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### Editor's Introduction

I received a letter from Dr. Barbara Valotti, Marconi Museum Curator of the Guglielmo Marconi Foundation in Bologna, Italy, for publication in this Historical Corner. Dr. Valotti has read several articles written by Prof. Fred Gardiol (Ecole Polytechnique Fédérale de Lausanne) about the presence of Guglielmo Marconi in Salvan, Switzerland, and Marconi's experiments. Besides the references Dr. Valotti includes, I wish to point also to the Ecole Polytechnique Fédérale de Lausanne site (<http://itopwww.epfl.ch/LEMA/>) [1], where there is a page on Marconi and Salvan. This page had totalled about 7500 visits up to the day I wrote this introduction (at the beginning of February 2007).

Prof. Fred Gardiol has read the letter and has been so kind as to prepare, with Prof. Yves Fournier, a reply to Dr. Barbara Valotti in a very short time, allowing me to publish both letters in this issue. I do believe this debate is interesting and useful, as it tries to shed some light and clarifies the available documentation on the event. Any other possible contributions to this debate will be very welcome in the future.

### Reference

1. Direct link:  
[http://itopwww.epfl.ch/LEMA/Last%20News/index.php?open=journees\\_Marconi.html](http://itopwww.epfl.ch/LEMA/Last%20News/index.php?open=journees_Marconi.html)

# A Letter to Prof. Fred Gardiol Concerning the Supposed Experiments of Guglielmo Marconi at Salvan

Dear Professor Gardiol,

**Y**ou published very recently [1] and earlier [2, 3] some accounts on the supposed experiments which Guglielmo Marconi should have conducted in Salvan, Switzerland.

I am not very confident with the spoken witness of such experiments recorded in 1965 by Maurice Gay-Balmaz (born in 1885) and the associated documentation, but there are some questions which puzzle me.

### Question 1

Is the witness of a 80-year-old man, who is recalling an episode happened when he was a 10-year-old boy, the only evidence of such experiment? Is such an evidence enough to "certify" an historical event?

### Question 2

Guglielmo Marconi wrote many papers and memories, and he had numberless biographers: in none of these, to the best of my knowledge, there is evidence of the Salvan experiment. If the Salvan experiment was so crucial, why he never reported it? Furthermore, are there documents stating that Marconi was really in Salvan in that period?

In many interviews and other official occasions Marconi mentioned the wireless telegraphy experiments carried out in his father's villa (Villa Griffone, in Pontecchio, near Bologna) in 1895, but he never mentioned Salvan. The most important lecture he gave, for example, was certainly on the occasion of the award of the Nobel Prize for Physics (in December 1909, he was 35-year-old). In the first page of his lecture, when he started to talk about his first crucial experiments, he stated:



At my home near Bologna in Italy I commenced early in 1895 to carry out tests and experiments with the object of determining whether it would be possible by means of Hertzian waves to transmit to a distance telegraphic signs and symbols without the aid of connecting wires... [4]

and it went on describing the developments of those experiments always referring to that location. Moreover, 12 years ago new sources on young Marconi were found [5]. Thanks to the recovery of some extremely interesting documents, we have been finally able to shed new light on Marconi's formative years. Important information regarding his activity and his family was discovered and in none of these documents (among them there also detailed lists of his father's accounts for books, materials, travels, family life) Salvan is mentioned.

For the year 1894, in one occasion he mentioned the fact that he went with his family for a holiday in the Alps, near Turin, Italy, and this information matches with the fact that in that area he could have met with Professor Rosa (who, at that time, lived in Piemonte, the region around Turin). Vincenzo Rosa had given private lessons in physics to young Marconi in Leghorn (on the coast of Tuscany) between 1892-1893. The quotation of some passages of the related document is worth reading also to introduce my following point:

"When I was twenty years of age, in 1894, I went with my family for a holiday in the Alps, not far from Turin. While I was in the Alps I got the idea that not merely signals but actual words and voices could be transmitted from one place to another without wires....

When I got back from the Alps I shut myself up in my attic laboratory, and got to work on my new theory. For months I lived the life of a hermit.... I knew I would succeed, but I knew that success would require hard work and faith in the final results. I found patience the best ally in my early work.

In those early days I found two local youths who were prepared to help me.... They did not always understand what I was doing, but they were fired by my enthusiasm and stoutly defended me against the scepticism of the other young men of the neighbourhood....

It was in the spring of the following year that I made my first great experiment. The months that had passed had been a time of grave doubt and worry for me.... But I had the consolation that three people believed in me – my mother and my two local assistants. We were a little community intellectually shut off from our friends, living in a world of our own.

A brief description of the earliest transmitting apparatus will be of interest. I had discovered that the simultaneous use of elevated transmitting and receiving aerials connected to the ground through the generators and receivers had a marked effect.

By connecting one of the spheres of the spark-gap by means of a vertical wire to a metal plate buried in the earth I was able to multiply many times the range of communications for a given amount of power. I discovered, too, that the distance of communication increased

very rapidly if the height above ground of the elevated aerials was increased.

The first experiment that I carried out on these lines was in the villa at Pontecchio. I had the transmitter near the attic window and the receiver a few hundred yards away on a small hill.

I sat in at the transmitter and Mignani, one of my assistants, watched the receiver. I tapped out the letter "s," and if there was any response Mignani waved a white handkerchief.

Soon the thrill of the experiment began to pall. I was not satisfied.

Communication of this kind is useless if it has to be done on a short range, I argued, for it would be simpler to signal by ordinary visual means. The waves must bridge long distances.

Then arose the problem: Would the waves overcome obstacles such as hills? There was only one way to solve the problem, and that was by experiment.

I instructed Mignani to take the receiver to the other side of the hill out of sight of the house and watch the signals. Take this gun, I told him. I'll tap three times. If there are three clicks on the receiver, fire the gun. Mignani went off with the gun, and I called my mother into the room to watch the momentous experiment. And here is what happened.

I waited to give Mignani time to get to his place. Then breathlessly I tapped the key three times. For what seemed an eternity I waited.

Then from the other side of the hill came the sound of a shot.

A few moments later Mignani came running excitedly down the hill to tell me that the experiment had succeeded. That was the moment when wireless was born. [6]

### Question 3

In any case, in what ways and for what reasons would the Salvan experiment more important than the Pontecchio ones? From the description you gave it is stated but not very evident, that transmission may have occurred out of the line of sight. This is an interesting result that Marconi should have reported, instead of claiming that result on later experiments. It is also not mentioned any grounding of transmitters or receivers, which is commonly credited to have led to the success of the experiment in Italy.

Since you have emphasized so much the Salvan experiment I would like to have your comments on the above questions.

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2. Fred Gardiol, "Inauguration of IEEE Marconi Milestone in Salvan," *IEEE Antennas and Propagation Magazine*, 45, 5, October 2003, pp. 84-85.

3. Fred Gardiol, "Marconi in Switzerland," *IEEE Antennas and Propagation Magazine*, 38, 6, December 1996, pp. 68-69.

4. [http://nobelprize.org/nobel\\_prizes/physics/laureates/1909/marconi-lecture.pdf](http://nobelprize.org/nobel_prizes/physics/laureates/1909/marconi-lecture.pdf)

5. B. Valotti, "The Roots of Invention: New Sources on Young Marconi," *Universitas* (Newsletter of the International Centre for the History of Universities and Science – CIS – at the University of Bologna), n. 7, January 1995, pp. 1-5.

6. Guglielmo Marconi, *How I Made My Discovery*, Rome, Italy, Marconi Fund, National "Lincei" Academy.

# Reply from Profs. Fred Gardiol and Yves Fournier Concerning the Experiments of Guglielmo Marconi at Salvan

Dear Dr. Valotti,

**T**hank you for your letter and the very interesting document about Marconi's early experiments, which indeed raise some puzzling questions. You are certainly right in voicing your doubts. However, you should know that newspaper articles have been presenting the testimony of Maurice Gay-Balmaz for more than thirty years. Our own publications rely mostly on previously printed material, and the same questions might have been asked to many authors in the past.

## Reply to Question 1

The testimony of Maurice Gay-Balmaz, an 80-year-old gentleman – recalling an episode that happened when he was a 10-year-old boy – is indeed the key element in our publications. But this testimony did not come out spontaneously: M. Gay-Balmaz was a quiet and unassuming person, who certainly did not step forward and suddenly boast that he had helped Marconi seventy years before! His story would have been irremediably lost if it hadn't been for the presence of mind of fellow citizens. In the 1960s, some inhabitants of Salvan still recalled the presence of a nice-looking young foreigner, roaming around in remote places, accompanied by a local boy and carrying some eldritch-looking equipment – wasn't there some kind of witchery? They had carefully kept track of them (what would people do nowadays in a similar situation?).

Feeling that something important had probably happened a long time before, Mr. Fernand Fourier, a leading citizen of Salvan, suggested to Mr. André Nusslé, a radio reporter vacationing nearby, to go and interview Maurice Gay-Balmaz. The reporter looked for M. Gay-Balmaz, and convinced him to answer some questions. On July 22, 1968, the "Radio Suisse Romande" broad-

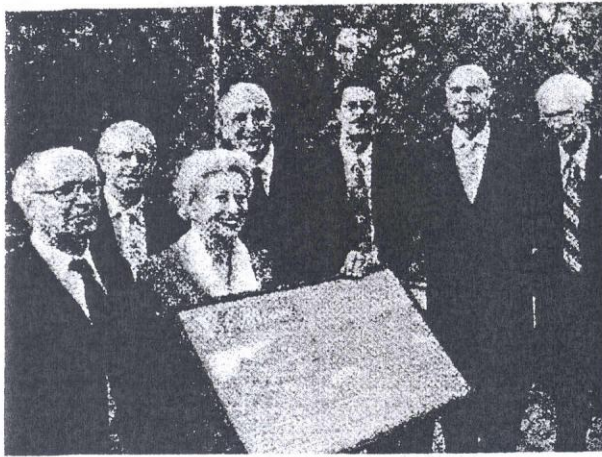
casted the most significant parts of the interviews. Visitors to the Marconi Museum in Salvan can still hear now the original recordings. In view of the limited background of the interviewee, it would sound ludicrous to believe that he could have made up the story himself!

And there is some independent evidence of Marconi's stay in Salvan: After his departure, his landlord found some electric wires in the room, and told this to his children and grandchildren. Unfortunately, since Marconi stayed in a private house, his name does not appear in hotel records.

As to whether Gay-Balmaz's testimony is sufficient to "certify" a historical event, a number of people feel that it does. In 1975, a commemorative plaque was installed on the "Pierre Bergère" by the Municipality of Salvan, in the presence of the Vice-Consul of Italy, and the event was reported in Swiss and Italian newspapers [1]. In August 1996, the Salvan authorities celebrated the hundredth anniversary of the first transmission. One of the notable guests was Prof. Gian Carlo Corazza, President of the Marconi Foundation in Italy, who presented the Mayor of Salvan, Mr. Pierre-Angel Piasenta, with a beautifully engraved silver plaque portraying the Villa Griffone and the Marconi Mausoleum (the plaque can now be seen in the Marconi Museum in Salvan) [2]. The youngest daughter of Guglielmo Marconi, Princess Elettra Marconi Giovanelli, visited Salvan a number of times, and even wrote a preface to the booklet published by one of us [3].

Last but not least, the site has now been recognized by the IEEE History Committee and the IEEE Executive Committee as a "Historical Milestone in Electrical Engineering and Computing." Neither committee did voice the slightest objection to the proposal made by both of us (they only requested a change in the wording of the citation, deleting the name of Gay-Balmaz!) [4]. The Milestone bronze plaque was inaugurated on September 26, 2003, in the presence of a brochette of dignitaries (Figure 1), among them Mr.





**Figure 1.** On the "Pierre Bergère" (l-r): Mr. Thomas Burgener (State Counselor), Mr. Pierre-Angel Piasenta (Mayor of Salvan), Princess Elettra Marconi Giovanelli, Mr. Pascal Couchepin (President of Switzerland), Prof. Yves Fournier, His Excellency Pierre B. Francese (Ambassador of Italy in Bern), Prof. Ray Findlay (IEEE Past President) (photo by O. Rausis).

Pierre B. Francese, Ambassador of Italy, and Prof. Gabriele Falciasecca, President of the Marconi Foundation in Italy.

## Reply to Question 2

There is no dispute about the fact that Marconi started experimenting in his father's villa (Villa Griffone, in Pontecchio, near Bologna) since 1893 and that, towards the end of 1895, a gunshot indicated a transmission over some 2.5 km. But, while the Marconi document cited by Dr. Valotti does not mention Salvan by name, it does not state explicitly that all the experiments carried out between these two events took place in this same vicinity. Hence, there is no evident inconsistency between Gay-Balmaz's account and the content of Marconi's document. On the contrary, some parts of it actually fit quite well:

"I found two local youths who were prepared to help me....They did not always understand what I was doing, but they were fired by my enthusiasm...." According to the testimony of Gay-Balmaz's, Marconi did exactly the same thing in Salvan.

"I discovered, too, that the distance of communication increased very rapidly if the height above ground of the elevated aerials was increased." Compare this with what Gay-Balmaz told: "There was a little pole, about two and a half meters long...in which there was a wire that linked it to a small receiver, which for me was only a bell." [5] He thus stated that in Salvan he held an elevated receiving aerial, while Marconi placed his transmitter in an elevated place (the Pierre Bergère).

There are indications that, around the same time, Marconi was sighted in Cap d'Antibes, in the south of France, trying to communicate with a ship [6]. And we don't know whether he did not go and experiment in a number of other places within this general time period. Over the years, Marconi carried out experiments in many parts of the world, and he may have had reasons not to mention some of them.

Why didn't Marconi ever mention Salvan? As long as we don't find a written document stating in an explicit and definitive manner that he did stay, or that he did not stay, in Salvan, this will remain an open question.

## Reply to Question 3

Rating is a traditional academic exercise: How can one determine whether an experiment is more or less important than another one, when both are closely related? The Salvan experiment and the many Pontecchio ones are all part of long string of significant events, which started in Andorno and extended all the way to the coast of Newfoundland. Marconi kept repeating experiments, checking and rechecking the results obtained over a variety of geographic locations.

The transmission out of the line of sight observed close to Salvan may have been due to reflections on some rock face and, before reporting it, Marconi probably wanted to check whether this effect would occur again elsewhere. As for grounding, did you ever try to ground a transmitter on top of a granite rock?

We hope that this additional information will help you to understand why, together with many other people, we feel that Marconi did actually stay in Salvan in 1895 and was helped at the time by the boy, Maurice Gay-Balmaz.

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