition and revision" (Stacey and Hay, 2004).

If the collection is considered to be the "museum's memory", like all memories they are "undetectable" unless articulated by the owner (Keene, 2005). As humans have unconscious or forgotten memories that can suddenly be triggered, museum stores have forgotten, mislabelled or misplaced specimens that when re-found have value and importance which can be quantified immediately. For this reason the *'HSP'* and other similar projects identified in this research hold great significance. In terms of 'life events', some herbarium specimens at RBGK are practically 'celebrities', very much at the front of

the museum's conscious memory, with their images frequently used in publications, posters and exhibitions. It is hoped that the *'HSP'*, as well as illustrating specimens entrenched with narratives as those listed in the previous chapter, will unearth specimens currently in the museums' unconscious that have not seen the light of day since they were collected. This will provide further opportunities to tell their particular narratives and add to their 'life events'.

Obsession, domination and the ability to exert control over collections

Like many human experiences, creating a collection can lead to obsession, fuelled by the intimate and sometime passionate relationships that humans can have with objects: "let us grant that our everyday objects are in fact objects of a passion - the passion for private property, emotional investment in which is every bit as intense as investment in the 'human' passion" (Baudrillard, 1968, p.91).

It is possible for a collection to dominate the collector and for the collector to submit to its demands. Blom (2002) discusses the personality type most likely to develop an obsession with collecting or a collection: "it takes this mind-set, its voluntary seclusion and single-minded pursuit of one goal and one goal only, to keep on going oblivious to the consequences" (p.170). The *'HSP'* has dominated its creator because the project strictly followed a classification whose sequence dictated the pattern of life rather than enabling her to plan around it. The classification system 'decided' what the artist painted next; weeks and months passed steadily, constrained by the charted structure that is the arrangement of the plant families. The project created obsessional feelings and it is hard to pinpoint exactly which factors caused this. Certainly the enormous scope of the task, as well as the need for strict targets to complete the collection within a time limit, have played their part. It is suggested that some naturally occurring obsession must have been present to consider the project in the first place. The environment in which the painting has been created also had an effect, as the herbarium taxonomists are extremely focussed and in many cases they verge on obsession themselves. Indeed, it might be claimed that this is an essential quality for someone entering the profession!

However, there is evidence of a two way relationship. Collections provide a sense of purpose, offer an escape and allow the collector an element of control over something in their life. "Collections are like pets: objects of affection: they are also objects of

domination and control" (Danet and Katriel, 1994 p.228). Collectors are perhaps possessed with this type of motivation for control in varying degrees, enabling them to "construct a special private world which they can control directly in a wide range of ways" (Pearce, 1995 p.175). Pearce (1995) reflects that "we control the disposition of our collections in ways in which we control little else" (p.175), suggesting that "collecting offers the exercise of power" (p.178) for the collector, in that they have the ability to manipulate the collection, to whatever ends they wish, by choosing what is to be included or discarded.

Just as the *'HSP'* dominated the life of its creator, it also provided a considerable sense of purpose and a certain level of security. The project provided me with purposeful intent within the herbarium, especially as the project is deemed to have scientific integrity. By its very nature the concept of the project is easily explained and clearly understood by the specialists who work there. The scheme involved all families housed in the herbarium, which brought to light the whole collection rather than specimens from just one family, as in earlier projects. In addition a higher level of collaboration became possible than with previous art projects. From his experience, Fortey (2008) suggests that life in a museum could be considered to resemble a kind of asylum "where a life could be spent painlessly away from the real world" (Fortey, 2008, p.213). It could be said that the *'HSP'* project enabled and supported the artist's wish to continue working in the private world of the museum.

The collected object - possession and handling

Danet and Katriel (1995) interviewed collectors in Israel, concluding that they are fully aware of the importance of ownership and control in their activities. In their work, Danet and Katriel (1995) comment on two further aspects of ownership: firstly this allows for the handling of the object, "the sensuous aspect of collecting- handling, touching, playing with and caring for the collection" (p228/9), and secondly the sense of accomplishment provided by ownership of material objects. Pearce (1995) also discusses the physical and tangible attributes of objects, she comments that because they take up space they can be possessed, handled and physically organised.

Herbarium specimens have exceptional physical or sensory qualities especially as their texture, shape and smell can be extraordinary owing to their geographical location, the plant chemistry or just due to alteration by the storage techniques of pressing and dying.

Some specimens are covered in dense hairs, for example, and it is delightful to stroke the particularly velvety kinds. This tactile knowledge of the specimen accentuates and broadens the experience of the physical object and the memory is often recalled when looking at an illustrated image. Stewart (1993) describes “the acute sensation of the object –its perception by hand taking precedence over its perception by eye” (p.139). This tactile experience is shared by other artists and described in more detail in Chapter Four.

Classification and organisation of objects in a collection

Elsner and Cardinal (1994) believe that classification must precede collection. An object must be named and described or ‘classified’ even in some small way, before it can be incorporated into its correct position within a collection. These authors describe a collection as a living classification “experienced in three dimensions” (p.2).

The spatial organisation of a collection can be a very important factor and one that sets it apart from hording activities: “the space of the collection is a complex interplay of exposure and hiding, organization and the chaos of infinity. The collection relies upon the box, the cabinet, the seriality of shelves. It is determined by these boundaries” (Steward, 1993, p.156). Baudrillard (1968) echoes this thinking and suggests that a collection’s seriality and the display of that seriality can in some cases be more important and appealing than the ownership of the separate objects, “even further down the same path, the book itself may count less than the moment when it is put back in its proper place on the shelf” (p.112).

The *‘HSP’* follows these principles. To visually depict a classification of flowering plants, a sub-collection was created that required the artist to ‘live’ the classification. By sequentially researching and locating each specimen, the classification was re-constructed as a piece of art in two rather than three dimensions, its components were slowly accumulated and precisely arranged, organised and defined by boundaries, i.e., those of the paper, just as any other collector would acquire objects, organise and display their collection.

Completion of the collection

In collecting behaviour there can be a psychological struggle with a simultaneous craving to complete a collection, but a panic that completion will in some way signify an end of the

purpose or occupation of the collector (Pearce, 1995; Belk, 1994). Depending on personality type, collectors encourage closed or open collections, and adopt strategies to make this possible. Where the desire to complete the collection is strong, collectors choose to acquire objects in defined and accessible sets, making it possible to collect them all. In other cases the collector will choose a collection that can never possibly be completed so it can continue as a life's work.

The *'HSP'* creates a clearly defined 'visual collection' with distinct boundaries and would be considered a 'closed set' of objects. As previously discussed, the intention is to illustrate every flowering plant family and this task was completed within the parameters that have been set for it. Pearce (1995), however, correctly surmises that collectors can be "bound up in ideas about what constitutes the 'end' or the 'completion' of a collection, and what constitutes 'perfection' or 'perfect' examples within the chosen range" (p.185). There remain questions that relates to the completion of the collection; for example, can a plant family be truly represented by one specimen? In particular the larger plant families or those that contain significant structural variation within the group? Should there have been more samples to show the variety within the family? Is the chosen specimen the correct one to use scientifically?

A final factor relevant to this project is that of the 'unique' object. Baudrillard (1968) cites the unique object as being: "defined by its final position and hence creating the illusion that it embodies a particular goal or end" (p.98). Within the herbarium at RBGK there is one plant family with no representative specimen: Haptanthaceae. The only specimens of Haptanthus hazletti, the single species in the family, are found in Honduras, the country of origin. This project, and collection will not be completed without being able to access this specimen. It really is 'the unique object'. Missing an illustration from the 'visual collection', the whole project will become a comment on the collection at the herbarium at RBGK rather than illustrating a complete classification system. Baudrillard's (1968) comment that "the object attains exceptional value only by virtue of its absence" (p.99) could not be more correct than under these circumstances.

Conclusion

The *'HSP'* can be viewed as a visual collection built from the larger physical herbarium collection at RBGK. As with other collections, the *'HSP'* had an unintentional beginning; it became apparent that a comprehensive collection was forming only some time after the project's initiation.

Collectors view their activities in the most serious light and use terminology suggesting this, for example 'hunting for objects'. Once an object is 'captured' it is removed from its original context and naturalised into the context of the collection. This act replaces the original function of the object with a purpose that works towards the collection as a whole. This has been demonstrated to apply to the *'HSP'* as well as the herbarium specimens chosen as representatives of their family, not just of their species. Possession of an object can be a very powerful force and is one that collectors list as an important feature of their activities. For the collector, being able to handle, touch and physically move the objects around in space is exceedingly important. Specimens used for this project have provided those qualities and other artists interviewed for this research project have mentioned touch as an important feature in their relationship with the specimens they work with.

Large institutional collections are webs or collections of persons as well as objects. These people are the 'authors' of the museum and often have relationships and connections with each other through the objects. This has been experienced in this project where the artist feels a sense of 'knowing' certain collectors without ever having met them. The herbarium at RBGK houses millions of specimens; because of the shrouded nature of their storage many of these may never again see the light of day. This project has allowed some of them to come back to light and life, even for aesthetic purposes if not scientific.

The organisation of a collection is extremely important, whether it be vertically on shelves or horizontally spread throughout a room. This is certainly true of the *'HSP'* where the boundaries of the paper form the space and the collection is displayed as a carefully considered composition. A collection is a complicated arrangement and the viewer is not able to identify all the layers or aspects by sight alone. A collection is composed of more than just its physical attributes each item has a connection to the places and people it has passed through and an ability to stir memories of these. The collection can be considered a 'sacred' space and therefore an object is rendered sacred on entering the collection.

Traditionally the canvas or paper can also be considered a sacred space where the creative mind expresses its inner thoughts. This project has therefore combined those two 'sacred' spaces - the collection and the picture plane.

A broad psychology of collecting has been demonstrated through the accumulation of specimens for the visual collection of the *'HSP'*. Interviews with other artists working within natural history collections, established that they too are to a greater or lesser extent subject to these forces – a topic that will be developed further in Chapter Four. It is demonstrated here that artists generating 'taxonomic art' such as the '*HSP'*, by following a classification "master plan" and completing a closed set collection, are subject to similar psychological principles as collectors. Artists also feel the pressure to complete the collection and can become obsessed and dominated by their projects. They too become possessive about the objects they perceive to be in 'their' collection, not the physical but the visual representation. This insight into the psychology of collecting suggests significant links between 'specimen based art' and collecting. Structured collecting is an intense activity with rules, boundaries and background research necessary, and it has become clear that 'specimen based artwork' produced within public collections follows similar rules. This chapter illustrates how artists working with collections or in this type of environment may unwittingly lean towards constructing their projects as if they were themselves collectors.

Chapter Four

How are artists utilising natural history collections to produce narrative led 'specimen based' art projects?

Introduction

In Chapters Two and Three material culture theories that can be applied to the creation of the *'HSP'* as well as the psychology of the relationship between artist and object or collection were reviewed. This Chapter applies those particular theories identified in the last section as relevant to the *'HSP'* in analysing many other similar 'specimen based art projects' whilst drawing parallels and identifying differences with the *'HSP'*. The primary research methodology applied in this Chapter was by interview, which was chosen because it allows for specific lines of inquiry.

Of the thirteen artists contacted and interviewed, ten had completed or were in the process of creating narrative-led specimen based artwork with specimens being replicated in some form. Three further artists, Mark Dion, Fiona Hall and Brian Collier produced installation pieces using actual specimens and had developed artwork themed around the museum environment, scientific fieldwork and particular collectors. After consideration it was decided that the focus of this second group of artists was slightly different and issues explored in their projects too far removed from those considered here. In addition, Putnam (2009) has already produced a comprehensive volume reviewing artworks where there is an application of "museological methods to both the production and presentation of their work" (p.34). Here Putnam (2009) comments on the "increasing tendency" (p.34) by contemporary artists "to employ typical museum display devices such as vitrines, archive boxes, specimen jars, descriptive labels, drawer cabinets and even packing crates" (p.34).

The chapter begins with a short summary and images of specimen based artwork projects from ten contemporary artists. It is broken down into ten sections, one per artist, in alphabetical order. These summaries describe the first contact the artist made with natural history specimens, their projects, technical information about the pieces and narrative elements developed. The second half the chapter examines how the artists developed their responses and identities relative to the qualities of the scientific artefacts and museum

environment experienced, and how these responses relate to wider material culture theory and collection studies.

Artist summaries

Elaine Duigenan

Elaine Duigenan is a British photographer who has produced a set of specimen images entitled *'Mysteries of Generations'* (2001). These photographs feature specimens from the Hunterian Museum, Royal College of Surgeons, London. The items housed in this museum are anatomical specimens, used by medical students and vets (Figure 37, p.85), and they are unique in comparison with the other projects utilising specimens collected and stored for taxonomic purposes. The anatomical specimens were prepared by John Hunter 1728-1793 who was a pioneer anatomist and surgeon. Duigenan suggests the specimens reflect the dedication of one of history's "great characters, who spent every moment of the day, exploring, testing, teaching, questioning, collecting" (Duigenan, 2010a). Duigenan found particularly appealing that specimens were dated from a time when scientists were beginning to discover "what's going on in the world" (Duigenan, 2010a).

Previously, Duigenan had been a photojournalist and she 'discovered' these specimens when visiting the museum, which was close to her home. She comments "I was amazed" (Duigenan, 2010a) and "totally taken by the specimens" (Duigenan, 2010a). Once permission to photograph the collection had been sought and granted (something Duigenan states "wasn't easy" [Duigenan, 2010a] to obtain), she worked within an accommodating Anatomy and Pathology Museum who allowed her a temporary studio space where she worked one day a week from 1997 to 2000.

Duigenan soon realised that a primary focus was necessary to produce a strong body of images. She decided this would be foetal specimens (displayed independently or within dissections of the uterus) and newborn animals. She comments that these were "by far the most interesting because of their intrinsic connection to the start of life" (Duigenan, 2010b).

Duigenan developed and printed her own black and white contact prints. Specimens were bottom-lit by placing specimen jars on appropriately sized apertures cut into black velvet covering a light box, a method which also prevented glare on the glass jars.

Although the specimens captured in Duigenan's *'Mysteries of Generations'* (2001) are different from the taxonomic specimen projects examined in this study, these images are of great interest to this research. The specimens have the capacity to narrate the story of anatomical discovery, by an important figure, John Hunter, who led the development in surgery techniques at the time. In a manner similar to other artists in this study, Duigenan was attracted to qualities of 'specimen status' as well as the connection that the specimens had to their 'maker' and the point in history when they were given their permanence and 'new life' as a specimen.

Duigenan's images are shot sensitively, the specimen bodies glow softly and angelically in preserving fluid, as if this was always their destiny. The juxtaposition of the heavy glass jars and stained labels with copperplate handwriting remind the viewer of the reality of how and when these stunning and unusual objects came to exist. The use of black and white photography, and Duigenan's specific lighting technique, highlight the darkness around the specimens, revealing only a bare hint of other collection jars in the background. The result is that bodies appear cosy and content, suspended in their watery worlds. Duigenan's images clearly possess a sense of discovery. The choice of foetal exhibits and the nature of anatomical specimens mean that normally concealed inside structures are revealed. In addition, Duigenan's images reflect a discovery that beauty and a sense of peace can be found in the most astounding places.

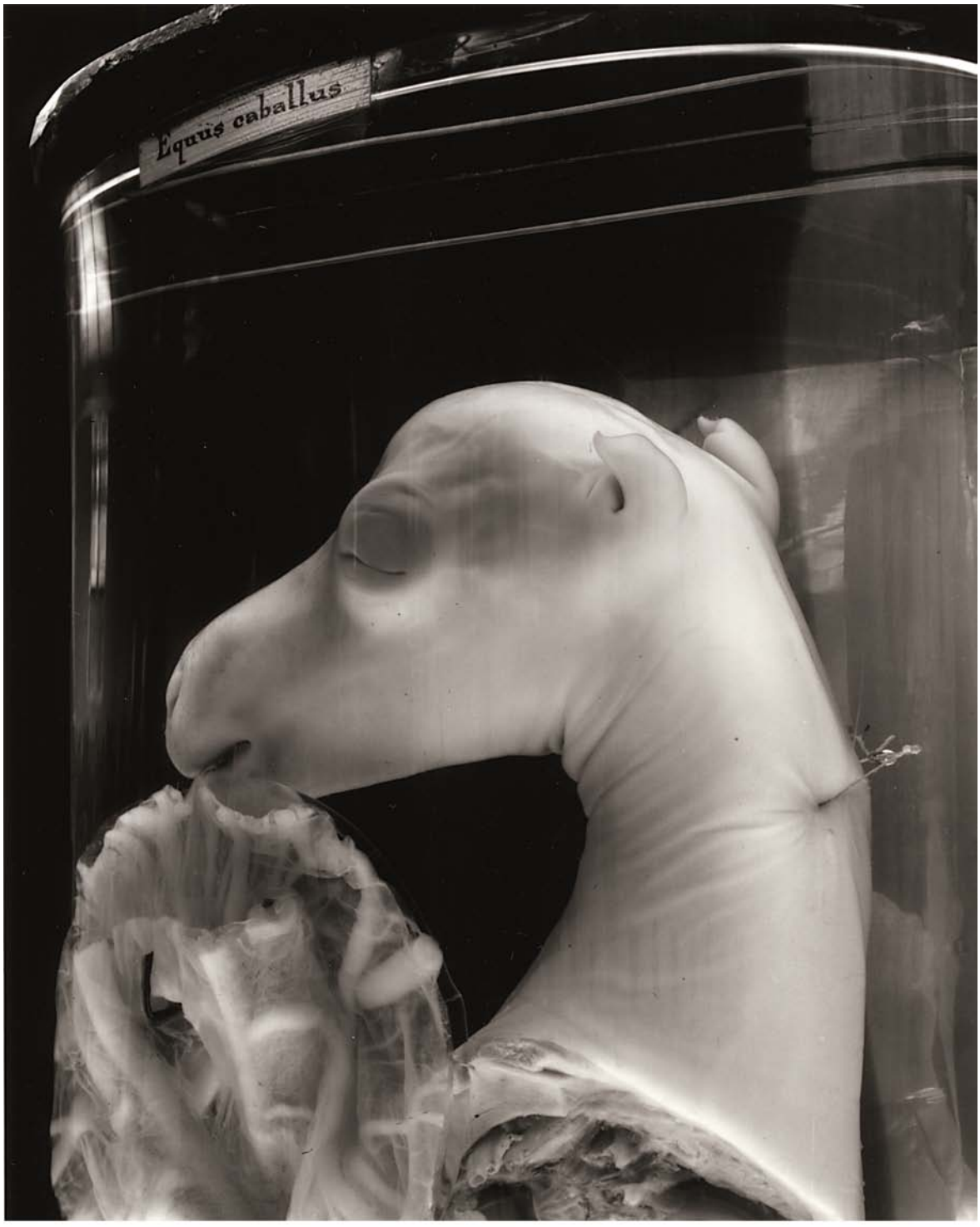

Figure 37

'Equus caballus' from *'Mysteries of Generations'* by Elaine Duigenan, 2001, photograph

Mark Fairnington

Mark Fairnington is a British painter who also stumbled across the subject of natural history specimens by accident. Fairnington visited the Oxford Natural History Museum (ONHM) with the intention of enlarging and capturing surface detail of objects using a camera mounted on a microscope. The ONHM has a large and comprehensive collection of insects which Fairnington decided to exploit, focusing particularly on the Mantidae family. Once amongst such a large and rich source of visual material, Fairnington implemented the following specimen selection process. He became more interested in those "conspicuously damaged through being collected" (Fairnington, 2007) and devised a simple process, choosing five specimens "which were not beautifully pinned down, but the ones which were slightly scrunched and damaged" (Fairnington, 2007) (Figure 38, p.88). In this way the chosen specimens exhibited faults created by the processes of collecting, storage and display.

Once under the microscope, the specimens are moved around and forty to fifty shots taken at different levels of magnification, enabling Fairnington to return to his studio with hundreds of photographs to piece together. O' Reilly (2005) describes this process as a "broad sweep of the net that captures all aspects of the specimen" (p.13). Fairnington poetically compares the process to a collecting trip in that "you go out, gather what you can and bring it back and then you construct the most believable image out of what you've got" (Fairnington, 2007). Fairnington creates montages from the photographic images and uses these as the primary source material for his paintings. The time spent in the museum environment was relatively small.

Fairnington produced an exhibition and book from his first exposure to natural history collections, both entitled *'Dead or Alive'* (2002). Subsequently, in 2004, Fairnington had a successful exhibition in conjunction with the NHM, London entitled *'Fabulous Beasts'*. He has since had several other exhibitions in commercial galleries.

At the time of interview, the walls of Fairnington's studio were covered by large paintings, including scenes from the NHM storage depot and two large birds of paradise. The focus of Fairnington's work at that time (2007) was still the 'specimen'. Throughout the last few years his work has evolved to explore and consider 'specimen status' and he suggests that "my interest always rests in how painting functions, as a sort of way of talking about the

thing" (Fairnington, 2007). In *'Dead or Alive'* (2002), Fairnington attempts to illuminate themes related to the 'life history' and changing status of a specimen including its collection and storage process. Specimens that historically have had fictitious stories surrounding them, such as the birds of paradise, led him to paint *'Paradise (birds we cannot see)'* (2004) (Figure 39, p89). Unused or retired specimens feature in paintings of scenes from the NHM storage depot, including *'The Raft'* (2006) (Figure 40, p.90). The architecture of display is investigated in *'The Hummingbird Tree'* (2003) (Figure 41, p.91) and *'The Ancestors'* (2004) (Figure 42, p.92), and the moral and environmental aspects of specimen collection are questioned in the juxtaposition of real skin and glass eye in the series of animal eye paintings from 2004 *'Seal'* (Figure 43, p.92).

Fairnington is highly proficient in accurately rendering surfaces, such as the hard shiny exoskeleton of an insect or the coat of a hoofed animal. In paintings where he collected visual source material at different levels of magnification, Fairnington creates the illusion of some elements being closer to the eye, by replicating these in a slightly blurred manner as if the image were captured by a camera with a shallow depth of field. This technique is used to great effect on the pin in the insect thorax, which is considerably foreshortened. This also adds to the illusion when standing in front of the actual painting since it takes some time to comprehend the pin; once noticed, though, it is obvious in that painting and in others.

Fairnington has been very creative in the variety of ways he has examined the notion of the specimen. He is particularly good at including small and hidden details which when noticed make the whole piece function on a different level. For instance, the reflection of windows in the glass eye of a stuffed specimen, or in the scenario outlined above, the viewer might consider the possibility that the insect is alive and then discover the clue (the pin) and notice the damage to the body indicating its actual state.

Farmington's paintings are beautifully crafted artworks and their scale further enhances their impressiveness. However, to juxtapose this beauty, carefully concealed under the exquisite rendering of surfaces are connotations of violence, sadness, misunderstanding and neglect. Fairnington has purposefully chosen to make monuments from specimens who have had negative experiences in the past and have a potentially bleak outlook in the future. By doing this he is attempting to make us aware of our considerable national

collections, commenting on our duty to continue to care and conserve these objects, which as animals, died at the hands of humans. We should also find new ways to use and celebrate such specimens if they are no longer required for science.

Figure 38

'Specimen 7' by Mark Fairnington, 2000, oil on canvas, 214 x 189cm

Figure 39

'Paradise (Birds we cannot see)' by Mark Fairnington, 2004, oil on panel, 71 x 128cm

Figure 40

'The Raft' by Mark Fairnington, 2006, oil on canvas, 225 x 450cm

Figure 41

'The Hummingbird Tree' (detail) by Mark Fairnington, 2003, Oil on canvas, 214 x 300cm

Figure 42

'The Ancestors' by Mark Fairnington, 2004 Oil on canvas, 199 x 224cm

Figure 43

'Seal' by Mark Fairnington, 2004, oil on wood, 20cm diameter

Donald Farnsworth

Donald Farnsworth is an American artist who worked with zoological specimens at the California Academy of Sciences in 2007, creating a set of images entitled *'Origin: Specimens'* (2007) (Figure 44, p.94). The artist has always been interested in specimen collection and has a small personal collection of shells, insects and skulls. The primary inspiration for the artworks came after "a championing of totally lame-brained ideas about evolution" (Farnsworth, 2007). By this he refers to the controversial decision of the Kansas Board of Education in 2005 who voted for students to study doubts about modern Darwinian Theory, a decision backed by the then president, George Bush. Farnsworth decided to "start looking at the facts: the visible evidence of evolution and natural selection, as well as the years of carefully researched scientific inquiry into the subject" (Farnsworth, 2007).

Farnsworth's pieces in *'Origin: Specimens'* (2007) are created by scanning specimens (directly on a scanner bed) or, where this wasn't possible, by using traditional photography. A background was created using a copy of 'Origin of the Species' from a free online library, reformatted to create a text block. Using Adobe Photoshop the two layers were combined and middle layers added, digitally painting a shadow to give the appearance that the specimen was on top of the text. Farnsworth comments that "as simple as this sounds, in some cases I may have incorporated twenty layers or more to create the desired effect" (Farnsworth, 2007). He also spent time 'editing' the aesthetics of the specimens: "I also digitally enhanced colours, removed evidence of pushpins and collapsed thoraxes, cloned the smallest feathers, smoothed edges……redrew missing elements" (Farnsworth, 2007). Farnsworth's choice of specimen to be overlaid on a certain section of text would often relate to the content of the text, but his main criterion for specimen choice was aesthetic.

Farnsworth's choice of text, Darwin's 'Origin of the Species' is integral to the purpose and statement of his artwork. Farnsworth comments that "Darwin's work was groundbreaking and many of his theories have been proven over many decades. He faced opposition in his time from individuals and groups whose arguments were depressingly identical to those spouted by 'creationists' today" (Farnsworth, 2007). Farnsworth makes the point that Darwin researched his 'theory' with utmost scientific rigor. Through his pieces, Farnsworth wanted observers to "contrast the record" (Farnsworth, 2007), viewing the subject matter on which the text is based, i.e., the specimen, along with the actual text

beside it. Farnsworth therefore included “ephemera such as the wooden drawers in which the bird skins were kept, or the tags on the specimens” in the prints “so as to position the viewer as an observer within a scientific context” (Farnsworth, 2007). Farnsworth’s images were conceived as a statement, reminding the viewer that there is an enormous body of scientific proof to support the Theory of Evolution. He chose animal specimens to represent the extensive research that was required to formulate and construct the theory (now accepted as fact in the scientific community) because specimens are the tools that Darwin and other scientists used to compile data to support their hypotheses.

Farnsworth’s images are unique, as he physically uses the specimens to create the image by scanning them. Interestingly, however, the authenticity of the individual specimen is less important in the statement he wishes to make by this artwork, since Farnsworth alters and corrects any abnormalities and damage to the specimens.

Farnsworth intends his pieces to be quickly interpreted, and this aim is met. It is difficult to analyse whether they elicit the response which is intended by the artist, because the weight of feeling against the theory of Evolution is not as strong in the United Kingdom as in many other countries. However, it can be assumed the pieces have the capacity to incite more controversy in America where the issues surrounding Darwinian Theory are currently more hotly debated and criticised.

Figure 44

‘Bird Skin Tray 1’ by Donald Farnsworth, 2007, pigmented inkjet on rag paper 68 x 120cm

Rob Kesseler

Rob Kesseler is a British photographer who works primarily with natural history specimens. His current work (2010) makes use of contemporary technology such as the electron microscope and image editing computer programmes such as Adobe Photoshop. Over the last few years, and in conjunction with RBGK scientists Dr Madeline Harley and Dr. Wolfgang Stuppy, he has focussed on the study of fruits, seeds and pollen and produced three award-winning books (2004b, 2006, 2008).

Of primary interest for this research project is Kesseler's project *'Botanizing the Library'* (2004a). For this, Kessler was, one of twelve artists, invited to make an artwork in response to a museum collection in Kent or Sussex. Kesseler was based at an underutilised herbarium and butterfly collection at the Folkestone Museum and Library that "they don't know what to do with" (Kesseler, 2007). Here Kesseler "extracted fragments" (Kessler, 2004a) from the museum's collections of zoological and herbarium specimens and presented them against many different backgrounds, e.g., maps and text from local author Jocelyn Brooke, postcards, flower illustrations, contemporary photographs of local plants and magnified images of pollen (Figure 45, p.96).

In *'Botanizing the Library'* (2004a), Kesseler used herbarium specimens as historical documents relating to a certain geographical area, to "celebrate two centuries of the flora and fauna of Folkestone through the work of four former residents" (Kesseler, 2004a). In this project he has typically chosen to photograph specimens that demonstrate their age; they are faded and 'dusty', reinforcing the historical nature of the project. Kesseler comments that specimen collection by private individuals can be viewed as a very Victorian interest and a thing of the past, noting "attitudes change and it is no longer quite as acceptable to plunder the countryside to build up private collections of dried specimens" (Kesseler, 2004a). Kessler describes his artistic response to the collection as a "botanical celebration in words and images drawn from the hidden riches within and from the hills surrounding Folkestone Library and Museum" (Kesseler, 2004a).

In his photographs Kesseler seeks to provide the viewer with the realities of older natural history collections, i.e. he does not shy away from capturing the faded, desiccated and delicate nature of the specimens, particularly herbarium specimens, rather he celebrates their age, history and longevity in comparison to their collector. With *'Botanizing the*

Library' (2004a), Kesseler sought to capture the essence of people and places in the past through artefacts that still survive today. His subject matter of a currently disused collection of natural history objects collected by past people in and around Folkestone is perfect for this purpose. His images so closely depict age-faded, wrinkled specimens, attached to dusty discoloured backing paper, with a multitude of stains and marks, that the viewer can almost smell the musty aroma accompanying the actual object.

Figure 45

Colt's foot from *'Botanizing the Library'* by Rob Kesseler, 2004, photographs

Nick Knight

Nick Knight is a world renowned British photographer who in 1992 worked with Dr Sandra Knapp at the NHM, London on the exhibition *'Plant Power'*. On searching for interesting subjects for the exhibition she showed him the substantial herbarium collection. He describes this first encounter: "I was completely hooked. I felt as if I had discovered a jewel" (Knight and Knapp, 2001, Preface). This produced a three and a half year project photographing specimens for the exquisite book *'Flora'* (Knight and Knapp, 2001). The book contains 46 colour plates carefully selected from thousands of considered herbarium specimens. Knight describes the specimen selection as "wholly unscientific, and that my interest was in looking for the most 'beautiful' examples" (Knight and Knapp, 2001, Preface).

'Flora' (2001) is carefully designed with large colour plates that take up the first section and no text breaking the flow of the images (Figure 46, p.98). Towards the back of the book Knight's photographs are replicated as thumbnails accompanied by comments by Knapp. In these pieces Knapp presents the scientific and label information, provides botanical facts, information on the collector and explains how herbarium specimens are created and stored. By splitting images and information into 'art' and 'science', the herbarium specimens have maximum visual impact and allow the reader to experience the same sense of wonder that Knight felt when he encountered the first specimen.

'Flora' (2001) is an exploration of the pure aesthetic beauty of the scientific documents that are herbarium specimens. Rather than capturing the significant age and frailty of the plant material or preserving the integrity of the specimen by making images as true to life as possible, Knight has produced images that give the specimens a strong, clean and bright appearance, especially with the removal of labels, tags and backing paper. His technique enhances the transparency and colour of the specimens which appear to glow and have produced images with an exquisite aesthetic. In *'Flora'* (2001) the combination of carefully selected specimen images by Knight and scientific information about the collections by Knapp makes the NHM collections more accessible to the reader.

Figure 46
Detail of *'Brownea rosa-del-monte'* from *'Flora'* by Nick Knight, 2001, photograph

Fred Langford Edwards

Fred Langford Edwards is a British photographer and for many years an unwitting collector. Langford Edwards started producing collection-based art as a way of dealing with objects he had collected over a ten to fifteen year period.

Langford Edwards began to randomly photograph the things he had collected until he realised he was classifying objects into specific groups. He developed this idea in his photography, researching order and classification systems. His first set of photographs concerned with collections *'The Study of Disciplines'* (1995) where grouped objects were displayed in tableau's, born out of this first voyage into the world of collections and classification (Figure 47, p.102). *'The Study of Disciplines'* was developed into a touring exhibition, described as "a series of constructed images commenting on the classification of knowledge" (Langford Edwards, 2007a, p.31). After its success, Langford Edwards became a full-time independent artist, who continued researching and developing the theme of collection and classification by focussing on institutional collections. Langford Edwards has worked with international institutional collections of all sizes. He has taken sets of photographs from many collections including natural history specimens (zoological and botanical), human remains, religious statues and ethnographical and medical objects. Many of these sets have been developed into exhibitions on various scales.

To date Langford Edwards has had four major exhibitions where the primary subject matter is natural history specimens (both botanical and zoological). The first of these, *'The Order of Things'* (2001), was described as "A series of five interrelated installations on the theme of taxonomy and biodiversity" (Langford Edwards, 2007a, p.31). In 2007 Langford Edwards developed two exhibitions to celebrate the 200th anniversary of the birth of the Swedish naturalist Carl Linnaeus (1707–1778). One of these, *'Nomenclatio transitorius'* (2007), featured specimens from the Manchester Museum's natural history collections, all photographed in minute detail capturing a range of textures, colours and surfaces. Combined with each image was a text-based piece which had, as a background, elements of the genetic code, and laid over the top the particulars of the specimens' classification as well as information from different naming systems, e.g. the Latin, common and vernacular names (Figure 48, p.103). This is "all presented in a uniform way and with equal importance. Together, these pairs of images encapsulate the two core traditions of museum natural history as an observational and text based discipline" (Langford Edwards, 2007a,

p.5). In this exhibition, Langford Edwards' images focussed on individual specimens with text- based pieces used to suggest ways in which we make meaning from them.

From 2007 to 2009 Langford Edwards worked on a project to "promote the contributions of Alfred Russel Wallace to the theories of Natural Selection and Evolution" *(*Langford Edwards, n.d). Darwin and Wallace (1858) were given equal status and recognition at the first public reading of their paper on Natural Selection. Subsequently however, Darwin's collections have been well documented, catalogued, researched and carefully housed while Wallace's have remained scattered through the country; many are poorly catalogued and often mis-labelled. Langford Edwards was awarded a Welcome Institute grant for the project and produced an exhibition entitled *'Alfred Russel Wallace: The Forgotten Evolutionist'* (2009) in conjunction with Dr George Beccaloni, a Wallace expert from the NHM, London. There were two phases to this project: Langford Edwards first researched, located and photographed surviving Wallace specimens in UK museums and collections (Figure 49, p.104), then he went on two expeditions in Wallace's footsteps; one to the Rio Negro, a major tributary of the Amazon, and the second to the Malay Archipelago. For the purposes of this project the first 'specimen based' phase of Edward's project will be outlined in detail.

On this "ten month investigation into the specimens and artefacts collected by Wallace" (Langford Edwards, 2009a, p.3), he was surprised how little cataloguing and research had been carried out on Wallace's material. He made several exciting discoveries that prompted curators to look more carefully at their collections that contained "previously un-credited and mis-catalogued" Wallace specimens (Langford Edwards, 2009a, p.3). One of Edward's most striking images is that of a folded Orang-utan skin (Figure 50, p.104). This was collected when Wallace was in Borneo where he shot up to seventeen Orang-utans.[1] One of these was sold to Lord Derby and eventually donated to the presently named World Museum in Liverpool. Also of particular note is a tray of Wallace material that his grandson Richard Wallace donated to the NHM, London. This tray had been left to decay unnoticed and untouched in a domestic attic for forty years. Beccaloni delicately restored this fantastic and forgotten find prior to Langford Edwards' photograph. (Figure 51, p.105)

[1] Many of these Orang-utans were sold by Wallace's agent, Samuel Stevens. During the 1800's, private collecting was fashionable and a way to demonstrate wealth and status. It was common practice for gentlemen collectors to kill exotic animals, not for science, but to sell and use the proceeds to fund expeditions.

The photographic exhibition *"Alfred Russel Wallace: The Forgotten Evolutionist"* opened in 2009 at the Zoology Museum at Cambridge University. It was intended that it should open in this year when much media attention was devoted to the 150th anniversary of the publication of 'Origin of the Species' by Charles Darwin. The exhibition explores "the life, ideas, and surviving collections of Wallace, and the physical hardships he endured during his travels" (Langford Edwards, n.d.)

A set of Edward's photographs of particular interest to this project have never been exhibited. When photographing at the NHM in Berlin, Langford Edwards stumbled across a closed storage gallery housing bird specimens. One side of this gallery was damaged in the bombing of Berlin during the Second World War. The museum, positioned in East Berlin, was not a priority in post war reconstruction and after the bombing the specimens lay where they fell and gathered dust until c. 1947 when the glass in the formal display cases was replaced. The specimens were not attended to after this, but remained behind the new glass still damaged and covered in dust and debris. Some have recently been conserved, but when Langford Edwards visited the museum in 2002-03 many of the bird specimens had not been cleaned or repaired. Some sat still on their perches with heads or parts of their bodies missing (Figure 52, p.106). Collections such as the pelicans still remained in a heap on the floor and some had their identification labels pinned to their body with dressmaking pins (Figure 53, p.107). Langford Edwards comments that an image based on this latter scene reminded him of Henri Cartier-Bresson's *'Unmasking of the Collaborator'* taken during the liberation of Paris (Langford Edwards, 2007b). Langford Edwards has not yet exhibited this set of photographs because the images are very emotive; "exhibition curators will be a little bit anxious about showing some of this work because it is very strong visually" (Langford Edwards, 2007b). This set of images has the capacity to symbolise aspects of the bombing of Berlin and the damaged specimens could be seen to stand for the innocent citizens who lost their lives. The handling of the specimens since the Second World War can be seen as a commentary on the treatment of national collections in times of difficulty.

Langford Edwards has visited many and varied collections recording visual information in them. He is tenacious in his approach to researching, finding and capturing the images he requires to fulfil his project ideas. Langford Edwards is adept at noticing and recording

unusual and minute details in both zoological and herbarium specimens, especially those elements that show human interaction.

Although Langford Edwards is an image-based artist, his recent projects have a comprehensive scientific or historic grounding. In *"Alfred Russel Wallace: The Forgotten Evolutionist"* (2009), Langford Edwards utilised specimens to narrate the story of a great natural history scientist and explorer whose contribution to science is largely forgotten. The project thus unearthed new material and created the first Wallace photographic archive.

Figure 47

'Nitrogen Cycle' from *'The Study of Disciplines'* by Fred Langford Edwards, 1995, photograph

Figure 48

'Digitalis pururea' from *'Nomenclatio transitorius'* by Fred Langford Edwards, 2007, photograph and text-based plate

Figure 49
Specimen from *'Alfred Russel Wallace: The Forgotten Evolutionist'*
by Fred Langford Edwards, 2009, photograph

Figure 50
Folded Orang-utan skin from *'Alfred Russel Wallace: The Forgotten Evolutionist'*
by Fred Langford Edwards, 2009, photograph

Figure 51

Tray of Wallace specimens discovered in an attic from
'Alfred Russel Wallace: The Forgotten Evolutionist' by Fred Langford Edwards
2009, photograph

Figure 52

Damaged bird specimen from Berlin by Fred Langford Edwards, 2002/3, photograph

Figure 53
Damaged bird specimen from Berlin by Fred Langford Edwards, 2002/3, photograph

Lyndall Phelps

Lyndall Phelps is an Australian artist based in the United Kingdom, whose art projects range from photography, installation, sculpture and re-enactment. These projects tend to be based on the history and stories revealed by objects and places. Phelps is particularly interested in forgotten, lost or hidden narratives, and views her projects as a way of making historical stories and objects 'visible' once again. Phelps suggests the common emotion that runs through her projects and the material she chooses to work with is a sense of loss. She is drawn to this sensation but at the same time seeks to rectify the loss with her artworks.

Phelps has worked on two specimen based art projects reviewed in this section *'Evacuate'* (2007) and *'Coded Ornithology'* (2008).

'Evacuate' (2007)

Phelps was considering a project on horticulture and Joseph Banks when she toured the new Darwin Centre at the NHM, London. On this 'behind the scenes' tour the guide mentioned that during the Second World War some of the collections had been evacuated out of London to stately homes and country houses. This evacuation intrigued Phelps, especially as it is not a commonly researched historical event. She decided that there might be the possibility of an art project involving the specimen being reunited with the house that cared for it. With this concept in mind Phelps began a three year residency at the Museum. Phelps spent the first year looking through the NHM's archives to piece together the jigsaw of which particular animal specimens were sent to each care-home. This was difficult because no definitive list of houses and specimens exists, although each department kept their own records, some more coherently than others. She discovered that few stuffed animals were evacuated, but the skin and skull collections (which are more scientifically important) were more frequently relocated. In the vast majority of cases she was unable to determine the exact specimen that went to a particular house but managed to establish the species.

Since it is imperative to maintain a controlled environment for delicate specimens, it was impossible to physically take these specimens back to the houses, so the project relied on photography. Phelps decided on two series of photographs, one where specimen portraits were taken to the houses and re-photographed in a carefully planned position (Figure 54,

p.111), the second where a room in the house was photographed and then re-photographed with the specimen in the specimen storage area at the NHM (Figure 55, p.111). This gave the project variety and allowed flexibility of scale in that larger specimen skins, such as the tiger, could be included.

Phelps was able to utilise twenty out of the twenty five homes that were originally made available for the specimens and her intention was to use the houses in their current state rather than relying on archival images. By so doing, Phelps wanted to mirror a detail she had discovered from her research, i.e., that in the 1940's the owners resided with the specimens in the main areas of their homes rather than storing them in a basement. Phelps wanted to use these same areas and also give a hint of the building's current usage in the final photograph (three of the houses are no longer homes but are now a nursing home, a school and a retreat for a Polish religious order) (Figure 56, p.112). Phelps visited the houses knowing which animals they had received on evacuation, with the intention of planning her compositions in situ and attempting to link the likely species to a particular room or the general feel of the house. Returning to the NHM, she then selected her specimens for photography. In the second series where photographs of the houses are brought to the specimens and re-photographed in the Museum, Phelps felt it important to show how the collection is stored and cared for today.

'Evacuate' (2008), the exhibition, was formed from the final sets of images from both series looped on a plasma screen at The NHM, Tring. The project was accompanied by an untitled book, organised and bound in the style of a meticulous catalogue of Microlepidoptera specimens created by entomologist Hubert Stringer, who Phelps had discovered during her initial research. In this book Phelps has recorded label information from the 576 specimens photographed for the project.

'Coded Ornithology' (2008)

Phelps' next project was inspired by the coding system of coloured and numbered dots known as spot numbers developed and used within the NHM bird collections (currently stored at the NHM, Tring). Phelps was researching *'Evacuate'* (2007) when she came across the spot numbers providing a quick visual reference for organising birds into species, subspecies, geographical locations and gender. The system is imperfect, however, as each curator used the dots differently. The spot number system therefore functions no

higher than genus level, because the consistency is maintained only within one or a group of genera. Phelps was particularly interested in a classification system personalised to the point that it no longer functioned, i.e., one originally intended to provide structure but which had subsequently been torn apart.

While searching for locations in the storage areas to take photographs for *'Evacuate'* (2007), Phelps discovered the drawers in which the spot-number stickers were stored (dots of six colours and numbers 1-50 for each colour). With permission, Phelps removed a pinch of dots from each draw until she realised some were missing. On enquiry, it was learned these were accidentally hidden away. The curator gave her one of each of these last few so she had only a single complete set of dots. She then produced a set of pieces in which the dots were laid out in a grid, each set containing fewer and fewer dots until there was only one dot left on the sheet. The final piece totals 34 sheets, one of which is shown in Figure 57, p.112

The *'Coded Ornithology'* (2008) exhibition also included six photographs of birds taken for the *'Evacuate'* (2007) project, and selected for *'Coded Ornithology'* (2008) owing to the labels and spot numbers being clearly visible (Figure 58, p.113). In the middle of the room, under glass, was another installation where Phelps painstakingly remade the labels from the Museum's Barn Owl collection, complete with spot numbers (Figure 81, p.143). The piece was a developed as a memorial to the birds in the museum, but without the physical objects.

Phelps has a genuine sensitivity toward the specimens which is apparent in her work through the choice of specimens and compositions of the pieces. Phelps is both astute and intuitive in discovering and re-telling historical narratives. She believes that time spent with the collections helps develop the story, and if she feels this thread is strong enough, and that it provokes an emotional response, the project will follow. In her projects Phelps often painstakingly re-constructs objects she has identified as significant, such as the copy of the Stringer catalogue where she recorded specimen details or the Barn Owl labels. These labour intensive elements, reflecting Phelps's care and eye for detail, highlight the obsessive and time consuming nature of cataloguing and other curatorial activities.

Figure 54

Photograph by Richard Davies and Derek Adams from *'Evacuate'* by Lyndall Phelps, 2007

Figure 55

Photograph by Richard Davies and Derek Adams from *'Evacuate'* by Lyndall Phelps, 2007

Figure 56

Photograph by Richard Davies and Harry Taylor from *'Evacuate'* by Lyndall Phelps, 2007

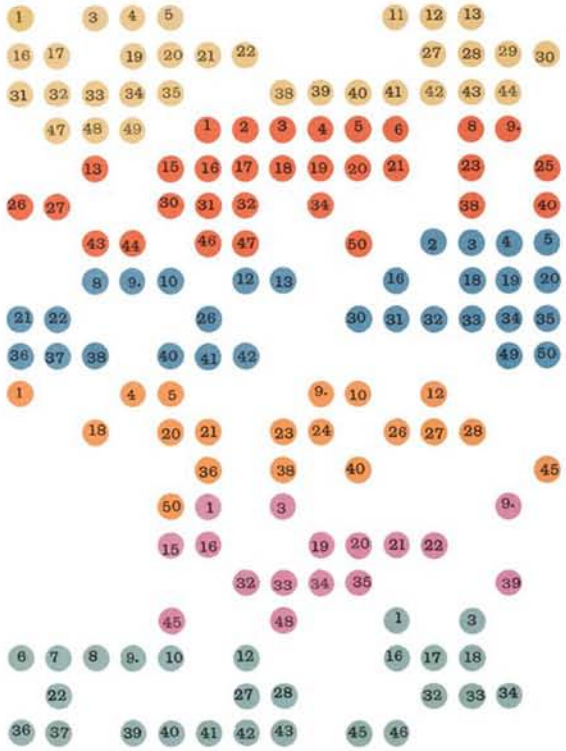

Figure 57

'Spot numbers, 18 of 34' from *'Coded Ornithology'* by Lyndall Phelps, 2007

spot numbers on paper

Figure 58

Bird specimens (spoonbills) photograph by Harry Taylor from *'Evacuate'* included in *'Coded Ornithology'* by Lyndall Phelps, 2007

Greg Pryor

Greg Pryor is an Australian artist who started working with herbarium specimens in 2002. What particularly captured his imagination with these artefacts is the combination of plant material and archival qualities. This includes the aesthetics of the dead plant and the structure of the whole herbarium sheet, i.e., label information such as date, collector and condition of the plant as well as ancillary details, e.g., pencilled 'conversations' between botanists seen on some sheets. Pryor created two exhibitions based on herbarium specimens which are of interest to this research project, *'Flora Nullius'* (2004) and *'Black Solander'* (2005).

Pryor is interested in the passage of herbarium specimens around the world since many plant specimens were taken from Western Australia at the beginning of European settlement and exported to Europe and elsewhere. He further correlates this with the disruption that settlement caused to aboriginal traditions and the ecology of the region. His installation *'Black Solander'* (2005) is a "memorial to those plants that had gone, to those that had ended their days in the war on the other side of the world, [specimens destroyed in the Second World War] and to those that had been erased by ball and chain, by white man's tenure of the land, by wheat, by cloven-footed animals and virulent invading plants from other parts of the world" (Pryor, 2005b)

Flora Nullius (2004)

Pryor describes himself as feeling "overwhelmed" (Pryor, 2008) when he first experienced the flora of Western Australia. In 2002 while on an art residency in Vienna, he enquired about the historical botanical collections in the city and discovered "that they had an almost complete census of western Australian species from the first 100 years of white settlement" (Pryor, 2005b). Pryor took up a three month residence at the Naturhistorisches Museum in Vienna (W) to work with these specimens. He describes this period as a "rich and intensive time – a real immersion" (Pryor, 2008). Pryor photographed and made detailed tracings of c. 200 Western Australian plants, carefully observing the attachments to the paper, labels and other marks botanists had made on the pages.

On return to Australia and with this primary source material, Pryor created *'Flora Nullius'* (2004) which comprised 183 corrugated cardboard parts showing herbarium specimens where all trace of the plant had disappeared, leaving only the attachments, discarded

capsules (small envelopes for herbarium specimen pieces) and labels made from small pieces of discarded mounting paper (Figure 59, p.118). The discarded mounting papers were collected by Pryor from the herbarium in Vienna when the old and fragile specimens were in the process of being remounted. The corrugated card employed in the piece is particularly symbolic as it is commonly used in herbaria for carrying specimens. These mock cardboard herbarium sheets also had the label information written in a corner and each piece was marked with a stamp Pryor had made for the project (Figure 60, p.119).

The specimens that Pryor observed in Vienna were some of the first to be removed from Western Australia and therefore are "taxonomic blanks" (Pryor, 2004), brought back and named by European botanists, most of whom never visited Australia. Pryor "began to see these papers with their attached labels and mounting tape as equivalents of the shackles and irons placed on the aboriginal inhabitants of Australia. Many aborigines, along with their rivers and mountains were also considered blanks and renamed" (Pryor, 2004). Pryor describes **'**Flora Nullius' as "about losing everything and giving a name to nothing" (Pryor, 2004). This theme of removal of flora is continued and explored to a further degree in 'Black Solander' (2005).

Black Solander (2005)

Pryor states that "In late 2004 I walked into the Western Australia Herbarium and declared that I wanted to draw every species of flower in the state" (Pryor, 2005b). The director of the herbarium agreed to the idea and Pryor was given a space within the archive to work. After consultations with botanists Pryor decided to illustrate a representative sample of every currently accepted plant species in Western Australia, using approximately 10,500 specimens. His selection did not include sub-species, and individual decisions were taken on species currently being described and named.

In *'Black Solander'* (2005) each plant specimen was drawn on a small sheet of black sugar paper with black ink (Figure 61, p.120). Beforehand, Pryor would cut the paper and make a small black mark where a bar code would be placed (all the specimens in the Western Australia Herbarium are bar-coded). After completing the drawing Pryor used the barcode to record all the label information in pencil on the drawing, via the herbarium's database. Finally Pryor added a small stamp with the words *'herbarium black solander'*, and another round stamp with his name. During the project Pryor became interested in the properties of

black ink, he collected and used different types of ink from around the world, recording which type of ink was used for each specimen.

Pryor was given lists of plant species and he would work through one and then ask for the next. This action, he notes, forced the herbarium to reorganise and collate their species lists. On specimen selection Pryor had two options. The herbarium holds a separate reference collection, containing one representative specimen per species, which is available for use by the public. The remainder of the collection is stored separately and is for use by appointment only. Pryor started by using the main collection, enjoying looking through the differences between the plants, labels and coloured papers, but after three weeks he checked his calculations to find this research and specimen selection procedure was too time consuming. He thus went back to using the reference collection in all but exceptional cases, when he would search through the main collection if he found a species particularly attractive.

Pryor made the piece with a specific room in mind so he planned the size of the work to fit the number of species within the dimensions of the room. The final number of specimens illustrated inevitably increased, however, and c. 1500 had to be rejected. In the final installation (Figure 62, p.121) the specimens were hung in the order they were completed, chronologically and corresponding roughly to family groupings, but they also reflected the architecture of the herbarium. As Pryor had worked through the rooms of the herbarium he felt the piece contained an architectural resonance.

'Black Solander' (2005) is named after the Solander box, designed by Daniel Solander (1733-1782) to bring specimens back to England from Australia. The box was designed to keep out the light and is used in museums and archives to this day. Pryor states that "My Solander box at PICA [the institution] would contain 10,500 specimens yet remain empty" (Pryor, 2005b). Pryor comments that "the work was designed as a study in funereal black. I wanted to fill a large room as if it was a mausoleum, a portent of the future" (Pryor, 2005b). The title *'Black Solander'* could also be seen as an allusion to the Solander Herbarium which was one of the earliest herbarium collections in Australia housed originally in Melbourne (Schrire pers. comm. 2011b)

'Black Solander' (2005) only took six months to complete with Pryor drawing an average of 100 specimens per day. He describes the experience as often repetitive and "like a menial task". He had to be disciplined and time-aware to process such a volume of specimens. He conceded that the drawing could be less accurate if all the label information was on the sheet. With so many drawings to complete it was impossible to illustrate the specimens in great detail. Pryor comments that the whole project, the complete floral diversity which the installation represents, was more important than the individual pieces.

In many ways Pryor's two herbarium specimen based projects are the most conceptual of the projects studied here. Both projects have numerous narratives that have been thoroughly considered and woven sensitively into the fabric of the installations. The primary discourse in both projects is a vanishing flora, whether in times gone by when specimens were removed during exploration by natural historians, or the more current threat of extinction due to ecosystem destruction and climate change. Objects can give "voices to the voiceless" (MacGregor, 2010, p. xxiii) when they are associated with those "who were unable to write their own story" (MacGregor, 2010, p. xxiii). Pryor uses this concept in his work making interesting and inspired parallels between the treatment by European explorers of the indigenous flora and people. This association heightens the emotional experience for the audience.

Both *'Black Solander'* (2005) and *'Flora Nullius'* (2004) discuss the vanished specimen. In the former, the specimen is represented as a ghostly image or "shadow drawing" (Pryor, 2005a, p.3), described as "evidence of what is not visible, of what has disappeared and is lost" (Pryor, 2005a, p.3). In the latter, specimens have dissolved completely leaving only the attachments to the paper, labels and notes written on the sheet. It is to Pryor's credit that when he first came into contact with herbarium specimens in Vienna he took detailed tracings, noting minute details. Owing to this he was able to construct a sensitive and yet direct concept for the *'Flora Nullius'* (2004) installation.

'Black Solander' (2005), in its attempt to show all plant diversity in Western Australia, is able to illuminate just how many different species can be found in this area. As Pryor has included all the scientific information on each sheet the project can be considered a true survey of the complete collection. Based on the original concept of his installation, its sheer size, comprehensiveness, complexity, detail, use of black on black and complete

sensory experience, Pryor not only records the scientific details of the specimens but captures some of the obsessive nature of natural history collecting in the past.

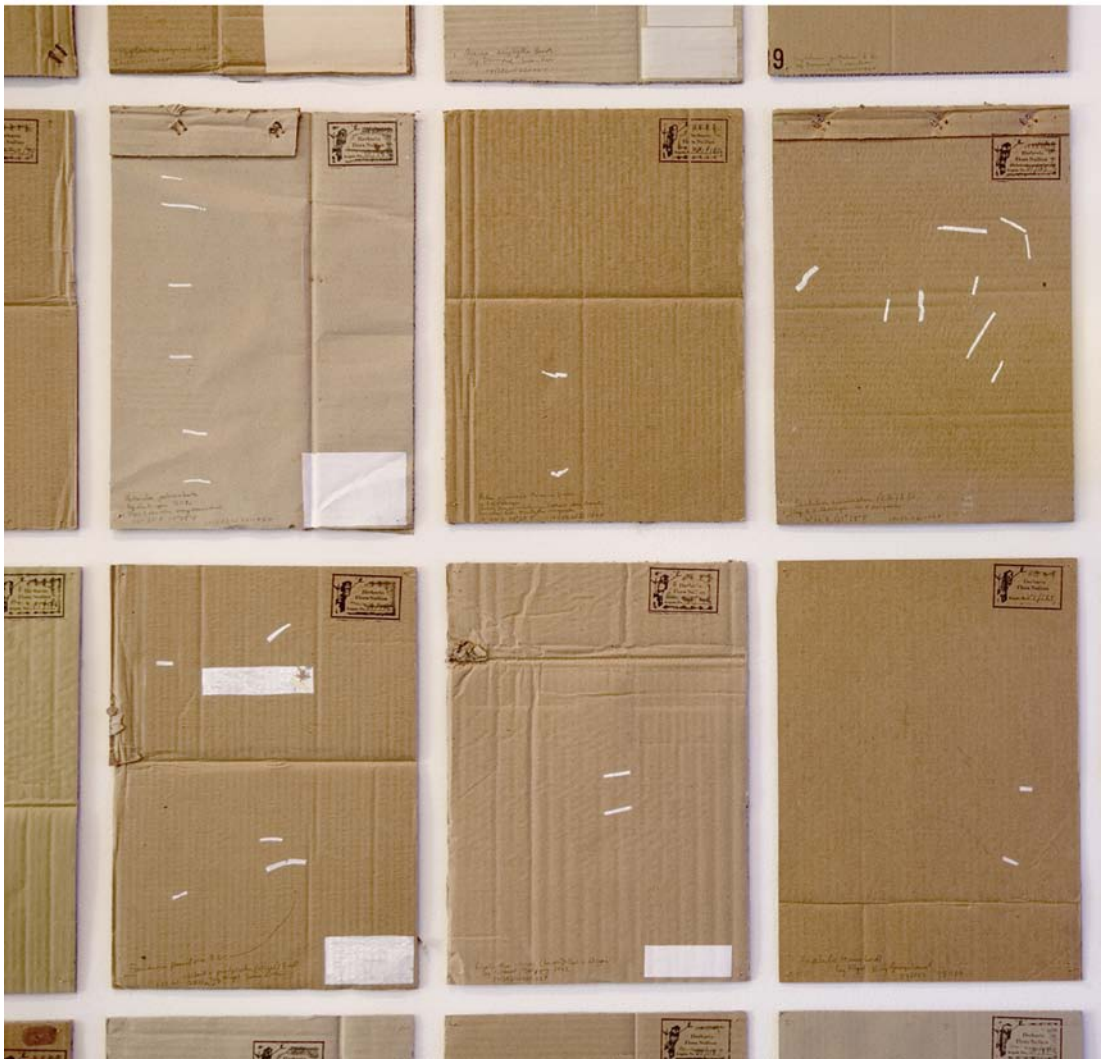

Figure 59

Detail from *'Flora Nullius'* by Greg Pryor, 2004, gouache, spirit based ink, ink from the bark of *Eucalyptus astringens,* collage on corrugated cardboard, panel dimensions: 42 x 30 cm, overall dimensions: 266 x 994 cm

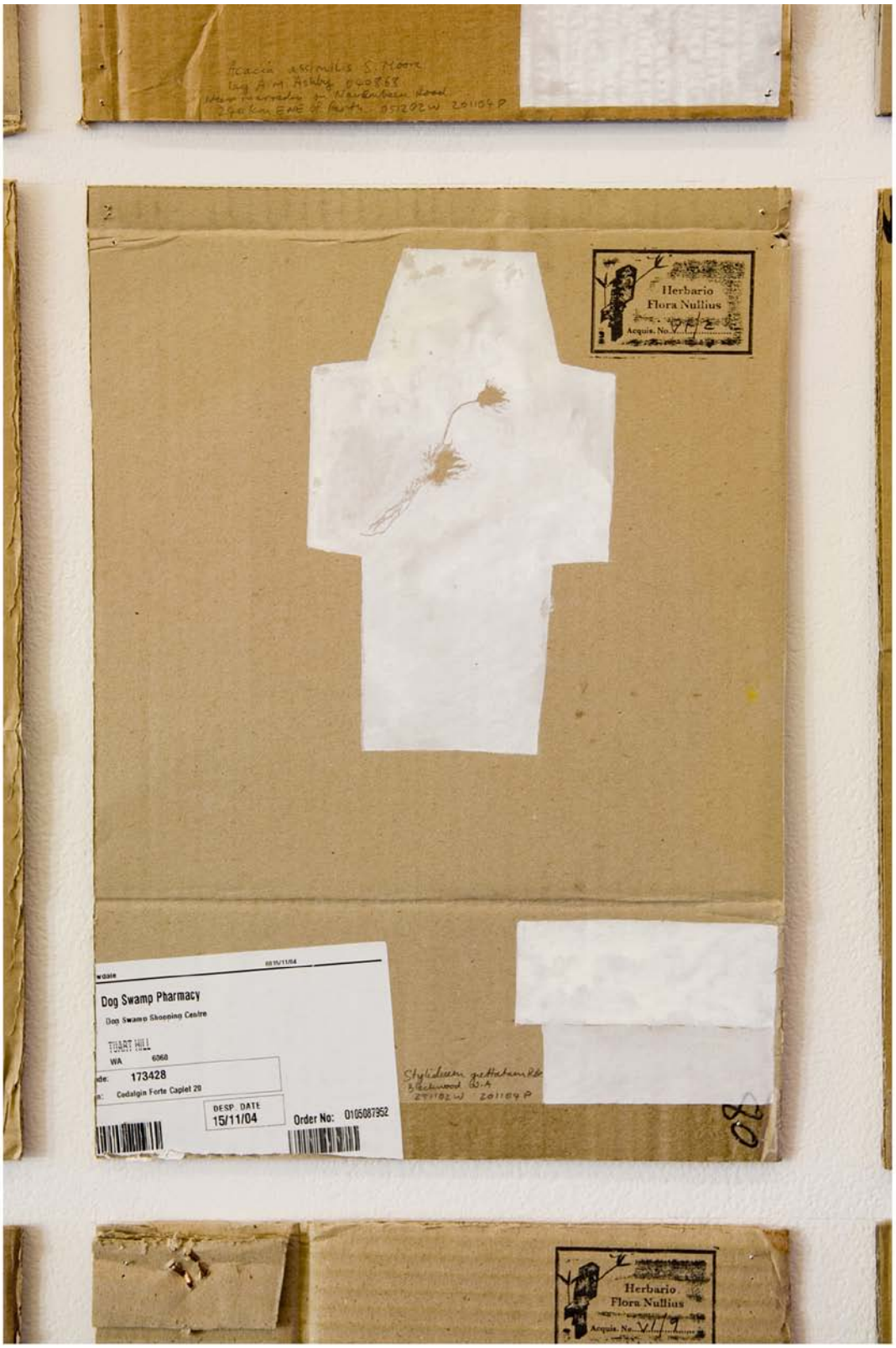

Figure 60

Detail from *'Flora Nullius'* by Greg Pryor, 2004, gouache, spirit based ink, ink from from the bark of Eucalyptus astringens, and collage on corrugated cardboard, 42 x 30 cm

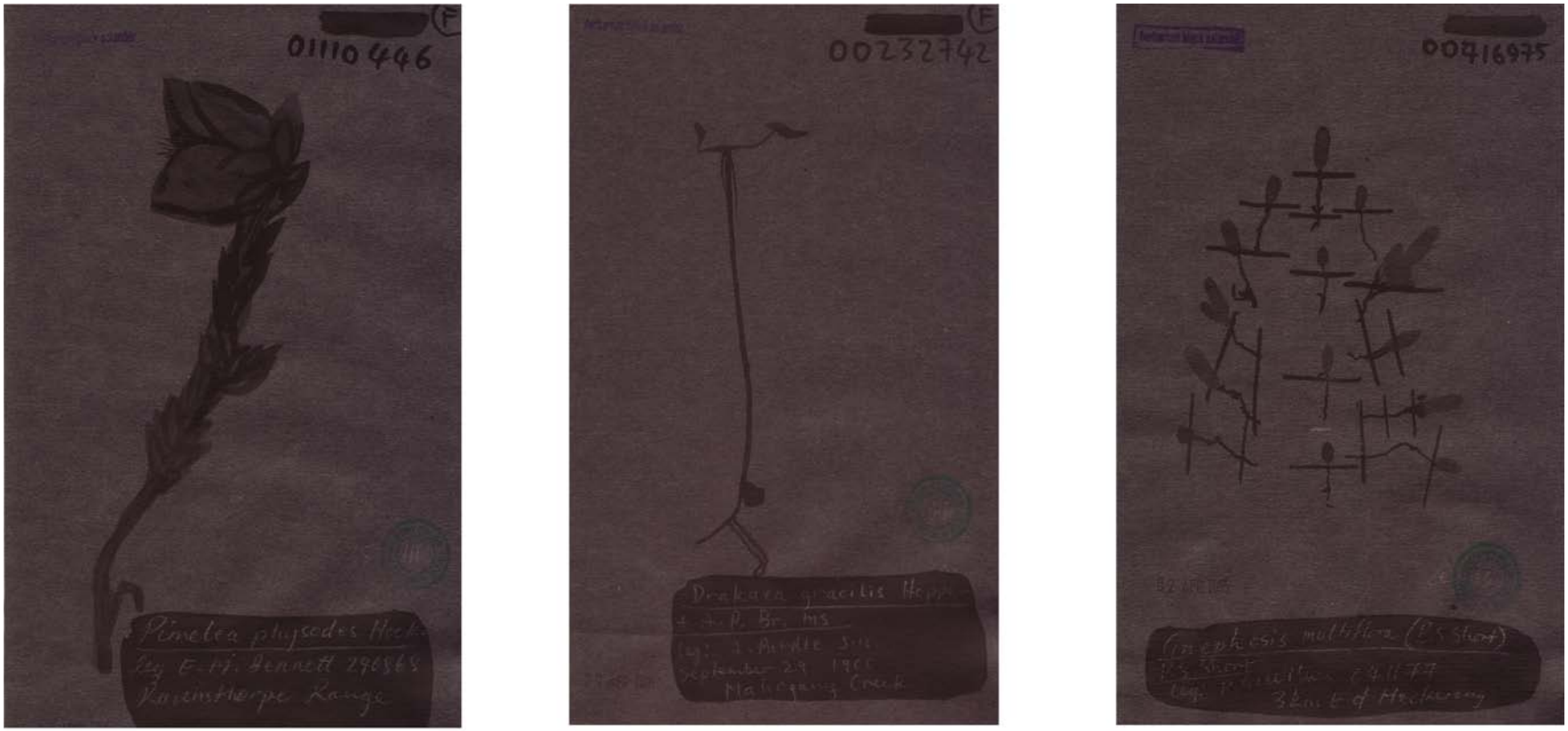

Figure 61

Pimelea physodes *Drakea gracilis* *Gnephosis multiflora*

Specimen drawings from *'Black Solander'* by Greg Pryor, 2005, ink, graphite and spirit based ink on sugar paper, each 21 x 12.5cm

Figure 62
'Black Solander' by Greg Pryor (installation shot at Perth Institute of Contemporary Arts), 2005
ink, graphite and spirit based ink on sugar paper, dimensions variable

Robyn Stacey

Robyn Stacey is an Australian photographer who started photographing natural history specimens in 2000. Stacey had always been interested in plants and was drying plant specimens and photographing them in various states of desiccation. As a result of her fascination with the dried specimens, Stacey visited the National Herbarium of New South Wales at the Royal Botanic Gardens, Sydney. Initially Stacey planned to spend three months in the Herbarium to produce images for an exhibition, but she soon realised that as well as the plants being aesthetically fascinating, they represented a cultural, social and historical narrative of early science and white settlement in Australia.

Most of Australia's early Governors were amateur scientists, astronomers or natural historians attracted by the unique and fascinating flora and fauna of the country (Stacey and Hay, 2004). Stacey comments that because of this, "white settlement and early science is inextricably linked to the flora and fauna of Australia", adding that she doesn't "think those connections are often made to the public in Australia" (Stacey, 2008). In light of this strong historic narrative, Stacey felt it was no longer appropriate to just produce one exhibition. This led to a three year residency at the National Herbarium of New South Wales and the outcome was the book *'Herbarium'* (2004) co-authored with writer Ashley Hay.

'Herbarium' 2004

The concept of *'Herbarium'* (2004) was a 'coffee table' book of beautiful specimen images, where one could just look at the pictures or delve a little deeper into the epic stories attached. The intention of the book was to raise the profile of the herbarium and to bring early science and the history of Australia to a contemporary audience, by exploring the historical narratives within the collection, and redefining the representation of the collection for Australia. Stacey wanted the book to have an aesthetic appeal to the general public, but also to be scientifically correct and have historic significance. She therefore also selected specimens such as those collected by Joseph Banks (1743-1820) and Daniel Solander (1733-1782) during the *Endeavour* voyage. She chose to photograph the whole herbarium page, including the label at the bottom, to encourage viewers who found the images appealing to discover the collector and perhaps pursue the story further (Figure 63, p.125).

In a much abbreviated sense, Stacey felt the order of images in the book should give a sense of the social and historic narratives contained in the collections. Of the four chapters in the book, the first is entitled 'The new world', where quintessentially Australian specimens are presented on black backgrounds, many of which come from Western Australia. The second chapter, 'Scientific fascination', displays specimens on white backgrounds, and comprises collections of naturalists attempting to understand the world around them. Such collectors in the mid-late nineteenth century were not strictly botanists but clergy, teachers, people in the navy or gentlemen of leisure, who had a scientific interest and desire to add to the 'body of existing knowledge'. The third section is the 'Hobby and decoration' chapter including specimens collected as souvenirs or remembrances of holidays, or to track a resettlement adventure. The last section, 'Exotics' contains specimens housed in the herbarium not native to Australia.

'Museum: the Macleays, their collection and the search for order' (2007)

While Stacey was working in the Sydney herbarium she uncovered another historically and scientifically important narrative, that of the Macleay family and their collection of natural history specimens. The collector Alexander Macleay was on the first board of directors at The Royal Botanic Gardens, Sydney, and had arrived in Australia in 1826 as Colonial Secretary. For the next three years Stacey began recording images from the Macleay Museum, now part of Sydney University. The result of this residency was another outstanding book co-authored with Ashley Hay, *'Museum: the Macleays, their collection and the search for order'* (2007) (Figure 64, p.126). In 1899 the Macleay collection was moved to Sydney University, as outlined in the will of the son of Alexander Macleay. The collection was required to be stored and displayed in a purpose-built Macleay Museum. It has since had a chequered history, falling into disrepair and neglect until the 1960's when two enthusiastic curators began to restore, catalogue and open the collections again to the public.

Stacey found that the selection of specimens for this project was different to that in *'Herbarium'* (2004), since here she would attempt to link the specimen to a particular story Hay wished to record and visa versa. In the Macleay collection all the specimens were significant in some or other way, including more than 10,000 type specimens. Others are historically resonant rather than scientifically important, such as the two lice plucked from

an albatross during the second Captain Cook voyage and a flea collected by Charles Darwin on the *'Beagle'* Voyage.

Stacey's two projects *'Herbarium'* (2004) and *'Museum'* (2007) have resonance with the *'HSP'* project. When Stacey walked into the herbarium for the first time, she said she had come for the aesthetic appeal of the plant specimens. After handling them and closely observing the paper labels and copperplate writing, however, their rich history and narrative potential became clear. Mirroring her own experience, Stacey's books initially draw attention by using the aesthetics of the dried plant material and our sense of natural curiosity toward animal specimens. On closer inspection, a very careful choice of historical context of the specimen is revealed by the label and this is further discussed and interpreted by co-author Hay. Although Stacey uses similar techniques to Knight in *'Flora'* (2001), *'Herbarium'* (2004) is a very different book, conceived with the intention of revealing historical and to a lesser degree, science based narratives. With the experience of this first book, Stacey realised that striking imagery linked to a strong historical narrative worked exceedingly well so she pursued a similar project with the Macleay collection, whose staff ten years previously had lamented that its "natural history collections have not received the recognition they deserve. Their rich diversity provides a fascinating and valuable record of aspects of the history of zoology and anthropology" (Stacey and Hay, 2007, p.45). Stacey has sensitively constructed two three-year projects from the historical stories that the specimens have privately harboured.

Figure 63

Detail of *'Cobra Greenhood'* from *'Herbarium'* by Robyn Stacey, 2004, photograph

Figure 64

'Gorilla skull' from *'Museum: the Macleays, their collection and the search for order'* by Robyn Stacey, 2007, photograph

Areta Wilkinson

Areta Wilkinson is one of New Zealand's foremost Māori jewellers. She was located for this project in 2007 through Ewen Cameron from The Auckland Museum, where she researched visual sources for her jewellery that were displayed in the exhibition *'Legere to Gather'* (2004). She explains this exhibition title by saying that: "Legere is Latin, the language of taxonomy, Legere [meaning to tie, bind, unite]. To Gather is a gathering of stimuli and the exhibition a celebration of the process" (Wilkinson, 2007).

Wilkinson has not always worked with herbarium material. The pieces she made for this exhibition, described as "fabricated silver plants" (Wilkinson, 2007), were developed from "earlier investigations of colonisation and identity" (Wilkinson, 2007). Wilkinson creates oxidised silver reproductions of herbarium specimens (Figure 65, p.129). She does not replicate the specimen exactly, but rather the piece is hand produced so it reflects the metal's properties and input from "the hand and the heart" (Wilkinson, 2010a). Nevertheless the copies are "reasonably accurate" (Wilkinson, 2010a) and the original specimen is recognisable or identifiable. In one instance Wilkinson cut the specimen shape directly from the metal to represent as closely as possible the original plant (Figure 66, p.130).

To create these pieces Wilkinson used a range of historical visual sources relating to the botanical collections made on James Cook's first expedition to New Zealand in 1769. These include herbarium specimens collected by Banks and Solander currently housed in the Auckland Museum and Lincoln herbaria, as well as etchings produced from Sydney Parkinson's paintings. Wilkinson states that specimens collected on this first expedition, and their meanings, were central to the project. This expedition "began the first systematic observation, collection and cataloguing of natural history specimens" (Bibby, 2004) from New Zealand and the start of English colonisation of the country "and a fraught history between Maori and guests" (Bibby, 2004).

Wilkinson explains in *'Legere to Gather'* (2004) that specimens are annotated with Māori, Latin and common names, so there is no prejudice, but she has put the Māori name (many of which are still in common use) first, suggesting an assertion of Māori knowledge and culture. When asked how her artwork might benefit the institution where the specimens are housed, Wilkinson comments that her artwork "provides a contemporary artistic/creative

intervention or response to historic material" (Wilkinson, 2007) which provides an alternative perception of the material and broadens the possible audience.

Wilkinson is aware of the cultural importance of native plants to Māori culture, from today back to the New Zealand of Cook's expeditions and even earlier. The specimen gathering of Cook's expedition of botanical and other cultural materials initiates the beginning of collecting and researching Māori culture, as well as the 'time capsule' storage methods of museums where articles are removed from their living culture. Wilkinson comments "There is a fraught dilemma, the nature of museums as a self imposed authority, and the preservation of early material which we are thankful for" (Wilkinson. 2010b)

Wilkinson's Māori roots are important when discussing aspects of significance of the plant specimens collected on these voyages. MacGregor (2010) comments on the importance of including opinions from communities or countries where objects originated; he notes that only they can truly explain the "meanings these things now carry in that context" (p. xxv). His example also has resonance with the narrative behind Wilkinson's pieces "only a Hawaiian can say what significance the feather helmet given to Captain Cook and his colleagues has for the islanders today, after two hundred and fifty years of European and American intrusion" (MacGregor, 2010, p xxv).

Wilkinson's pieces have the ability to reflect aspects of the pressed plant material they represent. They (specimens and pieces) are objects shaped by the human hand from raw materials. The specimens are shaped and moulded plant material, and Wilkinson's pieces are cut and shaped from silver. She has also carefully mirrored the pressed element and graphic shapes of the plant material in her choice of sheet silver. Her three dimensional response to the specimens provides the viewer with a more tactile link to the historical specimens she observed. Through these handmade objects, created by observation and the heart of the artist, the viewer can both imagine the tantalising possibility of touching the actual objects and become immersed in the historical significance of the whole expedition.

Figure 65
Silver reproductions of herbarium specimens from *'Legere to Gather'*
by Areta Wilkinson, 2004

Figure 66

Herbarium specimen and silver reproduction from *'Legere to Gather'*
by Areta Wilkinson, 2004

Discussion

The narrative specimen

Significantly, many of the artists entered the world of the institutional collection by chance and only then, sooner or later, realised the narrative potential and visual power of the individual specimen and the collection as a whole. Interviews with the artists uncovered a deep sense of discovery when research and time spent with the specimens revealed that they had more to express than they originally thought. Stacey comments "I realised as well as the plants being fascinating it was really the history of white settlement in Australia and the history of early science in Australia so then it became, much more, the plants then represented so much more, they took on this cultural, social dimension" (Stacey, 2008).

The artists clearly share an understanding of the ability of a specimen to 'personify' the collector or 'objectify' a moment in time and space, and therefore the visual potential of natural history specimens and textual information, to narrate a specific event or bring to bear a particular fact. The stories narrated above cover a variety of subjects that can be broken down into the following themes:

Historical: the Second World War, historic voyages and the beginning of white settlement overseas.
Scientific: collections of eminent scientists and institutions, the development of surgical techniques, the exploration of the diversity of a geographical area or biological group and the threat of changing ecosystems.
Political: the creationist refusal to accept the process of Evolution, colonial rule in Australia and New Zealand and the shipment of specimens to different continents.
Object based: the creation, aesthetics and life history of the specimen.

Gosden (2007) discusses the narrative potential of collections suggesting through objects "distant places are transformed, re-presented, and studied from afar through some of their material products. 'Big' ideas about the world are held together by sets of 'small' things" (P7). It is interesting to note that two 'big ideas about the world', are examined through specimens by more than one artist, these being European settlement in Australia or New Zealand and the consequences of the Second World War. The two Second World War sets of images make an interesting comparison; the War is examined from the perspective of

the bombing of London and Berlin, by Langford Edwards and Phelps respectively (Figures 52, 53, 54 and 55 pp.106-7 and 112). Phelps' images represent the careful, meticulous and planned evacuation of natural history specimens to country houses, a defensive move by the museum to protect national treasures. Phelps' images and the account of her discoveries speak of the great passion that, both the scientists that worked at the museum and the general public had in caring for the specimens. Langford Edwards' images tell a different story, perhaps of the bravado and anticipation of the German leaders that their capital city and national collections were safe from Allied attack. It was primarily the unattended state in which the specimens were left, however, that gives us images that represent the tragedy of war, where many things, people, objects and places were damaged and left forever broken. These images also tell a specific geo-economic story of post-war separated East Berlin that suffered neglect at the hands of Soviet communist rule.

Modes of representation

In this survey, photography is the most popular mode of final representation, used by Duigenan, Farnsworth, Kesseler, Knight, Langford Edwards, Phelps and Stacey. Photography is an excellent tool for narrative-led specimen based art projects because object authenticity remains intact through precise replication, but at the same time the photographer has artistic control of light, composition, subject matter and scale. Putnam (2009) comments that use of documentary photography of "specific exhibits" (p.114) in museum-based projects has the ability to "evoke the museum's traditional qualities and role in inspiring a sense of strangeness and wonder" (p.114).

The photographers have a variety of working techniques and approaches. Langford Edwards' style is crisp and clear; most often the zoological specimen is isolated on a "decontextulising white background" (Langford Edwards, 2007a, p.30). In some cases the specimen is placed on a clear glass shelf. This gives a clean and surgical appearance to the images that in turn emphasises the age, damage and decay of the specimens (Figure 67, p.134). For some images in *'Wallace'* (2009), Langford Edwards constructed a softer background by placing the specimen on tissue paper laid over black velvet (to make the contours more apparent). This backdrop is more sympathetic to the faded, warped and dusty textures of old notebooks and herbarium sheets and provides a conservationist impression to images involving animal specimens, because the viewer is led to believe the specimen has just been unwrapped from a protective layer (Figure 68, p.134).

With botanical specimens, Langford Edwards and Kesseler are similar in their technique, since they both exploit the colour, uneven surface and staining of the backing papers. Strong light at a low angle is used so that the point of contact between flattened plant and paper, where a small shadow is formed, is visible (Figures 69 & 70, p135). In addition, their use of magnification highlights the delicate desiccated textures of both paper and plant.

Among the photographers Duigenan is unique in choosing to produce black and white images. She explains that it gives the images a documentary touch and focuses the viewer's attention on the shape and "stunning complexity" (Duigenan, 2010a) of the dissected specimens, rather than their unnatural and slightly alarming colour. Her lighting method gives the specimen a soft glow around the edges, and enhances the form (Figure 71, p136).

The transparency and altered textures of herbarium specimens are captured by all the photographers, but in contrast Knight (2001) and in some sections Stacey (2004) have chosen to bleach the background of an image to remove all colour and uneven texture from the herbarium backing paper (Figure 72, p.137). This gives the plant a 'startled' cut away appearance, accentuating the extraordinary shape of the pressed plant. In some chapters, Stacey (2004) colours the specimen backing paper black, drawing attention to the colour of the plant as well as its 'unnatural' shape (Figure 73, p.137).

In the set of *'Beau Monde'* images Stacey (2004) constructed extraordinary compositions where a polystyrene ball covered in black velvet was adorned with two hundred and sixty butterflies (Figure 74, p.138). Stacey acted as curator as it was not possible for her to touch the butterflies herself; she comments that it was a very long painstaking process taking a week to set up and slowly adjust the position of each specimen. Similarly, Phelps' photographs of animal skins were taken by the museum photographers, with her acting as curator for the image, with artistic control over the selection and composition. She believes this worked positively, because it was a long time since she had produced photographs herself. She found it difficult, however, working with more than one photographer, having to explain her vision and not having complete control of the production of the image.

Figure 67
Specimen jar photographed by Fred Langford Edwards

Figure 68
'Penelopides exarhatus' from *'Alfred Russel Wallace: The Forgotten Evolutionist'* by Fred Langford Edwards, 2009, photograph

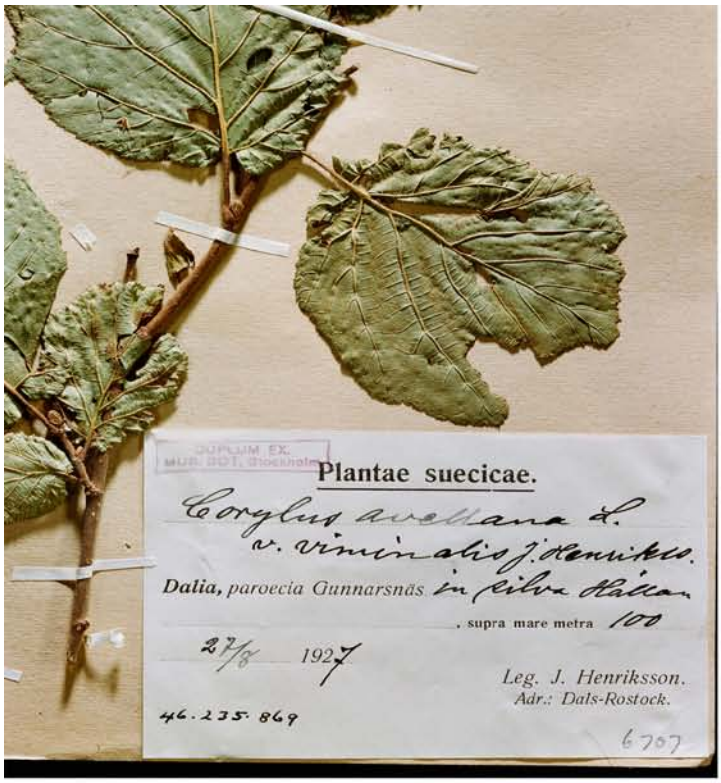

Figure 69

Herbarium Specimen photographed by Fred Langford Edwards

Figure 70

Herbarium specimen photographed by Rob Kesseler

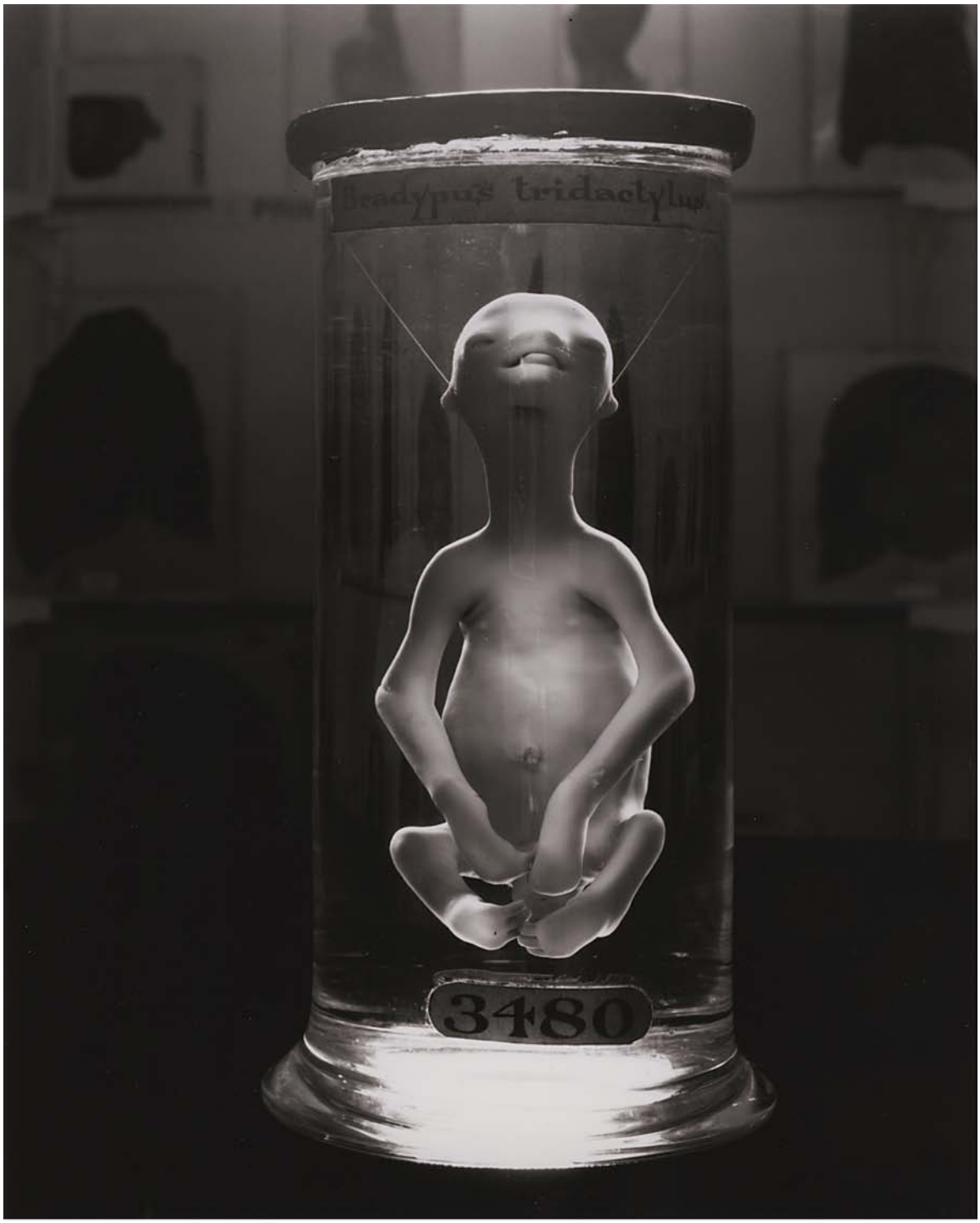

Figure 71

'Bradypus tridactylus' from *'Mysteries of Generations'* by Elaine Duigenan, 2001
photograph

Figure 72

'Stapelia gettliffei' from *'Flora'* by Nick Knight, 2001, photograph

Figure 73

'Proteaceae' from *'Herbarium'* by Robyn Stacey, 2004 photograph

Figure 74

'Beau Monde (Yellow)' by Robyn Stacey, 2006, photograph, 120 x 120cm

In the projects using other modes of representation, i.e., painting, drawing and jewellery making and installation, the artists accept that their techniques alter details in some aspects. There is a guaranteed subjectivity and 'artistic licence'. The least true to life image capturing technique is used in Pryor's *'Black Solander'* (2005) where his aim was to capture only the essence of the plant (Figure 61, p.120). He comments that some of his images are, by accident, drawn in water or extremely dilute ink, just forming ripples on the paper rather than an image, but he considers these 'mistakes' as enhancing the artwork's ability to comment on the disappearing flora in Western Australia (Pryor, 2008).

Natural history specimens as artefacts

For a piece of the natural environment to be relevant to concepts of material culture, man must first select and shape it and then give it cultural value. The artists surveyed consider the specimens they depict as humanly defined artefacts; they show this understanding through the use of visual symbols alluding to the specimen status of the dead animal or plant material. These symbols show human interaction with the object, the most obvious of these being the complete herbarium specimen including tapes, stitches and label, the card label attached to an animal specimen and the pin through the thorax of the insect.

Farnsworth includes labels and specimen storage boxes in his images so the viewer understands they are looking at taxonomic tools rather than simply dead animals; the viewer is given "cues that would indicate their role as a scientific observer" (Farnsworth, 2007). Langford Edwards' images often contain pins, storage jars, handwritten labels and dismembered parts of animal photographed in their packaging. All these things allude to the 'scientific' status of the specimen (Figure 75, p.141). In many of the images for *'Wallace'* (2009), Langford Edwards ensures that the writing on the label is visible and therefore the specimen details are legible as part of the whole image (Figure 76, p.142). Fairnington carefully depicts the pin through the insect's thorax in *'Dead or Alive'* (2002) often choosing specimens where this process of inserting the pin has caused the thorax to collapse (Figure 38, p.88).

Phelps wanted her photographs to look like portraits of specimens, not animals, making a conscious decision to include tags and labels, showing how they are currently stored to "re-enforce the specimen as something that is part of this scientific organisation" (Phelps, 2008). On the specimen selection process she states "I was keen to look for ones which were slightly, maybe odd, that people are not normally seeing, you don't normally see a folded aardvark!" (Phelps, 2007) (Figure 77, p.143)

Duigenan includes elements of specimen status such as parts of the heavy glass jars and hand written labels "because they are part of the object as a whole" (Duigenan, 2010a). In addition, her 'up-lighting' technique shines on and makes visible the small filaments that hold the specimen in space in the preservation fluid, reminding the viewer that the body of the specimen is connected, and in some cases held open, by the sides of the jar, making the jar and body of the animal one structure (Figure 78, p.144). Some of Duigenan's images

contain jars out of focus in the background, and here she requires the viewer to consider the specimen in context as part of a museum collection.

In herbarium-based projects the humanly created "peculiar and often breath-taking aesthetic" (Knapp and Knight, 2001, Introduction) of the specimen was the primary appeal for the artists surveyed. Knight comments that, "what attracted me most was the fact that these plants primarily didn't look like plants" (Knapp and Knight, 2001, Preface). Stacey considers that dried specimens are "the essence" (Stacey, 2008) of the plant, and believes the appealing aesthetics of the herbarium specimen to be created by the stripping out of elements normally associated with plants, such as their bright, clean colours. We are therefore encouraged to see more clearly the form, shape and structure of the plant. Pryor mentions a "scientific aesthetic" (Pryor, 2008) that becomes clear when looking through many sheets. He, like Stacey, is also attracted by the "drainage" of elements normally associated with traditional botanical beauty that depicts an idealised plant in "its most perfect form and flush of health" (Pryor, 2008).

The artists commented on the beauty of the composition of herbarium sheets. Whether they display a single plant or several smaller sections and dissections next to each other in harmony, the arrangement of the sheet with the label is more than the sum of its parts. When commenting on her decision to photograph the whole sheet rather than close up, Stacey suggests "what the sheet represents does become significant because it's the writing, the mounting, the arrangement" (Stacey, 2008). Wilkinson also comments on the dynamics of the herbarium page. In several sheets she observed numerous plants arranged together, and in response she created separate jewellery pieces for each plant and displayed these together in relation to the original sheet (Figure 79, p.154).

In some images, Langford Edwards identifies another type of human interaction, a more unconventional method of communication found commonly on herbarium sheets where small notes, 'conversations' between botanists, often spanning many years, are recorded in pencil on the mounting paper (Figure 80, p.146). He feels these notes "humanise" (Langford Edwards, 2007b) the specimens, leaving behind the trace of a human touch. Langford Edwards comments that this interactive process "makes them [the herbarium sheets] appear to be sort of dynamic… not just something that has been put away and left" (Langford Edwards, 2007b). Pryor's *'Flora Nullius'* (2004) also takes account of these

specimen-based ‘conversations’; he chooses to include them even though the specimens they relate to have disappeared.

Knight’s *‘Flora’* (2001) and Pryors’ *‘Flora Nullius’* (2004) images are an interesting comparison (Figures 46, 72, 59 & 60, p. 98, 72, 118-9). Knight is the only photographer who has ‘removed’ signs of human interaction from his images, the tapes and stitches holding the specimens to the page and labels have been taken away leaving only the pressed specimen image. In contrast, in *‘Flora Nullius’* (2004) the human interaction, tags, labels, capsules and notes on the paper remain and the specimen is completely removed. Phelps uses a similar technique with Barn Owl labels in *‘Coded Ornithology’* (2008) where the labels are displayed without any specimens (Figure 81, p.146). Both artists speak of ‘memorial’, Pryor to the disappearing flora and Phelps to birds taken from their environment.

Figure 75

‘Amazona oratrix’ by Fred Langford Edwards, 2007, photograph

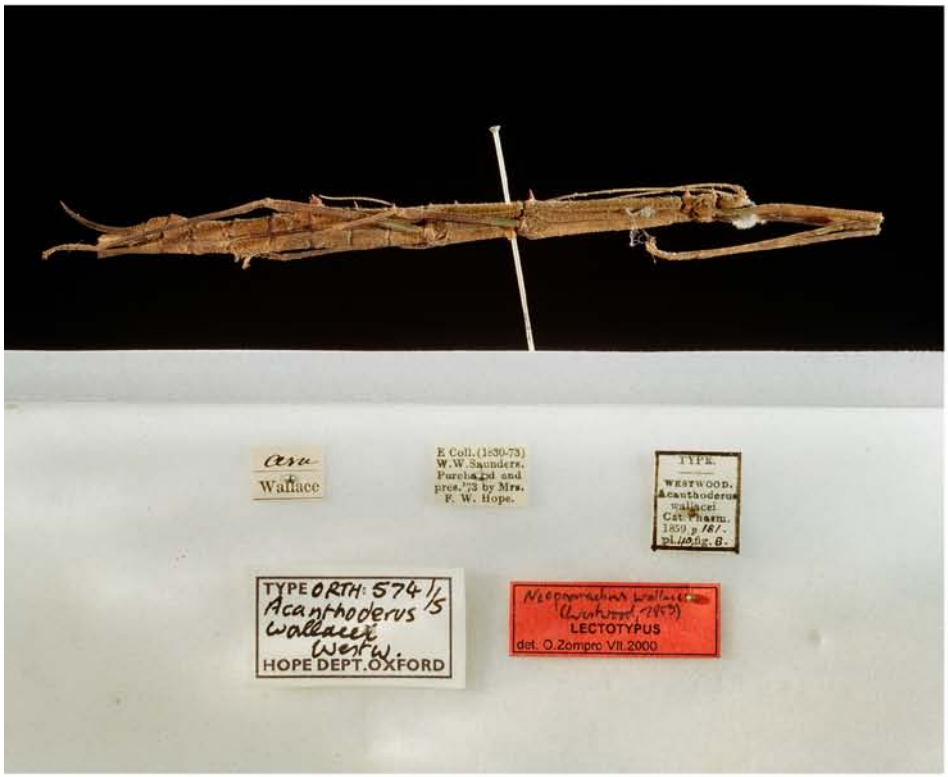

Figure 76

Specimens with labels from '*Alfred Russel Wallace: The Forgotten Evolutionist*' by Fred Langford Edwards, 2009, photographs

Figure 77
Folded aardvark from *'Evacuate'* by Lyndall Phelps, 2007, photograph by Derek Adams

Figure 78

'Macropus rufus I' from *'Mysteries of Generations'* by Elaine Duigenan, 2001

photograph

Figure 79

Silver reproductions of herbarium specimens arranged as a herbarium sheet from *'Legere to Gather'* by Areta Wilkinson, 2004

Plate 80

Herbarium sheet photographed by Fred Langford Edwards

Plate 81

'Barn Owl (Tyto alba alba) labels' from *'Coded Ornithology'* by Lyndall Phelps, 2008

Display methods and devices

Alberti (2005) suggests that in the history of museum display the meaning of an object was greatly "impacted upon" (p.568) by its proposed position in an academic classification system and also "its immediate display environment" (p.568). Fairnington noted some of these peculiarities in the architecture of display, and this led him to explore humanly created environments for specimens such as the *'Hummingbird Tree'* (2003) (Figure 41, p.91), where many specimens perch on one tree far removed from the realities of nature. In *'The Ancestors'* (2004) (Figure 42, p.92), birds of prey sit on stands designed to look like rocks and branches. Fairnington comments that these displays are "about the culture that created it rather than anything to do with the specimens" (Fairnington, 2007).

In *'Legere to Gather'* (2004), Wilkinson displayed her jewellery pieces in an area suggesting a plant collector's work-space, designed to function as an integral part of the work. Jewellery pieces lay on white stands resembling large herbarium specimen books placed on a white trestle table (Figure 82). The pieces appear to be at different stages of specimen preparation, "some specimens already pressed and flattened, others in the process of" (Wilkinson, 2007). Wilkinson comments that she used these book props to emphasise the amateur technique of pressing plants in books, and the necessity of historical reference books to correctly classify the collected specimens.

Figure 82

Display method in *'Legere to Gather'* 2004 by Areta Wilkinson

Death, immortality and the non-permanent made permanent

Chapter Two outlines the principle that natural history specimens achieve an immortal status though their death and decomposition is arrested by various means. The animal or plant, normally a non-permanent entity, is changed into a permanent one, a specimen. Chapter Two reviews these themes with regard to herbarium specimens; here they are extended to animal specimens, where emotions concerning death are magnified.

Duigenan comments it is humanity's fascination with prolonging life and fear of death that makes specimens so intriguing. She suggests that although the animal is dead, the condition of the specimen means it is viewed as if alive: "there is this wonderful tension…. because in some ways it's neither alive nor dead" (Duigenan, 2010a). This is particularly true of the foetal specimens in Duigenan's images where the body remains in perfect condition with eyes shut as if sleeping. Duigenan's chosen subject matter evokes strong emotions; foetal and new born baby animals are particularly vulnerable, we view them in her images, alone and stripped of their protection, and we are reminded that they once had an "amazing life force" (Duigenan, 2010a), that has been taken from them either before or just after they were born.

Phelps discusses the sense of loss she feels when working with animal specimens, in particular bird specimens, because of the "violent component to how they have ended up being there" (Phelps, 2008). Langford Edwards also plays on the human emotions surrounding the necessity of death to create the immortal specimen. In choosing to photograph zoological specimens with severed heads and scuffed false eyes, he reinforces the idea that an animal has lost its life. Fairnington's large animal specimen paintings are so lifelike that the only clue to an observer that the animal is a stuffed specimen is the view of the museum gallery reflected in its unnatural eye, reminding the viewer of its unfortunate fate. The immortality or permanence of specimens is also discussed by Hay, who states that "each individual object exists, collected, preserved and available for the future" (Stacey and Hay, 2008, p47).

As outlined in Chapter Two, specimen based artwork gives specimens and collections another layer of immortality and permanence in the form of visual or three- dimensional representation. In relation to this, Duigenan describes her photographs as "acts of preservation" (Duigenan, n.d). She comments that just as the specimen remains in

suspended animation, capturing and maintaining a point in time, the act of photography also permanently records a particular moment in time. Langford Edwards' '*Wallace*' (2009) project, where photographic images produced from scattered specimens have brought together parts of the Wallace collection, facilitates a new permanent archive of the collector's life through his objects.

'Personification' of an object and the 'life history' of a specimen

Material culture theories suggest that an object can be seen to 'personify' a collector. Many of the artists clearly consider that people leave some type of imprint on an object, and by its very nature Langford Edwards' *'Wallace'* (2009) project is based on this premise. Wilkinson's jewellery pieces are designed using specimens collected by Joseph Banks and Daniel Solander from the *Endeavour* expedition. In Stacey (2007) images are based on one family of collectors, and the text discusses various specimens and their connections to recorded family stories. Duigenan's photographs purposefully focus on anatomical specimens 'created' by one man, John Hunter.

Similarly, Phelps and Stacey suggest specimens have the ability to 'objectify' a place or become a geographical souvenir. Phelps took photos of specimens back to the places they had been evacuated to during World War Two, for this concept to work a connection between place and specimen has to be recognised. In *'Herbarium'* (2004) Stacey has images of seaweed collections made by one man. The collection starts in Ireland and ends in Australia with Stacey suggesting that the plants are geographical souvenirs "they function as memories for people and they function as a way of reminding them of home" (Stacey, 2008). The collection as a whole can be viewed as a diary of migration to Australia.

Of the artists surveyed, Stacey and Phelps agree that an object, in this case a specimen, can have a 'life history'. Stacey and Phelps choose specimens for their aesthetic appeal and found rich 'life histories' on labels, made up of places, events, people and connections experienced by the specimen. Phelps notes that two strands of 'life' are recorded on the label side by side, the "natural history life" (Phelps, 2008) experienced by the live animal with its stomach contents, eye colour, measurements and weight being noted. The other is the 'artefact life' where human interaction and the history of ownership are documented. Phelps found label information "completely fascinating" (Phelps, 2008), commenting on

more than just the facts of the animal, but also how the animal died and was presented to the collection. Labels “tell you about a lifestyle and social climate and all of those things in a different era” (Phelps, 2008). Phelps felt drawn to the specimens whose stories made her “react emotionally”, compelling her to “tell the histories of these individual objects” (Phelps, 2008).

The secret world of the natural history collection

Artists are observers, and there is no better experience than discovering a ‘secret’ world, full of striking emotive imagery with strong narratives. Natural history collections have the capacity to provide this. They are by their very nature delicate (in particular the older specimens), seemingly incarcerated under low light conditions, away from dust and too much handling. Natural history collections inhabit a world kept secret by the need for protection and longevity.

Not only are institutional natural history collections secret and private worlds but in large collections many specimens rarely and sometimes never see the light of day. Phelps discusses an awareness of hidden specimens, she comments that they “may not be seen by anybody for decades” and felt she was able to “bring them out again” via her images (Phelps, 2008). Fairnington mentions underutilised specimens in connection with his first paintings of the Mantidae, where the specimens had been in collections for approximately 200 years. He purposely selected less valuable, non-type specimens where there was a possibility they had not been viewed since they entered the collection. He comments that from this ‘hidden specimen’ “suddenly there is a big painting and it’s a bit like making a monument or replica” (Fairnington, 2007). For the same reasons the *‘HSP’* contains very few images of type specimens, these were only selected when no other material was available or where a particularly eminent collector was being represented. In his survey of artworks, Putnam (2009) also takes note of the tendency by artists to select more obscure objects: “Drawing frequently on the reserve collections, artists tend to chose objects which may be of less significance in the eyes of the museum curator” (p.132).

Changing significance and conservation of the specimen

Hay (Stacey and Hay, 2008) comments that specimens have the ability to change roles over time “whether that future uses it as a taxonomic or an historic reference, as an object of wonder to be exhibited and admired, [or] as an illustration of the past and present

Museum" (p. 47). In his interview Fairnington discussed the changing significance and conservation of specimens, in particular those stuffed, 'retired' display specimens from the NHM, London now stored in the Wandsworth depot. Here are specimens now considered redundant because they are not particularly useful for science or were previously used in museum displays when the fashion was for galleries filled with stuffed animals. They remain in the depot unable to be disposed of due to the ethical issues surrounding the death of the animal, but they are in need of care and conservation. It is here that Fairnington saw the giraffe head and necks that Fortey mentions in his book and are discussed in Chapter Two. These were featured in the painting by Fairnington *'The Raft'* (2006) (Figure 40, p.90), the title reflecting the visual connections between this painting and *'The Raft of the Medusa'* by Gericault. Through the production of artwork and therefore a completely different mode of representation than the one originally intended for them, Fairnington has been able to give disused and perhaps permanently redundant specimens a new lease of life. In addition this has enabled them to have a completely different type of immortality - that of a specimen, the preservation as an image in an artwork.

Phelps hopes that artwork celebrating the specimen will enhance the value of a natural history specimen. When discussing *'Evacuate'* (2007), she finds people are surprised that specimens were evacuated as they perceive them as objects with low monetary value, unlike for example, art. She hopes that by turning specimens into artwork they will be considered "as something precious that should be looked after and cared for" (Phelps, 2008).

The power of the specimen

Material culture theories suggest that objects are active agents with power to shape us and alter the way we behave. This is true of natural history specimens. Wilkinson notes that specimens inspire enquiry. She discusses this as a two way process in relation to the Banks and Solander specimens in *'Legere to Gather'* (2004). She comments that the artist has a "conversation" with the specimen while replicating form and texture, leading to information about the past, the material used in production and what aspects of the specimen should be shared with an intended audience.

Duigenan suggests the intrinsic nature of the specimens, their age, death and stillness, as well as the quietness and respect demanded by the environment they inhabit, all influenced

her “definite choice” (Duigenan, 2010a) to work in a slower and more considered way. Duigenan also found specimens inspired enquiry, leading her to research further information from the conservation staff at the museum about dissection and preservation techniques and the structure and manufacture of specimen jars. Duigenan suggests all this ‘extra’ information “somehow goes into the work”. The time spent with the specimens had a long-lasting effect on Duigenan who felt a “very direct influence” on her working practice which acted as “a catalyst for the work” (Duigenan, 2010a). Since then she has had a greater engagement with objects and her following projects have all been object-based.

Specimen based artwork as a visual collection

In Chapter Three, the concept was put forward and examined in detail that the artist’s actions created her own visual collection rather than just a selection of specimens. In this chapter this hypothesis is further explored in relation to other artists who produce specimen based artworks and the results are equally as positive. Many of the artists responded in a similar way to their groups of objects as proposed and considered in collection studies literature. Certainly the most important criterion for an object to be considered part of a collection, the alteration of original context and function, occurs in all the projects reviewed. Once the representation of a specimen is removed from the context of the institutional collection then its function as a scientific tool is replaced with a narrative one.

Many of the artists interviewed agreed that their projects could also be considered collections. Hay (Stacey and Hay 2004) wrote that in “selecting from the past the specimens she will catch in her lens- their lushness, their brilliance – Robyn Stacey creates a new story a new collection” (p.26). Stacey herself comments that she considers her images to be a personal and “thoughtful interpretation” (Stacey, pers. comm. 2008) of the collection. The parallel between Stacey’s *‘Herbarium’* project and the *‘HSP’* is clear as they both create new visual collections, from larger historical herbarium collections. Pryor’s *‘Black Solander’* (2005) follows the same criteria and is unmistakably a visual collection with clearly defined boundaries.

When asked whether her images constitute a collection Duigenan answered “yes, they do actually because I selected the specimens I wanted” (Duigenan, 2010a). However she comments that a ‘collection’ is “an interesting way of putting it” and that she “hadn’t really

sort of thought about it like that" (Duigenan, 2010a). As with Stacey, her choice of specimens was a "very sort of personal response and the collection if you like…is very much my own" (Duigenan, 2010a). She, like Phelps, indicates that her selection process has an emotional element as well as an intellectual grounding. Phelps considers *'Evacuate'* (2007) to constitute a collection: "it's obvious that it's a collection" (Phelps, 2008). Langford Edwards believes creating a visual collection is inherent in photography, that any photographer does it in a way; he notes however, the coincidence of "photographing specimens and building up a collection" (Langford Edwards, 2007b). *"Alfred Russel Wallace: The Forgotten Evolutionist"* (2009) is based around creating a comprehensive photographic collection from Wallace's scattered specimens, thereby bringing the Wallace collection together into one place, "it's the first time all this stuff has been together" (Langford Edwards, 2009b). This would be a much more difficult task to perform physically with so many institutions involved.

The collected object – possession, handling and memory

Collection studies suggest that possession and handling are important aspects of the collecting process, where the 'owner' can be in full control of their objects. Although ownership isn't possible in the case of specimens from a public natural history collection, there is a strong secondary type of possession through the creation of an image of the original object. The image becomes the possession rather than the actual object. This is true of the *'HSP'* and is shared by Phelps and Langford Edwards in respect to their projects. Phelps describes her emotional connection to her collection as: "it becomes part of me" (Phelps, 2008). Phelps was asked if she had a personal attachment to the specimens she chose to photograph, and whether she felt a type of possession. She answered very quickly "They're mine! They're under my bed! [the photographs] Definitely…it's bizarre they kind of become friends" (Phelps, 2008). Of the bird specimens at the NHM, Tring, Phelps talks about handling and the physicality of the specimens. On a few occasions she found herself unconsciously patting the birds as if they were alive. She re-arranged a family of barn owls collected from Suffolk that had been separated and dispersed among several drawers, and she comments "I put them all in the same drawer with the mother in front so that as though she was protecting them which is a completely bizarre thing to do but I kind of felt the need to do it" (Phelps, 2008).

As discussed in Chapter Two, objects can trigger memories. It is hypothesised here that the image of an object acts in this way and this is certainly true of images produced for the *'HSP'*. Duigenan's photographs act as "igniters of memory" (Duigenan, n.d.). She was asked whether the images of the specimens reminded her of the feelings of marvel she felt when she first experienced the specimens. She answered that when she occasionally looks at them "I go right back to that time" (Duigenan, 2010a).

Collection activity creating obsession

Theorists suggest collecting can create obsessive behaviour. The artists interviewed were asked, and their answers varied, about obsession and whether they felt their work captures or illustrates others collecting obsessions. Phelps believes "it's only natural that it does really" (Phelps, 2008) and Stacey comments that the obsessive tendency of collectors is one of the factors that initially drew her to working with natural history collections: "collectors are obsessive people …. they are fascinating as their stories are…its almost like the plants, they are wilder than anything you can imagine" (Stacey, 2008). Langford Edwards suggests his working methods mirror the "compulsion" or "irrationality" of collecting activity: "there is a definite parallel between the way I am building up a collection of images to the way that others have collected" (Langford Edwards, 2007b). Fairnington is less certain that his work communicates obsessive qualities because although he viewed huge numbers of collected specimens, he chose to concentrate on one specimen at a time to give "very specific individual images a kind of relevance" (Fairnington, 2007b). He does note that "there is something obsessive about the work for sure", but this is probably "something about the focus on surface detail" (Fairnington, 2007b).

Duigenan suggests that the anatomical specimens she photographed exhibit the overriding passion and commitment John Hunter had for biological knowledge and exploration in an era: "when there was still so much to be discovered" (Duigenan, 2010a). She found that the way specimens are dissected and suspended in the fluid is in itself meticulous, Hunter must have encountered "all manner of technical difficulties" (Duigenan, 2010a) in this task alone. Duigenan suggests there is a link between the experience she had when viewing the specimens for the first time and when Hunter was cutting the animal open 200 years ago to reveal the hidden and unexplored world inside.

The completion of the collection & organisation of objects within the collection

In the group of artists studied few attempted to produce a 'complete' collection of images. The opposite is true of Langford Edwards whose enjoyment in working with "the mass of material", is partly derived from the fact that his visual collection is like the institutional one in that "collections are always unfinished, they are never complete" (Langford Edwards, 2007b). Two projects attempt to complete a collection, the *'HSP'* and *'Black Solander'* (2005). They share a similar aim that specimen representation of the chosen diversity will be as comprehensive as possible. The diversities are different: the *'HSP'* illustrating at least one specimen from each flowering plant family, and *'Black Solander'* (2005) created from one representation of all currently accepted plant species in Western Australia.

Where the two finished projects differ is in the reality of being able to complete the chosen collection and how rigidly their composition was dictated.

The aims of the *'HSP'*, which are to entirely represent the flowering plant families stored at RBGK, and to portray a specimen from each year since the herbarium was founded has been accomplished. As a full diversity of flowering plant families it only lacks a specimen of the Haptanthaceae family. In *'Black Solander'* (2005) where Pryor planned to represent the whole diversity of a geographical area, he comments that completion of this mammoth task "eluded me...there were just too many unknowns, new discoveries, conjectures with the flora here [Western Australia], to be able to pin down" (Pryor, 2009).

Langford Edwards notes that the "way you organise a collection is never fixed, it's always up for negotiation in the light of new science, in the light of new methods of classification" (Langford Edwards, 2007b). This is an uncomfortable truth in relation to the *'HSP'* visual collection which has a very rigid organisational structure due the medium in which it has been produced and the chosen style of composition. The *'HSP'* visual collection has been organised to follow the most up-to-date DNA-based classification available at the start of the project in 2006. There is now no possibility of rearrangement, even though more recent classification systems have reorganised the family order. This is discussed further in Chapter Five, the Conclusions. The *'Black Solander'* (2005) visual collection loosely follows a classification system; some drawings were left out of the final installation due to demands for space. As the drawings are on separate sheets of paper, Pryor is able to exhibit

smaller collections or selections and can rearrange the organisation of his visual collection at any time. This gives him greater scope for dealing with classification system changes if he wishes.

Conclusion

The connections between the *'HSP'* and other projects reviewed are the foundation of this chapter although these are not discussed at length in this section in order to avoid repetition. In Chapters Two and Three the *'HSP'* was used as the case study to investigate and define how and why material culture theories apply to specimen based artwork. Only the material culture theories relevant to the *'HSP'* were applied in analysing the art projects in this chapter.

The aim of this project was, not only to create a piece of artwork, but through research to propose a context for it among other similar art projects so that it could be considered to be part of a more sensitive and/or conceptual art field than botanical illustration. This chapter has reviewed other art projects in order to do this. Theories from the discipline of material culture have been used to investigate the multi-layered narrative capability of the natural history specimen/ collection and how the artist has captured this in their artworks. This research successfully located a group of artists working in a similar manner with a novel group of objects and it is proposed here that together with the *'HSP'* these art projects together form a new genre of art - 'specimen based art'. The elite in this genre create images of specimens underpinned by rigorous and detailed understanding and appreciation of the scientific value of the originals. Artworks are created through exacting standards of production and can have the integrity and authority to enter into meaningful dialogue with scientific research. In addition the artworks have a narrative thread which may be apparent on the surface or revealed through additional literature.

The question is why this select group of artists chose to produce images of natural history specimens? In many cases the artists entered the collection for another reason, devoid of prior knowledge or the intention of producing a large scale project in relation to specimens. Whilst in the collection environment, and often in the 'off limits' or behind the scenes sections, they experience feelings of astonishment and wonder - whether it be for a single specimen or the enormity of the entire collection. Initially it is these very emotive feelings that they want to share with an audience through their pieces. However, institutional

collections are large and difficult to ‘find a way in’, or to tackle with any continuity, so a clear narrative pathway must be sought. Here they find that specimens have rich ‘life stories’ and experiences that the artist seeks to communicate; they become “objects with desires, rather than objects of desire” (Gosden, 2006, p.437). These stories range from the very basic - the unusual aesthetic of herbarium specimens to very complex issues surrounding historical human colonisation. The artefact’s ‘life story’ starts before the specimen is created, while it is still plant or animal in some far away place. It then develops through collection, artefact creation, naming and classification, time spent possibly as part of other smaller collections, until it reaches its current resting place, utilised (or not) as part of an institutional scientific collection. This route is not followed by all the artists, those researching a previously composed and constructed narrative seek out particular specimens that have been positively contaminated by a person, place or historical event.

The main factors inspiring the feelings of astonishment and wonder for artists relate to the sheer size and volume of large institutional collections. Linked to this are the time and effort taken over generations and by many individual scientists and collectors to build these archives. Every specimen provides a connection to another person, the collector, historically important or not. In addition the age and permanence of the specimens amazes - the life-span of a specimen being longer than a human life. The natural history collection also stirs emotive feelings that the artist wishes to convey, such as sadness and loss; the specimens were, after all, once living and mostly their death came about prematurely in order to be included in the collection. This study reveals that specimens should be regarded as active agents, capable of stimulating an emotional response rather than passive objects. In their material is the propensity to inspire enquiry, shape us and alter the way we behave, in effect enter into a relationship with the artist. Tilley (2006) suggests that “we touch the things and things simultaneously touch us” (p.61).

As a consequence of their projects many included artists felt they established their own collection, albeit a visual rather than a physical one from the larger institutional collection. In this respect artists feel there is a very real connection with the collecting aspect of their projects, the activities of the institution and the people who work there. Some artists also consider that their activities are adding to the ‘life story’ of the specimen, for example

making a painting ‘monument’ from a rarely viewed specimen or adding a label to the herbarium sheet to show use like so many collectors and scientists before them.

The environment within an institutional natural history collection is one of quiet contemplation and passion; it is here that historically important scientists walked, thought, touched and considered the specimens to develop ground-breaking science. Today, scientists still gather information from the same specimens. As an artist closely observing the environment, the obvious passion, hard work, contemplation and discovery of others is a humbling experience. In addition to these sensations are feelings of immense privilege that make the environment a very special, safe and fulfilling place to work. Fortey (2008) describes the passion and character of people who work in taxonomy “the kinds of people who are able to work alone for long periods without much encouragement, with modest financial reward” (p.140). There is some common ground between the two disciplines of art and science and similarly to the working practices of artists, scientists too work on long-term projects with passion and often little care for remuneration.

Lastly, the artists have all worked to a greater or lesser degree under the watchful eye of the scientists and curators. These individuals have long had an understanding of the possibilities for scientific specimens to narrate other stories, but have had no time, means or purpose to promote the collection they work with in this way. The artists included in the study, along with the help of the institution staff, have seen and understood the importance and abilities of the specimens to be visually exciting and at the same time capable of narrating their stories.

In conclusion, none of the artists specifically mentioned material culture theory, however unknowingly they are all using and developing concepts concerned with object and/or human relationships to produce narrative-based artwork. Through developing and analysing their relationships with the specimens, they have demonstrated that natural history artefacts, normally hidden away, are truly dynamic and special objects that can have an enormous capacity to communicate human-based stories in many different ways.

Chapter Five

Conclusions

This project was not intended to advance traditional botanical illustration but rather to use related techniques to construct an artwork concerned with the qualities and purposes of the specimen, not the living plant. First and foremost this project has produced a unique artwork where art and science combine. The *'HSP'* is a high impact piece created using a rigorous methodology, applied within a framework that set out to test the original hypothesis - that art can be used successfully to convert a complex, multi-dimensional evolutionary theory into a graphically simple representation which transforms its overall message to observers; in this it is very much a scientific endeavour. This painting encompasses and celebrates the herbarium collection as a whole and is fully emblematic of the "state-of-the-art" position around which global plant systematic debate now rages.

The practical and research elements of this project were carried out in parallel and each strand of information gathered was integral to the success of the project. The research into material culture theory provided a context vital for understanding the work in relation to what has gone before and the artist case studies provided the project with depth and richness, allowing the concepts researched to be considered in practice. The interaction with other artists provided inspiration and ideas to the current project and provided bench-marks for comparison of approach and technique. Most significantly it produced a context for the *'HSP'* among other projects underpinned with similar, well considered and researched specimen based narratives. Combined, these research areas not only consolidated my practical work in understanding, focus and decision making but enabled the identification of a new art genre where the *'HSP'* can be best placed, appreciated and understood. In addition it is hoped that the connections forged with other artists will lead to interesting opportunities for the future.

The piece illuminates stories behind the specimens and the artwork as a whole is a monument to these objects. The study of material culture literature, initiated by this thesis, has provided understanding of the latent potential of the specimen and collection. The literature study has therefore encouraged the analysis of relationships between artists and

the objects they interact(ed) with daily, and has increased awareness of potential narratives developed here. On a personal development level the project has significantly increased the artist's understanding of plant science; from the individual plant structures and identification of plant families to the complexities and variations in phylogenetic trees of relationship. In addition the accuracy of the painting has improved throughout the artwork along with techniques for capturing transparent and desiccated textures found in dried plant material. The work has provided an opportunity to scour the herbarium for plant families of most interest for future, more focused study and this is likely to be evident in my subsequent pieces and projects.

The completed painting

The most striking aspect of the *'HSP'* is its scale; the total length is 533cm and throughout this span, the meticulous style of illustrating every precise detail has been maintained. The composition of the whole painting accomplishes the aim of visually displaying a complete flowering plant classification at a glance. The painting was first viewed in its entirety by a selection of botanists and taxonomists on the 16th November 2009 (Figure 83). The intention of this viewing was to thank members of RBGK staff and to encourage suggestions for improvements before the painting was officially completed. (Comments made at this event can be viewed in Appendix Three).

Figure 83

'Herbarium Specimen Painting' on display 16th November 2009

The composition, as planned, has the capability of displaying and 'absorbing' very large and small plant forms without creating an imbalance. When the work is now viewed, the small, tighter section that was discussed on page three is no longer noticeable, particularly since larger gaps and inconsistencies in the composition have been corrected during a period of refinement that occurred in a five month block after the painting was finished. This period was particularly important because my botanical understanding and scientific rigor had improved throughout the project and it was imperative that the initial sheets were re-examined to bring them up to the same standard as the later ones.

The physical placement of the specimens in the composition was largely left to chance and fortunately worked extremely well. It was anticipated that the seventh sheet would need to be meticulously planned to fit the final families securely without compromising the composition. This sheet was started without any prior preparation, however, and once half completed it became a challenge to fit the last section together naturally. This was a risky strategy with tense moments but only the final three specimens were planned out to complete the artwork.

The painting contains at least one specimen collected in every year since the herbarium was founded in 1853. In addition, the complete assemblage of specimens illustrated in the *'HSP'* reflects a wide variety of other narratives, some understood and some yet to be realised or explored. These narratives cover historical and contemporary themes and can be science and/or human centred. Unfortunately, some historically significant individuals represented in a variety of ways in the collections at RBGK are not present in the painting. This may be because the relevant specimen did not show a diagnostic character or because older historically important specimens are more often damaged, with less aesthetic appeal, thus making them undesirable to represent a plant family.

The RBGK herbarium contains specimens of plant material from all flowering plant families except the one represented by *Haptanthus hazletti*. The general consensus from the first viewing of the painting was to not include a representation of this family and, instead, a small space has been left for it. It is hoped an illustration of a specimen may be added to the painting at a later date. Until recently, there were only two known herbarium specimens of this species in the world and despite numerous attempts, a living plant has not been located in 30 years. However, on April 23th 2010 a plant was discovered in Honduras (Shipunov, 2010). This recent find may allow samples of specimens to be sent to RBGK.

There are two significant areas where it is felt that under different conditions, the *'HSP'* could have been improved. Firstly the project would have benefited from more consultation time with botanists about specific diagnostic characters and plant orientation. In many cases, particularly with larger families, it would have been an advantage to have longer to research each specimen, but this was impossible given the size of the project and the time available.

Secondly, the painting fulfils many of the criteria that it was designed to meet but the ability to represent plant families in an up-to-date evolutionary order using the chosen composition structure was impossible. Keene (2005) is quite correct when she comments that "Any attempt to fix museum collections within a classification system is bound to fail, as all such systems are subject to the preconceptions of the time" (p.90).

Although there is no chance of, and no point in, altering large areas of the *'HSP'*, since classification systems continue to change as more species of each family are analysed,

several small changes were possible which the artist very much desired to make. However, discussions were held with RBGK staff (G. Bramley, E. Lucas, B. Schrire, T. Utteridge) about the possibilities of including families which have been recently described (and are therefore not included in APG II and the painting) and removing *Hydatellaceae* from its current position within the painting (Monocots) and placing it in the *Paleodicots* in the order *Nymphaeales* next to *Nymphaeaceae*, the water lily family, where it is now thought to reside (Stevens, 2001). None of these taxonomists thought it was appropriate to use one classification system and then update some aspects and not others, so the painting has not been updated in any way.

Although I felt much regret at this decision, it was realised that the very nature of taxonomic classification is one of change and that the painting would enter the world some years out of date at any time it was produced. These aspects of its composition reflect that systematics and some elements of our understanding of the world are still unresolved, dynamic and fluid.

Analysis of contact with other artists producing specimen based artwork

Over the course of the project, contact with the study artists has been regular. Three artists, Stacey, Pryor and Langford Edwards (second time) were interviewed at RBGK which gave them the opportunity to view the *'HSP'*, allowing them to understand the context of, and see the practical work connected with, this research project. It also allowed visual comparison of their working practices and insights to those used in the production of the *'HSP'*.

The interviews with the study artists were a particularly rewarding part of the project. It was enjoyable to share similar experiences and speak personally about their work and feelings toward natural history collections and specimens. Their obvious emotional attachment to the subject matter came across strongly. In addition, it was often apparent that connections and similarities existed between feelings and emotions when working with the specimens. Two areas of questioning which had strong and lively responses were those related to building a personal collection and feelings of privilege with being able to capture images of normally unseen objects.

What can be learnt from the distinct group of artists producing natural history specimen based art projects?

The artist working within institutional natural history collections experiences feelings of astonishment, wonder and privilege brought on by working in a rarely seen and secluded environment. These strong emotions are produced and revealed by exposure to large institutional collections, their objects and environment. Such initial responses induce a sense of curiosity often followed by a period of research where individual depth, meaning and narrative connected to each one of the specimens is realised. Ultimately the artist requires a vehicle to share their experiences and emotional responses to reveal lost, untold narratives or re-tell well known stories through a more unusual medium.

Specific objects possess power and presence; "the artefact through its "silent" speech and "written" presence speaks what cannot be spoken, writes what cannot be written" (Tilley, 1999, p.260). In the specimen based art works examined here it is this powerful articulation of meaning that is exploited by the artists. Whether the narrative for the art project comes first or is developed through time spent physically with the specimens 'listening' to their stories, the artists pursue 'object-based story telling' a method of visually communicating through images of the objects. Such a sensitive and intuitive method of visual communication enables the object to communicate its 'own messages' and allows for more than one layer of meaning, a factor important in natural history specimen-based artwork.

Natural history specimens are complex objects; projects involving their images are multifaceted. Gosden (2007) comments that "Through the artefact, layered and often contradictory sets of meanings can be conveyed simultaneously" (P.62). Some of these meanings are visually obvious, for example photographs of specimens showing the 'specimen status' via paper labels. An additional layer of meaning could be constructed by making all the label information clearly visible in photographs so the connections between the specimens can be clearly understood. Other threads run more deeply through the projects and are obscured from view; here further textual information is required to reveal the additional narrative.

Gosden's (2007) suggestion that collections as a set of 'small' things can reflect 'big' ideas about the world, is fundamental to the art produced by those artists studied in this project.

These artists use images of natural history objects to mirror issues from the outside environment, such as mans need to tame the world, human destruction, overpowering cultures, obsession and the desire to possess objects. Natural history specimens have the propensity to narrate these 'darker' stories because they have truly been altered by man, their lives have ceased and in death they have been removed from their natural environment, becoming a possession or in some cases a commodity. In this respect the specimens, particularity animals, are very emotive. There can be a sense of tragedy and sadness but at the same time they can promote darker, voyeuristic tendencies.
Specimen-based art creates ownership between artist and specimen, enabling the artist to continue feeling a personal connection or emotional attachment to an object. In addition, it creates an unusual and thrilling capacity for the artists to leave their mark on a collection, as so many eminent scientists have done before.

Artists interviewed and analysed for this research project are exploring, studying and developing our contemporary human relationship with specific objects (often pursued and collected in a different era) and in so doing they are unknowingly applying principles set out in material culture theory.

The contribution of this study to the multi-disciplined field of Material Culture

One aim of this study has been to contribute knowledge to the field of material culture theory. This was achieved by case study analysis of a group of artists interacting with a specific group of objects and employing these not for their original purpose, but to exploit their rich meanings and properties for outlining human-based narratives. These artists have therefore understood that objects have the capacity to "give rise to thought" (Gosden, 2006, p.440) and the propensity to "educate peoples senses, and thus their basic appreciation of the world" (Gosden, 2006, p.440).

It is proposed here that all of us artists now have a shared identity created by our specific interaction with natural history artefacts. In the act of working with these objects artists experience emotions and behaviours that have been created by time in the company of these specific objects. This study draws connections between artist experiences and highlights parallels between such experiences and the theories developed in material culture studies. Chapters Two and Three are case studies of those aspects of material

culture and collections research that seek to define how people build relationships with objects.

The viewpoint of the artist is a particular focus for this study as it is the artist who witnesses how an object translates their experience to the viewer. Renfrew (2006) comments that: “The visual arts work through the contact of the artist with the material world. The artist sees that world, experiences it, and then acts upon it, embodying and expressing that experience, and thereby offering us as viewers further experiences” (p.8)

This study supports material culture theories but is an original application of these ideas to a set of objects, natural history specimens, and to a group of artists that have never before been considered in this manner. Gosden (2007) comments that the “linkages between human life and the material world” (p.6) are currently under investigation. He suggests that “Objects are increasingly recognized as being integral to the way in which humans understand their world and the other people in it, so that knowledge and identity are thought to emerge through sets of relationships that are partly material” (Gosden, 2007, p.6). The findings of this study comply with this view, the objects in this case are natural history specimens being utilised to narrate scientific and historic stories about our world and the societies of the past, present and future. Knowledge and experience are expressed through the objects. Finally, our identity as artists or as a group of artists working in a certain way has been constructed through these objects.

It might be pertinent at this point to comment briefly on two other recent projects that connect to this research, since they are based on the concept of singular objects having the ability to inspire thought and narratives. *‘Treasures of the Natural History Museum’* (2008) is a celebration of specimens from the NHM, London. The book contains images of well known objects like those on display, a selection from some in storage and others that have never been on public view before. The book outlines that the specimens have been chosen for a variety of reasons “scientific importance, striking beauty or simply because they have an interesting story to tell” (Paterson, 2008, p.5). More substantial has been the British Museum and Radio 4 project *‘A History of the World in 100 Objects’* (MacGregor, 2010) which included radio broadcasts, a daily update on the British Museum website, an exhibition of the objects at the Museum and also a book. The concepts involved in this multimedia project are similar to those in artworks reviewed in this study. Just as in the

'HSP' and the others, objects were selected based on pre-set criteria. MacGregor (2010), Director of the British Museum, outlines that objects were required to range from the beginning of human history (around two million years ago) to the present day. Objects were chosen to address many aspects of human existence and to cover the world equitably. The objects needed to speak of connections to whole societies, not just narrow segments of them, and importantly the selection of objects needed to include everyday objects as well as works of art. In discussing the importance and value of object biography, MacGregor (2010) – like the artists – feels that objects, once researched, have the ability to communicate messages about "people and places, environments and interactions, about different moments in history and about our own time as we reflect upon it" (p. xv). The final outcome of *'A History of the World in 100 Objects'* (2010) is very similar to the *'HSP'* and others. It is a collection of objects, carefully researched and selected by a curator, whose aim is to weave a common thread through individual narratives to tell a larger human-based story.

The *'HSP'* study strongly supports the view that "The Museum is not an enclosed container for inert objects- it is a launching place for anthropological adventures into the past and, indeed, the future…..Its possibilities are infinite" (Gosden, 2007, p.6). Every artist involved in the scope of this thesis believes their projects to be just the tip of the iceberg as far as specimen-based narratives could go. They are each aware of many more avenues they could have taken and other ways in which their projects could be adapted or developed. The artists, through their experiences with museum collections and the strength, passion and emotion clearly visible in their images, prove that "Museums are not passive means of representing the world, but active modes of engaging and re-engaging with it" (Gosden, 2007, p.122).

Object biography is an aspect of material culture under scrutiny in recent years. Alberti (2005) echoes a plea from Simon Chaplin for "a deeper knowledge of the biographies not just of.....collectors but of the objects themselves" (p.571). Alberti (2005) calls for "historians of science" to give "objects voices" (Alberti, 2005, p.571), by constructing life histories from in depth studies of available provenance literature in museum archives. Through this, the linking of stories can be enhanced and further narratives, where objects play a part, unearthed. The Collections Council of Australia have developed a concept where one of the primary outcomes is narrating "compelling stories about items and

collections" (Russel & Winkworth p.10). This concept is called 'Significance' and was developed to assess the value of single objects and whole collections. It is suggested that 'Significance' enables meaning within collections to be unlocked and therefore made accessible to a wider range of users. This in turn facilitates and promotes "new ways of using collections" (Russel & Winkworth p.4). The concept involves creating a 'significance assessment' where the results of research and analysis, from a wide range of sources, are used to articulate the meanings and value of a single object, whole collection or objects in a series of different collections. The assessment explores the many elements that contribute meaning, including "history, context, provenance, related places, memories, and comparative knowledge of similar items" (Russel & Winkworth p.10). The 'significance statement' combines all the research from all the elements listed and is synthesised into a "readable summary of values, meaning and importance of the item" (Russel & Winkworth p.10).

It is proposed here that we, as a group of artists and not historians of science, have carried out the coordinated research and investigation Alberti calls for above, through the art projects reviewed in this research. In addition, many of the specimen-based art projects encompass the aspects considered in 'significance assessments'. However, the outcomes and findings of our research are presented not solely in text form, but in a more creative, visual and dynamic manner. 'Significance' comprises two main elements important in assessing the significance of objects; provenance and context. Provenance, or the life story of an object, spans its starting point and journey through various owners and contexts. This includes diverse physical environments where the object was found, used or created as well as its relationships with other objects, thus placing the object within "wider historic patterns or themes" (Russel & Winkworth p.32). In the vast majority of the art projects, these too are the primary considerations, the story of where the specimen came from, who collected it and where it has resided since. Additionally, these projects have explored connections between specimens to develop wide ranging historical or scientific narratives.

Lastly, Alberti (2005) suggests that objects such as scientific specimens which are considered to have very stable meanings and purposes are "mutable and polysemic" (Alberti, 2005, p.571). The evidence is that artists of specimen-based projects support this statement wholeheartedly.

Can museums use specimen based artwork to help revitalise 'dusty' collections?

Mark Dion, quoted in Corrin (1997), suggests 'The museum needs to be turned inside out- the back rooms put on exhibition and the displays put into storage' (Corrin, 1997, p.17). Keene (2005) notes that: "People who have not worked in museums may realize only vaguely that there are collections other than what is on display" (p.1). She comments that decisions about exhibitions and display are often made by people who are not physically involved with the collections, such as "stakeholders and those who provide funding for museums". Keene remarks that these people "do not perceive the collections as used or relevant" (Keene, 2005, p.1)

Currently museums such as the NHM, London have very few objects from their collections on display. Since the 1970's, many museums made dramatic changes to their exhibition spaces and gradually began removing most specimens from public view, replacing them with computerised or interactive game-type displays. The purpose of this was to update the Victorian galleries which were seen to be overly academic and "make the museum come alive and make it appeal to the general public" (Ament, 2010). Discussing this type of modernisation, Keene (2005) stated that "In response to pressure to be relevant now, many museums have shifted their focus from their collections to their audiences. This leaves no clear purpose for collections". She comments on the hope that her book, 'Fragments of the World' (2005), will highlight that "collections can be, indeed have to be, a central focus in the new directions that museums are taking" (Keene, 2005, p.1).

There may be some hope in this regard. Sharon Ament, Director of Public Engagement at the NHM, London, commenting on the positive engagement of the public with the few specimens which remain on display in the museum, suggests that the removal of specimens from the museum galleries is now considered to be "really controversial" (Ament, 2010), and adds that her current mission in these changed times is to put the specimens back out on display to "tell the stories" (Ament, 2010).

In 2005, Keene commented that an argument against displaying museum collections is that they are seen to be "too boring to interest people" (Keene, 2005, p.107). She suggests: "here is where new media designers and artists could come to the rescue" (Keene, 2005, p.107). The artworks reviewed in this study, and similar works are excellent tools to narrate or translate stories, to make scientific connections, expose reserve collections and display images of delicate and difficult to exhibit specimens. The featured artworks may

well be the link that curators are searching for in that they have the ability to focus attention on certain aspects of the specimen, or groups of specimens, and combine appealing contemporary aesthetics with traditional specimen display.

The question is - are these opportunities being fully exploited by the institutions they are created in? With regard to exhibitions and display, some of the artists interviewed think not. They express the view that their projects had not been used very productively to revitalise or expose the museum's stored collections. The photographs in Duigenan's *'Mysteries of Generations'* (2001), have never been exhibited although she thinks there are future possibilities. Langford Edward has had success with quite a number of small shows in museum galleries but found it difficult to promote his most recent exhibition *"Alfred Russel Wallace: The Forgotten Evolutionist"* (2009). Phelps' *'Evacuate'* (2007) was disappointingly shown only briefly at the Natural History Museum in Tring rather than in London, even though the project was based on the London collections. She comments that, "they haven't made anything of it ['Evacuate'] really which I kind of see as disappointing, in the sense that they have missed out on something" (Phelps, 2008). In addition *'Coded Ornithology'* (2008) was only shown at a small private gallery in Ely where the images of bird specimens were placed completely out of context and confused many visitors.

Fairnington was one of the artists interviewed who had the most high profile UK exhibition. *'Fabulous Beasts'* (2004) was successfully exhibited in the Jerwood Gallery in the Natural History Museum in London. Perhaps this is because his outcomes were large paintings, easily understood as fine art, and could simply be exhibited as such. However it can be argued that many of the more subtle aspects of the project and the links to the actual specimens or collections were not indicated.

Although this research has not been able to find a precise answer to why these projects have not been more widely exhibited so as to promote the collections they were based on, the following suggestions are made:

1. Large museums plan their exhibition programmes in advance and are tied to decisions regarding their direction in terms of marketing and education art. Curators then provide exhibitions to fit these requirements. Normally artists who come to use the collections are clear about their objectives and their outcomes rarely fit into the

existing exhibition programme. In addition, curators like to control the translation of the meaning of an object or narrative it can produce in conjunction with other objects, rather than allowing the artist to tell a story. Keene (2005) comments "Once the museum professionals have relinquished the controlling lens of exhibitions and themes chosen by them, the collections may assume a central place again" (Keene, 2004, p.154).

2. Perhaps the artwork falls between two genres – it is too literal to be considered fine art and not conceptual enough to be taken seriously. Curators seem very keen on 'art inceptions' where conceptual pieces are built around existing displays, for example Andy Goldsworthy's installation of compressed sand from the exhibition *'Time Machine: Ancient Egypt and Contemporary Art'* at the British Museum 1994-95.

3. In recent years museums have become very good at marketing and producing contemporary exhibitions. Current fashion in museum display seems to lean toward bright, colourful and 'fun' displays that provide instantly accessible information in quick bites. There also appears to be a trend that if technology is available then it should be exploited. In addition, education of children is high on the agenda. The projects reviewed in this study perhaps lean toward an adult audience. They are subtle and emotive and require interpretation, educational tools and a clear explanation. The information and narratives they contain are not always easily accessible and require thought and concentration.

There is, however, good evidence of success in using specimen-based art images in book form rather than exhibition. *'Flora'* (2001), *'Herbarium'* (2004) and *'Museum'* (2007) are examples of where art projects have been developed into a medium that can be widely distributed. Stacey's aim with both *'Herbarium'* (2004) and *'Museum'* (2007) was to produce high quality, visual publications to raise the profile of the collections, in particular the largely forgotten Macleay collection which would in turn provide increased funding opportunities. Her art projects have therefore provided increased interest and money for both institutions at a time when their funding was being reduced.

Further possibilities for the '*HSP*' and the findings of this research project

There have been positive discussions and it is intended that the *'HSP'* will be exhibited at RBGK in autumn 2011, in the Shirley Sherwood Gallery for Botanical Art. This exhibition will connect to RBGK's *'Breathing Planet'* programme that provides a framework for RBGK's scientific work. The exhibition will fill the central gallery and display not only the artwork but also making available to the public information stored in the plant collections at RBGK by narrating scientific and historical stories contained within the herbarium collections. There have also been discussions about an exhibition where the painting is displayed alongside some of the actual specimens used (or detailed scans thereof). In addition, photographs of relevant botanical collectors (historical and contemporary) and short stories about selected collecting trip highlights could be included. An exhibition of this type would enable a variety of threads to be followed by the viewer; artistic (e.g., the traditions of botanical illustration), scientific (e.g., the details of DNA plant classification and dried plant storage techniques) and historical (e.g., the history of the herbarium collection at RBGK and significant collectors and expeditions).

This research has placed the *'HSP'* in context among similar projects and proves that a new genre of art exists, here coined- 'specimen based art'. The project has created a small web of artists creating similar art projects, produced to the same exacting standards, with narratives, emotive themes and that are constructed from layers of meaning. A review of material culture literature was fundamental to this research as it developed an understanding of the relationship between artist and object. Material culture theory also promotes appreciation of the power and presence of significant objects and the active rather than passive role that an object can take. This understanding was invaluable in exploring the emotions, meanings and similarities behind the artists working methods, responses and projects.

This research has shown that specimen-based artwork communicates a variety of scientific, historical, political and object-based narratives on many levels, although a number of these are subtle stories with meanings that are not initially obvious and require viewers to read elsewhere. In many cases artists have, with the research required to successfully construct these narratives, acted as historians and developed significant 'object biographies'. In addition they have found and forged links between specimens in the same and different collections.

This project has discussed whether the artworks have been fully utilised by the institutions where they have been produced and concludes they have not. In addition, with regard to Phelps' experience, showing emotive specimen-based pieces out of context of the museum is problematic and does little to promote the collection or improve understanding of why specimens are scientifically important. With the NHM, London suggesting a move toward bringing specimens back into galleries, but with less financial resources for exhibitions in the next few years, perhaps specimen-based artwork will too find a new place in museum exhibition galleries.

Unlike some other institutions, RBGK has recognised the value of the *'HSP'* and *'Bean Painting: Specimens from the Leguminosae Family'* before it, in promoting its collections. The planned exhibition of the *'HSP'* in 2011 is a wonderful opportunity and a first chance to exhibit and explain the painting in the context of RBGK and its research. The artist will be consulted on the exhibition design and therefore able to comment on the painting and ensure the display of important themes.

The *HSP'* project has been a considerable journey and as it concludes, new, related horizons are opening. Although the creation of the painting is coming to an end, its own life, journey and influences are just beginning. Just as the actual specimens have life histories and adventures, good and bad, away from their creators, so will this monument to them. The painting will be sent out into the world imbued with meaning on numerous levels, a survey of the whole herbarium, the many hours of labour, the science and the history. For this reason it has many narratives to reveal to the viewer if they will spend time investigating the piece and the information that will be presented along-side it. The scale of the piece reflects the size and comprehensiveness of the herbarium. The length of time and effort the painting has required to complete it mirrors the quiet academic activities that take place in the institution daily. The painting has been created with a very deep sense of privilege and appreciation of a place, the herbarium at RBGK and the beautiful objects it houses, the herbarium specimens.

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Appendix One

Images from the '*Herbarium Specimen Painting*' and diagrammatic key

See separate document

Appendix Two

Database of specimens illustrated in the *'Herbarium Specimen Painting'*

All herbarium sheets have been bar-coded, labelled and digitised.

Carpological collection specimens have been labelled, they therefore appear without bar-codes in the following database.

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
1	K000630001	Amborellaceae	Amborella	trichopoda	Baill.		J. C. Bradford, H. F. Hopkins, B. Fogliani	1172	26	11	2002	New Caledonia	
2	K000630002	Chloranthaceae	Chloranthus	erectus	(Buch.-Ham.) Verdc.		T. C. Whitmore	TCW 3149	17	6	1978	Sarawak	
3	K000630003	Nymphaeaceae	Victoria	amazonica	Sowerby		D. J. Gwynne Vaughan	s.n			pres'd 1898	Brazil	
4	K000630372	Cabombaceae	Cabomba	aquatica	Aubl.		J. Murca, P. & P. B. Cavalcante	52470	10	8	1962	Brazil	
5	K000630005	Austrobaileyaceae	Austrobaileya	scandens	C.T.White		L. S. Smith	4631	30	9	1950	Australia	
6	K000630006	Schisandraceae	Schisandra	pubescens	Hemsl. & E.H.Wilson		Z. Qing-sheng	1341	24	8	1989	China	
7		Illiciaceae	Illicium	verum	Hook.f.		C. Ford	15/1891			1891	Hong Kong	
8	K000630011	Trimeniaceae	Piptocalyx	macrurus	Gilg & Schltr.		W. R. Philipson & A. Kairo	3670	25	7	1979	Papua New Guinea	
9	K000630597	Trimeniaceae	Piptocalyx	moorei	Oliver		C. Moore	s.n.		5	rec'd 1867	Australia	
10	K000630004	Ceratophyllaceae	Ceratophyllum	demersum	L.		R. Letouzey	14854	9	5	1976	Cameroon	
11	K000630008	Canellaceae	Warburgia	stuhlmannii	Engl.		P. A. Bradburne	101	28	9	1966	Tanzania	
12	K000630591	Canellaceae	Warburgia	elongata	Verdc.		S. Paulo	157		9	1953	Kenya	
13	K000630007	Canellaceae	Canella	alba	Murr.		Mr Marsh	192			1857	Jamaica	
14	K000630010	Winteraceae	Drimys	piperita	Hook.f.		A. Loher	5511			pres'd 1906	Philippine Islands	
15	K000630009	Winteraceae	Drimys	lanceolata	(Poir.) Baill.		J. R. Telford	45134	15	4	1972	Australia	
16	K000630014	Atherospermataceae	Atherosperma	moschatum	Labill.		W. A. W. de Bezeville	41827	17	12	1932	Sydney	C. Botanic Garden
17	K000630013	Calycanthaceae	Calycanthus	praecox	L.		Dr A. Henry	3565		10	1887	China	
18	K000630012	Gomortegaceae	Gomortega	keule	(Molina) Baill.		F. C. Meyer	9741	3	1	1966	Chile	
19		Hernandiaceae	Hernandia	peltata	Meisn.		H. G. Faulkner	3036	2	5	1962	Zanzibar	
20	K000630021	Lauraceae	Cinnamomum	verum	J.Presl		T. B. Worthington	3283	22	10	1947	Sri Lanka	
21	K000630022	Lauraceae	Cinnamomum	verum	J.Presl		F. G. Omar	8518	10	9	1922	Malay Peninsula	Cinnamon
22	K000630020	Monimiaceae	Palmeria	womersleyi	Philipson		R. D. Hoogland	5429	22	6	1956	Australia	
23	K000630019	Siparunaceae	Siparuna	guianensis	Aubl.		P. Acevedo-Rdgz et al.	P.3396	24	2	1990	Guiana	
24	K000630598	Siparunaceae	Siparuna	guianensis	Aubl.		R. Marqiuti et al	1223	14	10	1993	Brazil	C. Botanic Garden
25		Annonaceae	Polyalthia	hookeriana	King		P. S. Ashton	18042	14	11	1963	Sarawak	
26		Degeneriaceae	Degeneria	vitiensis	I.W.Bailey & A.C.Sm.		A. C. Smith	5880	2 to 12	9	1947	Sarawak	
27	K000630053	Degeneriaceae	Degeneria	vitiensis	I.W.Bailey & A.C.Sm.		A. C. Smith	5875	2 to 12	9	1947	Fiji	
28	K000630018	Eupomatiaceae	Eupomatia	sp.			J. J. Havel & A. Kairo	N.G.F. 17089	21	12	1962	Papua and New Guinea	
29	K000630016	Himantandraceae	Galbulimima	belgraveana	(F.Muell.) Sprague		R. Schodde	2124	7	9	1961	New Guinea	
30	K000630017	Magnoliaceae	Magnolia	stellata	Maxim.		S. L. Kelsey	11	1	4	1968	USA	C. Mt Cuba Botanical Park
31		Myristicaceae	Myristica	fragrans	Houtt.		T. B. Worthington	5589			no date	Sri Lanka	Nutmeg
32	K000630015	Aristolochiaceae	Aristolochia	odoratissima	L.		J. R. I. Wood	17185	4	3	2001	Bolivia	
33	K000630054	Hydnoraceae	Hydnora	abyssinica	A.Braun		P. A. & W. R. Q. Luke	4303	8	2	1995	Kenya	
34	K000630045	Lactoridaceae	Lactoris	fernandeziana	Phil.		O. T. Solbrig, H. E. Moore Jr & J. Walker	3911	25	12	1965	Juan Fernandez Islands	
35	K000630599	Lactoridaceae	Lactoris	fernandeziana	Phil.		C. & I. Skottsberg	230	8	1	1917	Juan Fernandez Islands	
36	K000630044	Piperaceae	Peperomia	tetraphylla	(Forst.) Hook et Arn.		H. S. Irwin, R. M. Harley, E. Onishi	28669	18	1	1971	Brazil	Pepper
37	K000630043	Saururaceae	Anemopsis	californica	(Nutt.) Hook. & Arn.		Mrs R. Summers	s.n		5	1893	California	
38	K000630042	Petrosaviaceae	Petrosavia	sakuraii	(Makino) J.J.Sm. ex Steenis		W. Bunnemeyer	5451	4	11	1910	Indonesia	
39	K000630041	Acoraceae	Acorus	calamus	L.		Mrs D. Slock	s.n			1837	British Isles	
40	K000630039	Alismataceae	Ranalisma	humile	(Kuntze) Hutch.		J. Leonard	4405	28	1	1968	Republic of Chad	
41	K000630040	Aponogetonaceae	Aponogeton	desertorum	Zeyh. ex Spreng.f.		T. Wild & H. Bisset	60	5	9	1969	Zimbabwe	
42	K000630038	Araceae	Arum	palaestinum	Boiss.		Elwes	s.n.	17	3	1922	British Isles	Tubers said to have come from Siehe, Israel, C. at Kew
43	K000630037	Butomaceae	Butomus	umbellatus	L.		Arnott	s.n.			1827	Europe	
44	K000630036	Cymodoceaceae	Syringodium	isoetifolium	(Asch.) Dandy		R. B. Drummond & J. H. Hemsley	3315			1953	Tanzania	
45	K000630052	Hydrocharitaceae	Vallisneria	americana	Michx.		J. & L. R. Heckard	552	16	9	1953	USA	
46	K000630035	Juncaginaceae	Triglochin	palustris	L.		no coll.	11072			no date	Eastern Asia	
47	K000630034	Limnocharitaceae	Limnocharis	flava	Buchenau		Md. Shah	Md. Shah 41	8	5	1957	Malaysia	
48	K000630033	Najadaceae	Najas	horrida	A.Braun ex Rendle		J. Leonard	4560	22	2	1968	Nigeria	
49	K000630032	Posidoniaceae	Posidonia	ostenfeldii	Hartog		Miss A. M. Baird	s.n.	20	5	1929	British Isles	C. in Kew
50	K000630031	Potamogetonaceae	Potamogeton	schweinfurthii	A.Benn.		Mrs. Richards	12158	15	3	1959	Tanzania	
51	K000630030	Ruppiaceae	Ruppia	maritima	L. var. longipes Hagstr.		H. E. Moore Jr.	1143	14	7	1946	USA	
52	K000630029	Ruppiaceae	Ruppia	maritima	L. var. longipes Hagstr.		F. C. Seymour	1037	25	7	1916	USA	
53	K000630026	Scheuchzeriaceae	Scheuchzeria	palustris	L.		Martius Herbarium	s.n.		11	rec'd. 1865	Europe	
54	K000630027	Tofieldiaceae	Tofieldia	calyculata	Wahlenb.		Z. Wisniewska et al	486		7	1952	Poland	
55	K000630028	Zosteraceae	Zostera	nana	Roth		Barnes	s.n	14	8	1847	British Isles	
56	K000630025	Alliaceae	Allium	schoenoprasum	L.		N. & E. Ozhatay	52070	6	8	1983	Turkey	
57	K000630600	Alliaceae	Allium	sikkimense	Baker		Elwes	s.n.			1877	British Isles	C. in Kew
58	K000630024	Agapanthaceae	Agapanthus	nutans	F.M.Leight.		L. E. Codd	7279		7	1971	British Isles	Originally Natal. C. at Kew 600-69-5437
59	K000630023	Amaryllidaceae	Narcissus	triandrus	L.		R. K. Brummitt & A. O. Chater	148	17	5	1972	Spain	
60	K000630048	Anemarrhenaceae	Anemarrhena	asphodeloides	Bunge		P. Rudall	s.n.	6	9	1996	British Isles	Originally Japan, C. at Kew
61	K000630047	Anemarrhenaceae	Anemarrhena	asphodeloides	Bunge		A. E. Lincent	7074	13	8	1923	Northern China & Mongolia	
62	K000630049	Anthericaeae	Chlorophytum	subpetiolatum	(Baker) S.Kativu		J. Pawek	10617	29	12	1975	Malawi	
63	K000630050	Asparagaceae	Asparagus	africanus	Lam.	var. africanus	B. Goldsmith	199/62		10	1962	Zimbabwe	
64	K000255664	Asparagaceae	Asparagus	africanus	Lam.	var. puberulus	McCabe	15			1856	Botswana	
65	K000630046	Agavaceae	Agave	roseana	Trel.		I. M. Johnson	4003	1	6	1921	California	
66	K000630051	Aphyllanthaceae	Aphyllanthes	monspeliensis	L.		Seeds donated by Nat. Hist. Mus. Paris	s.n.	6	2	2001	British Isles	Originally France, C. at Kew 2001/826
67	K000630055	Hyacinthaceae	Scilla	revoluta	Baker		P. Brandham & D. Culter	72/740	19	9	1973	South Africa	
68	K000630056	Laxmanniaceae	Laxmannia	grandiflora	Lindl.		E. Kelso	s.n.			1902	Western Australia	
69	K000630057	Ruscaceae	Ruscus	hypoglossum	L.		Dortman	s.n.			rec'd. 1903	Austria	
70	K000630070	Thermidaceae	Brodiaea	coronaria	(Torr.) Hoover	var. macropodon	W. Roderick	s.n			no date	California	
71	K000630064	Asteliaceae	Astelia	nervosa	Banks & Sol. ex Hook.f.		R. & E. F. Melville	6964	12	4	1962	New Zealand	
72	K000630065	Behniaceae	Behnia	reticulata	F.Didrichs.		B. Goldsmith	95/97		10	1967	Zimbabwe	
73	K000630066	Blandfordiaceae	Blandfordia	nobilis	Sm.		E. F. Constable	32229	22	1	1955	Australia	
74	K000630067	Boryaceae	Borya	sphaerocephala	R.Br		A. S. George	16188	20	8	1980	Western Australia	
75	K000630068	Convallariaceae	Convallaria	majalis	L.		Mrs Parker (Miss M. Cubitt)	s.n.			1854	British Isles	
76	K000401743	Dracaenaceae	Dracaena	sp.			W. Meijer	SAN 22924	15	10	1960	Borneo	
77	K000630071	Doryanthaceae	Doryanthes	palmeri	Benth.		no coll.	s.n.	1	4	1966	British Isles	Originally Australia, C. at Kew Australia House

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
78	K000058128	Eriospermaceae	Eriospermum	sp.			O. B. Miller	45127		1	1954	Zimbabwe	
79	K000256062	Eriospermaceae	Eriospermum	abyssinicum	Baker		J. M. Wood	1346	10	9	1881	South Africa	
80	K000630602	Eriospermaceae	Eriospermum	abyssinicum	Baker		D. J. Mc Donald	205	8	12	1977	South Africa	
81	K000630069	Herreriaceae	Herreria	montevidensis	Klotzsch ex Griseb.		K. Fiebrig	4402	19	7	1908/09	Paraguay	
82	K000630072	Hostaceae	Hosta	glauca	(Sieb. ex Miq.) Stearn		no coll.	s.n.	23	9	1936	British Isles	C. at Kew
83	K000630073	Hostaceae	Hosta	venusta	Maekawa		shown at RHS by Mr R.L. Elliot	s.n.	23 to 5	7	1963	British Isles	Originally Japan C. in British Isles
84	K000630074	Hypoxidaceae	Hypoxis	nyasica	Baker		Mrs H.M. Richards	22606	18	11	1967	Malawi	
85	K000630075	Iridaceae	Iris	xiphium	L.		E. Reverchon	s.n	13	5	1890	Spain	
86	K000630063	Ixioliriaceae	Ixiolirion	tataricum	(Pall.) Herb. & Traub		V. C. Robertson	R.A. 58			1955	Iraq	
87	K000630062	Johnsoniaceae	Johnsonia	lupulina	R.Br		R. Helms	s.n		12	1898	Australia	
88	K000630061	Lanariaceae	Lanaria	plumosa	Ait.		W. J. Burchell	4606			pres'd 1865	South Africa	Presented by Miss Burchell 1865
89	K000630060	Nolinaceae	Nolina	longifolia	Helmsl.		N. E. Brown	s.n.	2	8	1895	British Isles	C. by Hon. Mark Rolle, The Gardens, Bicton.
90	K000630059	Orchidaceae	Angraecum	sesquipedale	Thouars		Dr J. Fox	34		5	1885	Madagascar	
91	K000630058	Tecophilaeaceae	Cyanella	lutea	L.f.		E. G. H. Oliver	3646	5	10	1971	South Africa	
92	K000630092	Xanthorrhoeaceae	Xanthorrhoea	sp.			S. T. Blake	22659	1	4	1966	Australia	
93	K000630119	Asphodelaceae	Kniphofia	baurii	Baker		S. P. Bester	3502	9	1	1995	South Africa	
94	K000630118	Hemerocallidaceae	Hemerocallis	fulva	L.		M. Furuse	1604	27	10	1972	Japan	Growing wild from cultivated plants
95	K000630117	Xeronemataceae	Xeronema	callistemon	W.R.B.Oliv.		Mc Pherson	115-46	18	4	1953	British Isles	C. at Kew shown at RHS
96	K000630116	Burmanniaceae	Burmannia	coelestis	D. Don		R. Pullen	7203	30	8	1967	New Guinea	
97	K000630115	Burmanniaceae	Burmannia	oblonga	Ridl.		P. J. Edwards	1606	2	3	1985	Malaysia	
98		Dioscoreaceae	Dioscorea	karatana	P.Wilkin		P. Wilkin et al.	947	19	12	1997	Madagascar	Isotype
99	K000630114	Taccaceae	Tacca	palmatifida	Baker		P. C. Boyce	1083	15	3	1996	British Isles	Seeds donated from Indonesia, C. at Kew
100	K000630113	Nartheciaceae	Narthecium	ossifragum	Huds.		Arendal	s.n.			1838	Norway	
101	K000630112	Alstroemeriaceae	Alstroemeria	aurantiaca	D. Don		Watson, Cheese & Beckett	5234	26	6	1975	British Isles	Originally S. America, C. at Kew 088-73.00606
102	K000630110	Campynemataceae	Campynema	lineare	Labill.		T. E. Burns	338	17	2	1960	Australia	
103	K000630111	Colchicaceae	Gloriosa	superba	L.	var. superba	R. J. Chancellor	54	26	7	1953	Uganda	
104	K000630109	Corsiaceae	Corsia	sp.			T. M. Reeve, J. Tari, P. Yapo	3402	12	2	1981	New Guinea	
105	K000630108	Liliaceae	Fritillaria	meleagris	L.		R. Y. Indlay	s.n		4	1927	British Isles	
106	K000630107	Luzuriagaceae	Luzuriaga	marginata	Benth. & Hook.f.		R. Santesson	1693	11	11	1941	Chile	
107	K000630106	Melanthiaceae	Melanthium	virginicum	L.		A. Gray & J. Carey	s.n.		7	1841	North America	
108	K000630105	Petermanniaceae	Petermannia	cirrosa	F. Muell.		C. Moore	s.n.		5	rec'd 1867	Australia	
109	K000630104	Philesiaceae	Philesia	buxifolia	Lam. ex Poir.		King (perhaps G. King 1840-1909)	s.n.			no date	Patagonia	
110	K000630125	Rhipogonaceae	Ripogonum	papuanum	C.T.White		B. Gray	1643	26	2	1980	Australia	
111	K000630120	Smilacaceae	Smilax	china	L.		M. Furuse	46008	7	10	1967	Japan	
112	K000630121	Cyclanthaceae	Thoracocarpus	bissectus	(Vell.) Harling		P. J. M. & H. Maas	2476	10	8	1977	Guyana	
113		Pandanaceae	Pandanus	tectorius	Parkinson		M. J. Sands et al.	6619	14	5	1994	Indonesia	
114	K000630130	Stemonaceae	Stemona	curtisii	Hook.f.		A. F. G. Kerr	13876	4	1	1928	Thailand	
115	K000630129	Triuridaceae	Sciaphila	sp.			Dr A. Morrison	s.n	27	8	1896	Vanuatu	
116	K000630128	Velloziaceae	Vellozia	epidendroides	Mart.		N. L. Menezes et al.	CFCR 9238	27	1	1986	Brazil	
117	K000630127	Dasypogonaceae	Dasypogon	bromeliifolius	R.Br		J. H. Willis	s.n	5	9	1947	Western Australia	
118		Arecaceae	Raphia	hookeri	G.Mann & H.Wendl.		Donor, P.Turley CEB Cat no. 36210	s.n	5	5	1958	Nigeria	
119	K000630124	Commelinaceae	Tradescantia	occidentalis	(Britton) Smyth		D. T. Mac Roberts	2733	10	5	1979	USA	
120	K000630126	Haemodoraceae	Anigozanthos	manglesii	D.Don		J. Sonster	489	4	9	1946	Western Australia	
121	K000630123	Hanguanaceae	Hanguana	malayana	Merr.		L. H. Fitt	4	3	3	1985	Malaysia	
122	K000630122	Hanguanaceae	Hanguana	major	Airy Shaw		G. Shea	Shea 28111	10	11	1980	Indonesia	
123	K000630088	Philydraceae	Philydrum	lanuginosum	Banks ex Gaertn.		M. Furuse	41778	15	10	1963	Japan	
124	K000630087	Pontederiaceae	Eichhornia	crassipes	(Mart.) Solms		E. J. Palmer	7687	18	5	1915	USA	
125	K000630086	Anarthriaceae	Anarthria	scabra	R.Br		R. J. Cranfield	950	2	11	1978	Western Australia	
126	K000630085	Bromeliaceae	Tillandsia	stricta	Sol. ex Sims		L. B. Smith	2049	2	3	1929	Brazil	
127	K000630084	Centrolepidaceae	Aphelia	cyperoides	R.Br.		Dr. A. Morrison	s.n	6	11	1907	Australia	
128	K000630083	Cyperaceae	Pycreus	flavescens	(L.) P.Beauv. ex Rchb.	subsp. Flavescens	S. S. Hooper & C. C. Townsend et al.	851	17	3	1975	Tanzania	
129	K000630082	Ecdeiocoleaceae	Ecdeiocolea	monostachya	F.Muell.		B. G. Briggs	6302	25	9	1976	Australia	
130	K000630081	Ecdeiocoleaceae	Ecdeiocolea	monostachya	F.Muell.		B. G. Briggs & L. Johnson	8532	1	11	1988	Australia	
131	K000630080	Eriocaulaceae	Syngonanthus	longibracteatus	Kimp.		S. Bidgood, G. Leligo & K. Vollesen	4500	29	5	2000	Tanzania	
132	K000630079	Flagellariaceae	Flagellaria	indica	L.		A. Cuadra	A1074	13	9	1947	Borneo	
133	K000630373	Hydatellaceae	Trithuria	occidentalis	Benth.		Dr. A Morrison	s.n	16	11	1898	Australia	
134	K000630078	Joinvilleaceae	Joinvillea	sp.			M. J. E. Coode	7575	1	4	1993	Brunei	
135	K000630077	Juncaceae	Juncus	canadensis	J.Gay		F. Rolland- Germain	6154	18	8	1954	Canada	
136	K000630076	Mayacaceae	Mayaca	longipes	Mart. ex Seub.		A. Raynal-Roques & J. Jeremie	21282	21	4	1979	French Guiana	
137	K000630103	Poaceae	Briza	maxima	L.		T. B. Wolfe	s.n.			1853	Italy	
138	K000630091	Prioniaceae	Prionium	serratum	(Thunb.) Drège		Mauve & Hugo	121	10	10	1981	South Africa	
139	K000630090	Rapateaceae	Rapatea	pycnocephala	Seub.		R.M. Harley & R. Souza	10100	18	9	1968	Brazil	
140	K000630089	Restionaceae	Restio	bolusii	Pillans		E. Esterhuysen	30404	20	10	1963	South Africa	
141	K000630102	Thurniaceae	Thurnia	sphaerocephala	Hook. f.		G. Eiten, T. Eiten & G.M. Felippe	5272	1	2	1963	Brazil	
142	k000630101	Typhaceae	Typha	latifolia	L.		G.V.C. Last	721/1	12	8	1944	British Isles	
143	k000630100	Xyridaceae	Xyris	pauciflora	Willd.		C. F. van Beusekom et al.	4510	23	12	1971	Thailand	
144	k000630099	Cannaceae	Canna	indica	L.		S .M. Pire & L. A. Mroginski	107	16	11	1973	Argentina	
145		Cannaceae	Canna	indica	L.		H. L. Waterhouse	63	7	6	1929	Solomon Islands	
146	K000630098	Costaceae	Costus	wilsonii	Maas		T. Beliz	168	10	8	1977	Panama	
147	k000630097	Heliconiaceae	Heliconia	rostrata	Ruiz & Pav.		S. Buzato & M. Sazima	28.067	2	4	1993	Brazil	
148	k000630096	Lowiaceae	Orchidantha	maxillarioides	K.Schum.		J. F. Walsh	s.n.			no date	British Isles	M.W. Chase 3912K, Kew 1961-36802
149	k000630095	Marantaceae	Maranta	bicolor	Vell.		T. Moore	s.n		5	1852	British Isles	C. Purchased coll. 1887
150		Musaceae	Musa	truncata	Ridl.		Kiah	SFN 35007	23	3	1938	Malaysia	
151		Musaceae	Musa	sp.			W. Meijer	SAN 19522	12	7	1959	Borneo	
152	k000630094	Strelitziaceae	Strelitzia	reginae	Banks ex Aiton		no coll.	s.n.		3	1862	British Isles	Originally South Africa, C. at Kew
153	K000630093	Zingiberaceae	Zingiber	zerumbet	(L.) Sm.		G. E. Schatz & J. S. Miller	2539	9	1	1989	Madagascar	
154	K000630131	Buxaceae	Buxus	harlandi	Hance		S. Ying Hu	10003	25	4	1970	Hong Kong	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
155		Haptanthaceae											
156	K000630132	Didymelaceae	Didymeles	perrieri	Leandri		G. Mc Pherson	14495	21	11	1989	Madagascar	
157	K000300440	Didymelaceae	Didymeles	madagascariensis	Willd.		G. E. Schatz	2778	7	10	1989	Madagascar	
158	K000630134	Meliosmaceae	Meliosma	sumatrana	(Jack) Walp.		K. Sidiyasa	358	10	9	1990	Indonesia	
159	K000630135	Sabiaceae	Sabia	discolor	Dunn		L. Zhen-yu et al.	2630	13	5	1989	China	
160	K000630137	Trochodendraceae	Trochodendron	aralioides	P.F.Siebold & J.G.Zuccarini		D. E. Bufford, B. Bartholomew et al.	25249	3	10	1989	China	
161	K000630136	Trochodendraceae	Trochodendron	aralioides	P.F.Siebold & J.G.Zuccarini		Type of Bot. Mag. From Veitch & Sons	7375	25	4	1894	no location	C.
162	K000630138	Tetracentraceae	Tetracentron	sinense	Oliv.		Kirkham, Flanagan, Howick & Mc Namara	(SICH) 1759	21	9	1996	China	
163	K000630593	Tetracentraceae	Tetracentron	sinense	Oliv.		G. Forrest	13397		9	1914	China	
164		Nelumbonaceae	Nelumbo	luteum	Willd.		no coll.	s.n.			no date	Jamaica	
165	K000630140	Proteaceae	Protea	lepidocarpon	R.Br.		J. D. Hooker	s.n.			no date	South Africa	
166	K000630139	Platanaceae	Platanus	orientalis	L.		J. D. Hooker & D. Hanbury	s.n.		9 to 10	1860	Syria	
167	K000630186	Berberidaceae	Berberis	chilensis	Gill.		M. F. Gardner, S. G. Knees & M. L. De Vore	4419	21	1	1990	Chile	
168	K000630185	Circaeasteraceae	Circaeaster	agrestis	Maxim.		Grey Wilson et al.	4243	26	8	1981	Nepal	
169	K000630184	Eupteleaceae	Euptelea	pleiosperma	Hook.f. & Thomson		Fliegner, Howick, Mc Namara & Staniforth	SICH 1189	15	10	1992	China	
170	K000630183	Glaucidiaceae	Glaucidium	palmatum	Siebold & Zucc.		Kirkham, Coode-Adams, Howick & McNamara	EHOK 155	7	10	1997	Hokkaido	
171	K000630181	Hydrastidaceae	Hydrastis	canadensis	L.		Nuttall	s.n.			no date	North America	
172	K000630182	Hydrastidaceae	Hydrastis	canadensis	L.		Herbarium Careyanum	s.n.			no date	USA	
173	K000630180	Lardizabalaceae	Akebia	trifoliata	(Thunb.) Koidz.		M. Furuse	10940	3	5	1976	Japan	
174		Menispermaceae	Chlaenandra	ovata	Miq.		R. Schodde	2428	7	10	1961	Papua New Guinea	
175		Menispermaceae	Coscinium	fenestratum	Colebr.		J. F. Weber	109	20	10	1982	Sabah	
176		Papaveraceae	Papaver	somniferum	L.		C. Gray Wilson & T. F. Hewer	s.n			1972	Afghanistan	C. Opium Poppy
177	K000630179	Ranunculaceae	Anemone	coronaria	L.		N. Hiary	s.n	21	4	1983	Jordan	
178	K000630178	Sargentodoxaceae	Sargentodoxa	cuneata	Rehder & E.H.Wilson		Presented on behalf of RHS	s.n	29	4	1938	British Isles	C. at Wakehurst Place
179	K000630177	Sargentodoxaceae	Sargentodoxa	cuneata	Rehder & E.H.Wilson		E. H. Wilson	168		5 & 9	1907	China	
180	K000630144	Aextoxicaceae	Aextoxicon	punctatum	R.& P.		H. F. Comber	556	22	2	1926	Chile	
181	K000630143	Aextoxicaceae	Aextoxicon	punctatum	R.& P.		F. G. Meyer	9756	4	1	1966	Chile	
182	K000630142	Berberidopsidaceae	Berberidopsis	corallina	Hook.f.		W. J. Bean	s.n.	17	7	1906	British Isles	C. at Kew Gardens
183	K000630141	Dilleniaceae	Dillenia	indica	L.		Rawlings	2451	24	8	1901	India	Herbarium of Sir A.G & Lady Bourne
184	K000630145	Gunneraceae	Gunnera	strigosa	Colenso		Hector	s.n.		11	1862	New Zealand	
185	K000630146	Myrothamnaceae	Myrothamnus	flabellifolia	Welw.		Mrs H. M. Richards	10301	13	12	1958	Tanzania	
186	K000630147	Achatocarpaceae	Achatocarpus	nigricans	Triana		J. Cuatrecasas & V. M. Patino	27352	16	2	1969	Colombia	
187	K000630148	Achatocarpaceae	Achatocarpus	praecox	Griseb.		T. D. Pennington & G. Tenorio	10711	12	11	1982	Ecuador	
188	K000630150	Agestidaceae	Agdestis	clematidea	Moc. & Sesse		E. Palmer	420	11	11	1907	Mexico	
189	K000630149	Azioaceae	Sesuvium	portulacastrum	L.		D. R. Stoddart	4220	17	8	1973	Australia	
190	K000630151	Amaranthaceae	Celosia	argentea	L.		E. Westphal & J. M. C. Westphal-Stevels	9629	12	6	1977	Cameroon	
191	K000630152	Ancistrocladaceae	Ancistrocladus	guineensis	Oliv.		R. D. Meikle	598	15	11	1949	Nigeria	
192	K000044693	Ancistrocladaceae	Ancistrocladus	guineensis	Oliv.		Tamajong	16757	26	3	1946	Nigeria	
193	K000630153	Asteropeiaceae	Asteropeia	sp.			Duran	2254	15	5	1950	Madagascar	
194	K000630155	Barbeuiaceae	Barbeuia	madagascariensis	Steud.		J. S. Miller & A. Randianasolo	6220	30	3	1991	Madagascar	
195	K000630226	Barbeuiaceae	Barbeuia	madagascariensis	Steud.		R. C. Keating & J. S. Miller	2250	14	11	1989	Madagascar	
196	K000630154	Basellaceae	Basella	alba	L.		B. Verdcourt	1567	27	8	1956	Kenya	
197		Cactaceae	Melocactus	violaceus	Pfeiff.		D. C. Zappi	185	31	7	1989	Brazil	
198		Caryophyllaceae	Silene	conoidea	L.		B. Gilliat-Smith	K397			1927	British Isles	Originally Persia, C. at Kew
199	K000630156	Chenopodiaceae	Salsola	richteri	(Moq.) Karel ex Litw.		J. Bornmuller	1273	12	10	1900	Orient	
200	K000630157	Didiereaceae	Alluaudia	comosa	Drake		D. J. Du Puy & L. L. Dreyer	M1034	28	3	1997	Madagascar	
201	K000040054	Dioncophyllaceae	Triphyophyllum	peltatum	(Hutch. & Dalziel) Airy Shaw		J. T. Baldwin Jr	10333	15	11	1947	Liberia	
202	K000630158	Droseraceae	Dionaea	muscipula	J.Ellis		P. Roberts	s.n.		12	1956	USA	
203	K000630159	Droseraceae	Dionaea	muscipula	J.Ellis		P. Roberts	s.n.	8	6	1956	USA	
204	K000630160	Drosophyllaceae	Drosophyllum	lusitanicum	Link		Salzmann	s.n.		8	1825	Brazil	
205	K000630161	Frankeniaceae	Frankenia	serpyllifolia	Lindl.		H. J. Eichler	12976	26	9	1956	South Australia	
206	K000630162	Gisekiaceae	Gisekia	pharnacioides	L.		M. D. Gallagher	7776/2	20	3	1986	Oman	
207		Gisekiaceae	Gisekia	pharnacioides	L.		M. D. Gallagher	7802/5	31	3	1986	Oman	
208	K000630163	Halophytaceae	Halophytum	ameghinoi	Speg.		A. L. Cabrera, S. Botta, R. Kiesling, A. G. Lopez	29544	11	10	1978	Argentina	
209	K000630171	Hectorellaceae	Lyallia	kerguelensis	Hook.f.		J. D. Hooker	766			1840	Kerguelen Islands	
210	K000630170	Limeaceae	Semonvillea	pterocarpa	J.Gay		H. Tolken & D. S. Hardy	989	8	4	1965	South Africa	
211	K000630169	Mollunginaceae	Telephium	imperati	L.		Davis	1800	9	8	1940	Cyprus	
212	K000630164	Mesembryanthemaceae	Namibia	ponderosa	(Dinter) Dinter & Schwantes ex Jacobsen		S. Loots, J. Le Harnie, H. van Wyk, P. Reiner	CM2632	23	9	2004	Namibia	
213	K000630168	Nepanthaceae	Nepenthes	maxima	Reinw.		Sarasin	275		4	1894	Indonesia	
214	K000630167	Nyctaginaceae	Bougainvillea	spectabilis	Willd.		M. A. Varavallo	s.n.	23	5	1993	Brazil	
215	K000630166	Petiveriaceae	Petiveria	alliacea	L.		B. A. Krukoff	6500	14 to 11	9 to 10	1934	Brazil	
216	K000630165	Petiveriaceae	Petiveria	alliacea	L.		J. Tweedie	1181			1836	Brazil	
217	K000384052	Physenaceae	Physena	madagascariensis			G. E. Schatz	2708	9	5	1989	Madagascar	
218	K000384030	Physenaceae	Physena	madagascariensis	Steud.		J. M. Hildebrandt	3389		3	1880	Madagascar	
219	K000384039	Physenaceae	Physena	madagascariensis	Steud.		L. J. Dorr et al.	3525	13	1	1985	Madagascar	
220	K000630204	Phytolaccaceae	Phytolacca	americana	L.		L. V. Turner	224		7	1917	Macedonia	
221	K000630205	Plumbaginaceae	Limonium	thouinii	Kuntze		L. F. H. Merton	3661	12	3	1959	Iran	
222	K000630206	Polygonaceae	Polygonum	viviparum	L.		T. B. Wolfe	s.n.		7	1855	France	
223	K000630207	Portulacaceae	Lewisia	pygmaea	(A.Gray) B.L.Rob.		A. M. Alexander & L. Kellogg	4698	8	6	1946	USA	
224	K000630208	Rhabdodendraceae	Lecostemon	crassipes	Spruce ex. Benth.		R. Spruce	1497		5	1851	Brazil	
225	K000630209	Sarcobataceae	Sarcobatus	vermiculatus	(Hook.) Torr.		C. A. Purpus	5774		5 to 10	1898	USA	
226	K000630210	Simmondsiaceae	Simmondsia	californica	Nutt.		A. Nelson & R. A. Nelson	1724	2	5	1935	USA	
227	K000630211	Stegnospermataceae	Stegnosperma	alimifolia	Benth.		A. Carter, A. M. Alexander & L. Kellogg	1980	16	11	1947	Mexico	
228	K000630212	Tamaricaceae	Tamarix	tetragyna	Ehrenb.		L. F. H. Merton	2593	30	3	1956	Cyprus	
229	K000630203	Balanophoraceae	Balanophora	latisepala	(Tiegh.) Lecomte.		A. G. F. Kerr	7864	7	10	1923	Thailand	
230	K000630202	Eremolepidaceae	Eremolepis	punctulata	Griseb.		M .F. Gardner, S. G. Knees	4051	5	2	1988	Chile	
231	K000630201	Loranthaceae	Loranthus	gibberulus	Tate		P. Heleus	s.n.	26	11	1891	Australia	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
232	K000630200	Misodendraceae	Misodendrum	quadriflorum	DC.			s.n.			1829	Australia	
233	K000630199	Olacaceae	Ximenia	americana	L.		W. H. Johnson	539	31	1	1900	West Africa	
234	K000630198	Olacaceae	Ximenia	americana	L.		H. F. Mooney	6697	18	3	1956	Ethiopia	
235	K000630173	Opiliaceae	Melientha	suavis	Pierre		K. Larsen & S. S. Larsen	33594			1974	Thailand	
236	K000630176	Santalaceae	Thesium	goetzeanum	Engl.		A. E. Haarer	124 B		10	1925	Tanzania	
237	K000630175	Viscaceae	Viscum	album	L.		L. Favrat & W. Barbey	s.n.	20	5	1879	Switzerland	
238	K000630174	Cynomoriaceae	Cynomorium	coccineum	L.		A. Beguinot	s.n.		4	1904	Italy	
239	K000349780	Aphanopetalaceae	Aphanopetalum	clematideum	Domin		Oldfield	s.n.			no date	Australia	
240	K000630257	Cercidiphyllaceae	Cercidiphyllum	magnificum	Nakai		J. Ohwi	283	15	8	1951	Japan	
241	K000630256	Crassulaceae	Crassula	pyramidalis	Thunb.		W. C. Worsdell	s.n.		9	1909	South Africa	
242	K000630255	Daphniphyllaceae	Daphniphyllum	himalayense	Müll.Arg.		A. Henry	9652A			no date	China	
243	K000630254	Daphniphyllaceae	Daphniphyllum	glaucescens	Müll.Arg.		G. Forrest	13669			1917-1919	China	
244	K000630253	Grossulariaceae	Ribes	uva-crispa	L.		S. C. Atchley	2228		7	1934	Greece	
245	K000630252	Haloragaceae	Myriophyllum	spicatum	L.		H. J. Goddard Herbarium	s.n.		7	1876	British Isles	
246	K000630250	Penthoraceae	Penthorum	sedoides	L.		Rugel	s.n.		7	1842	USA	
247	K000630251	Tetracarpaeaceae	Tetracarpaea	tasmannica	Hook.		R. Gunn	293	10	7	1840	Australia	
248	K000630249	Hamamelidaceae	Hamamelis	x intermedia	Rehd.		DeWolf & P. Bruns	2197	26	3	1968	USA	Originally China, C. at Harvard University
249		Hamamelidaceae	Altingia	excelsa	Noronha		F. K. Ward	s.n.			no date	India	
250	K000630248	Iteaceae	Itea	riparia	Collett & Hemsl.		K. Larsen & S. S. Larsen	34491	13	9	1974	Thailand	
251	K000630247	Pterostemonaceae	Pterostemon	rotundifolius	Ramirez		A. Salinas, A. Ocampo & A. Ramirez	7543	9	9	1993	Mexico	
252	K000630246	Paeoniaceae	Paeonia	cambessedesii	Willk.		DNA Bank Voucher Chase 16307				no date	British Isles	C. RBG Kew 1969-17456
253	K000470082	Peridiscaceae	Whittonia	guianensis	Sandwith		B. A. Whitton	84	13	8	1959	British Guiana	
254	K000630197	Peridiscaceae	Peridiscus	lucidus	Benth.		M. J. G. Hopkins, E. da C. Pereira & C. F. da Silva	1561	22	3	1995	Brazil	
255	K000630196	Saxifragaceae	Saxifraga	paniculata	D.A.Webb	subs. cartilaginea	Ledebour	s.n.			1838	Orient	
256	K000630195	Aphloiaceae	Aphloia	theiformis	Benn.		H. T. Chapama et al.	356	20	11	2005	Malawi	
257	K000630194	Geissolomataceae	Geissoloma	marginata	(L.) A.Juss.		H. C. Taylor	3870	31 to 1	8 to 9	1962	South Africa	
258	K000630193	Ixerbaceae	Ixerba	sp.			R. Melville	6606	6	3	1962	New Zealand	
259	K000630191	Picramniaceae	Picramnia	sp.			Conduz	17664			1913	Costa Rica	
260	K000630192	Strasburgeriaceae	Strasburgeria	robusta	(Vieill. ex Panch. & Sebert) Guillaumin		L. Bernardi	9444	6	8	1965	New Caledonia	
261	K000630190	Vitaceae	Vitis	vinifera	L.		J. B. Mitchell	s.n.		7	1843	Italy	
262	K000630187	Crossosomataceae	Crossosoma	californicum	Nutt.		H. M. Hall	24		3	1905	California	
263	K000630189	Stachyuraceae	Stachyurus	himalaicus	Hook.f. & Thomson ex Benth.	var. himalaicus	L. Zhen-yu	15245	6	3	1996	China	
264	K000630188	Stachyuraceae	Stachyurus	himalaicus	Hook.f. & Thomson ex Benth.	var. himalaicus	E. H. Wilson	10799	18	10	1918	Eastern Asia	
265	K000073642	Staphyleaceae	Staphylea	bumalda	DC.		Kirkham, Coode-Adams, Howick & McNamara	EHOK 135	1	10	1997	Hokkaido	
266	K000630245	Geraniaceae	Pelargonium	cucullatum	L.		H. J. R. Yorke	s.n.			1894	South Africa	
267	K000630244	Melianthaceae	Melianthus	major	L.		S. M. Thomas	21/3.			no date	New Zealand	
268	K000630243	Vivianiaceae	Caesarea	albiflora	Cambess.		Klotzsch	s.n.		5	recd. 1892	Uruguay	
269	K000630242	Alzateaceae	Alzatea	sp.			E. A. Vasquez	114	11	8	1967	Peru	
270		Combretaceae	Terminalia	orbicularis	Engl. & Diels		I. Friis, S. Bidgood, A. Hailu & E. Getachew	10936	12	12	2002	Ethiopia	
271		Combretaceae	Combretum	zeyheri	Sond.		Kisena	1177	22	8	1993	Tanzania	
272	K000630241	Crypteroniaceae	Crypteronia	paniculata	Blume		A. S. bin Abdullah	76	3	2	1962	Malaya	
273	K000630240	Lythraceae	Lagerstroemia	speciosa	(L.) Pers.		S. K. Samai	313	21	4	1966	Sierra Leone	C.
274	K000630237	Lythraceae	Sonneratia	alba	Sm.		M. O. Rankin	1169	4	4	1978	Australia	
275	K000630238	Melastomataceae	Tibouchina	stenocarpa	Cogn.		J. A. Ratter et al.	R. 7300	30	5	1994	Brazil	
276	K000630239	Memecylaceae	Memecylon	vitiense	A.Gray		M. J. Berry	L13367			no date	Fiji	
277	K000630236	Memecylaceae	Memecylon	vitiense	A.Gray		A. C. Smith	128	13 to 18	10	1933	Fiji	
278		Myrtaceae	Eucalyptus	pyriformis	Turcz.		R. Melville	1882	31	10	1952	Australia	C.
279	K000630588	Myrtaceae	Campomanesia	guaviroba	(D.C.) Kiaersk		F. Mazine et al.	1048	14	11	2003	Brazil	
280	K000630235	Oliniaceae	Olinia	emarginata	Burtt Davy		L. E. Codd	9381			no date	South Africa	
281	K000630596	Onagraceae	Fuchsia	magellanica	Lam.		I. B. K. Richardson & M. J. E. Coode et al.	4096	6	5	1976	Reunion	
282	K000630234	Onagraceae	Fuchsia	tillettiana	Munz		P. E. Berry	3467	9	4	1979	Venezuela	
283	K000630233	Penaeaceae	Saltera	sarcocolla	(L.) Bullock		R. Dahlgren & A. Strid	4995	3	3	1966	South Africa	
284	K000630232	Rhynchocalycaceae	Rhynchocalyx	lawsonioides	Oliv.		R. G. Strey	G5495	30	8	1969	South Africa	
285	K000630231	Rhynchocalycaceae	Rhynchocalyx	lawsonioides	Oliv.		H. B. Nicholson	5495	29	3	1974	South Africa	
286	K000630230	Vochysiaceae	Vochysia	pumila	Pohl		J. A. Ratter et al.	R.3247	2	7	1976	Brazil	
287	K000630229	Zygophyllaceae	Tribulus	cistoides	L.		J. R. Maconochie	2079	2	7	1975	Australia	
288	K000630228	Zygophyllaceae	Tribulus	astrocarpus	F.Muell.		D. J. Nelson	337	21	6	1962	Australia	
289	K000630227	Zygophyllaceae	Tribulus	macrocarpus	F.Muell. ex Benth.		M. Lazarides & J. Palmer	546	19	8	1988	Australia	
290		Zygophyllaceae	Tribulus	terrestris	L.		no coll.	s.n.			no date	India	
291	K000630225	Krameriaceae	Krameria	triandra	Ruiz & Pav.		P. C. Hutchinson	1497	1	10	1957	Peru	
292	K000044805	Huaceae	Afrostyrax	lepidophyllus	Mildbr.		J. E. Andoh	5818		10	1953	Ghana	
293	K000630224	Huaceae	Afrostyrax	lepidophyllus	Mildbr.		F. J. Breteler & J. J. F. E. de Wilde	700	18	9	1978	Gabon	
294	K000630223	Celastraceae	Euonymus	grandiflorus	Wall.		Kew Accession no. 1915-1201		11	7	1979	British Isles	Originally Bhutan 1914 Cooper 3562, C. at Kew
295	K000630221	Celastraceae	Euonymus	grandiflorus	Wall.		Chinese collectors on behalf of H. D. McLaren	Mc/L/ D.93		3	1933	Western Yunnan	
296	K000630222	Celastraceae	Euonymus	javanicus	Blume		P. Saigol	SAN 93107	25	9	1980	Sabah	
297	K000630216	Lepidobotryaceae	Ruptiliocarpon	caracolito	Hammel & N.A.Zamora		R. Vasquez & N. Jaramillo	9556	13	9	1987	Peru	
298	K000630215	Lepidobotryaceae	Ruptiliocarpon	caracolito	Hammel & N.A.Zamora		K. Thomsen	953	24	7	1994	Costa Rica	
299	K000630217	Lepidobotryaceae	Ruptiliocarpon	caracolito	Hammel & N.A.Zamora		B. Hammel, M. M. Chavarria, J. C. Saboria	18154	20	3	1991	Costa Rica	
300	K000630218	Parnassiaceae	Parnassia	palustris	L.		T. B. Wolfe	s.n.	6	8	1866	France	
301	K000630219	Pottingeriaceae	Pottingeria	acuminata	Prain		G. Forrest	25411		11	1924	Upper Burma	
302	K000630220	Stackhousiaceae	Tripterococcus	brunonis	Endl.		A. Morrison	21003	28	10	1911	Australia	
303		Anisophylleaceae	Poga	oleosa	Pierre		X. M. van der Burgt	625	4	2	2003	Cameroon	
304		Anisophylleaceae	Anisophyllea	corneri	Ding Hou		Y.C. Chang	FRI 19848	28	6	1972	Malaya	
305	K000630214	Anisophylleaceae	Polygonanthus	amazonicus	Ducke		C. Todzia et al.	2311	4	7	1983	no location	
306	K000630213	Anisophylleaceae	Combretocarpus	rotundatus	(Miq.) Danser		E. Banks	s.n.		11	1931	Borneo	
307	K000630263	Begoniaceae	Begonia	serratipetala	Irmsch.		Sayers	s.n.	2	12	1965	British Isles	Originally from New Guinea, C. at Kew H/4675/65
308	K000630262	Begoniaceae	Begonia	kaniensis	Irmsch.		P. J. B. Woods	378	23	11	1962	New Guinea	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
309	K000630261	Coriariaceae	Coriaria	pteridoides	W.R.B.Oliv.		P. J. Edwards	82	24	3	1970	New Zealand	
310	K000630260	Coriariaceae	Coriaria	japonica	A.Gray		K. Watanabe	s.n.	11	7	1895	Japan	
311	K000630259	Corynocarpaceae	Corynocarpus	laevigata	Forst.		T. F. Cheeseman	1687			1903	New Zealand	
312		Cucurbitaceae	Ruthalicia	longipes	(Hook.f.) C.Jeffery		J. O. Ariwaodo	A.R.S.1072	7	12	1966	Nigeria	
313	K000630265	Datiscaceae	Octomeles	sumatrana	Miq.		J. A. R. Anderson	S.27298	1	12	1966	Sarawak	
314	K000630264	Datiscaceae	Octomeles	sumatrana	Miq.		K. Sidiyasa	1300	3	12	1994	Indonesia	
315	K000630258	Leguminosae	Lotus	berthelotii	Masf		ex Uni. Bot. Garden Copenhagen				1974	British Isles	Originally Tenerife C. at Kew, A 297/72/02721
316	K000212515	Leguminosae	Indigofera	astragalina	DC.		D. du Bois	s.n.			1700	India	Oldest specimens in Herbarium
317	K000654028	Leguminosae	Acacia	suma	(Roxb.) Buch.-Ham. ex Voigt		S. Brown	700		3	1669	India	Oldest specimens in Herbarium
318	K000654029	Leguminosae	Acacia	suma	(Roxb.) Buch.-Ham. ex Voigt		S. Brown	699		3	1669	India	Oldest specimens in Herbarium
319	K000296857	Leguminosae	Streblorrhiza	speciosa	Endl.		Seed from plant grown from seed -coll. F. Bauer	s.n.			1836	New Zealand	Originally from New Zealand C. in Vienna Extinct
320		Leguminosae	Abrus	precatorius	L.		J. K. Masheswari	s.n.			1975	India	Krukoff collection
321	K000477174	Leguminosae	Colvillea	racemosa	Boj.		D. J. & B. P. Du Puy, Labat, Rakouth & Phillipson	M458	12	2	1990	Madagascar	
322		Leguminosae	Afzelia	quanzensis	Welw.		T. H. Muller	1974/1		10	1974	Zimbabwe	Krukoff collection
323	K000630267	Leguminosae	Pithecellobium	excelsum	Mart.		G. P. Lewis & B. B. Klitgaard	3336	28	5	1997	Ecuador	
324	K000630266	Leguminosae	Pithecellobium	excelsum	Mart.		X. Cornejo & C. Bonifaz	5896	7	11	1997	Ecuador	
325	K000630601	Leguminosae	Adenanthera	pavonina	L.		M. Godefroy	s.n.		11	1874	China	
326	K000630275	Polygalaceae	Polygala	major	Jacq.		S. S. Hooper	21019	16	7	1973	Montenegro	
327	K000630274	Quillajaceae	Quillaja	brasiliensis	Mart.		S. G. Tressens, V. Marunak, A. Radovancich	3007	7	1	1985	Argentina	
328	K000630273	Quillajaceae	Quillaja	brasiliensis	Mart.		L. B. Smith & R. Klein	12230	17	3	1957	Brazil	
329	K000630272	Surianaceae	Suriana	maritima	L.		N. Byrnes	2355	14	7	1971	Australia	
330	K000630271	Betulaceae	Betula	verrucosa	Ehrh.		O. J. Ward	11	30	4	1948	British Isles	
331	K000630270	Casuarinaceae	Allocasuarina	gymnanthera	L.A.S.Johnson		B. G. Briggs	NSW 62486	1	4	1961	Australia	
332	K000630269	Casuarinaceae	Allocasuarina	gymnanthera	L.A.S.Johnson		E. F. Constable	16280	12	9	1948	Australia	
333	K000630268	Fagaceae	Quercus	robur	L.		R. Melville	s.n.	26	9	1939	British Isles	
334		Fagaceae	Quercus	rex	Hemsl.		A. Henry	12665			pres'd 1900	China	Type Collection
335		Fagaceae	Quercus	mespilifolioides	A.Camus		J. H. Aplin	3/88..		11 to 12	1888	India	
336		Juglandaceae	Juglans	regia	C.DC.	var. sinensis	Prof Mori	s.n.	rec'd 7	6	1922	Korea	
337	K000630284	Rhoipteleaceae	Rhoiptelea	chiliantha	Diels & Hand.-Mazz.		Y. Tsiang	6709	26	8	1930	China	
338	K000630283	Rhoipteleaceae	Rhoiptelea	chiliantha	Diels & Hand.-Mazz.		Y. Tsiang	6568	22	8	1930	China	Type Collection
339	K000630282	Myricaceae	Myrica	gale	L.		J. Fraser	s.n.	23	5	1899	Scotland	
340	K000630277	Nothofagaceae	Nothofagus	procera	(Poepp.& Endl.) Gerst		S. Ross-Craig & J. R. Sealy	21	26	10	1962	British Isles	
341	K000630280	Ticodendraceae	Ticodendron	incognitum	Gómez-Laur. & L.D.Gómez		W. Haber & E. Cruz	7071	24	3	1987	Costa Rica	
342	K000630279	Ticodendraceae	Ticodendron	incognitum	Gómez-Laur. & L.D.Gómez		B. Hammel & P. Rivera	17834	25	7	1990	Costa Rica	
343	K000630278	Achariaceae	Guthriea	capensis	Bolus		S. P. Bester	2983	14	10	1994	South Africa	
344	K000426809	Achariaceae	Guthriea	capensis	Bolus		H. Bolus	818		4	1873	South Africa	
345	K000630276	Balanopaceae	Balanops	balansae	Baill.		H. S. Mackee	15401	31	7	1966	New Caledonia	
346	K000630289	Bonnetiaceae	Bonnetia	stricta	(Nees) Nees & Mart		R. M. Harley et al.	15908	4	2	1974	Brazil	
347	K000630287	Bonnetiaceae	Bonnetia	stricta	(Nees) Nees & Mart		R. M. Harley et al.	18826	17	2	1977	Brazil	
348	K000630288	Bonnetiaceae	Bonnetia	stricta	(Nees) Nees & Mart		R. M. Harley et al.	22103	15	5	1980	Brazil	
349		Caryocaraceae	Caryocar	microcarpum	Ducke		R. Spruce	175		8	1849	Brazil	
350	K000630286	Caryocaraceae	Caryocar	glabrum	Pers.		R. Spruce	1345		2	1851	Brazil	
351	K000630285	Chrysobalanaceae	Maranthes	floribunda	(Baker) F. White		A. A. Bullock	3317	14	9	1950	Zimbabwe	
352	K000104093	Chrysobalanaceae	Maranthes	floribunda	(Baker) F. White		P. J. Greenway & R. G. Miller	5678	14	9	1938	Zimbabwe	
353	K000630298	Dichapetalaceae	Dichapetalum	mossambicense	Engl.		H. G. Faulkner	3562	15	6	1965	Tanzania	
354	K000630297	Dichapetalaceae	Dichapetalum	mossambicense	Engl.		Greenway	4987	1	8	1937	East Africa	
355	K000630295	Euphroniaceae	Euphronia	hirtelloides	Mart.		B. & C. K. Maguire & A. Fernandez	44153	6	9	1959	Colombia	
356	K000630296	Euphroniaceae	Euphronia	hirtelloides	Mart.		O. Huber	9311	30	3	1984	Venezuela	
357	K000630294	Trigoniaceae	Trigonia	prancei	Lleras		R. Guillen & S. Coria	1928	18	6	1994	Bolivia	
358		Clusiaceae	Clusia	rosea	Jacq.		Rec. from Commissioner of Agriculture	s.n.		2	1913	West Indies	
359	K000630293	Clusiaceae	Clusia	sp.			J. J. Wurdack	581	28	5	1962	Peru	
360	K000630292	Clusiaceae	Clusia	sp.			J. J. Wurdack	1036	25	6	1962	Peru	
361	K000630291	Ctenolophonaceae	Ctenolophon	parvifolius	Oliv.		A. G. F. Kerr	14584	14	3	1928	Thailand	
362	K000630290	Elatinaceae	Elatine	minima	(Nutt.) Fisch. & C.A.Mey.		M. L. Fernald & H. K. Svenson	468	14	9	1928	USA	
363		Euphorbiaceae	Excoecaria	bussei	Pax		P. J. Greenway & Kanuri	13703			no date	Tanzania	
364		Euphorbiaceae	Excoecaria	bussei	Pax		E. Milne-Redhead & P. Taylor	11253			1955-56	Tanzania	
365		Flacourtiaceae	Hydnocarpus	polypetalus	(Slooten) Sleumer		P. J. A. Kessler & Z. Arifin	2771	24	2	2000	Indonesia	
366	K000630334	Goupiaceae	Goupia	glabra	Aubl.		W. Milliken, Ramos, Damiao, Mota & Latham	627	26	9	1987	Brazil	
367	K000630333	Hugoniaceae	Hugonia	tomentosa	Cav.		D. & L. Lorence, R. Sussman & I. Tattersall	4498	19	7	1984	Mauritius	
368	K000630332	Humiriaceae	Vantanea	obovata	Benth.		S. A. Mori & B. M. Boom	14337	11	6	1981	Brazil	
369		Humiriaceae	Vantanea	obovata	Benth.		R. M. Harley et al.	25834	1`	11	1988	Brazil	
370		Irvingiaceae	Klainedoxa	gabonensis	Pierre		D. J. Harris	2367	25	5	1990	Central African Republic	
371	K000630331	Irvingiaceae	Klainedoxa	gabonensis	Pierre		P. G. Waterman & D. Mckey	794	27	5	1976	Cameroon	
372	K000630330	Ixonanthaceae	Ixonanthes	reticulata	Jack.		Y.C. Chan	FRI 17516	22	9	1970	Malaya	
373	K000630329	Lacistemataceae	Lacistema	pubescens	Mart.		R. Spruce	178		9	1849	no location	
374	K000630328	Linaceae	Linum	usitatissimum	L.		C. E. Britton	3284	2	10	1927	British Isles	
375	K000630327	Linaceae	Linum	usitatissimum	L.		T. Waitland	266	1	4	1918?	British Isles	
376	K000630324	Lophopyxidaceae	Lophopyxis	maingayi	Hook.f.		D. H. Nicolson	1554	10	11	1961	New Britain (New Guinea)	
377	K000630326	Lophopyxidaceae	Lophopyxis	maingayi	Hook.f.		H. J. Lam	3014	14	5	1926	Indonesia	
378	K000630325	Lophopyxidaceae	Lophopyxis	maingayi	Hook.f.		E. E. Henty & D. B. Foreman	NGF 49342	9	11	1972	Papua New Guinea	
379	K000630323	Malpighiaceae	Byrsonima	crassifolia	(L.) Kunth		P. Cavalcante	2380	14	2	1970	Brazil	
380	K000630322	Malpighiaceae	Byrsonima	crassifolia	(L.) Kunth		P. W. Richards	6512	25	7	1968	Brazil	
381	K000630321	Ochnaceae	Ochna	integerrima	(Lour.) Merr.		C .F. van Beusekom & C. Phengkhali	516	19	4	1968	Thailand	
382	K000630320	Medusagynaceae	Medusagyne	oppositifolia	Baker		G. Proctor	3991	16	6	1970	Seychelles	
383		Medusagynaceae	Medusagyne	oppositifolia	Baker		Pe. T.	2790		rec'd 1	1902	Seychelles	
384		Quiinaceae	Lacunaria	sp.			S. Mori, L.A. Mattos Silva & T.S. dos Santos	10637	18	9	1978	Brazil	
385	K000630319	Pandaceae	Galearia	celebica	Koord.	var. celebica	J. Regalado & M. Q. Sirikolo	729	22	7	1993	Solomon Islands	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
386	K000630318	Pandaceae	Galearia	celebica	Koord.	var. celebica	I. Gafui & collectors	BSIP 18869	17	1	1970	Solomon Islands	
387	K000093469	Medusandraceae	Medusandra	richardsiana	Brenan		P. Brenan & C. F. A. Onochie	9486	18	3	1948	Cameroon	
388		Medusandraceae	Medusandra	richardsiana	Brenan		J. Olorunferni	FHI30606	30	5	1957	Cameroon	
389	K000036547	Passifloraceae	Passiflora	tridactylites	Hook.f.		C. Darwin	s.n.			no date	Galapagos Islands	Isolectotype
390	K000630317	Passifloraceae	Passiflora	pinnatistipula	Cav.		J. R. I. Wood	17661	2	12	2001	Bolivia	
391		Passifloraceae	Passiflora	ambigua	Hems.		A. Estrada	745	18	4	1997	Costa Rica	
392	K000630316	Malesherbiaceae	Malesherbia	linearifolia	Poir.		O. Fernandez	JBN 105	13	12	2004	Chile	
393	K000630315	Turneraceae	Mathurina	penduliflora	Baif.f.		F. Friedmann	2444		5	1974	Rodrigues Island	C. Herbario Musei Parisiensis
394	K000630314	Phyllanthaceae	Phyllanthus	rheophyticus	M.G.Gilbert & P.T.Li		C. Wang	33322	26	7	1933	China	
395	K000630313	Picrodendraceae	Austrobuxus	rubiginosus	(Guillaumin) Airy Shaw		A. Guillaumin	11026	23	2	1951	New Caledonia	
396		Podostemaceae	Podostemon	olivaceus	Gardn.		J. C. Wills	89-1899			1899	Sri Lanka	
397	K000630310	Putranjivaceae	Drypetes	amazonica	Steyerm.		M. Nee	50178	17	10	1999	Bolivia	
398	K000630311	Putranjivaceae	Drypetes	amazonica	Steyerm.		W. Morawetz & B. Wallnofer	111-71085	7	10	1985	Peru	
399		Putranjivaceae	Drypetes	amazonica	Steyerm.		J. R. I. Wood	14958	28	7	1999	Bolivia	
400		Rafflesiaceae	Rafflesia	manillana	Teschem.		W. H. Brown	s.n	21	5	1912	Philippines	
401		Rhizophoraceae	Rhizophora	apiculata	Blume		Kadir	A2625	21	8	1949	Borneo	
402	K000630587	Rhizophoraceae	Bruguiera	gymnorrhiza	(L.) Lam		Dr Kirk	s.n.	23	5	1858	Mozambique	
403	K000110551	Erythroxylaceae	Erythroxylum	coca	Lam.		T. Plowman & H. Kennedy	5792	1	4	1976	Peru	Cocaine
404	K000110553	Erythroxylaceae	Erythroxylum	coca	Lam.		T. Plowman	6042	4	5	1976	Peru	Cocaine
405	K000630309	Salicaceae	Salix	caprea	L.		D. A. Saunders	924	13	3	1934	British Isles	Pres'd E.J. Saunders 1948
406	K000630308	Salicaceae	Salix	caprea	L.		Bromfield	s.n.	16	5	1838	British Isles	Herbarium Bromfield
407	K000630306	Scyphostegiaceae	Scyphostegia	borneensis	Stapf		B. Lee	S.45301	27	10	1982	Sarawak Forest	
408	K000630307	Scyphostegiaceae	Scyphostegia	borneensis	Stapf		B. Lee	S.45412	3	11	1982	Sarawak Forest	
409	K000630305	Violaceae	Viola	tricolor	L.		E. F. Salisbury	s.n.	10	5	1902	British Isles	
410	K000630302	Brunelliaceae	Brunellia	sibundoya	Cuatrec.		G. P. Lewis & P. Lozano	3366	26	7	1997	Ecuador	
411	K000630304	Brunelliaceae	Brunellia	costaricensis	Standl.		L. Bernardi	10538	11	9	1965	Costa Rica	
412	K000630303	Brunelliaceae	Brunellia	boliviana	Britton ex Rusby		N. L. Britton & H. H. Rusby	s.n.			1890	Bolivia	Type Collection
413	K000630301	Cephalotaceae	Cephalotus	follicularis	Labill.		V. Mann & A.S. George	124	13	11	1969	Western Australia	
414	K000630299	Connaraceae	Cnestis	palala	Merr.		J. & M. S. Clements	3805		5 to 6	1927	Indo China	
415	K000630300	Connaraceae	Cnestis	palala	Merr.		A. H. Millard	K.L.1413	22	2	1959	Malaya	
416		Cunoniaceae	Cunonia	balansae	Brongn. & Gris		J. Bradford et al.	1108	12	12	2000	New Caledonia	
417	K000630348	Elaeocarpaceae	Elaeocarpus	floribundus	Blume		R. Geesink, T. Hattink, C. Phengkki	7017	26	5	1974	Thailand	
418		Elaeocarpaceae	Elaeocarpus	altisectus	Schltr.		M.J.Coode	8038	17	2	1998	Indonesia	
419	K000630346	Oxalidaceae	Oxalis	sericea	L.f.		Drege	s.n			no date	South Africa	
420	K000630345	Barbeyaceae	Barbeya	oleoides	Schweinf.		J. B. Gillett	5270	2	3	1933	Ethiopia	
421	K000630344	Barbeyaceae	Barbeya	oleoides	Schweinf.		M. G. Gilbert & J. Lauranos	2258	5	1	1972	Ethiopia	
422	K000630343	Cannabaceae	Cannabis	sativa	L.		M. Mc Callum Webster	7042	4	10	1961	British Isles	Found in Mortlake tip, Surrey
423	K000630342	Cecropiaceae	Cecropia	palmata	Willd.		G. T. Prance, Forero, Wrigley, Ramos & Farias	6574	27	7	1968	Brazil	
424	K000630341	Dirachmaceae	Dirachma	socotrana	Schweinf. ex Balf.f.		A. R. Smith & J. Lauranos	593	30	4	1967	Socotra	
425	K000630340	Dirachmaceae	Dirachma	socotrana	Schweinf. ex Balf.f.		A. R. Smith & J. Lauranos	763	23	5	1967	Socotra	
426	K000630339	Elaeagnaceae	Elaeagnus	angustifolia	L.		A. Vatova	s.n.		4	1923	Bulgaria	
427		Moraceae	Ficus	punctata	Thunb.		K. M. Wong	WKM 1660	14	3	1990	Brunei	
428	K000243316	Moraceae	Ficus	abutilifolia	Miq.		G. Schweinfurth	2842	20	12	1869	Sudan	
429	K000630338	Rhamnaceae	Ziziphus	mauritiana	Lam.		E. Bounougou	48	23	8	1964	Cameroon	
430	K000630337	Rosaceae	Rosa	moyesii	Hemsl. & E.H.Wilson		J. S. Gamble	30751		8	1920	British Isles	Originally China C. Highfield, East lines
431	K000630336	Ulmaceae	Ulmus	campestris	L.		Bromfield	s.n.	15	5	1840	British Isles	Herbarium Bromfield
432	K000630335	Urticaceae	Urtica	dioica	L.		W. B. Waterfall	1150		5	1876	British Isles	
433	K000630395	Dipentodontaceae	Dipentodon	sinicus	Dunn		G. Forrest	26561		5	1925	Burma	
434	K000630396	Dipentodontaceae	Dipentodon	sinicus	Dunn		J. Cavalerie	2253			1905	China	
435	K000630413	Tapisciaceae	Tapiscia	sinensis	Oliv.		E. H. Wilson	108		9	1907	China	
436	K000630572	Akaniaceae	Akania	bidwillii	(Hogg) Mabb		no coll.	s.n.		2	1912	no location	C. Linden, 248-72, Neotype
437	K000630578	Akaniaceae	Akania	bidwillii	(Hogg) Mabb		no coll.	s.n.		3	1899	British Isles	C. at Kew
438	K000630573	Bretschneideraceae	Bretschneidera	sinensis	Hemsl.		Wang-Te-Hui	12130		4	1919	China	
439	K000630575	Bataceae	Batis	maritima	L.		L. J. Cumana & W. Lampe	530	26	1	1974	Venezuela	
440	K000630579	Bataceae	Batis	maritima	L.		A. Harrison	1717	13	10	1958	British Guiana	
441	K000630580	Brassicaceae	Lunaria	annua	L.		G. V. C. Last	40/2	12	9	1943	British Isles	
442	K000674151	Brassicaceae	Lunaria	annua	L.		no coll.	s.n.		4	1898	British Isles	
443	K000630584	Capparaceae	Capparis	spinosa	L.		P. Furse	2873	27	6	1962	Iran	
444	K000630574	Capparaceae	Capparis	spinosa	L.		T. F. Hewer	H3804	20	5	1976	Spain	
445	K000630582	Caricaceae	Carica	papaya	L.		D. A. Powell & H'ng Kim Cheng	669	1	10	1983	Christmas Islands	
446	K000630583	Cleomaceae	Cleome	maculata	Briq.		J. P. H. Acocks	21019	30	1	1960	South Africa	
447	K000630581	Cleomaceae	Cleome	macrophylla	Briq.		L. E. Codd	5951	18	4	1950	South Africa	
448	K000630394	Emblingiaceae	Emblingia	calceoliflora	F.Muell		A. S. George & H.K. Airy Shaw	12929	9	12	1974	Western Australia	
449	K000630603	Emblingiaceae	Emblingia	calceoliflora	F.Muell		Oldfield	s.n.			no date	Australia	Type Collection
450	K000630387	Gyrostemonaceae	Codonocarpus	cotinifolius	(Desf.) F.Muell.		D. J. Nelson	1774			1968	Australia	
451	K000630393	Koeberliniaceae	Koeberlinia	spinosa	Zucc.		J. Painter & F. A. Barkley	14370	28	2	1944	Mexico	
452	K000630577	Limnthaceae	Limnanthes	douglasii	R.Br.		Mrs F. Hayley	s.n.		5	1974	British Isles	
453		Moringaceae	Moringa	oleifera	Lam.		W. Burger	3390	15	12	1963	Ethiopia	
454	K000630381	Moringaceae	Moringa	oleifera	Lam.		L. Wynter	2075		4	1955	Jamaica	
455	K000630380	Moringaceae	Moringa	oleifera	Lam.		Fendler	2243			1857-1858	Venezuela	
456	K000630388	Pentadiplandraceae	Pentadiplandra	brazzeana	Baill.		A. Léonard	5891		8	1959	D. R. of Congo	
457	K000630397	Pentadiplandraceae	Pentadiplandra	brazzeana	Baill.		F. J. Breteler	710	2	12	1960	Cameroon	
458	K000630576	Resedaceae	Reseda	lutea	L.		S. Ecoyomides	1147	4	4	1968	Cyprus	
459	K000630392	Resedaceae	Reseda	lutea	L.		Davis	23901	6	8	1954	Turkey	
460	K000630389	Salvadoraceae	Salvadora	persica	L.		W. J. J. de Wilde & B. E. E. de Wilde-Duyfjes	9809	27	1	1966	Ethiopia	
461	K000630390	Setchellanthaceae	Setchellanthus	caeruleus	Brandegee		N. Taylor	246	2	7	1986	Mexico	
462	K000630401	Tovariaceae	Tovaria	pendula	Ruiz & Pav.		C. Sandeman	4400		11	1943	Peru	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
463	K000630399	Tropaeolaceae	Tropaeolum	majus	L.		R. Coveny & K. Davis	7660	23	5	1976	Australia	
464	K000630412	Apodanthaceae	Apodanthes	casearíae	Poit.		N. Zamora	1523	18	11	1988	Costa Rica	
465	K000630404	Bixaceae	Bixa	orellana	L.		R. S. Williams	579	14	1	1902	Bolivia	
466	K000630398	Diegodendraceae	Diegodendron	humbertii	Capuron		R. Capuron	27459-SF	15	3	1967	Madagascar	
467	K000630403	Diegodendraceae	Diegodendron	humbertii	Capuron		De Block, Rakotonasolo & Randriamboavonjy	1254	16	1	2002	Madagascar	
468		Cochlospermaceae	Cochlospermum	fraseri	Planch.		R. L. Specht	1245	22	10	1948	Australia	
469	K000382602	Bombaceace	Adansonia	fony	Baill.		P. B. Phillipson et al.	3468	8	2	1990	Madagascar	
470		Brownlowiaceae	Christiana	africana	DC.		J. F. Morales	2386	17	2	1994	Costa Rica	
471	K000630406	Brownlowiaceae	Christiana	africana	DC.		L. Sanou	BUR- 423	15	2	2006	Costa Rica	
472		Bytnteriaceae	Theobroma	cacao	L.		Dr Watts	H. 3206			1910	Dominica	
473	K000630407	Cistaceae	Cistus	ladaniferns	L.		J. C. Atchley	398		3	1935	Portugal	
474	K000630405	Cytinaceae	Cytinus	sp.			A. W. Hill, N. Y. Sandwith & W. B. Turrill	2691	23	4	1934	South Macedonia	
475		Dipterocapraceae	Dipterocarpus	zeylanicus	Thwaites		H. Kostermans	27394	8	3	1979	Sri Lanka	C. Botanic Garden
476		Durionaceae	Durio	kutejensis	Becc.		Van Valkenburg	JVV 1381	16	2	1994	Indonesia	C. Orchard Tree
477	K000630408	Helicteraceae	Helicteres	baruensis	Jacq.		M. J. Janson-Jacobs et al	4467	14	7	1995	Guyana	
478	K000630409	Malvaceae	Hibiscus	syriacus	L.		Mrs Cardew	s.n.			no date	British Isles	C.
479	K000630410	Muntingiaceae	Dicraspidia	donnell-smithii	Standl.		T. D. Pennington, P. E. Owen & N. Zamora	13583	15	2	1992	Costa Rica	
480	K000630411	Neuradaceae	Neurada	procumbens	L.		Mr. J. Th. Bent	s.n.			1896	Sudan	
481	K000630402	Pentapetaceae	Dombeya	rotundifolia	Planch.		Tweedie	1145		12	1953	East Africa	
482	K000630400	Pentapetaceae	Dombeya	rotundifolia	Planch.		H. M. Gardner	2894		8	1932	Kenya	
483	K000391079	Sarcolaenaceae	Sarcolaena	multiflora	Thou.		R. Capuron	18.149SF	30	8	1957	Madagascar	
484	K000630377	Sparmanniaceae	Grewia	monticola	Sond.		H. P. van der Schyff	3208	11	11	1953	South Africa	
485	K000630379	Sparmanniaceae	Grewia	monticola	Sond.		G. Germishuizen	300	10	5	1977	South Africa	
486	K000630383	Sphaerosepalaceae	Rhopalocarpus	coriaceus	(Scott Elliot) Capuron		J. L. Zarucchi et al.	7498	26	5	1991	Madagascar	
487	K000630384	Sphaerosepalaceae	Rhopalocarpus	coriaceus	(Scott Elliot) Capuron		N. Dumetz	634	23	3	1989	Madagascar	
488		Sterculiaceae	Sterculia	rhynchocarpa	K.Schum.		J. J. Beckett	448	11	10	1980	Somalia	
489	K000630382	Tepuianthaceae	Tepuianthus	auyantepuiensis	Maguire & Steyerm.		J. Steyemark et al.	116093	27	2	1978	Venezuela	Isotype
490	K000630376	Thymelaeaceae	Edgeworthia	chrysantha	Lindl.		Miss F. M. Reid	48	rec'd. 22	5	1900	China	
491	K000630385	Tiliaceae	Tilia	europaea	L.		S. Ross-Craig & J. R. Sealy	1668	15	7	1951	British Isles	
492	K000630374	Anacardiaceae	Anacardium	occidentale	L.		W. E. Broadway	8093	17	6	1932	West Indies	
493		Anacardiaceae	Anacardium	occidentale	L.		The Imperial Forestry Institute	IFI 4899			no date	Brazil	
494	K000630417	Biebersteiniaceae	Biebersteinia	odora	Steph.ex		Ledebour	s.n.			no date	Russia	
495	K000630391	Burseraceae	Canarium	denticulatum	Blume		A. C. Church, Mahyar, Indah, Ismail & Hamzah	965	16	4	1994	Indonesia	
496	K000630378	Burseraceae	Canarium	denticulatum	Blume		W. J. J. O. de Wilde & B. E. E. de Wilde-Duyfjes	16952	17	5	1975	Sumatra	
497	K000630449	Cneoraceae	Cneorum	tricoccon	L.		B. Verdcourt & Wilmot-Dear	5371	6	7	1980	France	
498	K000630386	Kirkaceae	Kirkia	wilmsii	Engl.		Herman, Welman, Pienaar & Crosby	661	26	2	1983	South Africa	
499	K000630375	Leitneriaceae	Leitneria	floridana	Chapm.		A. Rehder	s.n.	30	5	1927	USA	
500	K000630416	Leitneriaceae	Leitneria	floridana	Chapm.		A. Osborn	s.n.	27	6	1930	USA	
501		Meliaceae	Entandrophragma	sp.			Hounty	341			no date	Tanzania	
502	K000630426	Nitrariaceae	Nitraria	schoberi	L.		A. Callier	285			1896	Northern Asia	
503	K000630425	Peganaceae	Peganum	harmala	L.		K. H. Rechinger	19116	27	6	1958	Greece	
504	K000630424	Tetradiclidaceae	Tetradiclis	tenella	Litv.		VCR	5/1031		6	1955	Iraq	
505	K000630450	Ptaeroyxlaceae	Ptaeroxylon	obliquum	Radlk.		Welwitsch	1694		8	rec'd.1881	Angola	
506		Rutaceae	Citrus	sp.			Brass	21941			no date	Papua New Guinea	
507	K000630455	Sapindaceae	Litchi	chinensis	Sonn.		H. H. Chung	2712	11	7	1924	China	
508		Sapindaceae	Aesculus	hippocastanum	L.		A. R. Smith	s.n.		10	1970	British Isles	C. at Kew
509	K000630427	Simaroubaceae	Ailanthus	integrifolia	Lam.		I. Gafui & collectors	BSIP 18801	10	1	1970	Solomon Islands	
510	K000630423	Cornaceae	Cornus	kousa	Buerger ex Miq.		P. Catt	s.n.	3	7	1996	British Isles	C. Wakehurst Place, accession no. 1988-5226
511	K000630422	Curtisiaceae	Curtisia	dentata	(Brum.f.) C.A.Sm.		DNA Bank voucher M.W. Chase 5717K				no date	British Isles	Originally South Africa, C. at Kew
512		Curtisiaceae	Curtisia	dentata	(Burm.f.) C.A.Sm.		L. A. Nkuna & E. Wyk	631	27	2	2003	South Africa	
513	K000630421	Grubbiaceae	Grubbia	rosmarinifolia	P.J.Bergius		E. G. Holiver	30024	8	9	1966	South Africa	
514	K000630418	Hydrangeaceae	Hydrangea	macrophylla	(Thunb.) Ser.		M. Haworth- Booth	s.n.		8	1939	British Isles	C. at Haslemere, Surrey
515	K000493279	Hydrangeaceae	Hydrangea	aspera	Buch.-Ham. ex D. Don		no coll.	s.n.	28	8	2008	British Isles	C. at Kew, accession number 1973-16043
516	K000630420	Hydrostachyaceae	Hydrostachys	angustisecta	Engl.		F. Haerdi	543/0		6	1960	Kenya	
517	K000630419	Losasceae	Nasa	macrothyrsa	(Urb. & Gilg) Weigend		no coll.	s.n.			1998	Germany	Originally Peru, C. Grown in Munich, Collected 1997
518	K000630445	Actinidiaceae	Saurauia	sp.			W. Vink	16437	29	8	1963	New Guinea	
519	K000630451	Balsaminaceae	Impatiens	hawkeri	W.Bull		no coll.	s.n.			1978	no location	
520	K000493251	Clethraceae	Clethra	arborea	Aiton.		no coll.	s.n.			2008	British Isles	C. at Kew, accession number 1987-4005
521	K000630454	Coridaceae	Coris	monspeliensis	L.		G. Bentham	s.n.			no date	France	
522	K000630444	Cyrillaceae	Cyrilla	racemiflora	L.		A. H. Curtiss	1774			rec'd 1882	USA	
523	K000630441	Diapensiaceae	Diapensia	lapponica	L.		D. F. H. Wilkins	1157	30	6	1875	USA	
524		Ebenaceae	Diospyros	macrophylla	Bl.		Wirawan	432	28	1	1964	South West Java	
525		Ebenaceae	Diospyros	wallichii	King & Gamble		R. N. Parker	2337a	10	12	1924	Burma	
526	K000630442	Ericaeae	Erica	melastoma	Andrews		E. G. H. & I. M. Oliver	11287	14	8	1999	South Africa	
527	K000081643	Fouquieriaceae	Fouquieria	formosa	Kunth		C. Conzaffi	5199	26	11	1936	Mexico	
528		Lecythidaceae	Couratari	guianensis	Aubl.		N. T. Silva	506	8	1	1958	Brazil	
529	K000432586	Lissocarpaceae	Lissocarpa	benthamii	Gurke		R. Spruce	3108		10	1853	Brazil	Lectotype
530	K000630453	Lissocarpaceae	Lissocarpa	benthamii	Gurke		R. E. Schultes & I. Cabrera	13486	7	8	1951	Colombia	
531	K000630414	Maesaceae	Maesa	macrocarpa	Scheff.		L. L. Forman	220	23	6	1956	Celebes/ Sulawesi	
532	K000630589	Maesaceae	Maesa	denticulata	Mez		Madulid, Gaerlan et al.	23883	28	4	1996	no location	
533	K000630452	Marcgraviaceae	Marcgravia	nepenthoides	Seem.		G. Rivera	1977	3	10	1992	Costa Rica	
534	K000630415	Myrsinaceae	Ardisia	villosa	Roxb.		C.F.van Beusekom et al.	4216	13	12	1971	Thailand	
535	K000630439	Pentaphylacaceae	Pentaphylax	euryoides	Gardn. & Champ.		S. Y. Hu	12067	4	6	1972	Hong Kong	
536	K000630438	Pentaphylacaceae	Pentaphylax	euryoides	Gardn. & Champ.		Y. W. Taam	124	1 to 31	12	1937	China	
537	K000630436	Sladeniaceae	Sladenia	celastrifolia	Kurz		A. F. G. Kerr	5367	6	5	1921	Thailand	
538	K000630437	Sladeniaceae	Sladenia	celastrifolia	Kurz		G. Forrest	11653			no date	China	
539	K000630448	Polemoniaceae	Polemonium	caeruleum	L.		no coll.	s.n.		5	2000	British Isles	C. at Kew, accession number 1973-21098

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
540	K000630446	Primulaceae	Cyclamen	pseudibericum	Hildebr.		O. Sonderhousen	743	30	3	1981	Turkey	
541	K000630430	Roridulaceae	Roridula	gorgonias	Planch.		H. U. Stauffer	5095	2	9	1963	South Africa	Flower show
542	K000630440	Samolaceae	Samolus	repens	Pers.		Dr. A. Morrison	804	9	11	1895	Australia	
543	K000630447	Sapotaceae	Mimusops	kummel	Bruce ex A. DC.		R. M. Harley	9465	31	8	1959	Tanzania	
544		Sapotaceae	Mimusops	letestui	Lecomte		R. Catterall	s.n.			no date	Nigeria	
545	K000630443	Sarraceniaceae	Sarracenia	purpurea	L.		Schweinitz	s.n.			1832	no location	
546	K000630463	Styracaceae	Styrax	officinale	L.		Miss M. E. Edmonds	161	14	4	1928	Syria	
547	K000630473	Symplocaceae	Symplocos	caudata	Wall.		M. Furuse	5291	27	2	1974	Japan	
548	K000630585	Symplocaceae	Symplocos	sp.			A. P. Davis	816	8	5	1995	Papua New Guinea	
549	K000630595	Symplocaceae	Symplocos	botryantha	Franch.		X. Bai-Zhong	3700	15	7	2004	China	
550	K000630435	Tetrameristaceae	Tetramerista	glabra	Miq.		P. S. Ashton	BRUN 841	19	12	1957	Brunei	
551	K000630592	Pellicieraceae	Pelliciera	rhizophorae	Planch. & Triana		S. Hayes	76		6	1861	Panama	
552	K000630429	Pellicieraceae	Pelliciera	rhizophorae	Planch. & Triana		R. T. Pennington, N. Zamora & R. Aguilar	586	4	2	1995	Costa Rica	
553	K000630434	Mitrastemonaceae	mitrastemon	yamamotoi	Makion		M. Furuse	10277	22	11	1975	Japan	
554	K000630433	Theaceae	Camellia	japonica	L.		no coll.	s.n.	28	2	1935	British Isles	C. at Kew
555	K000630428	Theophrastaceae	Deherainia	smaragdina	(Planch. ex Linden) Decne.		DNA Bank Number, M. W. Chase 7869K				no date	British Isles	C. at Kew 1969-13985
556	K000097084	Hoplestigmataceae	Hoplestigma	pierreanum	Gilg.		G. Zenker	3383			1907	Cameroon	Syntype
557	K000097083	Hoplestigmataceae	Hoplestigma	pierreanum	Glig.		G. Zenker	2632			1903	Cameroon	Syntype
558	K000630432	Boraginaceae	Heliotropium	suaveolens	M.Bieb.	ssp. suaveolens	R. K. Brummitt & C. E. Powell	18743	14	10	1990	Greece	
559	K000630431	Hydrophyllaceae	Phacelia	hirsuta	Nutt.		R. A.Thompson, R. Rudman & F. L. Johnson	CO361	22	4	1989	USA	
560		Icacinaceae	Phytocrena	sp.			A. H. Talip & Ejan	SAN 85425	7	6	1977	Sabah	
561		Leptaulaceae	Gonocaryum	litorale	(Blume) Sleumer		J. Dransfield & S. Zona	JD7541	15	8	1995	Indonesia	
562		Leptaulaceae	Gonocaryum	sp.			E. R. Latupeirissa	94409	5	12	1994	Kalimantan	
563		Leptaulaceae	Gonocaryum	minus	Sleumer		L. L. Forman & J. B. Blewett	1084	26	10	1989	Brunei	
564	K000630457	Lennoaceae	Lennoa	madrepoides	Steud.		C. C. Parry & Ed. Palmer	568			1878	Mexico	
565	K000630459	Oncothecaceae	Oncotheca	balansae	Baill.		H. S. MacKee	37671	13	12	1979	New Caledonia	
566	K000630594	Vahliaceae	Vahlia	dichotoma	Kuntze		P. J. Greenway & Kanuri	13721	12	8	1969	Tanzania	
567	K000630456	Metteniusaceae	Metteniusa	tessmanniana	(Sleumer) Sleumer		G. P. Lewis, B. Merino & N. Aguirre	3447	13	8	1997	Ecuador	
568	K000630460	Eucommiaceae	Eucommia	ulmoides	Oliv.		no coll.	s.n.	8	5	1919	USA	C. Arnold Arboretum, Harvard University
569	K000630461	Eucommiaceae	Eucommia	ulmoides	Oliv.		no coll.	s.n.	4	11	1942	British Isles	C. Kew Arboretum, entry no. 911-30/ AA
570	K000630462	Garryaceae	Garrya	x Issaquahensis	Talbot ex E. C. Nelson		no coll.	s.n.	1	2	1980	Ireland	C. from seed supplied by Uni. of Washington, Isotype
571	K000630458	Aucubaceae	Aucuba	japonica	Thunb.		M. Furuse	10412	20	3	1976	Japan	
572	K000630509	Apocynaceae	Lepinia	solomonensis	Hemsl.		J. H. L. Waterhouse	213	27	7	1929	Solomon Islands	
573	K000630507	Apocynaceae	Mandevilla	cf. pohliana	(Stadelm.) A.H.Gentry		J. R. I. Wood, D. J. Goyder & N. Biggs	20050	19	11	2003	Bolivia	
574	K000630133	Apocynaceae	Ceropegia	speciosa	H.Huber		D. J. Goyder & A. J. Paton	3649	14	2	1992..	Malawi	
575	K000630501	Apocynaceae	Stapelia	gettleffii	R.Pott		L. C. Leach & H. H. & D. C. Mockford	12302	11	7	1964..	Mozambique	
576	K000630502	Gelsemiaceae	Mostuea	brunonis	Didr.		R. B. Drummond & J. H. Hemsley	3805	16	8	1953	Kenya	
577	K000630503	Gelsemiaceae	Mostuea	brunonis	Didr.		Frontier-Tanzania Costal Forest Research Prog.	474	23	1	1990	Tanzania	
578	K000630504	Pteleocarpaceae	Pteleocarpa	malaccensis	Oliv.		Maingay	s.n.			1867	India	
579	K000630505	Gentianaceae	Gentiana	sp.			J. R. I. Wood, D. J. Goyder	15448	14	12	1999	Bolivia	
580	K000171679	Gentianaceae	Fagraea	ceilanica	Thunb.		E. J. Lucas	40	24	11	2000	Indonesia	
581	K000630506	Loganiaceae	Strychnos	splendens	Gilg		no coll.	2191	4	10	1945	Portuguese Guinea	
582	K000176360	Rubiaceae	Coffea	ambongensis	J.-F.Leroy ex A.P.Davis & Rakotonas.		A. P. Davis & Rakotonas	68	14	2	1999	Madagascar	
583	K000630508	Rubiaceae	Coffea	arabica	L.		F. G. Meyer	8810	21	11	1964	Ethiopia	
584	K000466020	Rubiaceae	Coffea	brevipes	Hiern		O. Maurin	68	18	11	2002	Cameroon	
585	K000630590	Rubiaceae	Coffea	canephora	Pierre ex A.Froehner		P. Zadi Koubi	422	22	2	1984	Ivory Coast	
586		Rubiaceae	Vangueriopsis	shimbaensis	A.P.Davis & Q.Luke		W. R. Q. Luke	10894	22	1	2005	Kenya	
587	K000006428	Rubiaceae	Cinchona	macrocalyx	Pav. ex DC.		R. Spruce	s.n.		9	1859	Ecuador	quinine
588	K000630480	Acanthaceae	Ecbolium	viride	(Forssk.) Alston		I. Friis, S. Bidgood, M. Wondefrash & E. Getachew	10269	12	9	2001	Ethiopia	
589	K000630491	Avicenniaceae	Avicennia	marina	(Forssk.) Vierh.		F. R. Fosberg	48779	13	1	1968	Aldabra Island	
590		Bignoniaceae	Pithecoctenium	hexagonum	DC.		J. B. Hinton	7153	24	12	1934	Mexico	
591	K000630495	Buddlejaceae	Buddleja	globosa	C.Hope		no coll.	s.n.	12	5	1992	British Isles	Originally Chile, Kew accession no. 1991-1834
592	K000630499	Byblidaceae	Byblis	gigantea	Lindl.		A. Morrison	8551	14	12	1898	Australia	
593	K000630494	Calceolariaceae	Calceolaria	glacialis	Wedd.		no coll.	s.n.	1	5	2002	British Isles	Originally South America, C. at Kew acc. No.1996-905
594	K000630500	Callitrichaceae	Callitriche	stagnalis	Scop.		H. G. Tedd	961	1	4	1933	Turkey	
595	K000630497	Callitrichaceae	Callitriche	stagnalis	Scop.		F. Schultz	s.n.			1863	France	
596	K000630493	Carlemanniaceae	Carlemannia	griffithii	Benth.		B. B. Osmastou	s.n.	16	9	1903	India	
597	K000630492	Carlemanniaceae	Carlemannia	griffithii	Benth.		J. Sykes Gamble	3740A		10	1872	Tibet	
598	K000630498	Cyclocheilaceae	Cyclocheilon	somaliense	Oliver		Thulin, Eriksson, Gifri & Langstrom	8364	13	10	1992	Yemen	
599	K000285748	Gesneriaceae	Streptocarpus	hirtinervis	C.B.Clarke		A. Gassner & P. Cribb	133	27	1	1982	Malawi	
600	K000285749	Gesneriaceae	Streptocarpus	hirtinervis	C.B.Clarke		J. D. Chapman	H/677	7	7	1958	Malawi	
601	K000630496	Globulariaceae	Globularia	trichosantha	Fisch. & C.A.Mey.		P. Furse	2246	24	5	1962	Iran	
602	K000630510	Hippuridaceae	Hippuris	vulgaris	L.		B. T. Lowne	s.n.	19	7	1906	British Isles	
603	K000630511	Lamiaceae	Salvia	quitensis	Benth.		The Oxford Expedition	66			1981	Ecuador	
604	K000630512	Lamiaceae	Lavandula	angustifolia	Mill.		no coll.	s.n.	31	7	2000	British Isles	C. at Kew, Kew accession no. 1997-6042
605	K000630489	Lamiaceae	Clerodendrum	myricoides	R.Br		E. Polhill	54	6	2	1964	Kenya	
606	K000630571	Lentibulariaceae	Utricularia	stellaris	L.f.		H. I. Aston	2297	25	5	1982	Australia	
607		Martyniaceae	Martynia	althaeifolia	Benth		A. C. Macdonald	H 309-25	11	3	1925	Peru	
608	K000630471	Myoporaceae	Eremophila	alternifolia	R.Br		P. Luff	s.n.	2	10	1960	Australia	
609	K000630558	Nesogenaceae	Nesogenes	sp.			C. H. Jongkind & S. Rapanarivo	968	22	5	1993	Madagascar	
610	K000630477	Oleaceae	Jasminum	floribundum	R.Br. ex Fresen.		no coll.	s.n.	13	8	1957	British Isles	Originally from Kenya, entry no. 154/48 C. at Kew
611	K000251161	Oleaceae	Olea	europaea	L.						1350-1400 BC	Egypt	Section of Olive leaf wreath from Tutankhamun's tomb
612	K000251161	Oleaceae	Olea	europaea	L.		P. Newberry	s.n.			1930's	Egypt	
613	K000630479	Oleaceae	Fraxinus	excelsior	L.		Mr. E. Thurston	s.n.	6	9	1908	British Isles	
614		Pedaliaceae	Uncarina	grandidieri	(Baill.) Stapf.		O'Fanell	416/39	15	9	1970	Madagascar	C.
615	K000630478	Phrymaceae	Phryma	leptostachya	L.		M. Furuse	14970	9	8	1982	Japan	
616	K000630467	Plantaginaceae	Plantago	lanceolata	L.		A. J. Crosfield	s.n.	4	5	1889	British Isles	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
617	K000630469	Plocospermataceae	Plocosperma	buxifolium	Benth.		W. D. Stevens, P. P Moreno	18492	18	11	1980	Nicaragua	
618	K000630465	Schlegeliaceae	Schlegelia	darienensis	Sandwith		D. Neill & QCNE botany interns	11411	28	8	1998	Ecuador	
619	K000630468	Scrophulariaceae	Digitalis	purpurea	L.		Rev. L. Darwell	s.n.	7	8	1832	British Isles	
620	K000630470	Stilbaceae	Campylostachys	cernua	(L.f.) Kunth.		DNA Bank voucher M.W. Chase 5719K				no date	no location	
621	K000630474	Symphorematceae	Sphenodesme	ferruginea	(Griff.) Brig		A. G. F. Kerr	6866	4	4	1923	Thailand	C.
622	K000630472	Tetrachondraceae	Tetrachondra	hamiltonii	Petrie		Dr. Petrie	s.n.	1	10	1892	New Zealand	Type Collection
623	K000630469	Thomandersiaceae	Thomandersia	hensii	De Wild. & T.Durand		R. W. Carroll	1008	15	2	1988	Central African Republic	
624	K000630490	Trapellaceae	Trapella	antennifera	(H.Lév.) Glück		M. Togasi	1256	14	9	1955	Japan	
625	K000630481	Verbenaceae	Glandularia	sp.			J. R. I. Wood & D. J. Goyder	15836	22	1	2000	Bolivia	
626	K000630487	Convolvulaceae	Calystegia	sepium	R.Br.		no coll.	s.n.			1864	British Isles	
627	K000630485	Hydroleaceae	Hydrolea	ovata	Nutt.		R. Ohlsson-Salmon	108	1	10	2007	USA	
628	K000630486	Montiniaceae	Grevea	madagascariensis	Baill.		J. Leandri	2643	21	1	1960	Madagascar	
629	K000630483	Solanaceae	Solanum	melongena	L.		Sir A. G. & Lady Bourne	s.n.	24	2	1900	India	C.
630	K000630482	Solanaceae	Solanum	melongena	L.		Herbarium J. Gay	s.n.		4	1825	India	C.
631	K000005403	Solanaceae	Solanum	cheesmaniae	(L. Riley) Fosberg		C. Darwin	s.n.			1835	Galapagos Islands	
632	K000630484	Sphenocleaceae	Sphenoclea	zeylanica	Gaertn.		B. Anderson	1873	22	11	1969	Colombia	
633	K000630488	Bruniaceae	Nebelia	sphaerocephala	Kuntze		J. P. Rourke	1049	25	2	1968	South Africa	
634	K000630475	Columelliaceae	Columella	oblonga	Ruiz & Pav.		J. R. I. Wood	11070	12	5	1996	Bolivia	
635	K000630476	Columelliaceae	Columella	oblonga	Ruiz & Pav.		no coll.	s.n.			1894	British Isles	Originally Peru C. at Kew Bot. Mag. 6183
636	K000630569	Desfontainiaceae	Desfontainia	spinosa	Ruiz & Pav.		G.P. Lewis & P. Lozano	2718	25	10	1996	Ecuador	
637	K000630466	Defontainaceae	Desfontainia	spinosa	Ruiz & Pav.		Purdie	633			1826	Colombia	
638	K000630517	Escalloniaceae	Escallonia	tucumanensis	Hosseus		no coll.	s.n.	9	7	1966	British Isles	Originally Jucuman, Veruccrst 6833, C. at Kew,
639	K000630516	Escalloniaceae	Forgesia	racemosa	J.F.Gmel.		F. Friedmann	613	18	11	1970	Reunion	
640	K000630519	Paracryphiaceae	Paracryphia	alticola	(Schltr.) Steenis		Mackee	21541	11	2	1970	New Caledonia	
641	K000630515	Paracryphiaceae	Paracryphia	alticola	(Schltr.) Steenis		G. Mc Pherson	4763	1	8	1982	New Caledonia	
642	K000630464	Quintiniaceae	Quintinia	sp.			Wormesley & Floyd	6122	17	11	1954	Papua New Guinea	
643	K000630513	Sphenostemonaceae	Sphenostemon	papuanum	(Lauterb.) Steenis & Erdtm.		E. A. Widjaja & T. Partomihardjo	EAW 7023	19	8	1997	Indonesia	
644	K000630514	Sphenostemonaceae	Sphenostemon	papuanum	(Lauterb.) Steenis & Erdtm.		A. N. Millar & D. Sayers	NGF 23731	22	8	1964	New Guinea	
645	K000630518	Sphenostemonaceae	Sphenostemon	papuanum	(Lauterb.) Steenis & Erdtm.		R. D. Hoogland & R. Pullen	6062	29	8	1956	New Guinea	
646	K000630538	Apiaceae	Angelica	gmelinii	(DC.) Pimenov		Rev. P. Faurie	1148	4&5	8	1886	Japan	
647		Araliaceae	Schefflera	pachystyla	Harms		W. R. Philipson & M. N. Philipson	3278	7	8	1968	New Guinea	
648	K000630523	Griseliniaceae	Griselinia	ruscifolia	(Clos) Taub.		R. O. Cunningham	s.n.	25	11	1868	South America	
649	K000630522	Melanophyllaceae	Melanophylla	crenata	Baker		M. G. Cours	4717		4	1954	Madagascar	
650	K000630525	Myodocarpaceae	Myodocarpus	fraxinifolius	Brongn. & Gris		M. Balansa	2869			1868-1870	New Caledonia	
651	K000630520	Pennantiaceae	Pennantia	corymbosa	J.R.Forst & G.Forst		G. Loh	359121	10	12	1978	New Zealand	
652	K000352176	Pennantiaceae	Pennantia	corymbosa	J.R.Forst & G.Forst		S. McDonald & M. Morris	123	12	3	2006	New Zealand	
653	K000630524	Pittosporaceae	Pittosporum	tobira	[Dryand.]		M. Furuse	1357	29	9	1972	Japan	
654	K000630521	Torricelliaceae	Torricellia	angulata	Oliv.		E. H. Wilson	581		4	1900	China	
655	K000630570	Aquifoliaceae	Ilex	aquifolium	L.		no coll.	s.n.	26	1	1897	British Isles	
656	K000630586	Aquifoliaceae	Ilex	aguifolium	L.		ex garden of Mrs E. Kleinwort, Hayworths Heath	s.n.	29	11	1985	British Isles	C. at Kew, shown at RHS
657	K000630556	Cardiopteridaceae	Cardiopteris	quinqueloba	Hassk.		H. B. G. Garrett	1205	13	12	1940	Thailand	
658	K000630557	Cardiopteridaceae	Cardiopteris	moluccana	Blume		Dr. Meyer	s.n.		6	1884	Tanimbar Islands	
659	K000630555	Helwingiaceae	Helwingia	himalaica	Hook.f. & Thomson ex C.B.Clarke		no coll.	K016	26	4	1981	China	
660	K000630554	Helwingiaceae	Helwingia	himalaica	Hook.f. & Thomson ex C.B.Clarke		A. Henry	9032			pres'd 1898	China	
661	K000630552	Phyllonomaceae	Phyllonoma	ruscifolia	Willd. ex Schult.		A. F. Skutch	2974		12	1936	Costa Rica	
662	K000630553	Stemonuraceae	Stemonurus	scorpioides	Becc.		no coll.	271	24	1	1899	Indonesia	C.
663	K000630559	Alseuosmiaceae	Crispiloba	disperma	(S.Moore) Steenis		L. W. Jessup, J. G. Tracey & A. K. Irvine	308	4	2	1981	Australia	
664	K000630560	Alseuosmiaceae	Crispiloba	disperma	(S.Moore) Steenis		B. Hyland	9171	11	11	1976	Australia	
665	K000630561	Alseuosmiaceae	Crispiloba	disperma	(S.Moore) Steenis		B. Gray	948	21	3	1978	Australia	
666	K000630533	Argophyllaceae	Corokia	cotoneaster	Raoul		L. Travers	50			1861	New Zealand	
667	K000630532	Argophyllaceae	Corokia	cotoneaster	Raoul		no coll.	s.n.	18	5	1911	British Isles	Originally New Zealand, C. in Britian
668	K000630531	Argophyllaceae	Corokia	cotoneaster	Raoul		A. E. Wright	8950	25	5	1989	New Zealand	
669		Asteraceae	Phaenocoma	prolifera	D. Don		Kew Accession Number 1995-240		14	8	1995	South Africa	C. at Kew
670	K000630563	Asteraceae	Stifftia	fruticosa	(Vell.) D.J.N.Hind & Semir		G. P. Lewis, H. C. de Lima & S. Faria	s.n.	3	7	1997	Brazil	C. Botanic Garden
671	K000630564	Asteraceae	Helianthus	annuus	L.		R. K. Brummitt & N. A. Brummitt	20360	16	8	1999	USA	
672	K000630526	Asteraceae	Helianthus	annuus	L.		D. Mc Clintock	s.n.	11	10	1972	British Isles	C.
673	K000630565	Asteraceae	Bellis	annua	L.		E. Reverchon	s.n.			1883	Crete	
674	K000630566	Asteraceae	Bellis	perennis	L.		L. Favrat & W. Barbey	s.n.	8	5	1864	France	
675	K000630562	Asteraceae	Evax	pygmaea	Brot.		Gabr. Strobl.	s.n.	13	5	1871	Romania	
676	K000630527	Calyceraceae	Gamocarpha	poeppigii	DC.		H. J. Elwes	s.n.	27	1	1902	Chile	
677	K000630567	Campanulaceae	Campanula	punctata	Lam.		no coll.	s.n.	2	7	1981	British Isles	Originally Japan, C. at Kew acc. no 350 79 03281
678	K000630568	Campanulaceae	Lobelia	excelsa	Bonpl.		no coll.	s.n.	20	6	1990	British Isles	Originally Chile, C. at Kew acc. no 183 89 01265
679	K000630528	Goodeniaceae	Scaevola	auriculata	Benth		DNA Bank Voucher 2753 & 2982 M.W. Chase				no date	British Isles	C. at Kew LCD 1994-2938 & 1994-2938
680	K000630534	Menyanthaceae	Menyanthes	trifoliata	L.		E. Reverchon	s.n.		6	1870	Switzerland	
681	K000630537	Pentaphragmataceae	Pentaphragma	grandiflorum	Kurz		R. D. Hoogland & L. A. Craven	10750	29	7	1966	New Guinea	
682	K000630530	Phellinaceae	Phelline	billardierei	Pancher ex Loes.		Vieillard	350351			1861-67	New Caledonia	
683	K000630529	Rousseaceae	Roussea	simplex	Sm.		Rottler	s.n.			no date	Mauritius	
684	K000630536	Stylidiaceae	Stylidium	schoenoides	DC.		A. Strid	20605	29	9	1982	Western Australia	
685	K000060581	Stylidiaceae	Stylidium	pycnostachyum	Lindl.		E. Pritzel	884			1901	Australia	
686	K000630535	Stylidiaceae	Stylidium	nungarinense	S. Moore		J. Wedge & N. Siemon	JAW 269	11	10	1996	Western Australia	
687	K000060719	Stylidiaceae	Stylidium	spathulatum	R.Br		Dr. Bower	s.n.			1858	Western Australia	
688	K000060020	Donatiaceae	Donatia	fascicularis	J.R.Forst. & G.Forst.		S. Routledge	s.n.			1913	Patagonia	
689	K000060021	Donatiaceae	Donatia	fascicularis	J.R.Forst. & G.Forst.		Dr Coppinger	s.n.		2	1882	Straits of Magellan	H.M.S Alert
690	K000630551	Adoxaceae	Adoxa	moschatellina	L.		C. C. Townsend	33	28	4	1947	British Isles	
691	K000630549	Caprifoliaceae	Lonicera	etrusca	Santi		K. Abulaila, S. Saifan & Z. Tehabshem	2008JOR16-4	3	7	2008	Jordan	
692	K000493636	Caprifoliaceae	Lonicera	fragrantissima	Lindl. & Paxton		no coll.	s.n.	16	3	2009	British Isles	Originally China, C. at Kew, acc. no.1973-20110
693	K000630550	Caprifoliaceae	Lonicera	microphylla	Willd ex Schult.		C. C. Townsend	86/141	8	5	1986	USSR	

Key	Barcode	Family	Genus	Species	Authority	Infraspecific name	Collector	Number	Day	Month	Year	Location	Cultivated and other notes
694	K000630548	Caprifoliaceae	Lonicera	tangutica	Maxim.		Potarin	s.n.	19	7	1893	Tibet	
695	K000630544	Dipsacaceae	Dipsacus	sylvestris	Huds.		Sintenis	431	4	8	1873	Turkey	
696	K000630545	Dipsacaceae	Dipsacus	sylvestris	Huds.		no coll.	s.n.		8	1900	British Isles	
697	K000630543	Morinaceae	Morina	sp.			J. F. Rock	24980		4 to 5	1932	China	
698	K000630541	Valerianaceae	Kentranthus	sp.			Davis	22685	14	7	1954	Turkey	
699	K000630542	Sambucaceae	Sambucus	nigra	L.		Churchill	s.n.			1864	British Isles	
700	K000630539	Sambucaceae	Sambucus	nigra	L.		C. A. Smith	6079		7	1918	British Isles	
701	K000630540	Sambucaceae	Sambucus	nigra	L.		W. J. Bean	s.n.	8	9	1907	British Isles	C. at Kew
702	K000630546	Triplostegiaceae	Triplostegia	glandulifera	Wall. ex DC.		A. J. C. Grierson & D. G. Long	2734	19	7	1979	Bhutan	
703	K000630547	Viburnaceae	Viburnum	carlesii	Hemsl. ex Forb. & Hemsl.		DNA Bank Voucher 19170 M. W. Chase		24	3	2004	British Isles	Originally South Korea, C. at Kew acc. no. 1987-1718

Appendix Three

Comments on the *'HSP'* from the visitors book and email

First page of painting on display March 2007

It is an incredible selection of specimens, details and colours are fantastic. Looking forward to the next page.
Guillaume G.

Well done Rachel- a massive undertaking. It will be interesting to see the progression of form and shapes as you move through the families.
Lucy Smith

I'm very pleased to see the 1st final botanical illustration of your creative research. It is a wonderful rendering of each specimen selected by you. A wonderful composition that draws the viewer into a fascinating journey of discovery and joy of the natural forms. Thanks for making this visible to all of us!!
Marcela Montoya- Turnill

Well we know what you can so with beans but this is a whole different concept! Stunning and we are all proud of you.
Brian Schrire

Fantastic painting!
Chris Bisson

Wow Rachel, its amazing! I love the Aristolochia and Annon fruit- in fact all of it and perhaps monocots are exciting after all…! I cant wait for the next one- it's a giant game of botanical challenge.
Gemma Bramley

Have you considered King Tuts olives?! (Oleaceae)
Eve Lucas

An accurate & highly original take on plant evolutionary relationships. Compulsive viewing!
David Goyder

The realism and detail of your botanical artwork must be unmatched! One has to look very closely to see you have not actually mounted specimens! The concept is also very interesting; I say nothing of the ambition that must be behind it. And few exhibits could be more a elegant defence of the importance of the herbaria of the world. I admire you!
Aljos Farjon (who only does conifers)

Beautiful
Annon.

Thrilling and I wish I had room to accommodate a print to accompany the earlier seeds!
Mary Fear Hill

Will you paint me one?
Annon.

Stunning! The detail and colouring is amazing, Love it
Tracey Wells

Once again Rachel has broken the boundary by moving the art of the botanist into a new genre.
This one of seven pieces records a creative concept to scientific illustration, using the specimen collections of the Kew Herbarium in a unique manner. Amazing work Rachel and six more paintings to come!
Marilyn Ward

This is a fascinating painting and needs lots of looking at to appreciate all the specimens. I would be nice to have the diagrammatic key to help ‘read’ it. I love the muted and harmonious colours and the delicate textures, especially the thin transparent parts. I was concerned about the right hand edge being torn but am told you intended it to be like that. I

wonder if you kept a photo of it as it was before being separated? I look forward to seeing the next part of it…. With best wishes,

Christabel King

Stunning- something really unique and remarkable. Following on from Eve's suggestion, you could incorporate lots of the noteworthy specimens, e.g. Darwin material, Livingstone scraps, Wallace specimens (maybe hard to find outside ferns and palms) – ask around. Neil Brummitt is a mine of information on such matters.

Bill Baker

Very Beautiful! The brown colours give an antique/ fantasy quality.

Grace Prendergast

It seems amazing to me that in an art form with such a long history, such a fresh approach and a new standard of technical excellence have appeared. But I would like to have a key to help identify some families. I hope you will also consider how your amazing work might be used in teaching family recognition, even if that is not your main aim.

Helen Fortune

Wow!

Sally Bidgood

Very Beautiful I would love to have your eye- incredible detail

Clare Keogh Ireland

Whole painting on display 16th & 17th November 2009

Amazing detail and scope- awe inspiring

Fiona Ainsworth

Iiex aquifolium fruit and Desfontainia speciosa foliage see me

Susyn Andrews

I am privileged to have been to the ‘first view’ of this exquisite and extremely professional artistic- scientific work. Thank you for this opportunity- much love,
***Lulu Rico*-Arce**

Most amazing exhibition, full of talent and promise
Pandora Sellars

Absolutely breathtaking seeing it in one long piece for the first time. Wonderful to see every family- especially the strange obscure and boring given the same meticulous treatment as the showy. [as we mentioned, check the bracteoles on the Symplocos] Congratulations,
Tim Utteridge

An absolute joy!
Lin Tucker

Spectacular piece- each a work of art in and of itself. I feel so privileged to have seen the opening- what a joy!
Ruth Stiff

Painting on display November 2010

A spectacular piece of work! With the emphasis on characters and not just type work is excellent. The fact that there’s also illustrations of a lot of rare and few- species families adds value.
Best of luck with your dissertation! With work like this it should be a walk in the park!

Amazing to see such a beautiful artwork that I can also learn about the amazing history of plants! Amazing commitment to a worthwhile and original idea and wonderful to see it here in Kew where it has all been drawn from, especially in an age when modes of classification are changing so much, thought- provoking, beautiful and inspiring- well done
Gemma Anderson

Comments by email

Good to hear the painting's finished…congratulations! It's one of the most beautiful and conceptually sophisticated pieces of work I've ever seen- you should be very proud of it.
Dan Fern

Although I said it when I came to see your painting last Tuesday, I just wanted to put in writing that I thought it was stunning.
I know I am not a botanist but it was very easy for me to recognise a lot of the individual items on the painting. They were done with such care & were also very.beautiful. I hope that you do very well with your PhD.
Angela Bond

Appendix Four

Copy of consent form for interviews

The interview consent document has been signed by the following artists that were interviewed in person-

Elaine Duigenan
Mark Fairnington
Rob Kesseler
Fred Langford Edward
Lyndall Phelps
Greg Pryor
Robyn Stacey
Areta Wilkinson

For further information
Supervisors:
Prof. Dan Fern dan.fern@rca.ac.uk
Dr. Eve Lucas e.lucas@kew.org

'The Glow of significance: Narrating Stories using Natural History Specimens'

Interview Information Sheet

Dear Participant,

I am a student in the Communication Art and Design Department. As part of my studies, I am conducting a research project entitled *'The Glow of significance: Narrating Stories using Natural History Specimens'.* You have already been interviewed for this research project which explores how artists are using images of natural history specimens to narrate historical, scientific and object-based issues.

I am writing to ask for your consent to use quotes in my thesis from the interview/s I have conducted with you. My research is of a positive nature commenting on the benefits of such artwork. if you wish I am happy to provide you will any sections of my draft thesis which contain your comments before you sign the consent form.

All the information gathered from interviews will be stored securely, and your opinions will be accurately represented. Any images of your artwork will be clearly identified and only used with your consent.

If you have any concerns or would like to know the outcome of this project, please contact myself or either of my supervisors Dan Fern/ Eve Lucas at the above email addresses.

Thank you for your involvement,

Rachel Pedder-Smith

Complaints Clause:
This project follows the guidelines laid out by the Research Ethics Code of the Royal College of Art.

If you should have any concerns about your rights as a participant in this research, or you have a complaint about the manner in which this research is conducted, it may be given to the researcher or, if an independent person is preferred, addressed to the Research Ethics Committee of the Royal College of Art at the above address.

For further information
Supervisors:
Prof. Dan Fern dan.fern@rca.ac.uk
Dr. Eve Lucas e.lucas@kew.org

'The Glow of significance: Narrating Stories using Natural History Specimens'

Interview Consent Form

I *(please print)*……have read the information on the research project *'The Glow of significance: Narrating Stories using Natural History Specimens'* which is to be conducted by Rachel Pedder-Smith from the Royal College of Art.

I agree to voluntarily participate in this research by interview and give my consent freely. I understand that the project will be conducted in accordance with the Information Sheet, a copy of which I have retained.
I understand that I can withdraw from the project at any time, without penalty, and do not have to give any reason for withdrawing.

I consent to Rachel Pedder-Smith using quotes and opinions expressed in my interview/s in her PhD thesis.

I understand that all information gathered from my interview will be stored securely, my opinions will be accurately represented. Any images of my artwork will be clearly identified and only used with my consent.

Print Name:……..

Signature…….

Date: …….

This project will be conducted in compliance with the Research Ethics Code