Story of the First Identification in Forensic Dentistry Endorsed by the American Justice System

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Abstract: In 1849, Webster killed Parkman. The latter's body was never found but his dental prostheses were discovered and later identified. Webster was arrested and prosecuted for murder. The analysis of the dental prostheses carried out by Parkman's personal dentist positively identified the prostheses, resulting in Webster being condemned to death. This was the first case of identification in forensic dentistry, which was endorsed by the American courts.

Keywords: Forensic dentistry, History, Justice.

George Parkman was born in 1790. He studied medicine at Harvard Medical College in 1813. He travelled throughout Europe to deepen his knowledge and gain new skills [4]. He discovered a profoundly humanistic medicine working with pioneers of the subject who devoted as much time to their patients' well-being as to therapeutics. Upon his arrival home, he began to put into practice everything he had learned in Europe. However, in Boston, he came up against the medical lobby, which was reluctant to break away from old habits. Disappointed, he decided to distance himself from the medical world and took over his father's business when the latter died in 1835. Parkman made a fortune in real estate and pawn broking. He became a highly influential citizen in Boston.

For almost 40 years, Parkman and Webster were colleagues at Massachusetts Medical College. In 1849, Webster was a professor of chemistry who had been teaching there for 25 years. He became indebted to Parkman; he owed him the sum of $2,432.

On November 23, 1849, Parkman is thought to have gone to see his colleague in his laboratory. Nobody saw him again. It was Ephraïm Littlefield, the university janitor and dissection assistant, who found the remains of a body of stout build supposedly similar to that of the businessman. On November 30, the police decided to carry out a search of Webster's chemistry laboratory and discovered the remains of a set of dentures, fragments of gold and the charred remains of a human body. Webster was immediately arrested for murder.

The trial started on March 19, 1850 and lasted 12 days. Webster was sentenced to death. He was hanged on August 30 1850.

The victim's identity was proved thanks to the false teeth. During the trial, Parkman's dentist, Dr Nathan C. Keep (1800-1875) and his assistant Dr Lester Noble, proved that two pieces of evidence (a block of mineral teeth and part of a marked set) were the remains of dentures made and fitted by keep him self [2]. These two elements were perfectly matched to a plaster cast of the deceased's mandible that the practitioner had kept in his office and on which could be read « *Dr Geo Parkman 1846 »* written by Noble.

The dentures were fitted on November 4 1846. A few days later, the practitioner had to grind down the part of the dentures in contact with the tongue in order to make more space. This grinding left traces which left no doubts as to Parkman's identity.

Here is Dr Nathan Cooley Keep's testimony at John Webster's trial [5].

"I am a dental-surgeon and I have been practicing this occupation for thirty years in this city. (…)

I knew Dr George Parkman. I met him in 1825 when I was studying medicine with Dr John Randall. Dr Parkman was sick at that time and Dr Randall treated him. I myself also treated him several times at his home. In 1825, I became his regular dentist and he often came to me for treatment or dental advice [5]. On December 3, when I had just returned home from a trip to Springfield, Dr Lewis showed me a set of mineral teeth. I immediately recognized them as being the teeth that I had made for Parkman in 1846. (…)

Parkman's mouth was very unusual regarding its shape and junction between the upper and lower jaw, so much so that I remembered it really well. I remember all its characteristics. The making of his dentures was a most unusual procedure.

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When Dr Parkman ordered his new teeth, he asked me how long it would take before he would receive them. I asked him why. He answered that the university of medicine was about to open and that for this particular occasion, there would be a ceremony during which he would almost certainly be asked to deliver a speech. (…)

It left me little time but I did my best to meet the deadline. The distinctive nature of his mouth was so marked that I had to use all my expertise in the matter. (…)

As usual, I started by taking prints of the patient's mouth. I got a perfect reproduction of his mouth by applying soft wax on a piece of iron to lower the jaw, then by pressing all this against his jaw until the wax was cold. This is how a mould is made. I oiled it and poured plaster inside. 10 minutes later, the plaster was hard and I had a perfect reproduction of the dental arcades. The mould of the mandible showed four natural teeth and three residual roots.

The next step was the making of metallic plates which fitted his gums and to which the new teeth were fixed. First, I made temporary plates to check they fitted. They are generally made of copper or other soft metal by making a metallic print which is applied with pressure using plaster moulds. The copper used in the making of the plates in question is placed between the moulds and sufficient pressure must be applied to create the negative of the plaster mould. These plates are transferred to the mouth to check the fit. If they fit well, that means the mould is good and that the gold plates of the final appliances can be made. (…)

Dr Parkman had no natural teeth in his upper jawbone [5]. (…)

Once the plates had been tested, the gold plates were made and fitted in the patient's mouth.

As I had reproduced the two jaws separately, it was necessary to position them together in order to make sure they matched.

To do so, I applied wax to the teeth and made the patient bite into it. Plaster was then poured onto the prints of the bite and the moulds could thus be aligned. (…)

Occlusion of the two jaws was highly unusual. The line of the jawbone and the projection of the mandible were very pronounced which resulted in an abnormally long chin.

Subsequently, teeth of the correct size were fixed to the gold plates. The teeth as well as the artificial gum were made of clay and were placed in moulds to be baked and set. (…) The shape of Parkman's mouth made this very difficult.

As for the jawbone appliance, the teeth were made in a single block which was cut into three parts at the canines before baking. (…)

Those three blocks were fitted to a single plate. The same applied to the upper part. The two sets were linked together with spiral springs allowing the patient to open and close his mouth without moving the dentures. The teeth were fixed to them with platinum pins. My assistant and I had to start all over again because of a mishap. We finished just 30 minutes before the ceremony. "

The hearing was adjourned due to a fire alarm in the prosecutor's office but was promptly resumed.

"As I wasn't sure I had finished everything, I asked Dr Parkman to come back [5]. He complained of not having enough space for his tongue. I filed the inside of the dentures near the tongue in order to gain space. I also removed the pink of the gums and the enamel inside the teeth causing minor aesthetic damage.

I saw my patient very regularly to carry out the necessary treatment and repairs. The last time I saw him was two weeks before his disappearance. He had broken a spring and had called late at night so that I could repair it. It was around 10 (…). I spent half an hour putting everything right. It was the last time I saw him in my office.

I left town on November 28 and came back the following Monday. It was then that I heard about his disappearance. Upon my return, Dr Lewis showed me those three pieces of mineral teeth (referring to the fragments found in the oven) [5].

At first glance, I noticed the similarity with the work I had done for Dr Parkman. The most recognizable part was the right mandibular block. I recognized its shape and outline which looked strangely like the one I had worked on for such a long time.

Several other parts had been severely damaged by the fire. I therefore looked at the plaster models of the

said dentures, and comparing them with the best preserved piece, I no longer had any doubts. It was definitely my patient.

There was at least enough matter to be able to determine where the fragments came from. This one came from the upper right jaw, that one from the left and the third one from the central part of the same jaw. The lower left jaw was almost complete. By deduction, the part which was attached to it seemed to be the right part. This last piece came from the same dentures and the other parts corresponded to the remaining free space. Only one piece remained unidentified. It could have been the small piece of the front of the mandible. I thus identified the position of 5 pieces out of 6. Only one unknown piece remained. That gave us the 6 parts of the dentures. I also found the platinum pins still attached to the teeth.

I found gold fragments and tiny pieces of bone caught in the teeth.

It was highly likely that the prostheses went in the oven when they were still in the mouth of the deceased. Mineral teeth thrown into the fire whilst still in the mouth would be impregnated with humidity which would gently evaporate. If they had not been in his mouth and had been brutally thrown into the fire, they would have smashed to pieces. Another fact which confirmed that they were in his mouth is that the springs would have propelled them everywhere had they not been confined. When the teeth were returned to me, the blocks were joined together like now. "

In reply to a question from a member of the jury, Dr Keep answered: "The handwriting on Parkman's moulds was written during the making of the dentures. Those moulds have remained in my cellar ever since. I keep them mainly in the event of incidents during the making of prostheses [5]."

His testimony finished as follows: "Dr Parkman had no single false teeth. As for natural teeth, he only had one tooth and two roots on the left side and three teeth and one root on the right side. On the left, starting from the back, there were first of all two roots and a tooth (canine) and on the right, still starting from the back, the root (2^{nd} premolar), then three teeth (1^{st} premolar, canine, lateral incisive). (…) "

Nathan Keep was born on December 23 in Longmeadow, Massachussetts [2]. Gifted with his hands, he soon became interested in dentistry after doing an apprenticeship at a local jeweller's. In 1821, he went to Boston. In 1827, he graduated from Harvard Medical School. He practiced dentistry for 40 years and was commended for his skills. In 1843, he graduated from Baltimore College of Dental Surgery and received the honorary title of Doctor in Dental Surgery. Keep invented numerous dental instruments and was one of the first to make porcelain teeth. He was also the first doctor to have used ether anaesthesia in childbirth, notably on April 7 1847 at the birth of Fanny Longfellow's daughter.

He attended the trial of John Webster, George Parkman's murderer. It was the first time that dental work had served as evidence during a trial in the United States.

In 1867, the first announcement of the creation of the Harvard Dental School was published. Nathan became its first dean which seemed natural given the untiring steps taken by the dentist to ensure the opening of the school. Keep's dream came true and Harvard became the first dental school in the world to be run within a university.

From an administrative point of view, his decisions demonstrated his admirable character and remarkable moral values.

Robert T. Freeman was a black man. He was one of the sons of a slave family. After applying unsuccessfully to study in many dental schools, he arrived in Boston and asked to meet Nathan Keep. On Keep's recommendation, Harvard University decided that colour or birth should not be an issue anymore regarding students' admission. Therefore, Robert T. Freeman was accepted at the age of 22 and graduated

Figure 1: Dr Nathan Cooley Keep (1800-1875) [3].

in 1869. He was the first Afro-American student to graduate from a dental school.

Figure 2: A plaster cast of Dr Georges Parkman's mandible (1846) [3].

Keep's motto was "Justice and Rights over Conventions". His action in Freeman's case highlighted his leadership qualities and helped establish an aura of morality and justice which still emanates from the university today [2].

Nathan Cooley Keep died in 1875. A statue located in the gardens of the school pays tribute to his paramount role in the foundation of Harvard dental school.

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