

The use of Pictorial Art in Forensic Odontology

Xavier Riaud*

Dental Surgeon, Doctor in Epistemology, History of Sciences and Techniques, Laureate and national associate member of the National Academy of Dental Surgery, free Member of the National Academy of Surgery 145, route de Vannes, 44800 Saint Herblain, France

***Corresponding Author:** Xavier Riaud, Dental Surgeon, Doctor in Epistemology, History of Sciences and Techniques, Laureate and national associate member of the National Academy of Dental Surgery, free Member of the National Academy of Surgery 145, route de Vannes, 44800 Saint Herblain, France; E-mail: xavier.riaud@wanadoo.fr

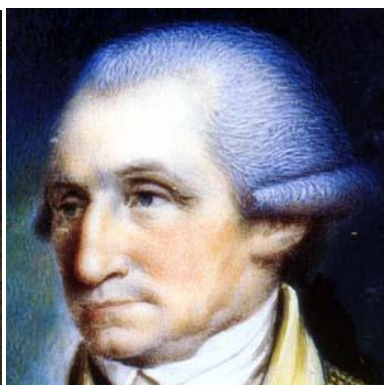
States of America did not have teeth at the end of his life, that he saw eight dentists so that they would make him dentures that were always doomed to fail. Moreover, he greatly corresponded with one of them, John Greenwood (1760-1819) who was said to have made his last dentures. It is well-known that he greatly suffered from his teeth all his life. The best testimony of this fact is a series of three paintings, achieved at different stages of his life. They represent as such an indelible mark, an undeniable vestige of the age-related oral alteration of George Washington's face [9].

Today, pictorial art is often used for archaeological but also odontological purposes.

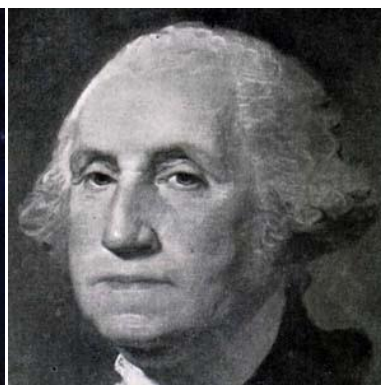
Let's take the example of George Washington (1732-1799). It is common knowledge that this former president of the United



The Virginia Regiment (1772)



Ramage Miniature (1789) [9]



Portrait by the Athenaeum (1796)

When he was 40 years old, he still had teeth and his face looked young. When he was 57, the lower level of his face collapsed due to a lack of teeth, but some were still remaining. When he was 64, his face was that of a toothless old man, who was wearing a removable total and low dental prosthesis and which seemed probably inappropriate in the present context. The loss of vertical dimension is very obvious.

The same analogy can be noticed in Francis I of France's portraits (1494-1547).



Francis I in 1525



Francis I in en 1535 [5]

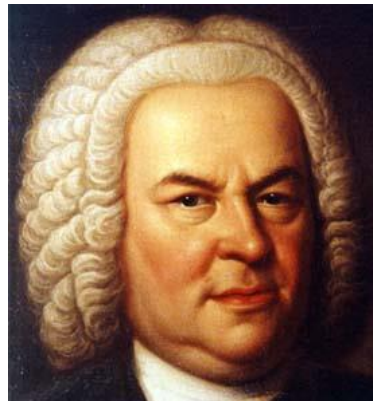
On the 1535 painting, Francis I was 41 years old. There was one detail that best characterized him: a nose which had become very prominent, much more than in 1525 when his face seemed well proportioned. Apart from this, there were no notable changes on his face. However, within ten years, his nose grew because the vertical dimension of his face greatly collapsed. This facial lowering only happened because of the loss of the posterior teeth which usually insure the jaws to be blocked to one another. Moreover, given Francis I's big lower lip, which is quite prominent on the 1535 portrait, it is highly likely that there were no upper incisors left.

In forensic odontology, the use of pictorial or photographic art, brings another testimony. As a matter of fact, it provides sufficient evidence which is considered as important when identifying a skull when the latter is superimposed on the portrait.

Thus, the skull of Johann Sebastian Bach (1685-1750), the famous composer, was exhumed in 1895.



Bach painted by Haussmann (1746)



Bach by Haussmann (1748) [8, 9]



Bach's skull photographed in 1895 [9, 8]

In the table of contents of his review *Musical Quaterly*, Gerhard Herz stated that: "... in addition to Bach's characteristics such as his protruding mandible and his double chin..." Charles Sanford Terry confirmed in his description of the famous composer's remains that he had: "... a massive skull, ... powerful jaws." Added to that, there was also the special shape of the mouth and the line on the right side of the mouth. This was highly noticeable on Haussmann's 1748 portrait. Not to mention the distinct line of the cheekbones and the jaw on the left side of the face which could be seen in the limits between the light and the shades of the face. After a close examination of Haussmann's portraits, it was clear that the mandible extended beyond the maxilla [9]. The skull confirmed that the musician showed a significant inverse occlusion which without being corrected by life-saving orthodontia, had produced a face with unglamorous features. In Carl Seffner's 1908 sculpture which was made from the 1895 exhumation report exhibited in Leipzig, there was no protruding mandible. When the skull is superimposed on the sculpture, the inverse occlusion is substantially reduced on the statue [4].

Haussmann's portraits do not show this protruding mandible. However, the composer was represented with an occlusion which seemed satisfying and a canine tooth on the right side whose marked cusp supported the upper lip, which does not correspond to the known aspects of Bach's dentition. Another subsidiary criterion to the comparison of the skull with the portraits was obviously the number of teeth still remaining in the mouth when the painter did his work of arts. Thereon, considering a specialist's points of view, the skull lacks

some elements. Some portraits dated from the burial, 144 years ago. It would appear that the middle right incisor, the right lateral incisor and perhaps the left lateral incisor were missing. Haussmann's 1748 portrait confirmed the lack of teeth. Moreover, there is no document relating the evolution of Bach's mouth throughout his life, which makes any sorts of comparison very difficult. All the elements which were known date from the last period of his life. For instance, Seffner's statue represents the man with more teeth than what Bach was supposed to have at the end of his life [9].

Even though the teeth were missing during the burial, there is still an intermaxillary relationship. The lower teeth are still adjacent to the upper ones, which avoids some sort of lowering which is common to all the edentulous. The presence or the lack of teeth indisputably influences a person's facial contours. They can be sunken due to the emptiness caused by the loss of teeth or they can be solid if the teeth are still fixed on the maxilla. It is unquestionable that Bach's malocclusion was a major aesthetic handicap which can explain why there is no pictorial art of him before the end of his life.

As a matter of fact, when a historical personality is concerned and when a skull is in escheat, this process is consistently used. Only the pictorial material can change. It was the case for Agnès Sorel (1422-1450), the mistress of the King of France, Charles VII.

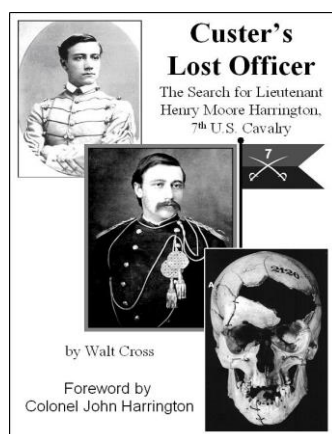
555 years after her suspicious death, a group of 22 researchers coming from 18 different laboratories provided evidence after a 6-month investigation that the young lady died of mercury poisoning. Was it due to wrong dosage or was it criminal? No one knows. However, after studying seven remaining teeth collected from the exhumed urn, it seemed that Agnès Sorel had a very satisfactory oral health and only had a cavity. But above all, these organs contributed to determine the

approximate age of the deceased, give or take two years. Thus, the young lady was said to be around 28 years old when she passed away, which was confirmed by a Carbon-14 dating of a metacarpal fragment. Then the team of scientists tried to compare the remains of the skull with Sorel's face from her recumbent statue in Loches, which was done from life. For that purpose, a paleopathologist superimposed the skull with the sculpted face with a computer. For his part, an anthropologist performed a forensic facial reconstruction of the skull from anthropometric measures and photographs of the latter. The comparison of the two methods showed a perfect match between the skull, the facial reconstruction and the sculpture [1].

The same thing was performed for the skull of Diane de Poitiers (around 1499/1500-1566), the favourite of King Henry II of France. In 2008, at the foot of the chapel of Anet, Diane de Poitiers's remains were exhumed. Thus, an unaffected edentulous mandible, a left hemi-maxilla and a tooth were collected. The bones were superimposed with the last portrait of Henry II's mistress made by Clouet in 1562, exhibited in museum of Chantilly. The result matched the facial characteristics [2].

But the bone can also be superimposed with a photograph and provide strong evidence.

On June 5th 1876, in the wake of the battle of Little Big Horn, the Sioux nicknamed Lieutenant Henry Harrington, the bravest man they had to face. During 130 years, his remains had disappeared. A short time ago, his skull was recovered. A forensic team immediately examined it. They notably looked for Harrington's surviving relatives in order to find potentiel photographs which could prove to be decisive in the soldier's identification. They were successful. The family lended to the researchers several portraits of the 7th Cavalry's officer when he was a young man. After the superimposition, the result was unequivocal. Henry Harrington's head was identified [3].



Walt Cross's book cover (2010) [3]

It was also the case for Josef Mengele, the Nazi doctor. He died in 1979 and his skull was found in 1985. Without conclusive dental X-rays, the scientists Snow and Helmer decided to use the technique of superimposing the face on the skull using a video computer. 30 comparison dots were made on the skull and the same was done on Mengele's picture. They compared the two with the video. If all the dots lined up, then the identification was undeniable. After the recording, the images were superimposed and the specialists drew the conclusion that the exhumed skull was well and truly the Nazi's [6].



Wolfgang Gerhard's skull, Mengele's presumed skull [6]



Josef Mengele [10].

In conclusion, any pictorial material proves that outstanding and sustainable results can be achieved nowadays, thanks to computer programs developed by scientific laboratories. It is an identification technique which made steady progress and which should not be neglected.

References

1. Charlier Philippe, « Qui a tué la Dame de Beauté ? Etudes scientifique des restes d'Agnès Sorel (1422-1450) » [“Who killed the Dame de beauté? Scientific studies on Agnès Sorel's remains (1422-1450)”], in *Revue d'Histoire des Sciences médicales*, July – August – September 2006, XL volume, #3, pp. 255-263.
2. Charlier Ph., Huynh-Charlier I. & Carlier R., « Apport de la radiologie en paléopathologie en particulier dans les maladies infectieuses » [“The contribution of radiology in paleopathology, notably in infectious diseases”], in *Comité de lecture de la Société française d'histoire de la médecine du 13 juin 2009*, Paris.
3. Cross Walt, *Custer's Lost officer*, First Edition, 2010.
4. Leopold Dieter, “Plastische Gesichtsrekonstruktion unterstützt von Seffner. Bild-Bild-Analyse der Bach-bilder”, in *Akfos Newsletter*, 2003; 10 (3): 86-89.
5. Condé museum, Chantilly, 2009.
6. Ramsland Katherine, “The Anthropologist meets the Angel of Death”, in <http://www.crimelibrary.com>, 2005, pp. 1-3.
7. Riaud Xavier, *Les dentistes détectives de l'histoire [The dental detectives of history]*, L'Harmattan (ed.), Collection Médecine à travers les siècles [Medicine throughout history Collection], Paris, 2007.
8. Schweide William, Princeton, New Jersey, 2006.
9. Towe Teri Noel, “The face of Bach – Bach's physiognomical characteristics”, in *The Queens College Lecture*, March 21, 2001, <http://npj.com/thefaceofBach>.
10. U.S. Holocaust Memorial Museum, Washington D. C., 2003.