



NatSCA

Natural Sciences Collections Association

<http://www.natsca.org>

NatSCA News

Title: The Odontological Collections at the Royal College of Surgeons of England

Author(s): Milly Farrell

Source: Farrell, M. (2010). The Odontological Collections at the Royal College of Surgeons of England. *NatSCA News, Issue 19*, 77 - 81.

URL: <http://www.natsca.org/article/125>

NatSCA supports open access publication as part of its mission is to promote and support natural science collections. NatSCA uses the Creative Commons Attribution License (CCAL) <http://creativecommons.org/licenses/by/2.5/> for all works we publish. Under CCAL authors retain ownership of the copyright for their article, but authors allow anyone to download, reuse, reprint, modify, distribute, and/or copy articles in NatSCA publications, so long as the original authors and source are cited.

The Odontological Collection at The Royal College of Surgeons of England

Milly Farrell

Assistant Curator, The Royal College of Surgeons,
35-43 Lincoln's Inn Fields, London, WC2A 3PE
Email: mfarrell@rcseng.ac.uk

Abstract

The Odontological Collection at The Royal College of Surgeons of England is a large research source that contains a variety of both animal and human cranial material. Accumulated over the past two centuries, the collection now consists of over 11,000 specimens that are used by researchers in a diverse range of fields. The array of species represented presents many possibilities for comparative anatomy studies. Although stored in species order, the material has been categorised into two groups; those displaying growth of the teeth and jaws, and those displaying pathology or malformation. The most extensive aspect is the primate collection, which consists of approximately 3,000 complete skulls that encompass every extant genus. This material is of particular relevance to those involved in the natural sciences. Catalogue details are available on the online catalogue 'Surgicat' (<http://surgicat.rcseng.ac.uk/>).

Key words: Comparative Anatomy, Evolutionary Anthropology, Odontology.

Introduction

The Royal College of Surgeons of England houses two museums; The Hunterian Museum and The Wellcome Museum of Anatomy and Pathology. The Hunterian Museum is our public museum which is open to all visitors. The Wellcome Museum supports medical training and can only be accessed by medical professionals or students on recognised courses in medicine and allied health subjects. It is these two institutions with which The Royal College of Surgeons is commonly associated. However, stored away from the public realm is the extensive Odontological Collection, which contains a vast array of human and animal cranial material. Of the over 11,000 specimens approximately two thirds are animal, representing a wide range of genera which is largely mammalian. Those involved in evolutionary anthropology have found the collection to be particularly valuable, specifically with regards to the primate skulls which are both diverse in species and extensive in number. This short article will provide a brief overview of the history and contents of the collection, with a particular focus on the animal material. It is hoped that this summary will be of interest to those involved directly or indirectly in the natural sciences and will encourage readers to direct those researching relevant spheres towards the Odontological Collection. Every item is recorded on our online catalogue 'Surgicat' (<http://surgicat.rcseng.ac.uk/>). However, as this is work in progress, not all of the animal specimens have a thorough description or image attached as of yet.

History to the collections

The collection has been accrued over the past two centuries and was founded by the former Odontological Society of Great Britain (now the Royal Society of Medicine, Odontological Section). As such, the original purpose of the collection was to aid training and research in dental development and growth. Such training was not to be focused on the human dentition alone and the donation of natural history specimens towards expansion of this collection was encouraged. Proof of this can be found in the original transactions of the Society, which state that the first acquisition to the collection was of a Hippopotamus skull donated in 1859. From here the accumulation of such material continued and although the fields of research using the material have diverged from dentistry alone, the original purpose of the collection in supporting scientific investigation has remained unchanged.

At present, the largest mammal specimens include a killer whale mandible (*Orcinus orca*), several Asian elephant skulls (*Elephas maximus*) and an array of both hippopotamus (*Hippopotamus amphibious*) and rhinoceros (*Rhinoceros unicornis*) skulls. Conversely, the smallest mammal skull in the Odontological Collection is from the chiroptera material and is of a fruit bat of the genus *Artibeus* (Fig. 1). At present the non-human primate collection contains almost 3,000 complete skulls which range from the largest in the world, the mountain gorilla (*Gorilla gorilla*) to one of the smallest, the greater dwarf lemur (*Cheirogaleus major*). Mammals make up the bulk of the material although a wide variety of other vertebrates are represented. Such a diversity of species holds great potential for further phylogenetic studies.



Fig. 1. Fruit bat skull. From the genus 'Artibeus' (Image copyright Royal College of Surgeons)

The variety of Ivory

The Odontological Collection contains over 250 ivories from a range of both terrestrial and marine mammals (Fig. 2). Most are fragmented or complete tusks although a few are carved dentures which have been fashioned from hippopotamus (*Hippopotamus amphibious*) ivory. Twentieth century dentures were commonly made from hippo ivory, as the tusk has a very thick enamel sheath making the denture much more durable under the stresses of mastication. A selection of these ivories has recently gone on temporary display within the Royal College of Surgeon's Inner hall which can be viewed by any college visitor.



Fig. 2. A selection of Ivory specimens from the Odontological Collection. The complete skull is of a tusked Babirussa (*Babirussa babirussa*). Items on the right hand side show elephant tusk segments with embedded weapons and reparatory reaction. The foreground left images show the tip of a hippo tusk alongside nineteenth century dentures carved from hippo ivory. (Image copyright Royal College of Surgeons)

The aim of the small display is to indicate the wide range of ivory-forming mammals, particularly as a common assumption is that ivory is solely derived from elephants and mammoths. The array in tusked mammal specimens represented by the Odontological Collection includes a variety of toothed whales and tusked pigs, alongside walrus (*Odobenus rosmarus*) and dugong (*Dugong dugon*) specimens. Furthermore, several of the elephant and mammoth tusks and teeth display pathologies such as cysts and infections. An interesting collection of elephant tusk portions has also been accumulated that reveal imbedded weapons such as a spear tip or iron bullet, inevitably used in poaching attempts. It is clear from the reparatory reaction of the dentine that each animal has consequently survived the attack and in some instances the segment of weapon has been nearly ejected from the tooth by the secondary dentine (Figs. 3 and 4).



Fig.3. Segment of elephant ivory with iron bullet. A thin extension of reparatory dentine has grown in reaction to the entry and pathway of the bullet. (Image copyright Royal College of Surgeons)



Fig. 4. Portion of elephant tusk showing the pathway of a bullet. Secondary dentine has grown in reaction to the bullet's pathway and has extended from the entry point through to the opposite surface of enamel where the bullet remains embedded in the tusk sheath. (Image copyright Royal College of Surgeons)

Rare specimens

For those involved in extinction studies, the Odontological Collection may prove of interest given its selection of almost 200 fossils encompassing a variety of specimens from the woolly rhino (*Coelodonta antiquitatis*) to the megalodon shark (*Carcharocles megalodon*). Furthermore, of the eleven thylacine specimens (*Thylacinus cynocephalus*), four are complete and undamaged skulls. Given present climate shifts and the affect environmental change is having on the natural world, the wide range of skulls, teeth and jaws of endangered species contained within the Odontological Collection add further value to this extensive resource. At present the collection holds skulls of many near-extinct animals such as the black rhino (*Diceros bicornis*), giant panda (*Ailuropoda Melaneuca*) and tiger (*Panthera tigris*). These specimens are to be recatalogued in due course so that prospective researchers can achieve easy access to images and a full description online before arranging a visit.

Extensive primate collections

The primate collection has formed the basis of several investigations in evolutionary anthropology. Such studies have benefitted from both the wide variety of species type and the extensive quantity of inter species skulls. The non-human hominid material encompasses all of the great apes. Patterns of growth can be noticed in both the teeth and cranial bones and such comparability can then be contrasted to the few instances of pathology and/or trauma. Minor calculus deposits and dental caries are noticeable in several specimens, through to marked pathology such as gross infection of the facial bones leading to osteomyelitis, as seen in one adult male gorilla (Fig. 5). Of the smaller primates, work is in progress on updating taxonomy records so that external researchers can access a clear list of all of the species represented in the collections, which can then be made available for further study in the museum department's laboratory. At present conservation and curatorial work on the primates is underway, which includes an extensive reboxing plan (funded by the Royal Society of Medicine, Odontological Section) and the drafting of new descriptions



Fig. 5. Adult male gorilla skull. This skull shows ante-mortem trauma to the maxillae and right zygoma which has resulted in osteomyelitis extending to the frontal bone. The maxillary incisors have been lost as a result of this trauma. (Image copyright Royal College of Surgeons)

and pathology reports for each skull. Such analysis has unearthed non-metric traits such as supernumerary teeth and metopic sutures alongside a variety of pathologies. All of the old paper catalogue records for these 2000 plus primates have been individually scanned and attached to their respective electronic record. As such the primate collection has a more thorough description available online than that of the avian, reptilian and fish material.

A major part of the collection, consisting of over 1000 specimens, was bequeathed to the college by the late primatologist William Osman-Hill (1901-1975). As a lifelong collector of natural history, Osman-Hill had a passion for zoology which is clearly represented by the material bequeathed into RCS care. In contrast to the majority of the Odontological material, Osman-Hill's collection encompasses specimens from all anatomical aspects including some wet preparations, skins and complete skeletons. In some instances Osman-Hill collected assortments of a specific anatomical feature, such his selection of penis bones which total almost 90 in number and range in species from the walrus (*Odobenus rosmarus*) to the bush baby (*Otolemur crassicaudatus*).

Summary

In conclusion, the intention of this short article is to convey the extent of the faunal material held within the Odontological Collection and the possibilities this material may hold for current research. At present a variety of disciplines have found a use for the Odontological Collection and hopefully will continue to do so given the improvements being made to both storage and online documentation. As an establishment dedicated to surgical training, the natural science collections of the Royal College of Surgeons are often overlooked. It is hoped that this brief review has provided a small glimpse into the sheer scope of this material, which is currently underused despite its immense variety and excellent preservation.