

# Pietro Tacchini's activity as astronomer in the scientific correspondence kept at the UCEA

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## Abstract

A scientific profile of Pietro Tacchini (1838-1905) and especially his activity in the field of astronomy, is drawn by means of the correspondence kept in the Tacchini archival fund at the UCEA in Rome. A brief description of the fund is added and other archival funds concerning Tacchini are mentioned.

**Key words** *astronomy – history – correspondence – Tacchini – UCEA*

## 1. Introduction

The Tacchini archival fund kept at the Ufficio Centrale di Ecologia Agraria (UCEA) in Rome represents one of the most important sources to study the life and work of Pietro Tacchini (1838-1905), a leading Italian scientist in the 19th century (Chinnici, 1992).

The fund collects mostly letters of his correspondence and shows the variety of Tacchini's scientific interests, which covered astronomy and astrophysics as well as meteorology, seismology and others. The portrait drawn by this correspondence is that of a man with a strong curiosity for natural sciences, a good observer, an excellent draftsman, a passionate interest in science, open to the new developments of astronomy, a successful organizer, a skilful diplomat, actually a very modern scientist.

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## 2. Short biographical note

Tacchini was born on March 21st March 1838 in Modena. He graduated at the local Archigymnasium as an engineer and then he went to Padua to specialize in astronomical research as suggested by the director of the Modena Observatory, Giuseppe Bianchi (1792-1866). In 1859 Bianchi resigned because of his loyalty to the Duke of Modena, deposed and exiled by a revolutionary government. Tacchini replaced him as director of the small Modena Observatory but in 1863 he had the opportunity to work at the prestigious Palermo Observatory and accepted the position of Adjoint Astronomer there, proposed to him by Giovanni V. Schiaparelli (1835-1910) on behalf of the just born Italian Government. In the Tacchini fund at the UCEA we find some letters concerning his good relationships with his teachers in Padua, Giovanni Santini (1787-1877) and Virgilio Tretteno (1822-1863): he asked their opinions and suggestions, he informed them about his work, and other matters.

Tacchini spent sixteen years at the Palermo Observatory, the most fruitful years of his scientific career (Foderà Serio and Chinnici, 1997). Even if the Director of the Palermo Observatory was officially Gaetano Cacciatore (1814-1889),



**Fig. 1.** A portrait of Pietro Tacchini (1838-1905).

a politician more than a scientist, Tacchini undertook all the scientific activity of the Observatory until 1879 when he was appointed director of the newborn Ufficio Centrale di Meteorologia in Rome, as well as of the Collegio Romano Observatory, from which he retired respectively in 1900 and in 1902. He died in Spilamberto (MO) on 1905, March 24th.

### 3. Main scientific achievements

Tacchini's scientific activity in astronomy covered many domains. Solar physics was by far his main interest: since 1865, once the large Merz equatorial of the Palermo Observatory had been mounted, he observed the solar photospheric features (sunspots, faculae, granulation), taking part in the international debate on their

description. From 1871 he carried out spectroscopic observations of the chromosphere, producing an early classification of prominences, whose observations he reproduced by means of excellent drawings. He also made spectroscopic observations of comets and zodiacal light and he paid attention to observe polar aurorae to study the interaction between the Sun and the Earth. In the field of positional astronomy his main contribution is the measurement of the coordinates of 1001 austral stars carried out in the years 1867-1869 by means of the Pistor and Martins Meridian Circle of the Palermo Observatory. He also studied the shooting stars and designed a device to determine their radiants. Astronomy was not his only interest: he also worked also in the field of meteorology, making such an important contribution to the establishment of a national meteorological network as to be named director of the newly established Ufficio Centrale di Meteorologia in 1879. During his stay in Rome, he was also interested in seismology and terrestrial magnetism: not by chance, in 1887 the Ufficio Centrale di Meteorologia became Ufficio Centrale di Meteorologia e Geodinamica and Tacchini, as director, gave an important impulse to promote and refurbish many geodynamic observatories.

Tacchini was also very active in the establishment of new scientific societies: in 1871, in cooperation with Angelo Secchi S.J. (1818-1878), director of the Collegio Romano Observatory, he carried out a scientific programme of observations of solar prominences which resulted into the establishment of a scientific society for monitoring the solar chromosphere, the *Società degli Spettroscopisti Italiani* (Chinnici, 2008a). In the Tacchini fund at the UCEA, we find letters written around 1872-1873 by Giuseppe Lorenzoni (1843-1914), Lorenzo Respighi (1824-1889) and Arminio Nobile (1837-1897), the first members of the Society with Giovan Battista Donati (1826-1873), Secchi and Tacchini himself, which reveal the personal and scientific controversies that arose over the new Society. In 1895 he also established also the *Società Sismologica Italiana* with the aim to publish and spread news, as fast as possible, about geodynamic events in Italy and abroad. Tacchini had a prodigious editorial



Fig. 2. Solar prominences drawn by Tacchini in 1871.

activity: he was President of both societies and editor of their official journals, the *Memorie della Società degli Spettroscopisti Italiani* and the *Bollettino della Società Sismologica Italiana*, edited by him respectively during the years 1872-1889 and 1895-1905. At the same time, he was editor of the *Annali dell'Ufficio Centrale di Meteorologia* during the years of his direction, namely 1879-1898 and also restarted the publication of the *Memorie dell'Osservatorio del Collegio Romano*, which he edited in the years 1887-1902.

#### 4. A promoter of Italian astronomy

Tacchini also played an important political role and appears to be the only effective counterpart to Giovanni V. Schiaparelli, who was by

far the most influential astronomer in the Italian policy of science at that time. In 1874 Tacchini proposed a reform project for the Italian astronomical observatories (Poppi *et al.*, 2003) which became law in 1876 (*decreto Bonghi*): from Tacchini's correspondence kept at the UCEA it is possible to track back some steps which led to the approval of the law. The Tacchini reform today appears to have been a sound but questioned and maybe premature project: it met with a strong opposition from the Italian astronomical community and unfortunately had no practical consequences on the development of the astronomical research in Italy.

He was also a strong promoter of the establishment of new observatories and, being an engineer, often drew the plans of the proposed Observatory. In 1875 he planned the establishment of a spectroscopic Observatory in Calcut-



**Fig. 3.** The Bellini Observatory on the Mount Aetna.

ta (Chinnici, 1995-1996), which had to serve as a winter station for the solar observations programme of the Società degli Spettroscopisti Italiani: the Observatory was installed at the St. Xavier's College and directed by Eugène Lafont S.J. (1837-1908) but, unfortunately, the Observatory could not contribute to the Society's scientific programme. The following year, Tacchini planned the establishment of an astrophysical Observatory on the slopes of the Mount Etna: a high site in fact could give the best chances to make solar spectroscopic observations as well as to try to observe the solar corona, normally visible only when the Sun is eclipsed. Many letters from and to local authorities show the genesis of the project and its development which led to the establishment of the Catania Observatory in 1885. Through Tacchini's correspondence at UCEA it is also possible to track the path of the establishment of the Mount Cimone Observatory, which Tacchini planned in 1880 as an astronomical and meteorological Observatory, as well as that of a mag-

netic Observatory in Sestola (MO) and many minor meteorological and geodynamic observatories in Central and Southern Italy.

### 5. International recognitions

Tacchini took part in many scientific expeditions and many documents in the UCEA archival fund concern this activity. In 1870 he was the main organizer of the Italian scientific expedition which observed the solar total eclipse of December 22nd in Sicily (Chinnici, 2008b) and four years later he was named chief of the small Italian expedition to India for observing the transit of Venus of December 9th (Chinnici, 2003). He was also invited to join foreign expeditions to observe the total solar eclipses of April 1875 at the Nicobar Isles, May 1882 in Egypt, May 1883 in Micronesia, August 1886 at the Antilles, August 1887 in Russia and May 1900 in Algeria. He collected his reports and travel notes in a book published in

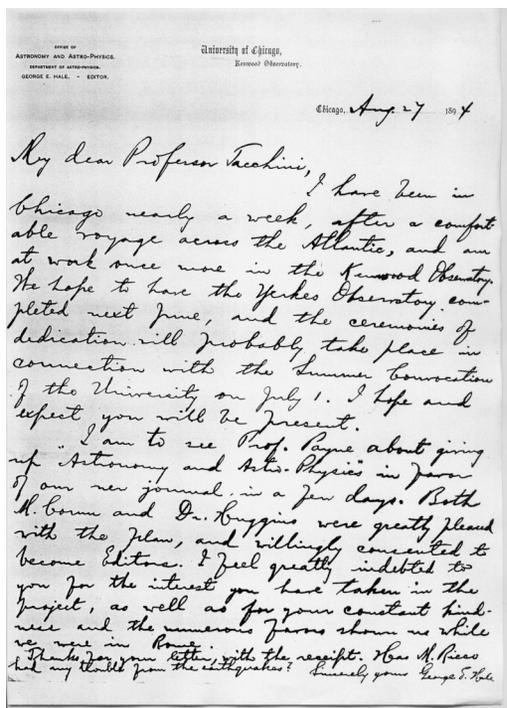


Fig. 4. A letter by George Ellery Hale (1868-1938) to Tacchini.

1888, *Eclissi totali di sole*, whose aim was to collect funds to build a monument to Angelo Secchi in his native land, Reggio Emilia: Tacchini had proposed to build a solar tower in memory of the important solar research carried out by Secchi, but this project was never accomplished. He was also member of many international committees, the most important were the Commission Internationale Permanente pour la Carte du Ciel (1887) where he contributed to assign a part of the photographic work to the Catania Observatory (Chinnici, 1995) and the Committee on Solar Research (1904). All his international activity, his exchanges and contacts abroad are well expressed by the great amount of foreign correspondents and confirmed by the prestigious awards he obtained, such as the Légion d'Honneur in 1887 by the French Republic, the Rumford Medal in 1888 by the Royal Astronomical Society, the

Royal Society of London membership in 1891 and the Prix Janssen by the Parisian Académie des Sciences in 1892.

## 6. The Tacchini archival fund at UCEA and other related archives

The Tacchini archival fund at UCEA is contained in twelve boxes and collects about 4,500 items (Chinnici, 1994), mostly (about 95%) correspondence, which can be divided into: scientific correspondence (about 70%); private letters (about 20%); circulars, invitations, etc. (less than 10%); minutes (less than 0.5%). The correspondents are more than 800, about 40% foreigners. About 30% of correspondents have been identified as astronomers, Italians cover 25%: those most represented in the UCEA fund are Tacchini's friend in Padua Giuseppe Lorenzoni (more than 120 letters), Tacchini's Director in Palermo Gaetano Cacciatore (more than 90 letters) and Tacchini's companions in the transit of Venus expedition, Alessandro Dorna (more than 70 letters) and Antonio Abetti (more than 50 letters). Among the foreigners, the most represented astronomers are George E. Hale (more than 30 letters) (Chinnici, 1997), Jules C. Janssen and Norman Lockyer (about 30 letters) and Rudolph Wolf (more than 20 letters), namely the most important astrophysicists of that time: the absence of letters by Secchi may be surprising but actually these precious documents were kept by Tacchini's family and donated to the Arcetri Observatory.

Additional archives contain documents concerning Tacchini's life and activity, even if the Tacchini fund at the UCEA is by far the largest. Other important archival funds are those of the INAF-Osservatorio Astronomico di Roma at Monte Porzio (RM), ex Museo Copernicano archive, whose Tacchini fund contains two boxes with more than 500 letters to Tacchini (De Simone and Monaco, 1997/a), while some letters by Tacchini can be found in the Donati fund (De Simone and Monaco, 1997/b) as well as in the Dorna fund, Respighi fund and Secchi fund (De Simone and Monaco, 1996). Another important archival fund is that of the Biblioteca Estense in Modena, whose Tacchini fund con-

tains more than 300 letters and many other documents, drawings, etc. Finally, there is the Secchi fund at the Pontificia Università Gregoriana archive in Rome where more than 200 letters written by Tacchini to Secchi are kept and have recently been published (Buffoni *et al.*, 2000), and the private archive of the Tacchini family, where some letters by and to Schiaparelli and some other documents are kept (Lugli, 2001).

The extensive amount of archival material on Tacchini has not yet been completely explored but it already promises to be a very interesting source and confirms the importance of this leading figure of 19th century Italian astronomy, whose scientific work and role certainly requires further investigation.

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