

# **Guidebook**

## **Extraction Instruments Before Modern Dentistry (1700s)**

By Nimra Khan

*This guide was created as a volunteer project by Nimra Khan for the National Museum of Dentistry. Nimra is a pre-dental student at the University of Maryland, Baltimore County, where she is pursuing a degree in Biology. Nimra loves to explore the unknown and is always up for a challenge. In her free time, she likes to read, get creative with DIYs around the house, and paint.*

# **Introduction**

This Guidebook is meant to assist readers with understanding the different dental instruments used for tooth extraction from Medieval times until Modern Dentistry (1700s-today) (*Dental History*, n.d.). An extensive search for the earliest extraction instruments has yet to be uncovered, partly due to the lack of records of such events. Luckily, as civilizations and societies intertwined, so did their knowledge and ideas. Naturally, this led to many keeping records, which allowed us to gain insight into how tooth extractions occurred back then.

Forceps are the first extraction instruments on record and the main instruments we currently use for extracting teeth. Forceps were first mentioned in Ancient Greece, dating to 3000 BCE (A History of Dentistry, by Arthur Ward Lufkin ... Illustrated with 90 Engravings, n.d., p. 48). As Ancient Greece became a great civilization, Asclepias was credited with being the father of surgical tooth extraction (A History of Dentistry, by Arthur Ward Lufkin ... Illustrated with 90 Engravings, n.d., p. 48). At the time, dental forceps were called odontagra (A History of Dentistry, by Arthur Ward Lufkin ... Illustrated with 90 Engravings, n.d., p. 48). Other civilizations also used forceps, including ancient Rome and the Arabians. It is uncertain when these societies stopped using forceps, but they reappeared around the 1700s and eventually became the primary dental extraction instrument in the late 1900s. While forceps were temporarily discontinued, other instruments, the pelican and the tooth key, took their place.

The first extraction instrument brought to our attention after the forceps was the pelican, dating back to the 14th century and continued to be used until the 18th century (*Dental Instruments: Past and Present · Surgery · Stony Brook Omeka S*, 2024). This instrument is named after its similar appearance to that of a bird. The pelican may have been invented by Guy de Chauliac, the most famous surgeon during the Middle Ages, but some contradict this, and it is uncertain who invented the pelican (Guerini et al., 1909, p. 157). The pelican has been around for quite some time since the Greeks, dating back to the time of Hippocrates; as stated in one of de Chauliac's Books, *De Affectionibus*, (Guerini & National Dental Association (1897-1922), 1909, pp. 51–52). This book mentions a forceps being used to extract teeth, but the image shows the forceps with heads shaped like a pelican.

As the instrument has been used throughout the centuries, it is crucial to consider the design change correlated to significant historical events. For example, instruments changing from iron to steel were seen to occur at the time of the Industrial Revolution, dating back to the 1750s. During this time, iron was converted into wrought iron, which was then converted into blister steel (“Steel - History | Britannica,” 2019). Blister steel was sought after due to its higher carbon content, which made it more workable than iron. Furthermore, changes in handle materials also occurred during the Industrial Revolution (*History of Wooden Handles / Wood Handles Production*, n.d.). Lastly, the Ivory trade, at its peak in the 1800s-1900s, explains why some pelicans have ivory handles (<https://www.facebook.com/thoughtcodotcom>, 2016).

The following primary extraction instrument we have on record is the tooth key. This instrument is named after its similar appearance to an actual skeleton door key. The tooth key was introduced shortly after the pelican, but we have yet to find any record of who invented this instrument. Instead, the first acknowledgment of the tooth key was in a paper published by Alexander Monro in 1742, but there are speculations that the tooth key could have been around since the 1730s (Galen & De Sanitate Tuenda, 1831). Unfortunately for this instrument, there are few changes due to the popularity of the forceps being reintroduced. From what we gathered, the 1700s was a time when there was a push to develop universal instruments.

As you will see in an upcoming guidebook, *Extraction Instruments Post-Modern Dentistry (1700s)*, we will encounter more pelicans and tooth keys. Still, we will hold some considerable changes from the pelicans and tooth keys we have placed in this guidebook. These “new” pelican and tooth key instruments can be considered a fusion of the past with instruments, such as forceps and elevators, developed around the 1700s. For now, the focus will be on the two instruments mentioned, the Pelican and the tooth key. As we get closer to the 1900s-2000s, a standard shape develops among the instruments of the past and the current instruments. Last but not least, it is important to consider that the pelican and the tooth key were used simultaneously in the same period. This is perfectly normal since dentistry, after all, is not a one-size-fits-all field. Each user preferred which instrument worked or was most helpful to them.

## **The Pelican**

The pelican was used from the 14th through 19th centuries. Pelicans displayed at the Dr. Samuel D. Harris National Museum of Dentistry date back to the 1700s. The general shape of the pelican remains relatively constant. The head is curved, with claws and cross-hatched teeth to grip the tooth better. The head is attached to a straight shaft, and at some point, on the shaft, two pelican beak-shaped claws are either hinged to one another or stamped at the pivot point of the two shafts. Lastly, the pelicans displayed in this section are dated later than their actual date due to them being replicas. The earliest pelicans are based on their simplicity. As more parts or features are added, they become more complex. In addition, most of the pelicans on display have unknown origins.

### **Earliest Pelican Instrument**



**Date:** 1650

**Material:** Steel

**Origin:** Unknown

**Characteristics:** Double-ended Pelican. This pelican is a replica of one that dates back to the 1650s. Since the pelican is made of steel, we can safely conclude this originated close to the early-mid 1700s. The two shafts connected to the claws are attached to the fulcrum, allowing more movement.

## Pelicans Emerge with Rounded Handles in Place of Two Shafts



A)



B)

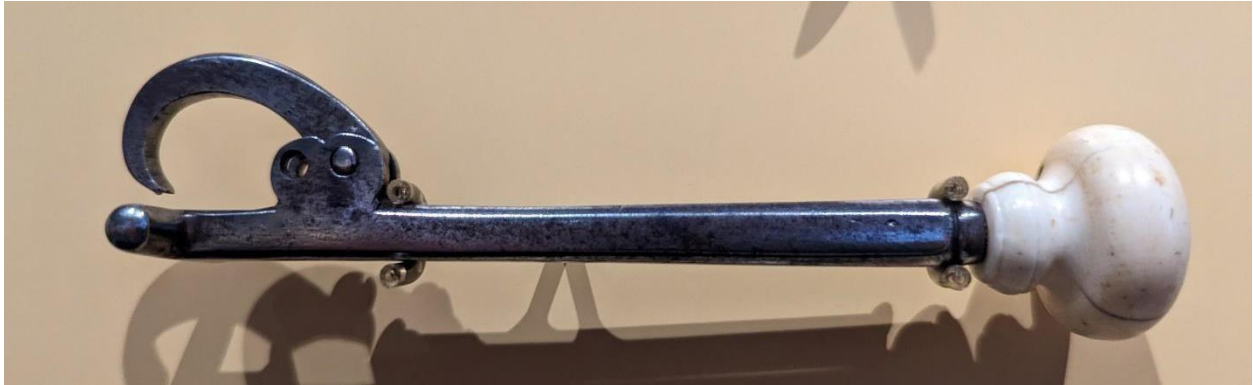
**Date:** (A)-1737; (B)- Late 1800s

**Material:** Shaft: Steel; Handle: (A)-Ivory; (B)-Wood (possibly Walnut)

**Origin:** Unknown

**Characteristics:** Pelican (A) has a round ivory handle with an adjustable screw shaft for the claw. The round, button-like circle is used to adjust the shaft's length. The shaft has ridges engraved on the side. Pelican (B) has a similar shape and design but is a refined version of Pelican (A) due to it being made later.

**Pelicans Still Have Round Handles, but the Jaw Has Been Separated from the Shaft, Making it Detachable**



**Date:** 1780

**Material:** Shaft: Steel; Handle: Ivory

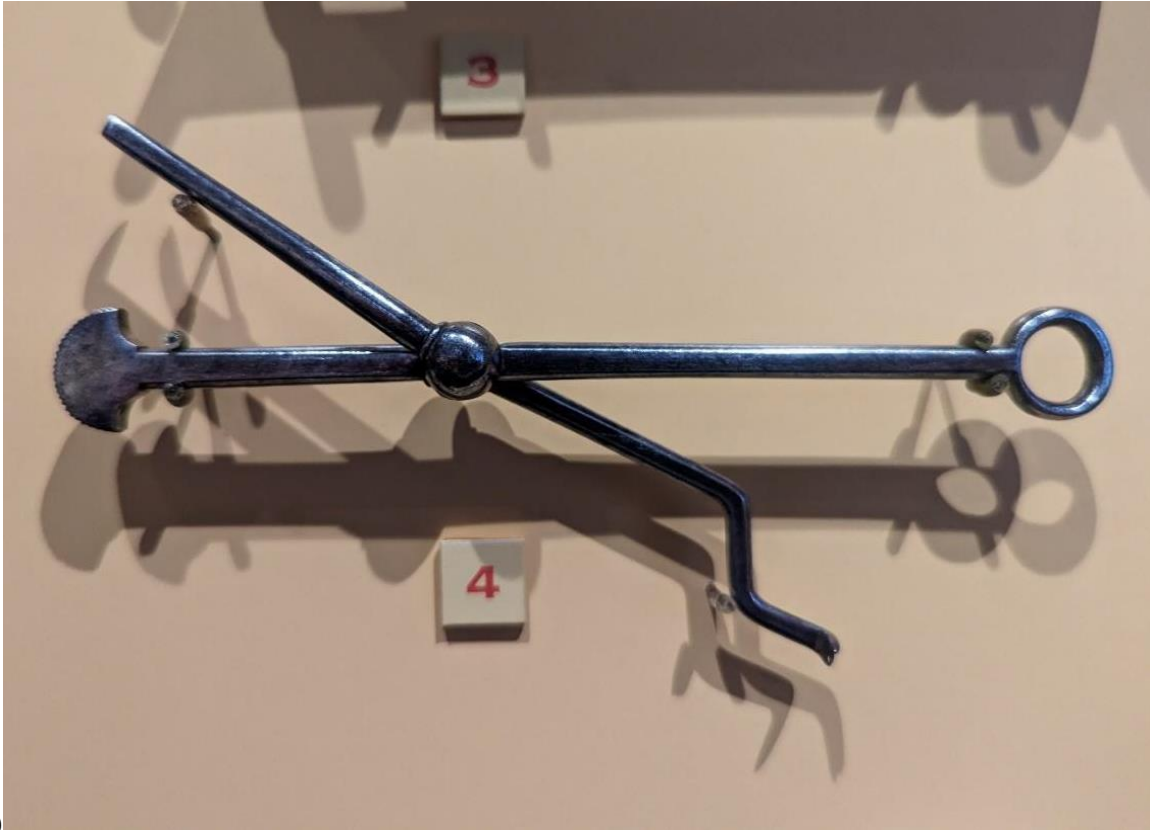
**Origin:** Unknown

**Characteristics:** Ivory round handle with a straight shaft and a transverse bar at the end. Right before the transverse bar, there is an area where the claw is secured by a pivot point, allowing it to move, and a hole in the front of the pivot point allows the claw to be positioned differently.

**Design of Earliest Pelican Brought Back, but Now Double-Ended Pelican**



A)



B)

**Date:** Early 1800s

**Material:** (A)-Iron; (B)-Steel

**Origin:** Unknown

**Characteristics:** Both Pelicans have multiple claws attached to the fulcrum, allowing users to extract teeth of different sizes. This is another version of the 1650s Pelican. A couple of differences are the ends of the Pelican. Pelican (A) has the same bell-shaped ridged ends as the 1650s Pelican, but Pelican (B) has only one side with that shape. In addition, Pelican (B) was used for children, which explains why the bell-shaped ridged ends are a bit smaller than Pelican (A).

## Pelicans Show More Complexity, with Their Shape More Forceps-like



**Date:** 1850

**Material:** Metal: Steel; Handle: Wood (possibly Walnut or Rosewood)

**Origin:** Down brothers

**Characteristics:** This Pelican takes the shape of a lever-plier. The handle is part of the straight shaft, and the pivot point detaches the claw. Before the claw, there is a lever with a pivot point to allow movement of the claw.



**Date:** early 1800s

**Material:** Shaft: Steel; Handle: Wood (possibly Boxwood)

**Origin:** Unknown

**Characteristics:** The head of the pelican has a claw and is curved with a straight shaft. The shaft's end flattens into a bolster to act as the fulcrum.



## **The Tooth Key**

The tooth key appears like an actual skeleton door key. It is uncertain who invented the first tooth key, but this instrument was introduced in the 1730s. For its entire useful period, we see a general shape, a handle connected perpendicularly to the shaft, and the shaft ending in a claw. Like the pelican, the earliest tooth keys are much simpler, and as time goes on, they become more complex.

### **Earliest Tooth key**



**Date:** Late 18th-century

**Material:** Iron

**Origin:** Unknown

**Characteristics:** The whole key is shaped like a skeleton door key. The open handle and shaft are one piece. It is not certain if the claw is adjustable or removable.



**Date:** 1750-1800s

**Material:** Shaft: Iron; Handle: Wood

**Origin:** Unknown

**Characteristics:** This tooth key is shaped like a letter “T” rather than a door key. The handle is made of wood, and the shaft is attached. It is uncertain if the claw is adjustable or removable.



A)



B)

**Date:** (A)-1810; (B)-Early 19th-century

**Material:** (A)-Shaft: Iron; Handle: Ivory; (B)-Shaft: Iron; Handle: Wood

**Origin:** Unknown

**Characteristics:** This tooth key is shaped like a letter “T” rather than a door key. The shaft is placed through the handle. The claw not only pivots but also rotates, thus allowing one key to be used for extractions on both sides of the mouth.



**Date:** Mid-1800s

**Material:** Shaft: Steel; Handle: Wood

**Origin:** Unknown

**Characteristics:** The shape is similar to the previous tooth key, but a lever mechanism has been added, ostensibly allowing pressure on the claw to spread.



**Date:** 1840

**Material:** Iron

**Origin:** Unknown

**Characteristics:** The shape of this tooth key has the same overall handle and body as the first tooth key. However, the shaft is made of two pieces. This allows for the key to be folded for more accessible storage. The claw can be rotated, allowing this key to be used on either side of the mouth.

## Tooth keys with Different Handles and a “Bayonet-style” Shaft.



A)



B)



C)



D)

**Date:** (A)-Early 1800s; (B)-Early 1800s; (C)-Mid-1800s; (D)-Late 1800

**Material:** Shafts: Steel; Handles: (A)-Ebony; (B)-Ivory; (C)-Wood; (D) Wood

**Origin:** Unknown

**Characteristics:** Each handle for this type of tooth key is made from different materials, and some of them have handles through the body of the shaft, such as tooth key (A), (C), and (D), while tooth key (B) has the shaft placed into the handle. Though each of the handles is unique, the shape of the shaft has many similarities.





**Date:** 1835

**Material:** Shaft: Steel; Handle: Steel overlaid with Mother-of-Pearl

**Origin:** Unknown

**Characteristic:** The handle for this tooth key is made of different materials, and the handle goes through the shaft. The tooth key has a “bayonet” shaft. The end of the body shaft has a claw attached to the body shaft; thus, the claw is removable and can be replaced with another claw. The claw can also rotate 360° to allow the key to be used on both sides of the mouth.



**Date:** 1846

**Material:** Shaft: Steel; Handle: Ivory with Mother-of-Pearl inlays.

**Origin:** Unknown

**Characteristic:** Possibly a custom-made tooth key. The handle goes through the shaft. The tooth key has a “bayonet” shaft. The end of the body shaft has a claw, but it is uncertain if it is attached or part of the body shaft. The body shaft has extended claws on either side, which come together at the pivot point and are placed in the center of the body shaft.

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