



The Fairley Collection

Rufus Ross*

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John Maxwell Fairley was a prolific collector and amassed quite a collection of old dental instruments, obtained mainly from the North East of Scotland. John qualified LDS in 1941 and a year later graduated BDS from St Andrews University. He was a member of the Lindsay Society in 1985 and on the committee from 1988 until 1990. One of his contributions to dental history was a comprehensive account of the development of dentistry in his native city of Dundee, presented to the Society in February 1987; an account of which can be read in the Dental Historian No. 14 of April 1988.

There are 142 individual items and all have been identified and catalogued by Dr Henry Noble. It's worth a moment to reflect on how this was done, although some of you may already know the technique. A tiny drop of Tippex is spread on the article and allowed to dry for 24 hours. The letters and numbers are then inscribed using a very fine pointed pen - in this case an Edding 1800. This is also left for 24 hours and then the label is covered with a nail varnish. Each article has the prefix letters "LS" (Lindsay Society), followed by a number. A description of each numbered item can be found in the "[Fairley Collection Catalogue](#)" compiled by Dr Noble.

The assemblage consists of sealers, chisels, pluggers, excavators, plastic filling instruments and a selection of forceps and keys used for extractions. In addition there are a number of burs designed to be used by rotating between fingers and thumb, with a thimble on the rear end of the bur to prevent the operator from boring a hole in the palm of his hand. Dexterity takes on a new meaning in preparing a cavity with this device! As was common in the 19th and early 20th centuries, many of the instruments had ornately decorated handles, some metal but mostly ebony or ivory.

The antiquity of some can be gauged from the manufacturer's patent marks, an automatic plugger bears the date 1887, another automatic plugger has a patent date of 1890. There is an interesting selection of seven dental keys, one of which was made by a John McLeod of College Street, Edinburgh who apparently was in business from 1813 to 1837.

Many of the instruments were made by the SS White Company of America, although a number were manufactured by Claudius Ash, of England and the Dental Manufacturing Company also features prominently. Some familiar names appear such as De Trey, described as Doctor De Trey, but others are not so familiar - many of the makers being long out of business.

The evolution of dental equipment reflects to some extent the development of dentistry itself from the earliest times to the modern day practice; from the primitive hand-made to the sophisticated equipment available in the 21st century. Hand cutting instruments however have not undergone such a change and are still designed to fulfil the same functions as they did several hundred years ago.

The Arabian physician, Albucasis (1050-1122) is generally considered to have described and illustrated instruments for scaling the teeth. He is reputed to have invented a set of 14 sealers. It is not however until the publication of the classic work, "Le Chirurgien Dentiste", by Pierre Fauchard in 1728 that a systematic approach to the use of instruments was established. In Lilian Lindsay's English translation of 1946, there are pages of illustrations of instruments for "chiselling and perforating." Although most preparation was carried out by hand instruments, Fauchard advocated the use of the manually operated bow drill, an unwieldy device widely used in the early 18th century, and adapted by dentists from the workshops of jewellers, silversmiths, lapidaries and ivory turners whose work required precise craftsmanship. The drill was rotated by a piece of string, later cat-gut, which was twisted round the drill and rotated by horizontal movement of the bow. Fauchard described a hand-operated drill which was turned by a hand crank. Archimedean drills utilising the spiral principle replaced the bow drills; and one example is LS102.

George Washington's dentist, George Greenwood, modified his mother-in-law's spinning wheel for use as foot-operated dental engine in 1790. The first commercially manufactured foot-powered engine was patented by Morrison in 1871 and for the next thirty years dentists nearly ran their legs off. Holding the drill steady and pumping with the foot often resulted in the dentist being thrown off balance and ending physically exhausted after the preparation of a tooth. At least poor circulation did not compound the problem. George Fellowes Harrington's motor driven drill invented in 1864 was the impetus which, over the next hundred years, led to the use of the electric motor and the high speed air turbines of today. Many of the early dental instruments were fashioned by the practitioner himself, seldom a qualified man. Ann Hargreaves in the "Dental Historian" of November 1989 reports the discovery of a blacksmith's will in which his tools used to draw teeth were bequeathed to a Thomas Jecke.(1) It would be fairly simple for a man skilled in fashioning iron implements, to make suitable instruments.

According to Dr Richard Glenner(2) there are four basic dental instruments which have remained in use from the early 18th century to the present day. These are extraction forceps, sealers, plastic instruments and instruments for the removal of caries. All of these, and more, are represented in this collection.

Extraction Forceps

Hippocrates in his book "De Medico" notes that the extraction of teeth was practised by the Greeks but it is doubtful if the ancient forceps on display in the Archaeological Museum at Athens were used for extractions. The pincer type forceps of the early 19th century changed to a more sophisticated version with the introduction, by Cyrus Fay and John Tomes, of the anatomical forceps. S.S. White adopted this pattern and showed illustrations in their 1876 catalogue although they had been in use since 1860. Present day forceps are basically unchanged from these early models. Two instruments, LS 117 and 118, have separating springs.

Pelicans

So called because of the supposed resemblance of the claw to the beak of that bird. The earliest reference is in a work by Guy de Chauliac of 1363 - "Chirurgia Magnum" (Editions in RCS, RSM & BDA). In an edition of 1695 a description of an extraction is given, one of the methods employed was "using forceps similar to those with which they bind barrels. " The only pelican in the collection (LS31) is described in the 1802 work by L Laforge, "Theorie et Pratique de l'art du Dentiste", 1810 ed. A copy is to be found in the Royal Society of Medicine library. It is described as "Le tire-toir" and recommended for the extraction of incisors, canines and the "petites molaires" of the lower jaw. Also according to Fauchard, the pelican is similar to the tire-toir, a tool used by coopers to force the last hoops on to small wooden casks.

Keys

There are seven in the collection. Like the pelican these instruments date from the 18th century. They were in common use in France and also England around this time. A full description of keys is found in "Old Instruments Used for Extracting Teeth" by Sir Frank Colyer. (3) They could cause considerable damage to surrounding teeth and tissues when the extraction of a tooth was attempted. They appear to have been hand-crafted and the ones in the collection appear to have undergone little wear and tear. The advent of forceps, particularly the anatomical type, superseded the use of these barbaric instruments.

Sealers

According to Glenner(4) the sickle was the oldest design and is still the most popular. LS 26 - 29 are fine examples of the popular pull sealer and LS 52, a double-ended instrument, could turn out to be dangerous weapon for the operator. James Snell, of London, in his "A Practical Guide to Operations on the Teeth" published in 1832, describes in detail his technique for scaling and recommends a diamond or spear-pointed instrument such as LS28. He says that when one uses this instrument the cutting edge of the sealer should go between the edge of the gum and the under surface of the tartar. When used in this manner, the tartar will sometimes fly off in scales which accounts for the term scaling.

Plastic Instruments

The introduction of gutta percha is attributed to Edwin Truman in 1847 and according to Arthur Lufkin in his "History of Dentistry", published in 1938, zinc oxychloride was used as a temporary filling in 1856 and zinc oxyphosphate in 1879. Edward C Kirk, in his "American Textbook of Operative Surgery" (1897) stated that all of these cements became known as plastic fillings and the instruments used for inserting them began to be called plastic instruments.

Hand Cutting instruments

When we think of instruments for removing caries we think of the modern excavator, but the excavator as we know it today did not evolve until 1908. G.V. Black in his "Operative Dental Surgery" reclassified it from a dual purpose instrument which both removed caries and formed the cavity to a single-purpose instrument for removing caries. He called them "spoons or spoon excavators." Black was also responsible for describing other hand instruments as chisels, hatchets, hoes and margin trimmers - terms which might have been taken from wood working and gardening. Many an hour has been spent by students digging out carious dentine using right and left excavators such as LS64-67, after which we had the inevitable pulp exposure. I wonder - do dentists use chisels in cavity preparation today? The turbine seems to be capable of all the cavity preparation we used to have to carry out with chisels, hoes and hatchets. Does anyone remember what a "6 -2 -12" was?

Pluggers

It is thought that the first filling was placed by the Roman physician Cornelius Celsus sometime in the first century AD. It was he that first recommended that decayed and broken down teeth which were to be extracted should first be filled with lead or lint so that they would not break; incidentally, this advice was also suggested by Peter Lowe in the 2nd edition of his "A Discourse on the Whole Art of Surgery" published in 1612. The plugger is one of two basic hand instruments for the treatment of caries which has remained part of the dentist's armamentarium since the 18th century, the other is the excavator.

With the opening of the Baltimore College of Dental Surgery, in 1840, the demand for dental instruments increased along with a plethora of manuals and text books outlining the "correct" approach to the treatment of carious teeth. As operative techniques became more complex the

number and types of hand instruments increased. In the 1876 "S.S. White Catalogue," a set of "New York" pluggers is advertised, 144 in all. Not to be outdone, the 1905 "W A Lockwood Catalogue" advertises a set of 195 pluggers.⁵ Most of the pluggers in the collection have octagonal ebony handles to ensure that the instrument could withstand the pressures usually applied. John Tomes in his 1859 "System of Dental Surgery", states that the operator should be able to make his own excavators to suit any peculiar case that may arise.

Elevators

The design of these has changed very little over the centuries. Colyer (6) notes that the first drawings are to be found in the work of Albucasis (1122) Two of the elevators, LS 93 and 94, bear the curious name "Geissfuss" - goat's foot. I have not examined a goat's foot but the illustrations in Colyer certainly look like an animal hoof, these two elevators are worth examining.

There are a couple of automatic pluggers used in condensing gold foil, a method of filling now obsolete. This collection is a reminder of the long, often turbulent and unregulated, history of a craft which after many endeavours became a profession. It is just one aspect of the ingenuity and craftsmanship with which the early practitioners fashioned their instruments to serve the dental needs of the populace. As D.W. Wright said in another *Dental Historian* article, "man-made objects speak to us of our past. Artefacts can provide a starting point for research." (7)

Researching this paper has given me much food for thought and a better understanding of our pioneering, dental forebearers.

- (1). Hargreaves A S, A Tudor Blacksmith's Simple Dentistry, *Dental Historian* November 1989: 18-19
- (2). Glenner, Dr Richard, *J.of the Hist. of Dentistry*, November 1998, Vol.46. No.3:121.
- (3). Colyer, Sir Frank, *Old instruments Used for Extracting Teeth*, 1952. pp82-144. Staples Press London
- (4). Glenner Op. cit.
- (5). Glenner, Dr R, *Bulletin Hist. Dent.* Oct 1989, 37(2) : 135-137.
- (6). Colyer, op. cit.pp 58-79.
- (7).Wright D.W., Early Dental Instruments. *Dental Historian*, November 1988 No 15:32-49.