

DENTAL EQUIPMENT 1700 - 1850David Wright

The period 1700-1850 is of particular interest in the study of the history of dentistry. Professionally, dentistry was still in the dark ages in 1700: by 1850, the first foundations of the profession we know today had been laid.

The same pattern can be seen in the development of dental equipment over the same period. In 1700, in general, dental equipment was little different from that in 1400, and in some ways inferior to that used in Greek and Roman times. By 1850, much of the equipment used bears a clear relation to that available today as can be clearly seen from the study of surviving artefacts.

The dental workplace itself is a case in point. Until well into the 18th century, most dental work was carried out by itinerant practitioners of varying competence. Dentistry, particularly exodontic dentistry, was a popular subject with the artists of the time and their work provides a graphic picture of contemporary dental practice. During the course of the 18th century, the dentist, particularly in the larger towns, tended more and more to operate from his (and very occasionally, her) own premises, though many of them still undertook annual journeys round the country to operate in the provinces as well, a practice which declined during the first half of the 19th century. The development of the fixed dental surgery is marked by the appearance of the specialised dental chair. One of the earliest illustrations is to be found in 'A Practical Guide to Operations on the Teeth' by the London dentist, James Snell, published in 1831. By 1850, specialised wooden dental chairs, often with elaborately carved frames, were in common use. It was not until the 1870s that the metal framed chair made its appearance.

Many smaller dental artefacts survive, and an interesting class is that devoted to tooth cleaning and oral hygiene. Since ancient times frayed

twigs have been used for cleaning the teeth. They are still used in some parts of the world today: indeed, they are still available in the United Kingdom, being quite popular among the Asian community. The familiar toothbrush was introduced during the second half of the 17th century in France. During the period 1790-1810 there was a craze in England for silver toothbrush sets: many examples survive and are almost invariably hallmarked from Birmingham or London. By the end of the 18th century, toothbrushes were in general use among the more affluent classes, and several tradesmen specifically described as 'toothbrush makers' are found in the trades directories of the period. The Wellcome collection includes one originally made for Napoleon Bonaparte. The fact that several toothbrushes owned by the Emperor survive suggests that he was in the habit of leaving them behind on his campaigns.

General oral hygiene sets were also popular among the wealthy during the period 1750-1850. The simplest were small sets of scaling instruments, usually with a mirror in the lid of the case to assist in the scaling operation. More elaborate sets included other instruments, such as toothbrushes, toothpowder boxes and tongue scrapers. A large number of such sets survive, as do larger scaling instruments for use by the dentist.

Instruments for cavity preparation are an interesting area for study. Prior to 1850, in general insufficient importance was attached to the eradication of caries prior to filling, although fillings had been carried out with some success well prior to that. Pierre Fauchard, writing in 1728, particularly recommends tin foil, rather than gold foil, as a filling material, and the large number of surviving excavating and stopping instruments which survive from the first half of the 19th century show that fillings were often attempted. From the 1830s onwards, attempts were made to improve cavity preparation prior to filling, using rotary excavators. The simplest of these was the bur and thimble. The bur is rotated between the thumb and forefinger, and the thimble, worn on the index finger, enables pressure to be applied without a hole being drilled simultaneously in the operator's hand by the back of the instrument. The Archimedean drill was also used from about the 1840s, but since two hands

are required to operate this type of drill, control was inevitably limited. Numerous other ideas were tried, but it was not until after 1850 that really practical drills appeared, culminating with the introduction of Morrison's treadle drill in the 1870s.

Where there is no conservative dentistry, or where it fails, dental extraction may have to occur. In the days before anaesthetics this was not a course to be taken lightly, and the patient was only driven to it in the face of the agonies of toothache. Forceps are the earliest exodontic instruments. Examples survive from classical times, but until well into the 18th century the designs were so crude that an effective grip on the tooth was not possible and alternative instruments were often used.

The first of these alternatives appeared in about 1300 - the pelican. Many examples of this instrument survive, and there was a wide variety of modifications. An adjustable design which obviated the need for a selection of claws was introduced at the beginning of the 18th century and remained in use until well into the 19th century, as signed examples demonstrate. Indeed, even the simple double-ended design was still being made up to at least 1820.

Another class of former exodontic instrument is the dental key, introduced around 1720. Early examples had loop handles and looked very like the conventional lock key, hence the name. By all accounts these instruments worked well in the hands of a skilled operator; in fact the important French surgical instrument making firm of Collin was still listing them in their catalogues as late as 1928. Again, many variants were produced.

Forceps continued to be used throughout the period and underwent some development. Several types included adjusting screws to regulate the separation of the jaws, in an attempt to prevent the collapse of very carious teeth during the course of extraction by forceps which basically acted like pliers. Another method of reducing pressure was the use of a spring between the handles: this is an idea Fauchard particularly deplores. After about 1830, considerable improvements in forceps design were made, so that the beaks of the forceps were designed to accurately

fit the neck of the tooth. Perhaps the most important innovator was the great Sir John Tomes who, from 1848, worked closely with Jean Evrard, a French instrument maker working in London. Apart from the finish, which would not be resistant to sterilization procedures, Evrard's forceps are similar to many of today's designs and are actually rather better made. Other manufacturers were quick to copy this approach to design, which became ubiquitous in the United Kingdom within twenty years.

The last area of dental equipment to be examined in this paper is dental prosthetics. The construction of a practical set of dentures, whole or partial, was a very skilled and time-consuming business. The first partial dentures were made by the Etruscans circa 600 BC, but the skill appears to have been lost after Roman times, to be rediscovered in the 17th century. Fauchard discusses denture making in some detail. It took hours of painstaking work to achieve a remotely acceptable fit since these dentures were made of ivory. Many of these survive. The Wellcome collection includes a particularly fine set associated with the so-called 'Ruspini' porcelain denture holder. Bartholomew Ruspini (1728-1813) certainly was dentist to the Prince of Wales, and the holder does carry the emblem of the Prince of Wales' feathers and appears to date from around 1800, so the association is reasonable, if not proven. Such dentures were expensive, and few people could afford them; indeed, to own a set was something of a status symbol at this date. However, ivory was far from ideal as a denture material, since it rotted in the mouth. Surviving examples show the truly disgusting condition which an ivory denture could attain, while still being worn. To overcome this problem, other denture materials were tried; in particular porcelain, commercially introduced into England by a Frenchman, Nicholas Dubois de Chémant, at the end of the 18th century. These were popular for several years, though they remained expensive and the fit was often poor. Some examples of de Chémant's work survive, but perhaps their best known memorial is the famous cartoon, 'A French Dentist.....' by Thomas Rowlandson.

Another alternative to ivory was the swaged metal (usually gold) plate, on which individual porcelain teeth were mounted, often combined with posterior ivory blocks. These were also expensive but were an improvement

on ivory. The Wellcome collection includes a good example of this type: the porcelain interiors are Claudius Ash's so-called 'gold tube' teeth (that is, the hole for mounting pins is lined with a gold tube) which were introduced in 1837. The gold plate would have been swaged on a metal model of which the BDA collection includes a rare survivor. The real breakthrough in denture making came in the 1850s, with the introduction of vulcanite as a denture base material. Vulcanite could be moulded directly on a model of the mouth, and was inert and strong enough to be work in the mouth. At last people who had lost their teeth could have an acceptable set of replacements at an affordable price.

The differences in dental equipment between 1850 and the present day, while apparently considerable, are in fact the result of five simple factors: the development of new materials for performing old tasks (such as improved metallurgy, plastics and filling materials), the discovery of anaesthesia, the understanding of the importance of antiseptics, the widespread introduction of electric power, and the invention of radiology. But dentistry is primarily a practical subject, and, between 1700 and 1850, practical and lasting solutions had been developed to meet many of its challenges.

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