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A Note on the Dental Key

By SIR FRANK COLYER, K.B.E., LL.D., F.R.C.S.

THE first knowledge we have of the dental key is in a paper published by Alexander Monro in 1742.¹ Monro describes it as “another instrument for drawing teeth” and it is not until 1754 that the word key appears in print and then under the name “Clef Anglaise” in a work by Lecluse.²

The instrument illustrated in Monro's paper is shown in Fig. 1. It consists of a metal shaft fixed in a wooden handle, at the end of the shaft is a projection to which a claw is attached by means of a screw. Monro states that the instrument as received by him from Dr. John Fothergill of London had a metal handle and that he

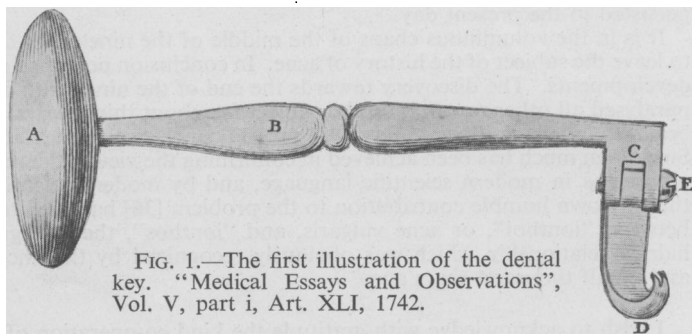


FIG. 1.—The first illustration of the dental key. “*Medical Essays and Observations*”, Vol. V, part i, Art. XLI, 1742.

¹*Medical Essays and Observations* (1742) Vol. V, part i, Art. XLI. Edin.

²*Nouveau Elements d'Odontologie*. Paris.

replaced it by the wooden one of a gimlet shape. This is an important piece of information because it tells us that the first key of which we have any knowledge was made entirely of iron. The key, as shown by Monro, is neatly constructed and it is unlikely that it is representative of the earliest stage of the instrument as there are several examples in museums of keys of a much more primitive character and with open handles similar to those of many common keys.

An early stage in the development of the key was the addition of a metal projection to the shaft on the side opposite to the claw, the latter being swung from the shaft. This piece of metal became known as the bolster and was the part which rested on the gum and formed the fulcrum. We have no idea when the addition was made but it is found in early examples of the instrument and is shown in A. L. B. Jourdain 1760.³

The second illustration of a key is in a French work by M. Bourdet (1757).⁴ In this instrument the end of the shaft has a slight double bend and the claw is screwed into a piece of metal fixed to the projection from the shaft. Bourdet himself calls the instrument a lever which he formed on the English key.

The next publication bearing on the history of the key is Perret's catalogue (1772), where there are illustrations of two useful alterations. The first is an arrangement which allows the claw to be used for the right and left sides without unscrewing the attachment to the shaft. This alteration, which was made by Garengéot, consisted in constructing the portion carrying the claw so that it could rotate in the head of the shaft, the position being fixed by a spring-catch attached to the body of the instrument. This method of carrying the claw on a swivel was improved upon by later authors. The second illustration shows an alteration introduced by Perret and consists in fixing the claw by a sliding rod within the shaft. A feature of one of the keys in Perret called by the name of Frère Côme is the handle, which is in the form of an elevator and can be unscrewed and used to lift the tooth from the socket after it has been raised with the key.

An important stage in the evolution of the key was introduced by R. Clarke (1795).⁵ The direction in which a tooth is removed by the key is in a curve at a right-angle to its axis of motion, and this, according to Clarke, is to be found by drawing a line through the point where the bolster rests on the gum and the middle of the handle. A disadvantage of the key with the straight shaft when used on the inner side of the teeth is that the axis of motion is in an oblique direction and there is therefore a tendency for the tooth to be pressed against the one immediately posterior. If, however, the shaft is given a bold double bend the axis of motion is in a straight line through the bolster and the middle of the handle and the tooth can be removed in a curve at a right angle to the line of the arch. The introduction of this marked double bend in the shaft was a great step forward in the development of the key.

In all the keys which had been illustrated up to 1795 the claw could be used in one position only. Spence, the friend of John Hunter, had the shaft extended to allow the claw to be fixed in advance of the bolster. This was a distinct improvement as it allowed the bolster to be placed on the tooth anterior to the one to be removed. In cases where there was sup-puration in the bone this was a great advantage as the bolster could be placed on an area comparatively free from tenderness. Fox in 1806 made provision for the claw to be used behind the bolster as shown in Fig. 2, which is a picture of his key.

During the next thirty to forty years changes were made in the key principally in the shape and size of the bolster and the introduction of contrivances to adjust the claw without the need of placing the finger in the mouth, but few of these modifications left a permanent mark on the character of the key. The alterations in the form of the bolster were designed with a view to minimizing the pressure on the gum. They did not always succeed in their object and this was particularly the case with the one introduced by T. Hardy in which the bolster was made sufficiently long so that the ends, which were padded, rested on the neighbouring teeth and so took the pressure off the one to be extracted. In theory the idea seemed a good one but in practice the results were stated by other authors to have been far from satisfactory as the pressure being transferred to the neighbouring teeth resulted in a tendency for them to be dislocated.

The key was a favourite instrument with practitioners for well over one hundred years but fell into disuse when forceps were introduced with beaks fashioned to fit the necks of the different classes of teeth. It continued, however, to be advocated by Garretson in his *System of Oral Surgery* (Philadelphia) as late as 1890 for the removal of certain teeth and Mrs. Lindsay informs me that it was used by a well-known practitioner as late as the early part of this century.

³*Traité des Dépôts dans le sinus Maxillaire, des Fractures, et des Caries de l'un et de l'autre Mâchoire; suivis De Réflexions et d'Observations sur toutes les opérations de l'Art du Dentiste.* Paris, Plate VI.

⁴*Recherches et Observations sur toutes les parties de l'Art Du Dentiste.* Paris, Plate IX, Fig. 5.

⁵*Medical Facts and Observations.* London, Vol. VI, p. 123.

Although nothing is known about the origin of the dental key it is possible that it may have been suggested by the common key. The similarity of some of the old forms of the latter to the early dental instruments is most striking as may be seen from the key illustrated in Fig. 3. Compared with the instrument shown in Fig. 1, the part above to the right of the

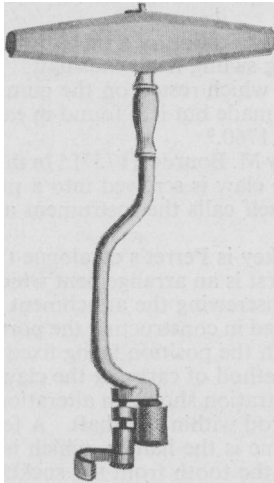


FIG. 2.—The dental key as modified by Fox.

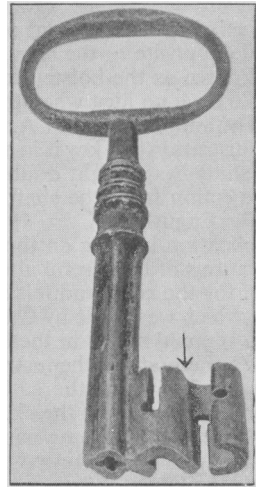


FIG. 3.—An example of a common key, date about the early part of the eighteenth century.

arrow corresponds to the projection from the shaft, the part below to the left to the claw. If a division were made at the position of the arrow and a hinge inserted, then it would be possible to use the key as an instrument for extracting teeth. That the key may have originated in this way is perhaps not too fanciful an idea, for the forceps are but a modified pair of pincers and the pelican was suggested by the instrument used by coopers to bind hoops on to barrels.

The view that the common key was probably the forerunner of the dental instrument is referred to by P. B. Goddard and J. E. Parker (1832)⁶ and they state on the authority of a friend that the famous surgeon of Cairo, Clot-Bey, was in the habit of taking out molars by means of a common key and a piece of twine, an operation he performed with great dexterity and rapidity. L. Koecker (1826)⁷ on the other hand regarded the key as an improved form of the pelican and other authors have described it as a combination of the davier and pelican.

There is no unanimity among writers about the original home of the key. It is called "The English key" by the French writers Perret and Jourdain; J. R. Duval, also a Frenchman, refers to an improvement he made in the "The English key", and C. Manicus in a German publication remarks that "The English key is used more frequently than any other instrument". The Italian writer Soldo illustrates and describes an instrument which he calls the English, or Fothergill's key, and Arroyo the Spaniard gives an illustration of the English key. Andrée, whose book was published in Leipzig calls it the English key and the German writer Bücking describes and illustrates the English key. The French authors Laforgue and Désirabode speak of Garengéot's key while Lefoulon uses the words "key of Garengéot, or English key". Gariot also gives the name "key of Garengéot" to an instrument which is similar to the one Perret describes as the English key. To add to the difficulties of unravelling the origin of the key we find in Serre that the instrument generally known as that of Frère Côme is named a "Lever with a cross-handle" and that the instrument he calls Garengéot's key is not like the form shown in Perret. On page 252 of Serre's work we read "This instrument (Garengéot's) is often called Frère Cômes' key". Serre says that he cannot understand why in France it is called Garengéot's key as that author does not mention or illustrate it in his works. He adds the remark that "the inventor of the key is unknown". Gerbaux seems to have no doubt about the home of the key, for he tells us that "the key of Garengéot, generally named the English key, is the instrument the most in use to extract the grinders, except in France, where in fact, it originated".

⁶*The Anatomy, Physiology and Pathology of the Human Teeth*. Philad., p. 101.

⁷*The Principles of Dental Surgery*. London, p. 308.

The date of the invention of the key is not known. The first illustration, as already mentioned, is in "Medical Essays and Observations" (1742). Lecluse in his "Nouveau Elemens d'Odontologie", which was published in 1754, says "You can use the Pelican which Garengot has formed on the English key and which I have altered twelve years ago". In a footnote he adds "An instrument which Dentists use in England". Bound up with the copy of this book in my possession is a small work on the teeth of children by the same author. At the end of the book is a letter from M. Bagard approving the manuscript of "Nouveau Elemens d'Odontologie". If the printed word is an exact copy of the manuscript then we have evidence that the key was known to Lecluse in 1740 and to the English before that date.

The key was probably unknown to Garengot when he published his book in 1725 as he does not include it in the list of dental instruments he described and illustrated. It was, however, known to him at a later date and he introduced certain alterations which led to the instrument being called by his name and his being regarded by some writers as its inventor. Fauchard (1728) makes no reference to the key although he deals in detail with the elevator, pelican and forceps. The absence of any reference by either Garengot or Fauchard would seem to indicate that the key was not generally known in France during the second decade of the eighteenth century. The key is not illustrated in Heister (1719), which may be regarded as a representative German work on surgery of that period and it is not mentioned by Mangetus (1721).

When we turn to English literature we find that there is no mention of the key in William Salmon's *Ars Chirurgica* (1799). "The Mallets and Forceps for drawing of Teeth" which are illustrated are copies of those in Scultetus and Paré. Referring to the operation of extraction of a tooth he states that "The Gums must first be opened with a *Fleam*, and the Flesh loosened round about the tooth, *Then done, you must with Pincers, half-Pincers, Punches, or a Pelican, lay hold of the Tooth, and with a wary and gentle kind of forcing bring it forth.*"

In a paper by Sir Ambrose Heal on "Cutlers Trade Cards" there are some interesting data which have a bearing on the date of origin of the key. These cards were "not paste boards but were engraved and printed on open sheets of good paper" and their purpose was primarily that of advertisement. Reproductions of eleven "cards" are included in Sir Ambrose's paper and seven of these have drawings of dental instruments, the double-ended pelican and forceps of the paces and crow's-bill patterns are represented but not the key. The dates of the "cards" are given by the author as from the last decade of the seventeenth century to about 1730. It is fair to assume that the instruments portrayed were those in general use at the period and as the key is not shown, it either had not been introduced or was but little known.

Evidence of a negative character is afforded by the case of surgical instruments purchased by The Company of Barber-Surgeons of Newcastle upon Tyne in 1703. The dental instruments in the case are a Douglas lever, a pair of forceps of the crow's-bill pattern, a double-ended pelican and an elevator; the key is not included.

Amongst the plates in a book by C. Bew (1819) is one depicting several old types of instruments for extracting teeth and amongst these is a very primitive form of key. At the end of the description Bew states "This instrument was in use in the reign of Queen Anne". This remark makes the absence of any reference to the key in the works of Heister, Mangetus, Garengot and Fauchard difficult to understand, for if the key had been invented before they wrote it seems incredible that all four should have omitted any reference to it and I think raises the question whether the information in Bew is reliable. There seems to have been some confusion in the mind of the author about the nomenclature of instruments, for example, the double-ended pelican is called "an instrument of the key species", and one somewhat like the instrument, called by Fauchard a lever, Bew describes as "An antiquated key instrument with a sliding rod". There is no evidence to support his statement and there is a certain amount of looseness of expression in some of his writing.

Disregarding this statement in Bew, and taking into consideration the available evidence, I am inclined to put the invention of the key to about the first half of the third decade of the eighteenth century.

[May 2, 1951]

Andrew Ure, M.D., F.R.S. (1778 - 1857)

By W. S. C. COPEMAN, O.B.E., F.R.C.P.

ANDREW URE, M.D., F.R.S., was one of those brilliantly versatile men of science of whom the end of the eighteenth and the beginning of the nineteenth century furnished a number of examples. Under the denomination of Natural Philosophy they assembled an encyclopædic