FRANCESCA STROBINO

Early Photographic Accounts at the *Prima Riunione degli Scienziati Italiani* (Pisa, 1839)

Abstract

This paper sheds light on a pivotal moment in early photography and its connection to science, re-contextualising some of the surviving accounts on the medium in nineteenth-century Italy. The first meeting of the Italian Scientific Association (Pisa, 1839) provides an excellent case study to investigate how Italian natural philosophers approached the invention focusing on the chemical and optical phenomena showing on the surface of the daguerreotype plate rather than the image it was carrying. By investigating the accounts presented at the scientific meeting, I argue for a re-think of our approach to early photography in Italy from a material and cultural perspective that extends beyond photographic images or apparatus.

Keywords

PULITI, TITO; DAGUERREOTYPE; SCIENTIFIC PHOTOGRAPHY; COLORED METALS; ELECTRICITY; ITALIAN SCIENTIFIC ASSOCIATION; TUSCANY

In the early days of photography's invention, the entanglement of science and photography was as crucial as that of the institutional forces and network of practitioners sustaining its development [–1]. Many studies have already focused on exploring the history of the photographic medium through the analysis of scientific meetings such as those of the Royal Society, the British Association for the Advancement of Science, and the Académie des Sciences [–2]. However, in spite of their relevance, international scholars have paid little attention to the *Riunioni degli Scienziati Italiani* (meetings of the Italian Scientific Association, hereafter RSI), started in the Grand Duchy of Tuscany in 1839, which are a vital site to explore how photography and its applications were discussed by Italian men of science [–3]. The

DOI: 10.4424/rsf2021-11
Open access article published by Forum Editrice Universitaria Udinese · www.rsf-rivistastudifotografia.it

constant interweaving of personal and professional networking around photography contributed to reinforce old connections and to forge new synergies between Italian, English, and French scientists.

In this paper I examine the I RSI, which took place in Pisa, 1839, focusing on some of the earliest accounts on photography publicly discussed in the Italian peninsula. The meeting, which coincides with the first year of photography's announcement, offers an institutional framework to explore early applications of sensitised paper to the study of the solar spectrum and of galvanoplasty to daguerreotype-based photomechanical processes. Official and published accounts of the meeting are here analysed next to unpublished reports, journal articles, and private correspondence between early practitioners and scientists, providing a crucial example of how the newest information on photography's progress and application was often mediated and facilitated by personal connections. Finally, this paper pays particular attention to the materiality of early photographic experiments, connecting the reception of the daguerreotype discovery with the material culture of Italian nineteenth century natural philosophers.

Pisa 1839, a good place and year to start

—

> Se l'amore del luogo natio non rende sospetto il pensiero di alcuno tra i soscritti al presente foglio, se il dritto veder dei nostri Colleghi non può interpretarlo diversamente, bene ci sembra che si apponesse chi giudicava doversi incominciare da Pisa. Perché questa città che fiorisce nel centro della nostra Penisola in ogni maniera di studi, è pure assai vasta ed opportuna ad albergare molti forestieri di ogni grado, è amena, tranquilla e ricca di Musei; ed a perenne e scambievole onore della Religione, della Filosofia e delle Belle Arti, mostra altera la Torre, da cui si bene esplorava le meraviglie del cielo il maggior dei Filosofi naturali dato dalla Toscana alla comun patria –[4].

—

With these lines written in March 1839, Pisa was presented to Italian and foreign *dotti* and natural philosophers as the chosen location to host the I RSI –[5]. The invitation was signed and endorsed by some of the most influential scientists of the time, including the French Prince Charles Lucien Bonaparte, nephew of Napoleon Bonaparte, and the Italians Vincenzo Antinori, Gaetano Giorgini, Paolo Savi, Maurizio Bufalini, and Giovanni Battista Amici. The latter – Amici (1786-1863), microscopist and Professor of Mathematics at the Reale Museo di Fisica e Storia Naturale in Florence (hereafter Reale Museo) – is a rather familiar name in photographic studies thanks to his correspondence with the English photographic pioneer William Henry Fox Talbot –[6].

The I RSI was openly supported by the Grand Duke of Tuscany Leopold II, described by many period sources as a natural sciences enthusiast, and inspired by the *Versammlungen*, started by the Gesellschaft Deutscher Naturforscher und Ärzte (Association for German Scientists

and Artists) in 1822 –[7]. These meetings of experts quickly became a crucial occasion to share and discuss the newest research, inventions, and discoveries in the fields of Natural Sciences, Physics, Mathematics, and Medicine, a model that the organisers of the I RSI adopted. In this context, the 1839 Italian initiative is significant as it was the first scientific meeting of the nineteenth century able to reunite 421 natural philosophers and circa 300 amateurs from all the Italian independent governments, 22 years before the Italian Unification in 1861 –[8]. Remarkably, among those listed to receive the proceedings there was only one woman, the English "Queen of Science" Mary Somerville who, however, did not attend the meeting –[9].

The "pleasant" Pisa was an advantageous halfway-point geographically speaking as well as a cultural statement –[10]. One of the non-scientific aims of the meeting was in fact to present the Grand Duchy of Tuscany as a prosperous territory, willing to pursue important industrial improvements in line with other wealthy European countries. It is no coincidence that, during the same year of the I RSI, the project of the Florence-Livorno railway (Ferrovia Leopolda) was approved by Grand Duke Leopold II and, by the end of 1848, the construction works were completed –[11]. Connecting the scientific meeting with the history, artistic heritage, and industrial strength of the Grand Duchy of Tuscany was therefore a crucial aspect, emphasised by the gift given to the attendees: a copy of the 3-volume new edition of *Descrizione storica e artistica di Pisa e de' suoi contorni* (Historical and Artistic Description of Pisa and its Surroundings) –[12]. It is within this cultural and industrial context that Tuscany men of science approached photography's invention, driven by the desire to pursue their own experiments and enter the international scientific debate.

Early daguerreotype experimentation at the Reale Museo in Florence

The I RSI took place between October 1-18, two months after the French Government disclosed the Daguerreotype process' specifications –[13]. Quite naturally, Italian scientists were drawn towards the French invention, which claimed to provide images of reality on a silver-plated copper –[14]. In March 1839, in preparation to the I RSI, Charles Lucien Bonaparte personally sent an invitation to the astronomer François Arago, who announced Daguerre's invention to the world in January of the same year –[15]. A few months before the I RSI, Amici's letter followed Bonaparte's asking Arago if his presence was to be confirmed –[16]. The letter is undated, but it is possible it anticipated by a few weeks the publication of the daguerreotype specifications, published in August 19:

—

> Il S.r Commendatore [Vincenzo] Antinori vi presenta i suoi complimenti e vi pregherebbe a volere procurare al nostro Museo uno dei primi Daguerrotipi che sia per uscire. Il prezzo vi sarebbe rimborsato tosto col mezzo del Ministro di Toscana. Se non fosse possibile avere

01

Giacomo Brogi,
Prof. Tito Puliti, 1870 ca.
Carte-de-visite, albumen print, primary support 8,9 × 5,8 cm (secondary support 10 × 6,2 cm).
Florence, Ferruccio Malandrini's private collection

a.

b.

subito questo singolare istrumento, vogliate avere la bontà di spedirci almeno la descrizione che l'autore sta per pubblicare –[17].

—

As Amici's letter attests, the request came directly from Vincenzo Antinori who, between 1829-1859, was the director of the Reale Museo where Amici worked. It is important to note how Amici explicitly underlined that the request was financially supported by the Tuscany minister, demonstrating the willingness of the Grand Duchy of Tuscany's government to actively invest in the brand-new scientific discovery –[18]. Unfortunately, Arago did not attend the meeting in Pisa and the commission was unsuccessful as Amici never received any objects or accounts of the process –[19].

Nevertheless, Tuscany men of science found other ways to experiment with the French invention. In September of the same year, on his way back from France, Marchese Grimaldi brought a Giroux daguerreotype apparatus with him and gave it to the Reale Museo for "soli 20 zecchini" –[20]. Even if Grimaldi's apparatus is the first documented trace of a daguerreotype entering in Grand Duchy of Tuscany, there is no corroborating evidence to prove it was the one used to make the first specimens –[21]. What is certain, however, is that a series of photographic experiments took place in September within the institutional frame of the Reale Museo. Thanks to the network of practitioners and scientists who brought daguerreotype technology in Italy, on September 2, Tito Puliti made the first known Italian experiments at the Reale Museo, where he was working as Assistant Professor of Experimental Physics (fig. 1) –[22].

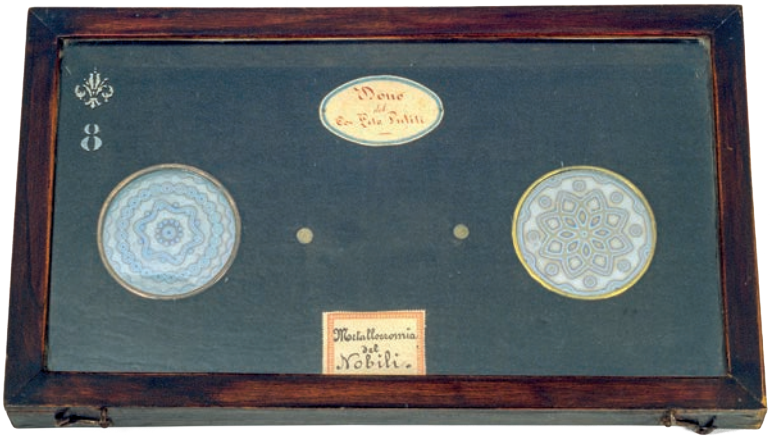
Photographic accounts at the I RSI: Puliti's daguerreotypes and Nobili's *metallocromie*

On October 6, towards the end of the third assembly of the I RSI, section of Physics, Chemistry, and Mathematics, Puliti was finally able to present to his fellow scientists the apparatus he employed to produce "apparenze fotogeniche secondo i metodi di Daguerre" –[23]. In the brief summary published in the *Atti della Prima Riunione* (proceedings of the scientific meeting, hereafter *Atti*), there is no reference to daguerreotype specimens presented before the attendees. However, a richer account was given by Gottardo Calvi, fellow of the Società di incoraggiamento delle scienze e lettere in Milan and the Accademia dei Georgofili in Florence, who reviewed the scientific meeting in three letters, published in "Rivista Europea" and subsequently as a small booklet –[24]. In the second letter, dated October 8, Calvi described Puliti as the first Italian practitioner able to carry out Daguerre's method, following only the information disclosed in technical accounts published in journals. Furthermore, Calvi's letter attests that Puliti presented daguerreotype specimens at the I RSI and made some new ones in front of the scientific gathering –[25]. It was, therefore, a public demonstration of the process before a scientific audience, the first in Italy. In this regard, it is interesting to point out how Calvi, as many other period sources, misleadingly refers to Puliti's specimens as "disegni fotogenici" (photogenic drawings), even if he underlines that they were made following Daguerre's method –[26]. The mistake, quite common at the time, is indicative of the little knowledge of paper photography in Italy and, consequently, of observers' difficulty to correctly address the object before their eyes –[27].

By comparing Calvi's letter to the *Atti*, we do have the impression that the Pisa scientific gathering was much more interested in understanding the theory behind the daguerreotype process rather than in commenting on the verisimilitude of the image it was carrying –[28]. In particular, Puliti's paper focused on explaining the physical phenomenon showing on the surface of the silver-coated copper plate, generally known as Newton's rings, a colourful interference pattern caused by light reflecting between two surfaces. It is in fact possible that Puliti's specimens were made on non-well-polished plates, with irregularities which interfered with the image giving rise to Newton's coloured rings. As a result of the observation of these colours, Puliti connected his daguerreotype experiments with the *metallocromie* made by Leopoldo Nobili, one of his colleagues at the Reale Museo who had died just 4 years before –[29]. Nobili's *metallocromie* (figg. 2-3) appear as iridescent figures, showing rings of lead oxide formed by electrolysis around a stripe of steel, a phenomenon that Nobili observed for the first time around 1828 –[30]. In spite of the significant difference between the two discoveries, it is important to underline how Nobili's *metallocromie* appears to be the closest reference for Italian scientists to understand the daguerreotype process and make sense of the invention. It is probably no coincidence that Puliti, who worked closely to Nobili, took up on

02

Leopoldo Nobili,
Metallocromia del Nobili,
gifted by Tito Puliti,
1830 ca.
Steel, diameter 7 cm.
Florence, Museo Galileo,
inv. no. 3881



03

Leopoldo Nobili,
"Nobili's metalochromic
apparatus", 1830 ca.
Wood, brass, 24,9×16,2 cm.
Florence, Museo Galileo,
Sala 14 / no. 109

experimenting with the daguerreotype. The familiarity with the materials involved, combined with solid hands-on knowledge of Nobili's theories, functioned as an essential base to understand the process and carry it out efficiently [31].

Despite little research on the topic, Nobili's work on electricity and coloured metals has close connections with early photographic experiments [32]. Between the late 1820s and the early 1830s, Nobili's discovery of a method to colour metals was quickly recognised to be of value for the scientific community [33]. Despite his Continental fame, as noted by Talbot in a letter to Amici, English physicists were slow to recognise the importance of his discovery, which attracted their attention only in the early 1840s, at the same time in which Jacobi and Spencer's galvanoplastic method for copying reliefs of medals and much more became fashionable [34]. The same Puliti repeated Jacobi's process in the Reale Museo in December 1839, using the Galileo medal minted in celebration of the I RSI as test object [35]. Talbot also took advantage of Nobili's observations for his own experiments, leading him to discover a "method of rendering a silver plate sensitive to light by exposing it to iodine vapours" in 1838, one year prior Daguerre's announcement [36].

But Talbot was not the only one experimenting in this direction. In December 1842, Dr Augustus Waller published in the "Philosophical Magazine and Journal of Science" an account on a new method to make coloured rings. At the beginning of the paper, he comments on what pushed him towards the experiment:

> —
>
> These coloured films however, merit attention independently of the purposes to which they may be applied in photography: the beauty of some of the phenomena themselves is peculiarly attractive; the numerous changes of colour they undergo, either by a variation in the thickness of the film, or by the action of light, assign them a place among the most curious facts of science, and the extreme facility with which they are obtained adds to the interest they excite [37].
>
> —

In practice, what Waller investigated was a new method of making coloured rings by using the same chemical process employed in the first part of the daguerreotype. The method involved placing bromine and chlorine at the centre of a well-polished silver or copper plate. By chemical action, a series of rings appeared, with the thinnest film at the circumference, as previously observed in Nobili's *metallocromie*.

Only a few months later, Talbot submitted a letter to the editor of the "Philosophical Magazine and Journal of Science" taking credit to be the first one to discover and publish the method to produce coloured Newton's rings (what he argued to be iodide of silver in various stages of development) by exposing a silver plate to vapours of iodide. As he wrote:

> —
>
> Now, since the History of Photography will be probably written some day or other, it is desirable that the different phenomena discovered

> should be ascribed to their first observers, with as much attention to accuracy as possible. As this is in most cases the only reward of scientific researches, justice requires that it should be scrupulously adhered to, and if by accident a mistake occurs it ought to be speedily rectified –[38].
>
> —

However, Talbot ended up contradicting himself. Even if he acknowledged the relevance of Nobili's discovery to Amici, he did not mention it in his public reply to Waller, where he argued for the importance to get the historical record of the discovery right.

Nonetheless, the above discussed accounts draw our attention to a series of important facts that are often overlooked in photographic history. What initially attracted the attention of Waller, Talbot, and the gathering of Italian scientists was the curiosity and the willingness to understand whether the chemical and optical phenomenon discovered by Nobili in his *metallocromie* and the one showing on the daguerreotype surface could somehow be put to use to control the colourful interference showing on the plate. The attempt was not as bizarre as it may appear. As observed in recent studies, daguerreotypes may be considered as the first realization of plasmonic colour printing –[39]. The image, created by metallic nanoparticles producing light-scattering, is characterised by an exceptional dynamic range which causes unique optical effects depending on the viewing angle. However, if the chemistry of the daguerreotype was relatively easy to understand for nineteenth century natural philosophers, the rich tonal range of the phenomena observed required a more complex investigation. What is important to underline here, is that the above illustrated accounts attest how the material culture of early practitioners and observers was heavily informed by the experiments to which they had access, influencing their way of approaching new discoveries.

Another relevant aspect to point out is how experiments involving electricity (electrolysis, galvanism, etc.) blended since the very beginning with daguerreotype experiments, opening the path towards the research of early photomechanical processes –[40]. Besides Nobili's *metallocromie*, this aspect is further underlined by a remark in the *Atti* mentioning a paper by Alfred Donné intended to cast light on Daguerres's discovery. Donné's account was published on August 20, just one day after the Daguerreotype process had been made public –[41]. As noted by Steffen Siegel, Donné's account contained an exceptionally early comprehensive report of the history of the invention, including several critical observations on the daguerreotype process –[42]. One of the more severe pitfalls highlighted by Donné, which he further explored in another paper published in mid-October, was the uniqueness of the daguerreotype image which pushed him to research a method to use the daguerreotype plate as a printing cliché –[43]. Donné's paper was not published in time to be discussed at the I RSI. However, his research was discussed in a paper by Macedonio Melloni read at the Reale

Accademia delle Scienze in Naples on November 12, 1839 –[44]. Melloni, who attended the I RSI, was not only an eminent scientist who had collaborated with personalities like Arago and Nobili but was also gifted with artistic skills –[45]. It was probably his brief employment as an engraver in Paris (1819) that put him in the position to better understand the reach of the etched method proposed by Donné. As reported, Donné not only found a way to stabilise the image on the silver plate, but

—

> quel che importa immensamente più, egli è pervenuto durante la serie delle sue investigazioni teoretiche [...] ad incidervele mediante alcune sostanze che probabilmente corrodono la lamina metallica essendo ridotte allo stato di vapore: laonde, ora si possono produrre su metallo e per la sola azione della luce e di alcuni chimici reagenti, indipendentemente da qualunque soccorso tratto dalle arti del disegno, degli scavi più o meno larghi e profondi totalmente analoghi ai lavori dell'incisione ordinaria, e trarne poscia parecchi esemplari su carta –[46].

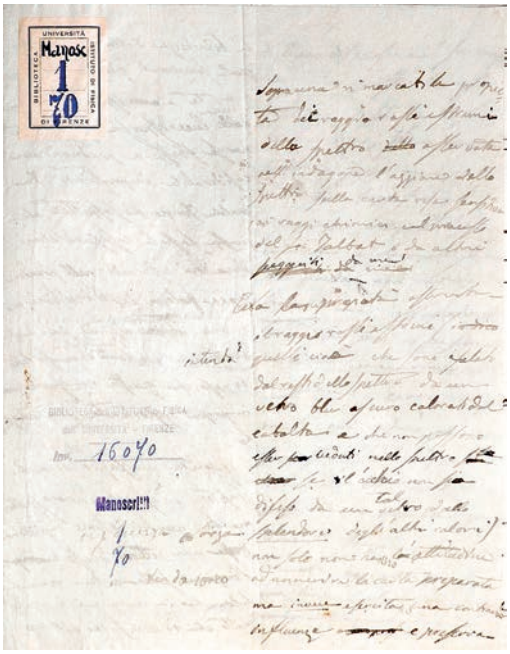
—

Other accounts: Del Bue's theory and Herschel's solar spectrum

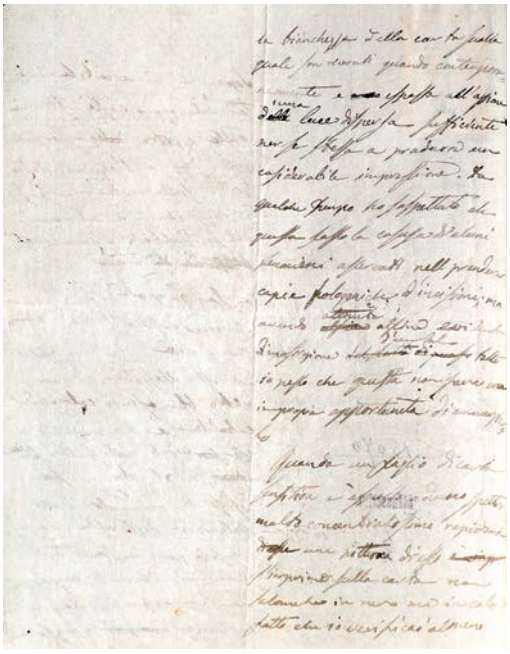
The brief account on Tito Puliti's experiments and Donné's report is, without a doubt, the most straightforward reference to early photographic research published in the proceedings of the I RSI. However, there were other accounts involving photography at the I RSI which received less visibility, due to the fact that the authors did not attend the meeting in person and that no photographic specimen was presented.

The Parma based chemist Giuseppe Carlo Del Bue offered a theory of the daguerreotype process, read on his behalf by Attilio Cenedella, a fellow chemist based in Brescia –[47]. Apparently, after a vibrant discussion reported in the *Atti*, Del Bue's letter was dismissed by the gathering as an "immature" explanation of Daguerre's process –[48]. Nevertheless, the *Compendio* (unpublished manuscript) and Del Bue's article on the daguerreotype published in the "Bollettino di Chimica e di Farmacia" provide a more nuanced insight on his theory –[49]. Unlike the *Atti* that follow the chronological order of the meetings, the Compendio presented Del Bue's theory together with Puliti's experiments as one of the optical topics discussed in the Physics section. While Puliti's account reflected an experimental, hands-on approach towards Daguerre's discovery supported by actual photographic evidence presented before the meeting, Del Bue provided a theoretical frame of the phenomenon from a chemical perspective welcomed by the gathering with much scepticism.

Nevertheless, Del Bue's article and letter are among the earliest original accounts produced in the Italian peninsula to go beyond a simple report of Daguerre's process –[50]. In his article, Del Bue discussed the chemical phenomenon responsible for the colours, what he called "i chiari e le ombre" (light and dark areas), visible in the daguerreotype –[51]. He argued that the trigger could be an "electrical effect" produced by the contact of different metals (copper and silver) and the reaction of



a.



b.

04

Luigi Pacinotti / Vincenzo Amici (transcribed by), *Relazione di John F. Herschel sulla "proprietà dei raggi"*, ms., 1839. Florence, Museo Galileo, Processi verbali, lettere e memorie della sezione di fisica, chimica e matematica, inv. IF 16049-16072

mercury and iodine, leading to the union of mercury and silver (lights) and sulphur and silver (shadows). According to the *Compendio*, the meeting concluded that further investigation and research were needed before judging Del Bue's theory and highlighted how, in spite of the various accounts presented at the I RSI, Italian scientists were still relatively confused around the physics and chemical phenomena involved in the daguerreotype process. Nevertheless, there are two constants in all the accounts discussed in the I RSI: electricity and colour.

The last contribution I am going to discuss is a letter that has, so far, received little attention in Italian photo history scholarship. In the Museo Galileo's archives, which conserve the surviving documentation of the RSI, there is a manuscript volume with the minutes of letters and papers presented in the section of Physics, Chemistry, and Mathematics, the same one in which the previous papers were discussed –[52]. One of the entries, bearing the title *On the Property of Rays*, is by the British scientist John Herschel (fig. 4a) –[53]. The minutes, handwritten by Luigi Pacinotti and Vincenzo Amici (son of Giovanni Battista), report the translation of the entire account sent by Herschel to Vincenzo Antinori and read at the opening meeting of the I RSI –[54]. However, it is here important to stress that the opening meeting did not provide a suitable context to discuss Herschel's report as it had mostly an institutional purpose rather than a scientific one –[55]. Nonetheless, Herschel's paper provided a vivid account on some of the early applications of Talbot's and Daguerre's discoveries to science, in particular to the study of the solar spectrum –[56]. Herschel outlined his current research on the

action of light on sensitive paper, chemically prepared as illustrated in "Talbot's process" (fig. 4b) –[57]. Upon experimenting with coloured media and prisms, he noted how when exposing sensitised paper to the red portion of the light spectrum, corresponding to Fraunhofer's rays A-C, no chemical action was recorded while, on the opposite end of the spectrum, rays F-G, the chemical effect was at its peak and the paper turned a black tint –[58]. Herschel also made clear reference to his experiments in making photogenic copies of engravings, highlighting how this practice exposed some of the phenomena above illustrated.

Besides the scientific relevance of Herschel's experiments, published one year later in the "Philosophical Transactions of the Royal Society", it is relevant to note that Herschel's paper was the only account on Talbot's photographic process presented to Italian scientists at the I RSI –[59]. Talbot tried to send some photogenic drawings to be presented at the I RSI via Giovanni Battista Amici, but he failed to send the parcel in time for the meeting –[60]. In this regard, in is interesting to point out how, without proof to be shown, Talbot's process was poorly discussed at the I RSI. However, even if there were no specimens for the Italian scientists to observe and inspect, it is nonetheless crucial to underline how Talbot's and Herschel's research were part of the I RSI, displaying some of the first scientific applications of the new discovery in various branches of observational sciences –[61].

As this paper has illustrated, the I RSI provides a precious insight into the interplay between the material and scientific culture of nineteenth century Italian natural philosophers and the reception of photography's invention. Puliti's daguerreotype specimens were shown, analysed, and discussed within the experimental context of optical physics and chemistry, which informed how Italian scientists approached the daguerreotype. The official proceedings of the I RSI also attest to the importance of Puliti's plates as a physical proof of the process which was discussed close to other similar Italian experiments, such as Nobili's *metallocromie*. Furthermore, the I RSI accounts attest how scientific environments were much more interested in the interferential colours visible in the plate rather than its subject which was never discussed during the meeting. In this regard, a more accurate reading of the I RSI's proceedings and unpublished accounts has revealed other critical photographic contributions by Del Bue and Herschel read on their behalf at the scientific meeting, actively participating to the early days of Italian photographic culture.

Notes

– 1 See Schaaf 1992; Schaaf 1996; Wilder 2009; Wilder 2015; Brusius / Dean / Ramalingam 2013.

– 2 See Schaaf 1979; Collins / MacLeod 1981; Tucker 2005, in particular the essay on sources pp. 273-284; Siegel 2017.

– 3 Most of the studies are in Italian. See for instance: Bonetti / Maffioli 2003; Maffioli / Tommasini 2003; Barbagli 2009;

Marini Bettolo / Capasso 1991.

– [4] Atti della prima riunione 1840, p. LXIX. "If the love of the native place does not make the thought of any of the subscribers to this sheet suspect, if the straight seeing of our colleagues cannot interpret it otherwise, it seems to us that those who judged we should start from Pisa were right. Because this city, which flourishes in the centre of our Peninsula in every branch of studies, is also very vast and suitable for hosting many foreigners of all levels, it is pleasant, quiet, and full of museums; and to perennial and mutual honour of Religion, Philosophy and Fine Arts, it shows proud the Tower from which the greatest of natural Philosophers given by Tuscany to the common homeland explored the wonders of the sky". (Translation by the author).

– [5] *Ivi*. See the letters published at pp. XLVII-LI.

– [6] Talbot Correspondence 2004. For further readings see also: Dall'Olio / Urbini 2020; Bonetti 2010; Smith 2002; Meschiari 2006; Zannier 1978.

– [7] Atti della prima riunione 1840, pp. LXIX, XLVII; Rassow 1922.

– [8] According to Gottardo Calvi (Calvi 1839, pp. 84-85), attended the I RSI: 242 from Tuscany, 22 from Piedmont, 18 from Lombardy, 18 from Veneto, and 72 from other Italian states. The foreigners were 49, the majority coming from England (12), France (10), and Germany (10). For further readings see: Hortis 1921; Pancaldi 1983; Marini Bettolo / Capasso 1991; Barbagli 2009.

– [9] #Note di persone 1839; #Somerville 1840a; #Somerville 1840b. Cfr. Rose Teanby's research on Somerville including her PhD project (De Montfort University, work in progress), and her recent talk *Mary Somerville: Refocusing the Queen of Science* (November 10, 2021, Photo Oxford Festival, The Royal Photographic Society).

– [10] Atti della prima riunione 1840, p. LXIX.

– [11] Tomassini 1989. Another interesting fact is that it was the English civil engineer Marc Isambard Brunel who engineered the Florence-Pistoia railway in 1847, providing the earliest account of Daguerreotype photography used in remote construction (see the news in "Art Journal", October 1847).

– [12] Grassi 1836-1838. All the three volumes, written and illustrated by the engraver Ranieri Grassi with 22 copper plates, are digitised with Progetto Google-BNCF and the Digital Library of Museo Galileo.

– [13] Daguerreotype process made available by the French Government on 19 August 1839.

– [14] Maffioli / Tommasini 2003, p. 20, endnote 11.

– [15] Cfr. #Amici 1839.

– [16] *Ibidem*.

– [17] #Amici 1839. "Sir Commendatore [Vincenzo] Antinori presents his compliments and would ask you to procure one of the first Daguerreotypes for our Museum. The price would be reimbursed to you soon through the means of the Minister of Tuscany. If it is not possible to have this unique tool immediately, please be kind enough to send us at least the description that the author is about to publish". (Translation by the author.)

– [18] Due to the small amount of information in Amici's letter, it has not been possible to identify the minister.

– [19] In a letter to the Maggiordomo Maggiore della Corte Lorenese dated September 28, 1840, Vincenzo Antinori recalls the unfruitful exchange with Arago. See Bernacchini 2008, p. 52.

– [20] Marchese Grimaldi tried first-hand to practice the daguerreotype process but, finding it too difficult, decided to sell his apparatus to the Reale Museo. The original price of the Giroux camera bought by Grimaldi was 500 francs. 20 zecchini corresponds to ca. 70 gr. of pure gold. See Bernacchini 2008, p. 52. Cfr. Miniati 1989, p. 208.

– [21] On this topic see also Naldi 2014.

– [22] Gazzetta di Firenze 1839. On Tito Puliti's daguerreotype experiments at the Regio Museo see: Bernacchini 2008; Miraglia / Palazzoli / Zannier 1979, p. 130; Malandrini 1991, p. 139; Maffioli / Tomassini 2003, p. 22; Images of Science 2017.

– [23] "Photogenic likenesses after Daguerre's method", Atti della prima riunione 1840, pp. XXIX, 18.

– [24] Calvi's letters provided a detailed and vivid narrative of the RSI, striking in their delivery of all the information and curiosities left out of the official proceedings (cfr.

Calvi 1839). The volume is digitized and accessible via Museo Galileo's Digital Library.

– 25 *Ivi*, p. 39. Calvi also adds how he could examine some of Puliti's daguerreotypes at the fine art exhibition in Florence, where Puliti exhibited three portraits and three views. Cfr. Esposizioni d'arte 1839, p. 6, Maffioli / Tomassini 2003, p. 28, footnote 38, p. 30. In Atti della prima riunione 1840, p. 18 it is specified that Cav. Configliachi, president of the session, asked Puliti to take a daguerreotype impression of Pisa famous buildings on October 10, at midday (cfr. Smith 2004).

– 26 Calvi 1839, p. 55.

– 27 Cfr. Bonetti 2010.

– 28 Maffioli / Tomassini 2003, p. 22.

– 29 L'eredità scientifica di Leopoldo Nobili 1984. See also the biographical account in Schettino 2013.

– 30 Sloane 1898 [1893], p. 392. A simplified description of Nobili's process can be found in the online portal of Museo Galileo at Metallocromie di Nobili.

– 31 On this methodological approach see Smith / Meyers / Cook 2014.

– 32 For further readings on the interplay between the daguerreotype process and electricity see Trnkova 2022.

– 33 Nobili was in correspondence with some of the most important scientists of his time, such as Arago, Herschel, and De La Rive. He never revealed all the details of his method and kept it as a secret. A general description can be found in the section *Elogio storico del cav. prof. Leopoldo Nobili* published in Antinori 1868, pp. 290-329.

– 34 #Talbot 1849. Cfr. Galvanoplastie et Daguerréotypie 1843. For further context on galvanoplastic experiments see also Trnkova 2022.

– 35 Italia Granducato di Toscana 1839; Riassunto dell'Album Scientifico 1840, p. 519. Cfr. Ronalds / Frost 2013 [1880], p. 414.

– 36 Talbot 1843. However, as Talbot explains in the paper, he was not aware of the "power of mercurial vapour to bring out the latent impression" leaving therefore his plate sensitive to light and pushing him to pursue his research toward the photogenic drawing process. Cfr. Talbot 1840; Schaaf 1996, pp. XXVII, 129.

– 37 Waller 1842, p. 427.

– 38 Talbot 1843, p. 94. The article is dated 21 December 1842.

– 39 Schlather *et al*. 2019.

– 40 Trnkova 2022; Bonetti 2020.

– 41 Donné 1839a.

– 42 Siegel 2017, p. 330.

– 43 Donné 1839b. Cfr. Bonetti 2003, pp. 33-34, footnote 14, p. 38; Bonetti 2014.

– 44 Donné 1840.

– 45 For Melloni's biography see Schettino 2009.

– 46 Melloni 1843, p. 29 "what matters immensely more, is that during his theoretical investigations [...] he managed to engrave them by means of some substances that probably corrode the metal plate being them reduced to the state of vapor: hence, marks can now be produced on metal with the sole action of light and some chemical reagents, regardless of any help drawn from the art of drawing, more or less wide and deep, totally akin to the works of ordinary engraving, and then make several copies on paper". (Translation by the author.)

– 47 Atti della prima riunione 1840, p. 42. Cfr. Calvi 1839, p. 61.

– 48 Atti della prima riunione 1840, p. 42.

– 49 #Compendio 1839.

– 50 Del Bue published the theory in his journal "Bollettino di Chimica e di Farmacia". See Del Bue 1839. Cfr. Il Daguerrotipo 1840.

– 51 Del Bue 1839, p. 36.

– 52 #Herschel 1839c.

– 53 Herschel's letter is also mentioned in Calvi 1839, p. 23. See also The Italian Scientific Association 1839.

– 54 #Herschel 1839a.

– 55 The assumption is supported by the fact that the Atti della prima riunione 1840 did not report details of Herschel's letter content.

– 56 It is possible that Herschel's account was a further elaboration of the one presented at the Royal Society on March 14, 1839, titled *Note on the Art of Photography or the Application of the Chemical Rays of Light to the Purposes of Pictorial Representation*. For further readings on this see: Wilder / Kemp 2002; Wilder 2015; Hentschel 2002.

– 57 Cfr. Carolin Lange's PhD project on Herschel's early plant-based photographic experiments (PHRC, De

Montfort University, work in progress).
— 58 #Herschel 1839c. Cfr. #Herschel 1839b.
— 59 Herschel 1840. See also Wilder / Kemp 2002.
— 60 See the correspondence between Talbot and Amici in Talbot Correspondence 2004. Cfr. Smith 2002; Dall'Olio / Urbini 2020.
— 61 Herschel's research on light sensitive paper and the solar spectrum was also briefly discussed in Fazzini 1839. However, besides misspelling Herschel's surname, Fazzini also wrongly attributed the sensitised paper to Herschel's invention and reported that said paper was able to fix all the colours of the visible spectrum.

I wish to express my gratitude to Kelley Wilder, Rose Teanby, and Carolin Lange from De Montfort University, Leicester, UK, and Petra Trnkova from the Czech Academy of Sciences, Prague, CZ, for their careful reading of this article and our lively discussions on photography. I am also grateful to both anonymous readers for their comments, Museo Galileo for providing access to the collection, and Ferruccio Malandrini for his generosity. Part of this article derives from the project *La fotografia in Toscana: storie di un patrimonio culturale* (*Photography in Tuscany: histories of cultural heritage*), P.I.: Prof Tiziana Serena, developed during my research fellowship at the University of Florence (2020) and my PhD research at PHRC, De Montfort University, Leicester (2019-in progress), supervisors Prof Kelley Wilder, Dr Geoffrey Belknap, and Dr Beatriz Pichel, supported by AHRC (UKRI), Research Society for Victorian Periodicals, Paul Mellon Centre for Studies in British Art – Yale University, the Royal Society, and the British Society for the History of Science.

Bibliography

Antinori 1868 Vincenzo Antinori, *Scritti editi e inediti di Vincenzo Antinori*, edited by Marco Tabarrini, Firenze, G. Barbèra, 1868.

Atti della prima riunione 1840 *Atti della prima riunione degli scienziati italiani tenuta in Pisa nell'ottobre del 1839*, Pisa, Tipografia Nistri, 1840.

Barbagli 2009 Fausto Barbagli, *Firenze e le riunioni preunitarie degli scienziati italiani*, in Mara Miniati (ed.), *Firenze scienza. Le collezioni, i luoghi e i personaggi dell'Ottocento*, Firenze, Polistampa, 2009, pp. 59-65.

Bernacchini 2008 Sabina Bernacchini, *L'introduzione del dagherrotipo all'Imperiale e Regio Museo di Fisica e Storia Naturale di Firenze*, in "AFT. Rivista di Storia e Fotografia", no. 47, 2008, pp. 49-54.

Bonetti 2020 Maria Francesca Bonetti, *La riproduzione delle immagini al tempo di Talbot e Amici, tra incisione e fotografia*, in Dall'Olio / Urbini 2020, pp. 71-74.

Bonetti 2014 Maria Francesca Bonetti Bonetti, *Looking at Reality. Daguerreian Pictures. From Silver to Paper*, in "Daguerreotype Journal", vol. 1, June 2014, pp. 30-43.

Bonetti 2010 Maria Francesca Bonetti, *Talbot et l'introduction du calotype en Italie*, in Gillez Chazal / Anne Cartier-Bresson / Monica Maffioli (eds.), *Eloge du négatif. Les débuts de la photographie sur papier en Italie (1846-1862)*, exhibition catalogue (Paris, Petit Palais – Firenze, MNAF, 2010), Paris, Paris-Musées and Florence, Alinari, 2010, pp. 25-35.

Bonetti 2003 Maria Francesca Bonetti, *'D'après le daguerréotype'... L'immagine dell'Italia tra incisione e fotografia*, in Bonetti / Maffioli 2003, pp. 31-40.

Bonetti / Maffioli 2003 Maria Francesca Bonetti / Monica Maffioli (eds.), *L'Italia d'Argento 1839-1859. Storia del dagherrotipo in Italia*, exhibition catalogue (Firenze, Palazzo Vecchio – Roma, Istituto Nazionale per la Grafica, 2003), Firenze, Alinari, 2003.

Brusius / Dean / Ramalingam 2013 Mirjam Brusius / Katrina Dean / Chitra Ramalingam (eds.), *William Henry Fox Talbot. Beyond Photography*, New Haven-London, Yale University Press, 2013.

Calvi 1939 Gottardo Calvi, *Il congresso di Pisa. Lettere di Gottardo Calvi*, Milano, vedova di A.F. Stella e Giacomo figlio, 1839, in <https://opac.sbn.it/risultati-ricerca-avanzata/-/opac-adv/isbd/MIL0651409> (22.08.2022).

Dall'Olio / Urbini 2020 Chiara Dall'Olio / Silvia Urbini (eds.), *L'impronta del reale. William Henry Fox Talbot. Alle origini della fotografia*, exhibition catalogue (Modena, Gallerie Estensi, 2020-2021), Modena, Gallerie Estensi-Panini, 2020.

Del Bue 1839 Giuseppe Carlo Del Bue, *Dagherròtipo*, in "Bollettino di Chimica e di Farmacia", no. 3, September 1839, pp. 34-36.

Donné 1840 Alfred Donné, *Procédé de gravure des images photogéniques sur plaque d'argent*, in "Bulletin de la Société d'encouragement pour l'industrie nationale", no. CCCCXXXIII, July 1840, pp. 270-271.

Donné 1839a Alfred Donné, *L'exposition du daguerréotype*, in "Journal des débats politiques et littéraires", 20 August 1839, pp. 1-3.

Donné 1839b Alfred Donné, *Transformation en planches gravée des images formées par le procédè Daguerre, Compte rendu des séances de l'Académie des sciences, séance du lundi 14 Octobre 1839*, pp. 485-86.

Esposizioni d'arte 1839 *Esposizioni d'arte, Accademia di Belle Arti di Firenze, Sala Maggiore, sezione Prospettiva, Primi saggi di disegni fotogenici eseguiti col metodo del signor Daguerre nell'Imperiale e Regio Museo di Fisica e Storia Naturale*, in "Gazzetta di Firenze", no. 121, 8 ottobre 1839, p. 6.

Fazzini 1839 Antonio Fazzini, *Poche parole sul dagherrotipo*, in "Poliorama pittoresco", no. 19, 21 December 1839, p. 151.

Galvanoplastie et Daguerréotypie 1843 *Galvanoplastie et Daguerréotypie*, Paris, Encyclopédie Roret, 1843.

Gazzetta di Firenze 1839 "Gazzetta di Firenze", no. 108, 7 September 1839, p. 3.

Grassi 1836-1838 Ranieri Grassi, *Descrizione storica e artistica di Pisa e de' suoi contorni*, Pisa, Presso Ranieri Prosperi Tip. dell'I.E.R. Università, 1836-1838.

Hentschel 2002 Klaus Hentschel, *Mapping the Spectrum. Techniques of Visual Representation in Research and Teaching*, Oxford, Oxford University Press, 2002.

Herschel 1840 John Frederick William Herschel, *On the Chemical Action of the Rays of the Solar Spectrum on Preparations of Silver and Other Substances, Both Metallic and Non-Metallic, and on Some Photographic Processes*, in "Philosophical Transactions of the Royal Society", vol. 130, 1840, pp. 1-59.

Hortis 1921 Attilio Hortis, *Le riunioni degli scienziati italiani prima delle guerre dell'indipendenza 1839-1847*, Roma, Società italiana per il progresso delle scienze, 1921.

Il Daguerrotipo 1840 *Il Daguerrotipo – Arago, Del Bue, Melloni*, in "Effemeridi scientifiche e letterarie per la Sicilia", no. 76, January 1840, pp. 48-58.

Italia Granducato di Toscana 1839 *Italia. Granducato di Toscana. Firenze 18 dicembre*, in "Gazzetta di Firenze", no. 150, 19 December 1839, p. 3.

L'eredità scientifica di Leopoldo Nobili 1984 *L'eredità scientifica di Leopoldo Nobili. Dibattito teorico e ruolo degli strumenti nella fisica del primo Ottocento*, exhibition catalogue (Reggio Emilia, Biblioteca, Panizzi e Firenze, Istituto e museo di storia della scienza), Reggio Emilia, Tipolitografia emiliana, 1984.

MacLeod / Collins 1981 Roy MacLeod / Peter Collins (eds.), *The Parliament of Science. The British Association for the Advancement of Science 1831-1981*, Northwood, Science Reviews, 1981.

Maffioli / Tommasini 2003 Monica Maffioli / Luigi Tomassini, *Il dagherrotipo nell'Italia del 1839*, in Bonetti / Maffioli 2003, pp. 15-30.

Malandrini 1991 Ferruccio Malandrini, *Tito Puliti*, in Italo Zannier (ed.), *Segni di luce. Alle origini della fotografia in Italia*, vol. 1, Ravenna, Longo, 1991, pp. 137-140.

Marini Bettolo / Capasso 1991 Giovanni Battista Marini Bettolo / Rocco Capasso (eds.), *Gli scienziati italiani e le loro riunioni 1839-1847. Attraverso i documenti degli archivi dell'Accademia nazionale delle scienze detta dei XL e della Società italiana per il progresso delle scienze*, Roma, Accademia nazionale delle scienze detta dei XL, 1991.

Melloni 1843 Macedonio Melloni, *Relazione intorno al dagherrotipo, letta alla R. Academia delle scienze nella tornata del dì 12 novembre 1839 dal socio corrispondente Macedonio Melloni*, s.l, s.n, [1843].

Meschiari 2006 Alberto Meschiari (ed.), *Edizione nazionale delle opere e della corrispondenza di Giovanni Battista Amici* (voll. 2, 3, 6), Napoli, Bibliopolis; [poi] Firenze, Fondazione Giorgio Ronchi-Tassinari, 2006.

Miniati 1989 Mara Miniati, *Museo di Storia della Scienza di Firenze*, in Michele Falzone del Barbarò / Monica Maffioli / Emanuela Sesti (eds.), *Alle origini della fotografia. Un itinerario toscano 1839-1880*, exhibition catalogue (Firenze, Palazzo Vecchio, 1989), Firenze, Alinari, 1989.

Miraglia / Palazzoli / Zannier 1979 Marina Miraglia / Daniela Palazzoli / Italo Zannier (eds.), *Fotografia italiana dell'Ottocento*, exhibition catalogue (Firenze, Palazzo Pitti; Venezia, Ala Napoleonica, 1979-1980), Milano, Electa and Firenze, Alinari, 1979.

Naldi 2014 Chiara Naldi, *The Daguerreotype Studio. Daguerre's Camera in Florence*, in "Daguerreotype Journal", no. 1, November 2014, pp. 34-41.

Pancaldi 1983 Giuliano Pancaldi (ed.), *I congressi degli scienziati italiani nell'età del positivismo*, Bologna, CLUEB, 1983.

Rassow 1922 B. Rassow, *The Society of German Men of Science and Physicians*, in "Nature", no. 110, 1922, pp. 750-751.

Riassunto dell'Album Scientifico 1840 *Riassunto dell'Album Scientifico*, in "Rivista Europea", vol. 3, no. 4, 1840, pp. 518-521.

Ronalds / Frost 2013 [1880] Francis Ronalds, *Catalogue of Books and Papers Relating to Electricity, Magnetism, the Electric Telegraph, Etc.*, edited by Alfred J. Frost, New York, Cambridge University Press, 2013 [first ed. 1880].

Schaaf 1996 Larry J. Schaaf, *Records of the Dawn of Photography. Talbot's Notebooks P & Q*, Cambridge, Cambridge University Press in cooperation with the National Museum of Photography, Film and Television, 1996.

Schaaf 1992 Larry J. Schaaf, *Out of the Shadows. Herschel, Talbot & the Invention of Photography*, New Haven-London, Yale University Press, 1992.

Schaaf 1979 Larry Schaaf, *Sir John Herschel's 1839 Royal Society Paper on Photography*, in "History of Photography", vol. 3, no. 1, 1979, pp. 47-60.

Schettino 2013 Edvige Schettino, *Nobili, Leopoldo*, in *Dizionario Biografico degli Italiani*, vol. 78, 2013, in <https://www.treccani.it/enciclopedia/leopoldo-nobili_(Dizionario-Biografico)/> (08.06.2022).

Schettino 2009 Edvige Schettino, *Melloni, Macedonio*, in *Dizionario Biografico degli Italiani*, vol. 73, 2009, in <https://www.treccani.it/enciclopedia/macedonio-melloni_(Dizionario-Biografico)/> (08.06.2022).

Schlather *et al.* 2019 Andrea E. Schlather *et al.*, *Nineteenth-Century Nanotechnology: The Plasmonic Properties of Daguerreotypes*, in "PNAS. Proceedings of the National Academy of Sciences", vol. 116, no. 28, June 2019, pp. 13791-13798.

Siegel 2017 Steffen Siegel, *Alfred Donné*, in Id. (ed.), *First Exposures. Writings from the Beginning of Photography*, Los Angeles, The J. Paul Getty Museum, 2017, pp. 329-331.

Sloane 1898 [1893] Thomas O' Conor Sloane, *The Standard Electrical Dictionary. A Popular Dictionary of Words and Terms Used in the Practice of Electrical Engineering*, London, Crosby Lockwood and son, 1898 [first ed. 1893].

Smith 2004 Graham Smith, *Picturing Pisa*, in"History of Photography", vol. 28, no. 4, 2004, pp. 389-391.

Smith 2002 Graham Smith, *Talbot, Amici and the Mystery of the Calotype*, London, Taylor & Francis, 2002.

Smith / Meyers / Cook 2014 Pamela H. Smith / Amy Meyers / Harold Cook (eds.), *Ways of Making and Knowing: The Material Culture of Empirical Knowledge*, Ann Arbor, University of Michigan Press, 2014.

Talbot 1843 William Henry Fox Talbot, *XV. On the Coloured Rings Produced by Iodine on Silver With Remarks on the History of Photography*, in "The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science", series 3, vol. 22, no. 143, 1843, pp. 94-97.

Talbot 1840 William Henry Fox Talbot, *Remarks on M. Daguerre's Photogenic Process, in Report of the Ninth Meeting of the British Association for the Advancement of Science Held at Birmingham in August 1839*, Math and Physics Section, London, John Murray, 1840, pp. 3-5.

The Italian Scientific Association 1839 *The Italian Scientific Association: Meeting at Pisa, October 1st to 15th, 1839*, in "The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science", supplement to vol. XV, series 3, July-December 1839, pp. 550-551.

Tomassini 1989 Luigi Tomassini, *Vedere Firenze nell'Ottocento*, in Michele Falzone del Barbarò / Monica Maffioli / Emanuela Sesti (eds.), *Alle origini della fotografia. Un itinerario toscano 1839-1880*, exhibition catalogue (Firenze, Palazzo Vecchio, 1989), Firenze, Alinari, 1989, pp. 11-30.

Trnkova 2022 Petra Trnkova, *Electrifying Daguerreotypes: On Correlations Between Electricity and Photography around 1840*, in "History of Photography", vol. 45, no. 2, May 2022, pp. 111-127.

Tucker 2005 Jennifer Tucker, *Nature Exposed. Photography as Eyewitness in Victorian Science*, Baltimore, Johns Hopkins University Press, 2005.

Waller 1842 Augustus Waller, *LXXVI. Experiments on the Coloured Films Formed by Iodine, Bromine, and Chlorine Upon Various Metals*, in "Philosophical Magazine", series 3, vol. 21, no. 140, 1842, pp. 426-437.

Wilder 2015 Kelley Wilder, *A Note on the Science of Photography: Reconsidering the Invention Story*, in Tanya Sheehan / Andrés Mario Zervigon (eds.), *Photography and its Origins*, London-New York, Routledge, 2015, pp. 208-221.

Wilder 2009 Kelley Wilder, *Photography and Science*, London, Reaktion Books, 2009.

Wilder / Kemp 2002 Kelley Wilder / Martin Kemp, *Proof Positive in Sir John Herschel's Concept of Photography*, in "History of Photography", vol. 26, no. 4, 2002, pp. 358-366.

Zannier 1978 Italo Zannier (ed.), *Henry Fox Talbot. La raccolta della Biblioteca Estense di Modena*, Milano, Editphoto, 1978.

—

Archival sources

#Amici 1839 Giovanni Battista Amici, *Letter to François Arago*, ms. draft, 1839. Modena, Biblioteca Estense Universitaria, Fondo Amici, folder 1125, collection no. 8452.

#Compendio 1839 *Compendio dei processi Verbali delle sedute che si tennero nella Sezione di Chimica, Fisica e Matematica nella Prima Riunione de' Naturalisti Italiani in Pisa*, ms., 1939. Firenze, Museo Galileo, Processi verbali, lettere e memorie della sezione di fisica, chimica e matematica 1839, ms. 1/58, collection no. 16098.

#Herschel 1839a John F. Herschel, *Letter from Herschel*, ms. letter, June 21, 1839. Firenze, Museo Galileo, Carteggio del Segretario generale della prima riunione 1839, ARSI 03, ms. 3.307.

#Herschel 1839b John F. Herschel, *Letter to William Herny Fox Talbot*, ms. letter, Slough, July 6, 1839. Bradford, National Science and Media Museum, collection no. 1937-4849.

#Herschel 1839c John F. Herschel, *Relazione di John F. Herschel sulla "proprietà dei raggi"*, ms., 1839. Firenze, Museo Galileo, Processi verbali, lettere e memorie della sezione di fisica, chimica e matematica, collection no. IF 16049-16072. Also in: <https://bibdig.museogalileo.it/Teca/Viewer?an=000000010064> (18.07.2022).

#Note di persone 1839 *Note di persone e Accademie italiane ed estere a cui si progetta il dono del volume degli Atti e lettere delle Autorità che ne regolano la distribuzione*, ms., 1839. Firenze, Museo Galileo, Archivio della 1. Riunione, Pisa, 1839, fasc. XIII, mss. 3.62-69 [bis], collection no. IF 16223-16230. Also in: <https://bibdig.museogalileo.it/Teca/Viewer?an=10144> (18.07.2022).

#Somerville 1840a Mary Somerville, *Letter to Acknowledge the Reception of the Proceedings of the Prima Riunione*, ms. letter, May 19, 1840. Firenze, Museo Galileo, Lettere di ricevimento degli Atti della Prima Riunione, ms. 3.106.

#Somerville 1840b Mary Somerville, *Letter to Acknowledge the Reception of the Invite the Second Riunione*, ms. letter, June 30, 1840. Firenze, Museo Galileo, Carteggio del Presidente generale, ms. 5.74.

#Talbot 1849 William Henry Fox Talbot, *Letter to Giovanni Battista Amici*, ms. letter, London, January 29, 1849. Modena, Biblioteca Estense Universitaria, Fondo Amici, collection no. 7325.

— *Databases and websites*

Images of Science 2017 *Images of Science. Scientific Photography in the Collections of the Museo Galileo*, edited by Stefano Casati / Giorgio Strano, online exhibition, Museo Galileo, 2017, in <https://mostre.museogalileo.it/cms/en/fotografia-scientifica-eng.html> (08.06.2022).

Metallocromie di Nobili *Metallocromie di Nobili*, virtual museum, Florence, Museo Galileo, in <https://catalogo.museogalileo.it/oggetto/MetallocromieNobili.html> (09.06.2022).

Talbot Correspondence 2004 *The Correspondence of William Henry Fox Talbot*, edited by Larry Schaaf, De Montfort University Leicester-University of Glasgow, 1999-2004 <http://foxtalbot.dmu.ac.uk> (08.06.2022).