

G. V. Schiaparelli and the Arcetri Observatory

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Abstract. In Autumn 1873, Schiaparelli was offered the directorship of the Arcetri Observatory in Florence, vacant because of the death of G. B. Donati. Schiaparelli accepted the position, intrigued by the possibility of working in a newly built institute of modern concept, hosting the largest refractor available in Italy. However, at the beginning of 1874 he withdrew his acceptance, due to family affairs. Nevertheless, he committed to follow the development of the Observatory, giving his advice at least until 1878.

Key words. Schiaparelli – Arcetri

1. Introduction

The Astronomer Giovan Battista Donati (Fig. 1), founder of the Arcetri Astronomical Observatory, died on September 20th, 1873, less than a year after the inauguration of the institute. It is said that Giovanni Virginio Schiaparelli was offered the vacant directorship, but that he declined it (see, e.g., Abetti 1949). However, a contemporary account says that he accepted the position (Anonym 1873). Which is the truth?

Thanks to unpublished documents from the Historical Archive of the University of Florence (ASUF hereafter Capetta & Piccolo 2004), we can now shed new light on this little known episode of the life of Schiaparelli and of the history of Arcetri. We provide here a short summary of the events, which are described in full details elsewhere (Bianchi, Galli, & Gasperini 2010).

2. A newly built observatory

The Arcetri Astronomical Observatory of Florence was inaugurated on October 27th, 1872. The new hill-top building provided an unobstructed view of the sky and better observing conditions than the older eighteenth-century observatory of *La Specola*, which was instead located within the city walls, a couple of km away from Arcetri. With the new building Donati, director of the *Specola* from 1859, wanted to provide a more stable housing for the great refractor built by his predecessor, the Italian instrument maker Giovan Battista Amici (1786-1863). The telescope (later called *Amici I*) was the largest in Italy, having aperture of 28 cm and focal length of 5.3 m. After having been used for a decade with a clumsy pedestal (Bianchi 2010), the telescope was provided by Donati with a robust equatorial mount. However, the equatorial mount had not been completed, as it lacked graduated circles and a clockwork.

Besides the central cylindrical dome for the *Amici I* telescope, the observatory build-



Fig. 1. Giovan Battista Donati (1826-1873).

ing was characterized by a west wing almost entirely dedicated to meridian observations, with three vertical slits for transit instruments (Fig. 2). Despite Donati is considered among the forerunners of spectroscopical studies in astronomy (Chinnici 2000), he wanted to devote the Arcetri Observatory to Classical Astronomy, i.e. to "those measures that are the foundation and base of all of Astronomy" (Donati 1866). Donati's aim was probably that of making Arcetri the Italian equivalent of other famous foreign institutes, like Greenwich and Pulkovo (it is not to be forgotten that, in the years the Observatory was planned, 1865-1870, Florence was the Capital of a young Italian Kingdom). Thus, his main request to the *Consiglio Direttivo* (Board of Directors) of the *Istituto di Studi Superiori*¹, from which the Observatory depended, was that of a large, high precision, meridian circle for position measurements². Together with the meridian circle, the Observatory also lacked a modern transit instrument for the determination of time.

Therefore, when Donati suddenly died of cholera on September 20th, 1873, the Arcetri

¹ In 1924 it became the University of Florence.

² Donati, *Relazione intorno ad alcuni importanti provvedimenti per il Nuovo Osservatorio*, MS, 22/2/1873. ASUF, *Soprintendenza*, 1873, file: 52.



Fig. 2. The Arcetri Observatory during its construction; view of the south facade (early 1872; Arcetri Photographical Archive).

Observatory was still incomplete in its main instrumentation, and not fully operational yet.

3. Schiaparelli director of Arcetri!

The unexpected death of Donati left the Institute without a professor of Astronomy (the directorship of the Observatory being associated to the chair). The Board of Directors, headed by the Institute's Superintendent (and mayor of Florence) Ubaldino Peruzzi (1822-1891), immediately started the search for a new professor. The names of the most illustrious Italian astronomers were considered, with the aim to augment the prestige of the Institute and attract students.

Among the candidates, G. V. Schiaparelli, director of Brera Observatory in Milan and already famous for the discovery of the association of comets and meteor showers, had the advantage of being well connected: one of the members of the Board of Directors was senator Luigi Menabrea (1809-1896), which had been one of his university professors in Turin. From the documents in the *Soprintendenza* series of ASUF, it appears that Schiaparelli was preferred over the pioneer astrophysicists A. Secchi S.J. (1818-1878) and P. Tacchini (1838-1905) because of his sound basis in Classical Astronomy, which was the topic of university courses.

Informal contacts started through the brother of the astronomer, the Arabist Celestino Schiaparelli (1841-1919), which

was living in Florence. After a short exchange of letters and a brief visit of G. V. Schiaparelli to Florence, an offer was made: 9000 Italian lire per year, about 30% larger than the salary Donati had earned and than Schiaparelli earned in Milan³. Schiaparelli accepted, with the only request to start in May 1874, to have time to complete a few unfinished works in Milan⁴.

From further correspondence, we can understand that Schiaparelli was well aware of the unfinished state of the Arcetri Observatory. However, the new building appeared to be more apt to Astronomy than that of Brera, and the instrumentation promised to be much better. Schiaparelli accepted the challenge. *Nature* wrote: "we may look for considerable results from an astronomer who has already done much with smaller opportunities (Anonym 1873)".

4. The refusal & the high directorship

In the first days of 1874, however, Schiaparelli wrote to Peruzzi that he could not go anymore to Florence⁵. As he explained to his brother Celestino, Schiaparelli had intended to go to Florence without his family, because his wife did not want to move; he planned to leave his family in Milan under the care of a trusted woman; but unfortunately, and untimely, this woman died and Schiaparelli could not leave his family alone⁶.

The Superintendent Ubaldino Peruzzi and the Board of Directors still had hopes that the Astronomer would eventually solve his problem and come to Florence. They left the chair of Astronomy vacant and informally conferred Schiaparelli the charge of "high director" of the Observatory, to deal with all scientific and technical issues. In the meanwhile, the salary

³ Peruzzi to Schiaparelli, Florence, 17/10/1873. Archive of Brera Observatory, Series *Schiaparelli*, 450, file: 4.

⁴ Schiaparelli to Peruzzi, Milan, 19/10/1873. ASUF, *Soprintendenza*, 1873, file: 240.

⁵ Schiaparelli to Peruzzi, Milan, 7/1/1874. ASUF, *Soprintendenza*, 1873, file: 240.

⁶ Schiaparelli to his brother Celestino, 17/1/1874. ASUF, *Soprintendenza*, 1874, file: 189.



Fig. 3. Ernst Wilhelm Leberecht Tempel (1821-1889). (Museo Galileo, Florence).

saved because of the vacancy was to be used to complete the astronomical instrumentation. Schiaparelli complied with the plan.

After yet another sudden death, that of the assistant Domenico Cipolletti (1840-1874), the only astronomer at work in Arcetri, the Board of Directors briefly thought of inviting A. Secchi S.J. to the directorship⁷. Rather than by the bright scientist, however, they were lured by the possibility of having in Arcetri the instrumentation of the Observatory he directed, that of the Collegio Romano in Rome; the papal observatory, in fact, was under threat of being confiscated by the Italian state. But that didn't happen yet, and the attentions of the Board of Directors soon turned back to Schiaparelli.

As a first act of the "high directorship", Schiaparelli proposed his assistant Wilhelm Tempel (Fig. 3) to replace the late Cipolletti. Without a formal training in Astronomy, Tempel was nevertheless a talented observer and successful discoverer of comets and asteroids (Bianchi et al. 2010). By finding new

⁷ ASUF, *Adunanze*, 23/6/1874.

worlds from Arcetri, Schiaparelli suggested, Tempel would have served well the plan of the Board of Directors: despite the vacancy of the directorship, the public would have not felt the Observatory vacant. The Institute accepted the proposal and Tempel was offered a position⁸.

By the end of 1874 the new building of the Observatory started to show important construction flaws. In particular, rain poured inside the meridian hall, and inside the dome directly on the Amici I telescope. Informed from Florence, Schiaparelli urged repairs.

5. Schiaparelli's *Relazione*

In January 1875 Schiaparelli went to Florence together with Tempel, which was introduced to his new employers. Schiaparelli's visit was again part of his "duties" as "high director": the Astronomer did a thorough examination (the visit lasted about a week) of the condition and needs of the Arcetri Observatory. Back in Milan, he wrote a detailed report (*Relazione*) which was sent to the Board of Directors at the beginning of the following February.

The *Relazione* is interesting not only for the detailed description it provides of the Observatory's conditions, but also because it shows the coldness of Schiaparelli with respect to the nascent Astrophysics, an attitude shared by many classical astronomers (Chinnici 2008).

In fact, the first part of the report is dedicated to the direction to give to the Observatory, whether Classical Astronomy or Astrophysics. A few months earlier, a newspaper's article by an anonymous Nostradamus (1874) suggested that the Observatory should have been dedicated entirely to spectroscopic studies, becoming a "laboratory of celestial physics, chemistry and photography". Only in this way, according to Nostradamus, Arcetri could excel over other institutes.

Schiaparelli opposed to this view and asked the support of the director of the Pulkovo Observatory, Otto W. Struve (1819-

1905)⁹. Both astronomers agreed that the Observatory's building, with his large hall for meridian instruments, left no doubt: Arcetri had to be dedicated to the high precision positional measurements of Classical Astronomy. Indeed, as written in Sect. 2, this was the original intention of the founder Donati.

Within this framework, Schiaparelli outlined the main needs of Arcetri. First, a complete revision of the roofs and terraces of the building and of the dome, to prevent further damages from rain; second, the division of the circles of the Amici I equatorial, that otherwise could only be used as a "simple telescope"; third, a resolution from the Institute to buy a great meridian circle, essential for positional astronomy. Schiaparelli also discussed in the report the purchase of a smaller instrument for the determination of time; he offered, as a temporary solution, a portable transit instrument by Ertel unused in Milan. The instrument was sent to Arcetri in March 1875, and was returned to Brera Observatory only in 1901.

The Board of Directors greatly appreciated the *Relazione*, which was eventually published with minor modifications among the publications of the Institute (Fig. 4), and on the Florentine newspaper *La Nazione*.

During his visit to Florence, Schiaparelli was also asked to give his opinion on some instruments made by G. B. Amici and offered to the Observatory by his heirs. The advice of Schiaparelli eventually led to the purchase of Amici's personal telescope, the 24 cm *Amici II* refractor currently kept at the Museo Galileo in Florence (Bianchi 2010).

6. The dark ages of Arcetri

Despite the detailed recommendations of Schiaparelli, nothing was done for the Observatory and its instrumentation. Systematic repairs of the building and all decision on funding the purchase of new instruments were stopped by legal disputes between the builder and the architect of the

⁸ ASUF, *Adunanze*, 9/9/1874.

⁹ A supporting letter from Struve, dated 15/1/1875, is included as an appendix to the report (Schiaparelli 1875)

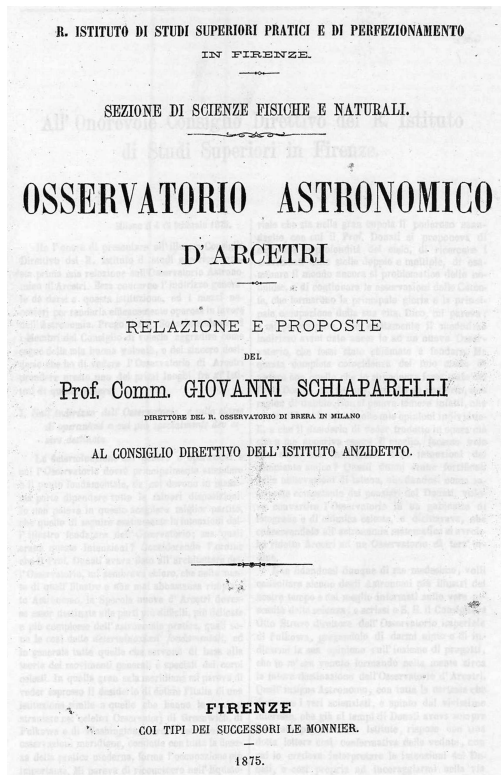


Fig. 4. Schiaparelli's report on the Arcetri Astronomical Observatory (Schiaparelli 1875).

Observatory, which had not been paid yet for their work, and the Italian Government, which considered them responsible for the bad construction. Only provisional, and ineffective, repairs were done, like covering the terraces with tiles (Fig. 5)

Nevertheless, Wilhelm Tempel managed to do some work from Arcetri. While he continued his observations of comets (he discovered C/1877 T1), he dedicated most of his time to the study of nebulae: not only he made accurate drawings of the largest objects, for which he was awarded a prize from the Lincei Academy in 1880 (Chimirri et al. 2009); he also discovered 109 new nebulae, mostly galaxies, his being the largest contribution from an Italian observatory to the making of the New General Catalogue of Nebulae and Clusters of Stars (Dreyer 1888; Steinicke 2010). The lonely work of the German astronomer, the only sci-



Fig. 5. The Observatory with the provisional tiling of the terraces around the dome, and over the west wing (meridian hall); view from north-east (1880s circa; Arcetri Photographical Archive).

entific employee of the Observatory, can be considered Schiaparelli's legacy for Arcetri.

In 1877 Schiaparelli and Tempel were asked to be members of a committee to evaluate the repairs needed by the building of the Observatory¹⁰. The report highlighted the well known problem: the ceilings were not waterproof and should have been rebuilt. The committee recommended the installation of two small domes on the east and west wings¹¹ for auxiliary instruments (the east dome was reserved for the Amici II telescope, but the telescope was never installed). The small domes should have been covered by metal, and a similar solution was suggested for the central dome of the Amici I, which was in a deplorable state.

The last involvement of Schiaparelli with Arcetri was in 1878, when U. Peruzzi asked him if Giovanni Celoria (1842-1920), assistant astronomer at Brera Observatory, would have been interested in becoming director of Arcetri. Schiaparelli said that Celoria could accept, but only if the repairs started and the new instrumentation was bought¹². Celoria confirmed that he would accept the directorship when the problems of the Arcetri Observatory were solved¹³.

¹⁰ The report is in ASUF, *Soprintendenza*, 1877, file: 36

¹¹ The two pyramidal roofs visible in Fig. 2 and 5 were just provisional, fixed, coverings.

¹² Schiaparelli to Peruzzi, Milan, 8/8/1878 ASUF, *Soprintendenza*, 1878, file: 300.

¹³ Celoria to Peruzzi, Milan, 21/10/1878 ASUF, *Soprintendenza*, 1878, file: 300.

But the repair works had not started yet. The conditions of the building worsened. The situation is well described by a visitor to the Observatory: "I was astonished; the walls swelling out with the damp rising inside them, stained, and with crumbling superficies; the dome, where Amici's larger telescope stands propped up at the distance of a few feet by wooden supporters (quite a forest!), and the 10½-in. telescope not serving its purpose at all; the machinery with which it is mounted, and the iron-work, &c., is stiff with rust. [...] The whole thing is in a most deplorable and disgraceful state" (Baldelli 1881). The Amici I was dismantled in 1887, to avoid damages by the rotten dome, and in 1888 the roof over the east wing, where Tempel lived with his wife, collapsed (Bianchi et al. 2010).

Finally, the repair works started in 1889, a few months after the death of Tempel. At that time Celoria could not move anymore to Florence, because in the meanwhile he got new duties in Milan. Eventually, Antonio Abetti (1846-1928) became director at the end of 1893, after the chair had been vacant for 20 years. Though he restored the instrumentation of the Observatory, he was never able to buy the great meridian circle that Donati and Schiaparelli desired for Arcetri. Only at the end of his career, before the directorship was passed to his son Giorgio (1883-1983), he managed to have the necessary funds. But the Institute opened to the teaching of Astrophysics, and the funds were diverted to the construction of the Solar Tower for spectroscopic studies of our star (Abetti 1921). In 1922, Arcetri became an *Astrophysical Observatory* (Abetti 1922). Eventually, Nostradamus won over Schiaparelli.

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