

Pietro Tacchini as meteorologist: his correspondence kept in the UCEA archives

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Abstract

The present work concerns Tacchini's activity during the years 1879-1899, while he was director of Rome's Ufficio Centrale di Meteorologia (Central Office of Meteorology-UCM) now called Ufficio Centrale di Ecologia Agraria (UCEA-Central Office of Agricultural Ecology). Even if that is only a limited part of Tacchini's work, we believe it is extremely interesting to investigate the studies he carried on, in order to bring to light the innovations he introduced in the meteorological field. The huge amount of letters of the Tacchini's epistolary preserved at the UCEA allow us to improve the scientific biography of this very important earth scientist.

Key words *Pietro Tacchini – UCEA – correspondence - history of meteorology – history of geodynamics*

1. Tacchini's career and studies

The aim of this work is to summarize Pietro Tacchini's studies, activities and his scientific career (fig. 1). Tacchini's studies cover a variety of interests, dealing with different fields of science: astronomy, meteorology and seismology. As a consequence, the amount of his scientific production is huge, including five hundred published works.

Having taken his degree in engineering at the University of Modena, in 1857 he began his activity, which he carried on until 1899 when he resigned as director of the Ufficio Centrale. He

worked in several sites: from 1857 to 1859 at the Padua astronomical observatory, under Santini's guidance; from 1859 to 1863 he was director of the Modena astronomical observatory; from 1863 to 1879, assistant astronomer at the Palermo observatory. In 1879, in Rome, he was appointed as first director of UCM with annex observatory. In 1899 he gave up his activity as director of the UCM, still keeping the astronomical observatory honorary direction. In 1902 he gave up his activity completely, left Rome and moved to Spilamberto (Modena), his native town.

Our report deals with Tacchini's meteorologist activity over the years 1879-1899, while he was director of the Ufficio Meteorologico.

Before Italy's unification, meteorological observations were collected in different Italian sites and neither comparison nor correlation between data were made. At the same time as the realization of the Papal States meteorological network in Piedmont, in 1865 the Ufficio Centrale di Meteorologia Marittima (Central Office of Maritime Meteorology) was founded in Florence for assistance to cargo activity. All these

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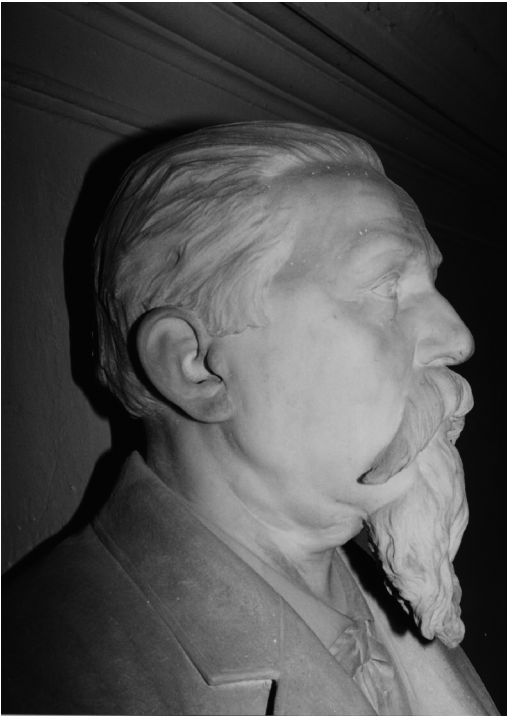


Fig. 1. Pietro Tacchini.

initiatives were autonomous, without any connections with each other. Italy, after the unification (in 1861) became one country and realized that there were common aims and social interests. On 26th November 1876 the Italian government founded the UCM, which can be considered the first attempt to realize a unique national meteorological service. The Office, located in the Collegio Romano, began its activities in May 1879. After father Secchi's death, the annexe astronomic observatory became the property of the Italian government. Its first director was Pietro Tacchini. Tacchini, in addition to scientific qualities, displayed unexpected an diplomatic disposition and important managing activities. He realized an institution that competed with foreign observatories. For this reason he allowed the existing meteorological organizations to keep their autonomy, supplying them with money, instruments and forms. He

Bollettino Meteorico
dell'Ufficio Centrale di Meteorologia
ROMA Anno I°
1879
30 Novembre

Stazioni	Barometro a 12 ^h al livello del mare 5 ^a prova	Termometro a 12 ^h 5 ^a prova	Umidità relativa a 12 ^h 5 ^a prova	Vento direzione e forza a 12 ^h 5 ^a prova	Stato del cielo a 12 ^h 5 ^a prova	Stato del mare a 12 ^h 5 ^a prova	Direzione della nebbia a 12 ^h 5 ^a prova	Stato del cielo tra 6 e 9 ^a ore	Osservazioni diverse.
Milano	746,2	+1,6	W	—	Interram- te opaco	—	—	Interram- te opaco	Nieve sui la montagna e il mercoledì.
Venezia	744,8	-0,2	NE	6	Nieve	Mozzo	—	Interram- te opaco	Bolle 12 alle 3 volte forti con neve e mare agitato.
Genova	744,7	+5,0	NE	14	Interram- te opaco	Agitato e mosso	S	Nieve	Venti forti nella giornata
Parma	744,3	+2,1	W	32	Interram- te opaco	Mozzo	—	Poggia	Poggia fra le 6 e di ore di nebbia e dopo vento forte con neve.
Frasco	751,9	+2,5	WNW	8	Poggia	—	N	Poggia	Fra martedì e 3 ^o minimo di temperatura + 1,2.
Roma	746,1	+12,0	SW	6	Interram- te opaco	—	WSW	opaco con pioggia	Poggia e nebbia nelle 4 ore. Nieve a venti forti ed un torvalle.
Foggia	746,1	+12,9	W	54	1/2 di cel- opaco	—	—	nullo	—
Napoli	747,5	+16,3	SW	26	Interram- te opaco	Molti agitati	SW	Interram- te opaco	Venti forti, fra la montagna e le 3 p. Poggia fra le 3 di ore e il mercoledì.
Bassano*	—	—	—	—	—	—	—	—	—
Lecco	743,9	+17,0	W	46	1/2 opaco	—	—	1/2 opaco	Poggia fra mercoledì e martedì.
Verona	751,4	+17,7	WSW	26	Interram- te opaco	Molti agitati	WSW	nullo	Temp. max: + 15,8 fra le 3 e 5 ore min: - 1,0 a 12 ore. Nieve e vento forti nelle 4 ore.

* Il sibpaccio manca.

Fig. 2. Bollettino Meteorico 30th November 1879 first issue.

asked them, in exchange, to send back meteorological data. After processing, these data were published in *La climatologia d'Italia* and in *Bollettino meteorico*, which began its publications on 30th November 1879 (figs. 2, 3, 4).

Tacchini organized the office in five divisions: instruments calibration, climatic studies, weather forecast, seismology and agro-climatology.

He published the monthly *Bollettino meteorico internazionale*, with observations coming from several foreign stations, and a bulletin with agrarian news named *Servizio meteorico agrario* in 1877, which became the *Rivista meteorico agraria* a few years later. At present the entire collection of publications is in the UCEA's library.

Tacchini studied not only meteorology, but he also carried on studies of geodynamics. Under his guidance geodynamics had a great devel-

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Austria ore 7 del mat.

Stazioni	Barometro reale o di alt. o di mare	Temperatura	Direzione del vento	Forza del vento	Stato atmosferico	Stato del mare
Praga	756,0	-4,6	S	Debole	Cielo tutto coperto	—
Lemberg	756,4	-4,2	S	Debole	Cielo tutto coperto	—
Vienna	756,9	-8,2	Calma	—	Cielo tutto coperto	—
Bregenz	755,3	-6,8	N	Debole	Cielo tutto coperto	—
Hornmansht	755,1	-6,2	E	Moderato	Neve	—
Uva	748,7	+1,6	Calma	—	Cielo tutto coperto	—
Pola	746,4	+2,8	E	Moderato	Pioggia	Agitato
Lesina	746,1	+14,0	S.E.	Toroso	Cielo tutto coperto	Agitato

Petroburgo

9 ^h sera del				7 ^h matt ^{ina} del				Umidità calcolata	Distanza di pioggia	
Baromet. a 0°	Direzione del vento	Forza del vento	Temperatura	Baromet. a 0°	Direzione del vento	Forza del vento	Temperatura			
748,2	N	Debole	Cielo tutto coperto	-19,5	750,9	S.E.	Debole	Cielo tutto coperto	-19,9	87 per 100

Fig. 3. Bollettino Meteorico first issue pag. 2.

Telegramma di Parigi

Saint-Denis 8 mm. Nice, 6 Marsiglia, 4 Perpignan. Lisbonne 10 mm. 5 Biarritz. Alger Nemours; depression descendue sur mer au nord. Vent NW assez fort, mer houleuse. Provence, SW fort. Alger, N fort. Languedoc. Pressions: 745 Nice, Lesina, Rome, Marseille; 748 Moscou; 750 Perpignan, Crisat, Belgrade, Brindisi, Palma; 751 Lisbonne; 754 Pleschawa; 755 Suedenosa, Gramingue, Scarborough, Coldingham, Hamburg, Kieff, Gibraltar, Tunis, Oporto, Madrid, Hermannstadt; 760 Wiek, Koebel, Pado, Stockholm; 766 Valencia.

Telegramma del New-York Herald

New-York midi 28 novembre.

Une depression augmentant en energie pendant la traversée arrivera sur les côtes de la grande Bretagne et de la Norwege entre le 30 novembre et le 2 decembre accompagnée de pluie et neige dans le nord et le sud-ouest réfléchissant au nord-ouest, bourrasques et forts vents.

St. Direttore
TACCHINI

Fig. 4. Bollettino Meteorico first issue pag. 3.

opment. That is the reason the Ufficio Centrale changed its name by Regio Ufficio Centrale di Meteorologia e Geodinamica (UCMG) on June 1887. Tacchini's idea to found a museum of sismometria – the topical subject of his paper *Antichi strumenti sismici* appeared on *Bollettino sismologico* in 1898 – is explained in the following words: «Nobody can understand how important collecting and keeping these ancient instruments. They were the forerunners of today's and are necessary for describing the history of seismometry. In the same way, as we collected the ancient instruments of astronomy, that we are going on collecting and keeping in Museo Copernicano, my idea is to do the same for the seismological ones collecting them in a new museum located in Ufficio Centrale di Meteorologia e Geodinamica». One century later, the museum has not yet been realized.

2. Tacchini's papers and publication

Tacchini proved also to be a good manager. At the International Congress of Meteorology, Rome 1879, he contributed with innovative ideas to coordinate the national meteorological services, founding Italy's Istituto Meteorologico Centrale and becoming its first director. He chose an elegant seat, the Collegio Romano, and engaged young and skilful co-workers such as Millosevich, Chistoni, Ferrari, and Lugli. Thanks to his guidance the office could compete with the best institutes in Europe.

Many daily and periodical publications were published concerning both scientific and practical subjects, like the operative management of data and meteorological stations. We can mention: *daily meteoric bulletin*, *the decade agrometeorological review* and *Annals of Ufficio Cen-*



Fig. 5. Outside Capanna Margherita.

trale di Meteorologia. This collection contains a large amount of data and bibliography concerning meteorology and geophysics.

The following are some of the most important Tacchini's papers published in *Annali di Meteorologia*.

Il clima di Roma: a complete review published in 1882. Tacchini presents all meteorological data recorded in the Collegio Romano since 1855 and 1861. This work is the basis for later works made by Eredia, Roncalli and many other researchers using this database.

Malarian fever and meteors in Rome region: treating this subject in 1884, Tacchini was a forerunner. He understood the influence of climate on human health, today a topical issue with studies trying to establish relationships between climatic environment and diseases.

Massaua climate: this work is a report done for the former Ministry of the war. It is an in-depth analysis of the meteorological observations made in the Massaua observatory in 1885. The instruments, part of the Italian colonies network, were supplied by the Ufficio Centrale.

Snow in Rome January 1880 and 1891: snowy weather is not frequent in Rome, the data recorded by Tacchini have been recently used by Roncalli, Mangianti and Beltrano to update to 1990 a complete file of snow-falls in Rome.

Sunshine in Rome 1887-1895: this work presents a complete record of sunshine days and hours in Rome done with Campbell Stokes



Fig. 6. Queen Margherita's visit to Capanna Margherita.

shine recorder. The idea to record sunshine was quite new. At that time, indeed, only temperature and rainfalls were registered.

Seeds and sand rainfalls: the paper describe April 24th 1897 rainfall. Seeds and sand were carried from the Sahara desert and it was a typical African perturbation that reached Italy.

Very important was Tacchini's commitment to found many important observatories all over Italy, especially the ones located at high altitude. We mention, first of all, the Etna observatory which supplied meteorological data of high altitude. Sestola, Monte Cimone and in the last period of his activity the Monte Rosa observatory, Capanna Margherita, the highest in Europe (figs. 5, 6, 7). It was very important and useful, even today, for glacier studies. In a paper we learn how Tacchini's will to realize these sites was very uneasy due to the lack of money, to say nothing about the difficulties of building an observatory at 4942 m.s.l. The realization of the Monte Cimone observatory was due completely to his will. The first idea dates back to 1852. In 1876 the Italian government and Club Alpino tried to realize it but were unsuccessful (fig. 8). When Tacchini moved



Fig. 7. Inner room and instruments of Capanna.

from Palermo to Rome in 1880 he received the task of building a tower in Monte Cimone. As director of the Ufficio Centrale per la meteorologia, he reached the aim to build it annexed to Sestola Observatory. The opening was in 1892.

This paper only concerns Tacchini's activity as a meteorologist during the period as director of Ufficio Centrale and this is only a very small part of his works. Reading Tacchini's many papers we discovered and realized that his work, studies and research in astronomy were predominant and very extensive.

3. Pietro Tacchini's scientific and personal correspondence

Like most of the great scholars of his times, Pietro Tacchini had an intense epistolary relationship with a large number of Italian as well as foreign scholars from various sectors of the sciences. By virtue of his role as director of the

Anno 1880, 28 gennaio.
 "..... Dunque noi dobbiamo intenderci, e procedere gradatamente al fine di riuscire a che "alle vette dei nostri monti, si possa andare con sicurezza, tanto per oggetto di studio che per divertimento puro. Il C.A.I. ha mezzi sufficienti per continuare nella via intrapresa. Cerchiamo dunque di fissare fin d'ora, d'accordo col Governo, la completa sistemazione di rifugi-osservatori ... Ecco ciò che io propongo alla S.V. alla quale sta tanto a cuore la nobile istituzione del Club Alpino. Al divertimento uniamo lo studio e l'opera sarà completa .
 Mi creda, ecc."

PIETRO TACCHINI

Direttore del R. Ufficio Centrale di Meteorologia

Fig. 8. Tacchini's letter to Quintino Sella president of CAI (Club Alpino Italiano) regarding the building of Capanna Margherita on Monte Rosa.

UCM (later UCMG), we should add to these correspondents the people in charge of public and private institutions, politicians and leading cultural figures. It is through this dense network of relations that it was possible for Tacchini to assure Italy a meteorological service first and then a geodynamic one as well, up to the standard of the other European countries and the study tradition until then guaranteed by networks of private scholars or those operating within the ecclesiastic colleges or the universities.

The UCEA library alone preserves more than 5,000 letters that he had received, from 1860 to 1901, from more than 1,000 correspondents, some 300 of whom foreign.

The epistolary, wholly reproduced in digital format by SGA – *Storia Geofisica Ambiente* – of Bologna, within the scope of the TROMOS Project (INGV-SGA 1990-2007) is currently the subject of study by numerous scholars from

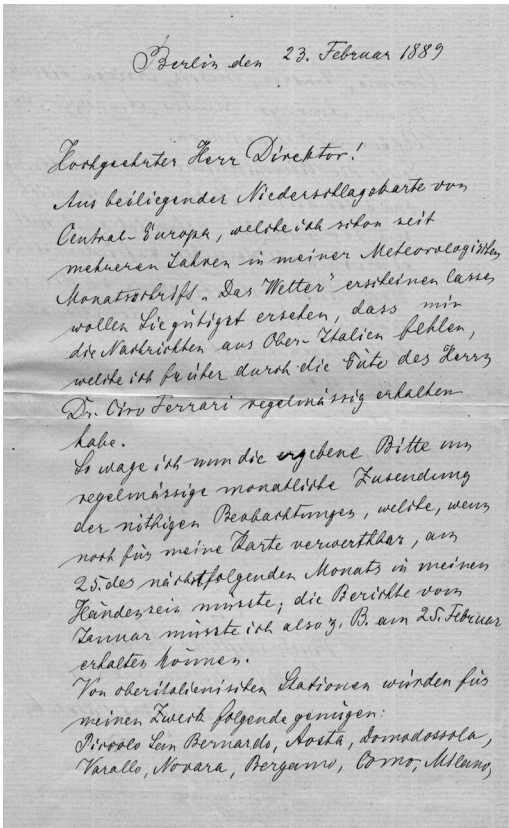


Fig. 9. Tacchini's correspondence with german scholar.

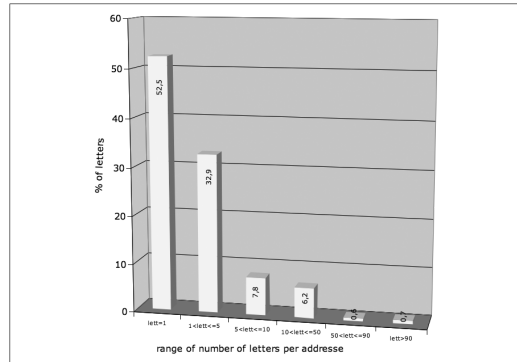


Fig. 10. Tacchini's letters statistical distributions.

been made available to scholars, with greater effectiveness particularly after its reproduction and it has so far contributed to outlining the figure of Tacchini better, but also that of some of his correspondents. As a preliminary step, it is possible here to sum up some statistical data relating to the size of some of the correspondence between the Italian and the foreign scholars (fig. 9). As has been said, Tacchini had about one thousand public and private correspondents in this epistolary fund, some 30% of whom foreign. Over 50% of the correspondents are present with just one letter in the Tacchini epistolary fund, while as many as 1.3% of the correspondents is present with over 50 letters, seven of whom with more than 90 (fig. 10).

a range of disciplines which Tacchini dealt with in different ways.

The epistolary archive is the largest one preserved at the UCEA, in which the institutional, scientific, political and private correspondence is mixed together. Tacchini's role in the birth and the development of the national services of meteorology and seismology in Italy, the substantial integrity of the archive, practically untouched up until the time of its reproduction, make this documentation extremely important for Tacchini's scientific and human biography and for the disciplinary history of meteorology, astronomy and seismology in Italy in the second half of the 19th century.

In this respect, this important archive has

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