

THE TWO HEADS OF THE ABBÉ

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ABSTRACT

At the end of the eighteenth century in three different European countries, three talking machines were constructed. One of them was made by abbé Mical. Up to now in phonetic literature only a few and hasty lines have generally been granted to this invention, even though, in our opinion, it is more representative than the other two developed at the same time. This work tries to fill in this blank space. We shall make use of occasional and reliable clues we have found to describe in detail both the ingenious abbé's machine and the reasons that contributed to send it into oblivion. In addition we shall try to advance a hypothesis on the working mechanism. A comparison will be made with those made by Kratzenstein and von Kempelen.

1. INTRODUCTION

Even though since the earliest times man has tried to duplicate human voice, only at the end of the eighteenth century some attempts were successful. In fact, around 1780 in France, Germany and Hungary, an abbé, Mical, a physician, Kratzenstein, and a jurist, von Kempelen, constructed three talking machines.

Whereas both working and structure of von Kempelen and Kratzenstein's machines have been described in detail by the inventors in their own treatises thus making them well known in the history of phonetics [1] [2], on the contrary, Mical's is nearly always ignored because no exhaustive article exists. Yet Mical's machine, as compared to the other two, meets more closely his century requirements being built, as people demanded, in a human form. We believe that several causes contributed to its adverse fate and therefore we have judged worthwhile to give a reliable account of Mical's life and of his talking machine. This is what we shall do in the present paper.

2. THE ABBÉ AND HIS AUTOMATA

Very little is known about Mical's life and his works of which no real trace has been found, also because from the collected evidence, it appears that the abbé always ended up in destroying what he had constructed.

Born in France in 1730, after his studies and his clerical vows, he lived a quiet and humble life devoting all his free time to mechanics, the science that fully drew and fascinated him. At the first he constructed a series of wonderfully carved automata capable to play in a perfect way several musical instruments. Then he made a bronze head that appeared to pronounce short sentences quite clearly. Both works, say testimonies, were destroyed by the abbé because he felt guilty of making naked figures in the first case and because in the second case he felt that the bronze head was not sufficiently perfect to be presented to the audience [3].

The destruction of these meticulous and complicated automata, whose production was surely cost the abbé a large sacrifice of time and money, must not surprise us. It is well known that the eighteenth century is the Age of

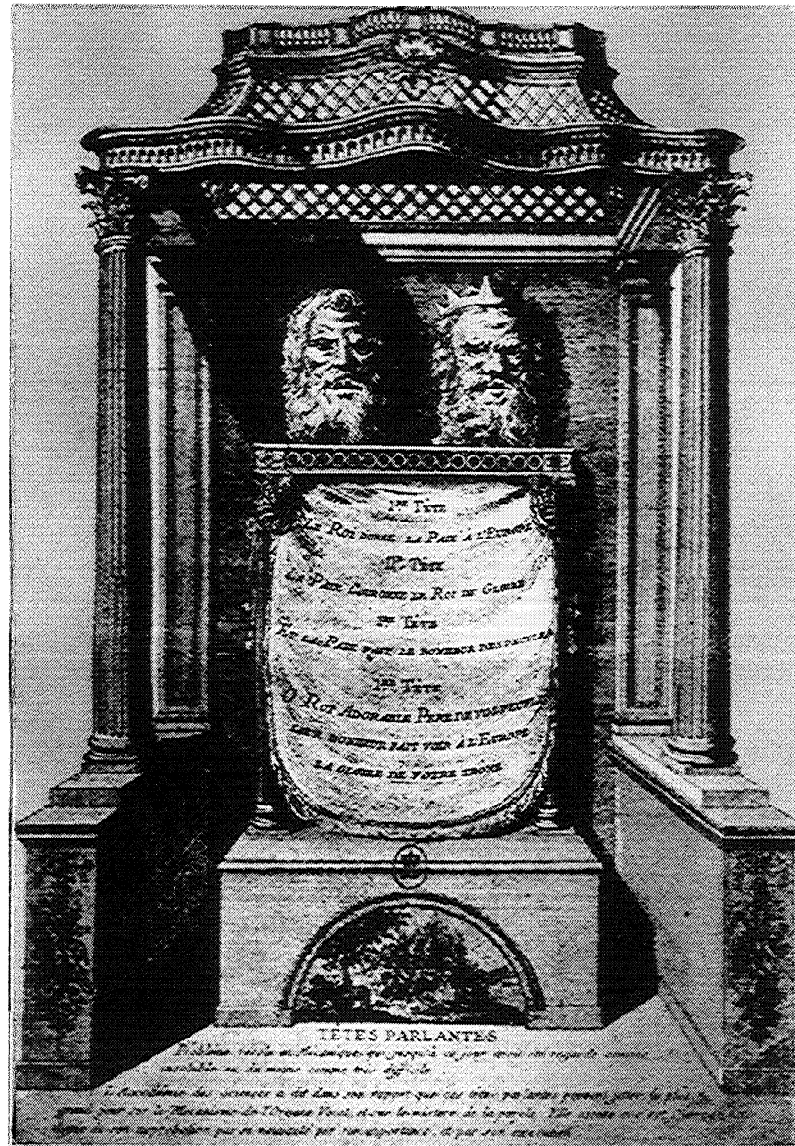
Enlightenment for sciences and technics. We are far from the period when any life-form figure was considered to be a devil work and its maker damned and banished. At the same time, though, the official religion feelings were still very strong. Just a few years before Mical's automata, Jacques de Vaucanson was impelled to destroy his flying angels. Vaucanson was attending the college of the Minim Friars when the provincial of the order, who was visiting the friary, was so upset by the looking the automata, that he cried shame and ordered their destruction. Also Pierre Jaquet-Droz, in the middle of the same century, was suspected of black magic for his Writer, a life-size figure of a boy, and was imprisoned for a some time by the Spanish Inquisition. Mechanics did not conform to religion!

The third and last work of Mical, represented by two talking heads, is surely the most interesting but, as already said, no text describes in detail its working neither shows its drawing. At this point it is easy to understand our emotion when one day, while we were skimming through a 1905 Nature issue, we came across a picture depicting a close up of two heads one of them crowned. The picture caption informed the reader that the figure represented the talking machine built by abbé Mical at the end of the eighteenth century. We remained fascinated by this casual discovery. The article author Henry René D'Allemagne, by praising such a mechanics masterpiece, wrote that abbé Mical had succeeded in a task in which many before had failed and also added that just that engraving, representing abbé's machine, could be seen at the Paris National Library [4]. Unfortunately any trace of this engraving has long been lost.

As it is shown (figure 1) the machine was made of a canopy held by Corinthian columns decorated in Louis XVI style. In the middle of the canopy the two heads rested on a plane supported by columns which in turn rested on a box hinge-locked. A drape was hanging on the two columns; on it the words that the two heads were known to utter, were written. The head on the left side in figure was going to pronounce the sentence: *Le roi donne la paix à l'Europe* while the other crowned one was going to reply *La paix couronne le roi de gloire*. Eventually the former would end by saying: *Et la paix fait le bonheur des peuples / Oh roi adorable père de vos peuples / leur bonheur fait voir à l'Europe / la gloire de votre trône*.

There is a comment still visible on the lower side of the picture. It says: "The Academy of Sciences has stated in its report that the two speaking heads can shed light on the vocal organ mechanism and on the mystery of the word. The distinguished assembly has declared that the abbé's work was worth of consideration for both importance, originality and performance". We do not know who the author of these words is: perhaps Mical himself or maybe some friend of his or someone assisting to the machine performance in front of the Academy of Sciences members on July 2, 1783. As the noteworthy inventions presented to the Academy were annotated and expounded in the "Archives des Découvertes et

des inventions nouvelles”, we have looked for reference to the abbé’s machine. Unfortunately no mention of it was found in the 1783 Archives. We tend to believe that the



3. HOW DID IT WORK?

cylinder with intervals between words and their prosody correctly marked. The keyboard, instead, contained all sounds and tones proper of the French language. They were reduced in number through an ingenious system developed by the inventor. Rivarol remarks that a skill use of fingers could make the machine talk slowly or fast. In other words making use of the keyboard, the vocal harpsichord could be used as an ordinary harpsichord reading a written text instead of a musical score. Bachaumont cites the two sentences uttered by

both heads adding that the last sentence could only be heard by pushing a bit the cylinder motor. According to Vicq d'Azyr the two automata were covering a hollow box containing artificial glottises of different shape and in contact with stretched membranes. An air flow passing through these glottises was directed on these membranes which gave sounds of different pitches and from their combination resulted a quite imperfect imitation of the human voice.

On these grounds is it possible to make a guess about the device conceived by the abbé? It certainly looks a hard task considering that the first two descriptions point to a device similar to a string instrument, while Vicq d'Azyr's words suggest a wind instrument. In this last case the bellows would be present and, through a hole, they would be connected to the hollow box. Inside the box the artificial glottises, formed by brass or ivory reeds of different length, had to be placed. These, in turn, moved by the air flow would transfer vibrations to the thin elastic membranes fitted to resonating tubes. This hypothesis does not seem to us very plausible primarily for two reasons: 1) no evidence exists of the presence of bellows; 2) von Kempelen's talking machine and Kratzenstein's synthesizer, both activated by the bellows, had structures entirely different from that of Mical's.

Now, by the other clues we have quoted above, let us give a look inside the box depicted in the figure and let us try to imagine the device structure.

Let us lower the front shutter by removing the hook placed in its middle. In the box an instrument more similar to a carillon than to a harpsichord can be seen. This instrument is formed of many metal lamellae laying in front of a toothed cylinder. The cylinder, by rotating about its axis through a spring loading mechanism, vibrates one or another lamella thus producing a succession of sounds. This way, by properly arranging the cylinder teeth, it is possible to obtain sounds in rapid succession (perceived as a continuum) or spaced by long or short silenced intervals. The other end of the lamellae was very likely in close contact with some membranes which in turn were to stimulate small resonators of different shape. This type of system is then formed of a matrix that permits to hear always the same sound succession after loading the cylinder. The so arranged cylinder reproducing human voice in "an imperfect way" was used by Mical to introduce his machine.

This entire hypothesis explains also Bachaumont's statement that in order to listen to the last sentence one had to push a bit the cylinder motor. Clearly the spring loading was not sufficiently strong and toward the end the cylinder rotation tended to slow down.

The sound was very likely directed to either head (one speaks, the other replies) through two tubes which were provided with levers. Closing or opening them alternatively one could have the perception of sound coming from different directions. Moreover by carefully observing the mouth positioning of the two heads one may note that the one on the left side has lips more open and extended while the crowned one exhibits lips more close and rounded. This different lip conformation modified the acoustic effect making the two voices qualitatively unlike. Not surprisingly the gravest timbre had been assigned to the crowned head as symbol of strength and power. Furthermore, indeed helpful were the sentences written on the drape. Listeners by

knowing in advance what they were going to hear, were favourably prepared to the performance. This artifice recalls the one contrived by von Kempelen who pronounced the sentence aloud before reproducing it with his talking machine.

The keyboard mentioned above containing all tones and sounds of the French language was in all probability embedded in the door that was lowered at the beginning. The keyboard was connected to the lamellae and was used to make manually other words. In this case the cylinder was not rotating and the lamellae were hitting an untoothed surface. This operation, however, needed a skilled performer.

The keyboard was presumably equipped with thirteen keys. This hypothesis springs from a dual consideration: on one hand, the organ constructed by von Kempelen, in a certain way similar to Mical's mechanism, had a keyboard with the same number of keys that excited different shaped artificial glottises; on the other hand Wheatstone, describing the device of talking machines, pointed out that thirteen keys were sufficient to reproduce all sounds of the speech [6].

4. ADVERSE FATE!

What we suggest thus far about the machine working mechanism may not entirely correspond to reality. However it looks indubitable that Mical's machine even with its limits should have left deeper traces or at least similar to those of von Kempelen and Kratzenstein, whose machines were built roughly at the same time. By analyzing more closely the three inventor positions we immediately realize that further causes have contributed to send the abbé's machine into oblivion.

Kratzenstein and von Kempelen were renowned people. The former was a famous academician and had won the Imperial Academy of Saint Petersburg prize with his treatise "Tamen resolvendi problema ab Academia Scientiarum imperiali Petropolitana ad annum 1780 publice propositum". Yet his machine should have been inferior to the abbé's since it was only capable to reproduce vowels. The latter was not only an important politician at the court of Maria Theresa of Austria and of her son Joseph II but had become famous around the world with his "chess player". His talking machine, rather complex, was able, upon request, to reproduce entire sentences in different languages. The device was certainly superior to Mical's but was missing human features as tradition demanded. Perhaps also our shy and reluctant abbé could have become equally well-known had not, right at that time, in Paris, people chatted a lot about two stunning frauds: the one relative to a talking doll constructed in Portugal, the other to a talking head constructed in France [3]. The doll, that the inventor had in his arms, was able to reply to all questions asked. This fact came to the knowledge of Inquisition and the inventor was immediately charged of witchcraft and arrested. During his trial, that was turning for the worse, the accused asked the judges to question directly the doll. Doctors cross-examined on religious problems and it answered every question in a very satisfactory way. Inquisitors were so pleased that released to it a Catholicism certificate. Eventually it turned out that the inventor was a ventriloquist who had cheated everybody.

The second fraud concerned another would-be inventor who had all Paris flock to see a prodigious talking head. This

head, too, was able to correctly reply to all questions asked. When the inventor was unmasked to be another ventriloquist the city felt quite embarrassed for being so credulous and started to be deeply suspicious against those presenting similar devices.

It is rather likely that in this atmosphere when Mical proposed to the French government the purchase of his talking heads, the authorities were rather cautious and sent the police lieutenant Jean-Charles Lenoir to examine the machine. At this point Lenoir, probably suspecting an in-existent fraud and being afraid to harm his career (he would become within two years president of the finance committee and king librarian), filled in a negative report. So the French government decided not to buy the machine.

All this should not be considered amazing because something similar did happen almost a century later to Joseph Faber and to his talking machine. He, too, was in fact accused of being a ventriloquist [7].

5. WHERE ARE THE TALKING HEADS?

There is a last reason that has decided the different fate of Mical's machine as compared to those of his contemporaries. As far as we know, Kratzenstein synthesizer was given to the Imperial Academy of Saint Petersburg, the last version of von Kempelen's is still today kept in the Munich Deutsche Museum but Mical's talking heads have long been lost. To be honest, even in this case, two conflicting testimonies exist [8] [3]. The first tells that the abbé was so disappointed by the machine unsuccessful purchase that he destroyed it just a

few years before dying (1789). The other tells that the machine was indeed sold by the inventor at a very high price to the French government or to a foreign nobleman. Since we know that the French government did not buy the machine and excluding any destroying by the inventor, only one last possibility remains. Mical, before submitting his machine to the Academy, on June 18 exhibited it to two members of the Academy, Mr. Benjamin Franklin and Mr. De Milly, and to two members of the London Royal Society, Mr. Barthelémy Faujas de Saint Fond and de Blayden, who happened to be in Paris at that time. The scientists apparently were struck and astonished by the performance. It is not possible to rule out the chance that one of them purchased the little masterpiece and took it to England or to America.

REFERENCES

- [1] Kempelen, W. R., von. 1791. *Le Mécanisme de la Parole*. J. V. Degen, Vienne.
- [2] Kratzenstein, C. G. 1782. Sur la naissance et la formation des Voyelles. *Observations sur la Physique*, Tome XXI, suppl. Paris.
- [3] Bachamont, L. 1884. *Mémoires Secrets ou Journal d'un observateur*. XXIII, 42-43. Paris.
- [4] D'Allemagne, H. R. 1905. Les ancêtres du phonographe. *La Nature*, 1667, 353-354.
- [5] Rivaroli, A. 1783. *Lettre à M. le président de *** sur le Globe aérostatique, sur les têtes parlantes et sur l'état présent de l'opinion publique*. Paris.
- [6] Wheatstone sir Charles. 1879. *The scientific papers*. London.
- [7] Pettorino, M. and Giannini, A. 1999. *Le teste parlanti*. Palermo: Sellerio.
- [8] Michaud, J. F. 1854. *Biographie universelle*. XXVIII, 186. Paris.