

Brief Communication: A Unique Dental Resource: The Odontological Collection at the Royal College of Surgeons of England

Milly Farrell*

The Royal College of Surgeons of England.

ABSTRACT This report describes the development of a searchable electronic data base of the dentally-relevant holdings of the Royal College of Surgeons of England. This odontological collection is accessible through the

world wide web at <http://surgicat.rcseng.ac.uk/>. Highlights of a few of the holdings are described here along with information for accessing the collection. *Dental Anthropology* 2009;22(3):93-95.

The Odontological Collection at the Royal College of Surgeons of England is a vast research source consisting of a wide range of cranial and dental material. Over 10,000 human and animal specimens are contained in the collection, all of which can be searched online and made available to researchers visiting the College by prior appointment. Two themes are covered by the collection: (a) specimens displaying pathologies of the teeth and jaws and (b) material illustrative of dental development and growth. Specimens displaying pathological conditions include a range of congenital, metabolic, and infectious diseases in addition to examples of maxillofacial trauma. Developmental material includes human specimens from foetus to adult and a range of animal material that has the potential for extensive comparative anatomical studies. The diversity and ready availability of the Odontological Collection make it useful to researchers from a range of disciplines. This article presents a brief history to the collection, reviews its contents, hopefully, discloses its potential for academic investigation. Details also are provided as to how to locate and navigate around the online catalogue 'Surgicat' to perform general or specific searches.

The origin of the collection dates back to the 1850s when the Odontological Society of Great Britain was founded. Four years later the College of Dentists was absorbed into this Society, leading to the creation of a museum. In the early 1900s the Odontological Society was incorporated into the newly-formed Royal Society of Medicine as its Odontological Section. The Society's collection was placed on loan to the Royal College of Surgeons in 1909, and in 1943 the collection was transferred to the College on a permanent basis. Transference was a goodwill gesture towards reconstitution of the museum, which was grievously damaged by bombing in 1941. Dental material from several sources has been collated throughout the last two



Fig. 1. The maxillae and mandible of a child aged 7 years 3 months, showing the developing dentition. The outer surface of the alveolar bone has been removed to expose the stages of development and eruption of each tooth type. From the collection of Sir John Tomes.

Correspondence to: Milly Farrell, Assistant Curator, Museums, The Royal College of Surgeons of England, 35-43 Lincoln's Inn Fields, London WC2A 3PE, Great Britain
E-mail: mfarrell@rcseng.ac.uk



Fig. 2. Five molar teeth from different individuals showing enamel pearls in the region of the root furcation.

centuries, the majority having originated from eminent surgeons, dentists, and zoologists who made regular donations to this ever increasing research source.

Significant figures in the field of dentistry made regular contributions to the collection, often of personally prepared skeletal material that exposes root formation or developing permanent teeth (Fig. 1). Such individuals include the seminal dentists Sir John Tomes, his son Charles, and Sir Edwin Saunders. Some specimens are of particular historical interest, such as the short twine necklace of 38 human teeth brought back from the Congo River by the explorer Henry Morton Stanley, and the selection of teeth retrieved from soldiers in 1815 who perished during the battle of Waterloo. The most recent contribution was Sir Winston Churchill's dentures, donated in 2000.

Some of the human material is archaeological in acquisition. Those obtained through excavation include the over 100 skulls assessed by A. E. W. Miles in order to formulate his renowned dental ageing chart based on tooth wear. These skeletal remains were unearthed from an Iron Age camp at Breedon-on-the-hill in Leicestershire, England, during the 1940s. Miles measured the areas of occlusal wear facets on the molar teeth and thereby calculated a rate of attrition through the stages of complete eruption to old age. The skulls used in this study are stored alongside Miles' original notes for each individual.

A diverse range of archaeological sites are represented in the collection, on both a temporal and geographic scale. Remains from seven Romano-British sites have been incorporated, the large majority of which have complete dental arches and generally show little dental displacement or disease. Furthermore, over 100 cranial specimens have been donated from two medieval burial sites in central London. Both of these populations show a range of non-metric traits and pathologies, including microdontia, supernumerary teeth and diseases that generally correlate with poor oral hygiene. Finally, there is a broad geographic range of archaeological sites represented in the collection, including three Egyptian mummy skulls and four Guanche mandibles (the

indigenous inhabitants of the Canary Islands).

The human material is a rich resource for the study of dental development, as all ages are represented, both in skeletal form and in casts or models. Over 200 sets of perinatal dentitions were collected during the 1950s and have subsequently been used to form the basis of doctoral research into the construction of a new dental ageing atlas, which is currently available through the Queen Mary University of London website (AlQahtani, 2008). Other material shows abnormalities in dental placement, from simple transpositions to the eruption of teeth into the zygomatic bone or even into the nasal fossa. All varieties of non-metric traits have been noted in the extensive array of individual mounted teeth showing the gradations of such anomalies (Fig. 2). Sets of molars have been mounted to effectively show the varying degrees of supernumerary cusps, such as parastyles and the cusp of Carabelli. Similarly, traits such as microdontia, anodontia and the presence of supernumerary teeth can be seen in prepared sections of the mandible and maxilla (Fig. 3). In addition to the skeletal and dental specimens, the large collection of dental casts illustrates a range of diseases and injuries, from congenital abnormalities such as cleft palates in their respective stages of repair, to maxillofacial gunshot injuries of soldiers from the First and Second World wars.

Concurrently, there are a few human specimens housed within the collection that do not relate specifically to the categories of development or pathology, but are potentially of a wider anthropological value. Examples include several skulls displaying variations in intentional modification of the dentition through dental filing, chipping or staining. Casts have been included



Fig. 3. The maxillae showing abnormality in positioning of the teeth and the presence of supernumerary teeth. The normal positions of the central incisors are occupied by two tubercle-shaped teeth. The left central incisor is misplaced and the right central incisor appears absent. From the collection of Sir Edwin Saunders.

alongside this sample to show variations in modification between cultural groups. A large proportion of these crania are Javanese in origin, having been donated by the anthropologist Joseph Barnard Davis in the late nineteenth century (Fig. 4). The effect of occupational or habitual activities on the dentition is a related theme. Such use of the teeth as tools is noticeable in the casts of Eskimo teeth depicting the practice of leather softening through mastication and the various sections of jaws showing pipe facets.

While approximately one-third of the collection is composed of human material, the remaining two-thirds consist of crania from a range of faunal taxa. Of the over 7,000 animal cranial specimens, some 4,000 are primates, including a significant number of specimens donated by the late primatologist Sir William Osman Hill. A wide variety of primates are represented in the collection, from the largest, the gorilla, to the smallest, the mouse lemur. This diversity in both animal species and geographic habitat holds the potential for extensive comparative study. Of the extinct species represented, the large majority are fossilised specimens that hold the potential for paleontological investigation. However, specimens of the more recently extinct Thylacine Wolf (*Thylacinus cynocephalus*) are incorporated in the collection as complete skulls or partial maxillae and mandibles. The collection also contains over 250 carved and un-carved ivory specimens that originate from both terrestrial and marine mammals, which could be used to form the crux of a variety of research projects. The range of species, the geographical spread of the collection, and the quantity of specimens stored, make the faunal material a valuable resource for comparative studies, especially in the field of evolutionary anatomy.

The latest stage in the recataloguing of the Odontological Collection began last October, with an aim to be completed by the end of 2010. All specimens are now listed on the online catalogue 'surgicat' and can be searched by anyone with internet access at <http://surgicat.rcseng.ac.uk/>. The initial search page of surgicat contains a 'free search' box under which one can search for specimens recorded under any category. A broad search of criteria such as taxon name, pathological term or acquisition source will promptly detail all relevant records in the museum's collections. For more specific searches, or to combine a set of queries, the 'expert search' system can be used. The human collection is now fully documented and



Fig. 4. Cranium of a 25 year old male from the Maluku Islands, Indonesia, showing modification of the anterior teeth. Quadrilateral reliefs have been filed into the labial surfaces. The left central incisor was lost post-mortem. Donated by Joseph Barnard Davis in the late 19th century.

all specimens are recorded by description and have attached photographs where relevant. Recataloguing the animal material began in July of this year and is an ongoing project. The Odontological Collection is an unparalleled source of dental information, the potential of which is yet to be fully realised. It is hoped that this overview provides some insight into the sheer scope of the odontological material contained and encourages prospective enquirers to refer to the collection in future study.

For details on accessing The Odontological Collection, or for any further help with performing surgicat searches, please contact Milly Farrell (mfarrell@rcseng.ac.uk).

LITERATURE CITED

- AlQahtani S J. 2008. Atlas of tooth development and eruption. Ph.D. Thesis, Barts and the London School of Medicine and Dentistry, Queen Mary University of London.