Part I

Bibliographical Essay

Bibliographical Distortions, Distortive Habits: Contextualizing Italian Publications in the History of Science

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In Italy, many works devoted to the history of science are published traditionally in philosophy journals. Also, a surprisingly large amount of brilliant, rigorous, and innovative research comes from publications that are deemed marginal—or are not considered at all—by the milieu of Italian academia. Why is this so, and how has it come about?

There is, I confess, an autobiographical strand in this note: for Italy is where I took my first steps as a scholar and, to a large extent, I have been intellectually and professionally shaped by this environment. And yet, it took Stephen Weldon's invitation to serve as his bibliographic adviser in matters Italian for me to even begin to notice how different Italy's publication politics are from those commonly found in other countries, especially in the English-speaking world. Now, all of a sudden, the mere fact that I had committed myself to selecting and collecting Italian language sources in the history of science made me aware of this anomaly. It finally dawned on me that even bibliographic records need to be studied historically and in context in order to be understood. The relevant context, then, is the scholarly traditions and the academic behaviors and misbehaviors that have shaped the history of science as a discipline in Italy. A better understanding of this context would take us a long way towards making comprehensible the entangled ideological, philosophical, political, social, and cultural roots of such peculiarities. More than that, these roots are still the prime movers of the conventions and norms that nowadays characterize Italian publications in the history of science.

Bibliographical Distortions: The 19th and 20th Centuries

The origin of a modern perspective on the history of science in Italy can be traced back to the last decade of the 19th century, when the philosopher, engineer, mathematician, and high-school teacher Giovanni Vailati (1863—1909) advanced his criticisms of the still-hegemonic, but declining, positivist assumptions about science. By supporting the need to avoid uncritical distinctions between humanistic and scientific studies, and by upholding a

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unitary view of knowledge, Vailati insisted particularly on the importance of the historical approach to science as the most effective method of keeping scientific thought safe from preconceptions. In accordance with this ideal, he opposed the extreme positivist view of the history of science as a mere progressive sequence of forerunners, pioneers, and discoveries, and instead asserted the centrality of historical contextualization in fostering both the development of the scientific enterprise and of scientific education in schools.[2]

Vailati's interdisciplinary interests and thought were deeply influenced by philosophers of science like Ernst Mach (1838–1916), Charles Sanders Peirce (1839–1914), and William James (1842–1910). As a sharp critic of the most dogmatic and reductive aspects of positivism, he embraced philosophical pragmatism, a school of thought he explicitly allied himself to in 1905. But his theoretical choices did not prevent him from acquainting himself with the works of many scholars with whom he partially or significantly disagreed, such as Pierre Duhem (1861–1916), Henri Poincaré (1854–1912), Bertrand Russel (1872–1970), and George Edward Moore (1873–1958). He corresponded with a number of these authors, and this broad epistolary network allowed him to thrust himself into the forefront of the philosophical community of his time.[3] It is not by chance that—despite his passionate commitment to the civic and educational development of Italian society—Vailati has often been described as more of a European than an Italian intellectual.[4] The events that followed his death are strikingly in line with this interpretation: for Vailati's strong engagement with and greater affinity for the international community, together with his advocacy of the history of science, were probably the main causes of his falling into oblivion in Italy soon after his premature death in 1909. In fact, his attempts to promote a unitary conception of knowledge were made just when the vast majority of Italian intellectuals were about to turn drastically away from pragmatism. This shift happened during the second and third decades of the 20th century, when the philosophy asserted by Benedetto Croce (1866–1952) imposed its hegemony over the Peninsula to such an extent, and in such a pervasive manner, that it would last for years to come.

Croce's thought, a form of absolute idealism that advanced the assumption that history is essentially an unfolding of the spirit (or "mind") through time, denied any value to science (which he deemed as an exclusively practical, and thus severely limited, form of knowledge) and opposed every form of philological and erudite historiography.[5] Thanks also to the efforts of Croce's student and follower Giovanni Gentile (1875–1944), this anti-scientific, anti-positivist, and anti-pragmatic view exerted an enormous and long-

[2] On this topic, see Mauro De Zan, ed., *I Mondi di Carta di Giovanni Vailati* (Milan: Franco Angeli, 2000); Dario Generali, "Storia e storiografia della scienza," in Francesco Andrietti & Dario Generali, *Storia e storiografia della scienza*. Il caso della sistematica (Milan: Franco Angeli, 2002), pp. 21–25, 31–32; Fabio Minazzi, ed., *Giovanni Vailati intellettuale europeo* (Milan: Thélema, 2006); Mauro De Zan, *La formazione di Giovanni Vailati* (Lecce: Congedo, 2009); Claudia Arrighi, Paola Cantú, Mauro De Zan, and Patrick Suppes, eds., *Logic and Pragmatism: Selected Essays by Giovanni Vailati* (Stanford: CSLI Publications, 2010); Fabio Minazzi, *Giovanni Vailati epistemologo e maestro* (Milan/Udine: Mimesis, 2011).

[3] See Giorgio Lanaro, ed., *Epistolario di Giovanni Vailati* (Turin: Einaudi, 1971); Lucia Ronchetti, ed., *L'Archivio Giovanni Vailati* (Milan: Cisalpino Istituto Editoriale Universitario, 1998).

[4] See, for example, Mauro De Zan, "Giovanni Vailati e la cultura internazionale," in *Giovanni Vailati intellettuale europeo*, ed. Minazzi, pp. 12—13.

[5] See Generali, "Storia e storiografia della scienza," pp. 19–21.

lasting influence on Italian culture. Gentile was a neo-Hegelian philosopher and politician who was one of the main ideologists of Fascism; his active and enthusiastic support of Mussolini's regime played a crucial role in the cultural policies pursued by the Italian government in those years.[6] When Gentile became minister of education in 1922, he promoted a reform of the Italian school system—the *Riforma* of 1923—that embraced and adopted many of Croce's views, including his sectorial and hierarchical conception of knowledge. Until 1969, the only kind of secondary education that gave access to any academic program in Italian universities was the *liceo classico* ("classical lyceum"), a humanistic curriculum focused on the teaching of Latin, Ancient Greek, philosophy, history, and Italian and classical literature that is still considered to be the most prestigious course of study in Italy's high schools.

The cultural and social consequences of this idealist hegemony were immense, and have survived into the 21st century, well after the Fascist era. They can still be seen in the mutual prejudices that nowadays affect large parts of both the humanistic and scientific communities in Italy—the former often tending to ignore or deny any cultural meaning to science, and the latter pitting "real" and "useful" scientific knowledge against "subjective" and "ornamental" humanities.[7] Actually, these divisive views have been internalized by not a few members of both sides, regardless of which side blames the other as the "wrong one." But, paradoxically, it is especially in the dogmatic belief held by many scientists and technicians that only scientific knowledge is practical and useful that we can find the most striking (though, perhaps, unintentional) confirmation of the influence of idealism on Italian culture. And, since history is traditionally considered a humanistic discipline, we can finally understand one of the main causes of the bibliographical anomaly that is the subject of this paper. In fact, the new renaissance of the history of science in Italy (which was also a consequence of the re-evaluation of Vailati's thought) did not start with scientists: rather, it came from within philosophy. More specifically, it started with the studies promoted by the *Scuola di Milano* ("School of Milan"), a group of intellectuals who emerged in the 1920s and who followed the works of the philosophers Piero Martinetti (1872–1943) and his pupil Antonio Banfi (1886–1957).

The members of this school explored an extremely wide range of topics. Yet, they all shared a well-defined epistemological and methodological approach that relied on critical rationalism, critical empiricism, and on a special consideration of the study of sources (which entailed attention to disciplines such as philology and textual criticism). Throughout the first and second halves of the 20th century, this group asserted itself as the vanguard of the philosophy and history of science in Italy, training a number of renowned

[6] Unlike Croce, who—after the murder of socialist politician Giacomo Matteotti (1885–1924)—turned against the Fascist regime, Gentile persisted in supporting Mussolini until his death. However, he harshly and openly criticized the anti-Jewish laws adopted in Italy in 1938. Among the many studies on Gentile, see Augusto Del Noce, *Giovanni Gentile: Per una interpretazione filosofica della storia contemporanea* (Bologna: Il Mulino, 1990); Anthony James Gregor, *Giovanni Gentile: Philosopher of Fascism* (New Brunswick: Transaction Publishers, 2001); James Gregor, *Mussolini's Intellectuals: Fascist Social and Political Thought* (Princeton: Princeton University Press, 2005).

[7] See Generali, "Storia e storiografia della scienza," pp. 9–28. On this topic, see also Francesco Luzzini, *Theory, Practice, and Nature In-between. Antonio Vallisneri's* Primi Itineris Specimen (Berlin: Edition Open Access/Max Planck Institute for the History of Science, 2018), p. 52.

academics such as Ludovico Geymonat (1908–1991), Giulio Preti (1911–1972), Mario Dal Pra (1914–1992), Paolo Rossi (1923–2012), Fulvio Papi (1930–), Evandro Agazzi (1934–), and many others.[8]

It was essentially (although not exclusively) from such a philosophical background that the new wave of Italian studies in the history of science later arose. And since these studies originated as a branch of the history of philosophy, it is no wonder that they tended to focus much more on the history of scientific thought than on scientific practices and instruments. This perspective was shared by all the primary members of the *Scuola*. Some notable examples are Giulio Preti, who assisted Antonio Banfi at the University of Milan in the early 1950s and taught an "Introductory Course on the History of Scientific Thought from the 14th to the 16th Centuries"; Paolo Rossi, who was another assistant of Banfi's during the same period and, as recent studies suggest, interacted with Preti and was significantly influenced by him;[9] Ludovico Geymonat, who from 1956 to 1978 held the first chair in the philosophy of science ever established in Italy (and was the editor and main author of the monumental treatise *Storia del Pensiero Filosofico e Scientifico*, "History of Philosophical and Scientific Thought");[10] and Mario Dal Pra, who in 1946 founded the *Rivista di Storia della Filosofia* ("Journal of the History of Philosophy"), a periodical still sought after by the Italian community of historians.[11]

The history of science in Italy remained *de facto* an ancillary discipline of philosophy even after the 1970s, when it became a subject taught independently in many humanistic faculties. Although with some important exceptions,[12] the hegemony of this theoretically-focused approach persisted until the last decade of the 20th century—when the influence exerted by international studies, and a growing awareness of the importance of the study of techniques and procedures for the understanding of scientific knowledge, persuaded a number of Italian scholars to explore new research paths. In Florence, Paolo Galluzzi (1942–), a student of philosopher Eugenio Garin (1909–2004), imparted a new direction to the journal *Nuncius*[13] and to the activities of the Museo Galileo (formerly "Institute and

[8] See Fabio Minazzi & Luigi Zanzi, eds., *La scienza tra filosofia e storia in Italia nel Novecento* (Rome: Istituto Poligrafico e Zecca dello Stato, 1987); Fulvio Papi, *Vita e filosofia. La Scuola di Milano: Banfi, Cantoni, Paci, Preti* (Milan: Guerini e Associati, 1990); Mario Dal Pra and Fabio Minazzi, *Ragione e storia. Mezzo secolo di filosofia italiana* (Milan: Rusconi, 1992); Davide Assael, *Alle origini della scuola di Milano: Martinetti, Barié, Banfi* (Milan: Guerini e Associati, 2009); Luzzini, *Theory, Practice, and Nature In-between*, p. 52. Finally, here is a link to an interesting research project focused on the *Scuola*: http://sdm.ophen.org/progetto/ (accessed November 28, 2018).

[9] On this topic, see Dario Generali, "Giulio Preti storico della scienza nelle lezioni milanesi del 1949–1950," in *Sul Bios Theoretikós di Giulio Preti*, ed. Fabio Minazzi, 2 vols., Vol. 1 (Milan/Udine: Mimesis, 2015), pp. 629–646. On Preti's thought, see Fabio Minazzi, ed., *Giulio Preti: Philosophical Essays* (Bruxelles/Bern/Berlin/Frankfurt am Main/New York/Oxford/Wien: Peter Lang, 2011).

[10] Ludovico Geymonat, ed., *Storia del Pensiero Filosofico e Scientifico*, 11 vols. (Milan: Garzanti, 1970–1997). On Geymonat's thought, see Fabio Minazzi (ed.), *Ludovico Geymonat. Un maestro del Novecento* (Milan: Unicopli, 2009).

[11] On the life and work of Mario Dal Pra, see Fabio Minazzi, ed., *Mario Dal Pra nella "Scuola" di Milano* (Milan/Udine: Mimesis, 2018).

[12] Such as the case of Luigi Belloni (1914–1989), who taught the history of medicine in scientific faculties at the University of Milan. In both his teaching and research activities, Belloni—who had a scientific background—placed a particular emphasis on the study of scientific practices and methods. On this topic, see Renato G. Mazzolini, "Luigi Belloni: 1914–1989," *Gesnerus: Swiss Journal of the History of Medicine and Sciences*, 1990, 47/2:187–190.

[13] Galluzzi was editor of *Nuncius* (formerly *Annali dell'Istituto e Museo di Storia della Scienza di Firenze*,

Museum of the History of Science") by focusing on the material aspects of science and by combining historiography with museography, museology and the study of instruments.[14] A similar, but independent, line of research was followed by Renato Mazzolini (1945–) in his works on the history of biology, where he devoted special attention to material practices and technologies.[15] Finally, a third wave of this new approach arose in the late 1980s and early 1990s at the CNR-ISPF, the Institute for the History of Philosophical and Scientific Thought in Milan (formerly CNR-CSPF), where Dario Generali (1953–) and Maria Teresa Monti (1955–) merged the Italian tradition of scientific historiography and textual criticism with groundbreaking works on the reconstruction of experimental activities and technologies in early modern medicine, biology, and the natural sciences. These efforts towards an "experimental history of science" culminated in 2000 with the establishment of the National Edition of Antonio Vallisneri's Works and with the many studies, critical editions, experimental replications, and digital humanities projects produced in the following years by this institution, which is known for its combination of scholarly rigor and innovative research.[16]

This new attention of Italian scholars to the practical side of the history of science has significantly impacted historical studies there throughout the past three decades, opening important breaches in the ideological barrier that still burdens the relationship between

"Annals of the Institute and Museum of the History of Science in Florence") from 1982 to 2004. The journal was renamed in 1986.

[14] This approach can be seen in the many books, chapters, and articles authored or edited by Galluzzi himself, as well as in the many studies and volumes published by various authors for the Museo Galileo, in *Nuncius* and *Galilaeana*, and in the *Nuncius* and *Galilaeana* Libraries. See, for example: Paolo Galluzzi, *Momento: Studi galileiani* (Rome: Edizioni dell'Ateneo & Bizzarri, 1979); Galluzzi, "L'Accademia del Cimento: gusti del principe, filosofia e ideologia dell'esperimento," *Quaderni Storici*, 1981, 16/48:788–844; Galluzzi, ed., *Novità celesti e crisi del sapere* (Florence: Giunti Barbéra, 1984); Galluzzi, ed., *Galileo: Images of the Universe from Antiquity to the Telescope* (Florence: Giunti, 2009); Galluzzi, *Tra atomi e indivisibili: La materia ambigua di Galileo* (Florence: Olschki, 2011); Galluzzi, *The Lynx and the Telescope: The Parallel Worlds of Federico Cesi and Galileo* (Leiden/Boston: Brill, 2017).

[15] Mazzolini taught the history of science and technology at the University of Trento from 1987 to 2015. Examples of his works include: Renato G. Mazzolini, *The Iris in Eighteenth-Century Physiology* (Bern/Stuttgart/Vienna: Hans Huber, 1980); Mazzolini, "Adam Gottlob Schirach's Experiments on Bees," in *The Light of Nature*, eds. J.D. North and J.J. Roche (Dordrecht/Boston/Lancaster: Martinus Nijhoff Publishers, 1985), pp. 67–82; Mazzolini, "Dallo 'spirito nerveo' allo 'spirito delle leggi': Un commento alle osservazioni di Montesquieu su una lingua di pecora," in *Enlightenment Essays in Memory of Robert Shackleton*, eds. Giles Barber and Cecil P. Courtney (Oxford: The Voltaire Foundation, 1988), pp. 205–221; and Mazzolini, ed., *Non-verbal communication in science prior to 1900* (Florence: Olschki, 1993). See also Massimiano Bucchi, Luca Ciancio, and Ariane Dröscher, eds., *L'esperimento della storia* (Trento: Fondazione Museo Storico del Trentino, 2015).

[16] See Dario Generali, "Mario Dal Pra: un maestro di rigore scientifico e civile nella Statale degli anni Settanta," in *Mario Dal Pra nella "Scuola" di Milano*, ed. Minazzi, 507–515, esp. pp. 509–510; Luzzini, *Theory, Practice, and Nature In-between*, pp. 51–53. Among the many works published by this research group, we can mention Maria Teresa Monti, ed., *Albrecht von Haller: Commentarius de formatione cordis in ovo incubato* (Basel: Schwabe Verlag, 2000); Benedino Gemelli, ed., *Antonio Vallisneri: Consulti Medici*, Vols. 1 and 2 (Florence: Olschki, 2006 and 2011); Dario Generali, *Antonio Vallisneri: Gli anni della formazione e le prime ricerche* (Florence: Olschki, 2007); Generali & Marc J. Ratcliff, eds., *From Makers to Users: Microscopes, Markets and Scientific Practices in the Seventeenth and Eighteenth Centuries* (Florence: Olschki, 2007); Ivano Dal *Prete, Scienza e società nel Settecento veneto* (Milan: Franco Angeli, 2008); Dario Generali, ed., *Antonio Vallisneri: La figura, il contesto, le immagini storiografiche* (Florence: Olschki, 2008); Maria Teresa Monti, ed., *Antonio Vallisneri: Istoria della Generazione*, 2 vols. (Florence: Olschki, 2009); Ivano Dal Prete, Dario Generali, and Maria Teresa Monti, eds., *Le reti in rete* (Florence: Olschki, 2011); Massimo Rinaldi, ed., *Antonio Vallisneri: Saggio d'Istoria medica, e naturale* (Florence: Olschki, 2012); and Francesco Luzzini, *Il miracolo inutile* (Florence: Olschki, 2013).

various branches of knowledge and, therefore, fostering interest and engagement even among scientists.[17] Undoubtedly, this process has produced positive and tangible effects on the ways the history of science is done in Italy. An increasing number of historians nowadays can include a fertile blend of scientific and humanistic studies in their curricula, and an equally increasing amount of interdisciplinary research is being published in monographs, in edited volumes, and in prominent historical journals such as *Physis, Galilaeana, Technai, Nuncius*, and *Automata*. Furthermore, high-quality contributions are now frequently published in journals focusing on specific subfields of the history of science. Such is the case, for example, for *Geographia Antiqua*; *Bollettino di Storia delle Scienze Matematiche*; *Medicina & Storia; Medicina nei Secoli*; *Quaderni di Storia della Fisica*; *Rivista di Storia della Farmacia*; *Medicina Historica; Geostorie*; and *Giornale di Astronomia*.

This lively scene presents encouraging evidence of how the history of science in Italy has become an increasingly transdisciplinary and inclusive endeavor. Yet, it cannot be denied that the bulk of Italian scholarship in this field is still tied to its philosophical origins. These origins, in turn, still play a dominant role in the politics of publication that underlie the bibliographical peculiarities of this discipline in Italy. It is not by chance that a large share of the studies focused on historical subjects in this country still tend to be featured in philosophical journals.[18]

However, the long dominion of idealism, and the scholarly traditions that followed, are not the only reasons behind this anomaly. There are other causes: more recent and far less noble, but equally intriguing. These must be sought in the present, and require us to venture in the tortuous meanderings of Italian academia.

Distortive Habits: or, Of Present Days

In this case, too, context matters—a lot. Thus, before delving into the main subject of this section, I need to spend a few words on the events that have affected higher education in Italy during the past decade.

In 2010, the Ministry of Education, Universities and Research led by Mariastella Gelmini (Berlusconi IV Cabinet) launched a radical reform of the academic recruitment system. The new law[19] was designed with the official intention of achieving a more rational distribution of funds (i.e., saving money) and fighting the gangrenous cronyism and nepotism in Italian universities. To this purpose, the Ministry introduced a two-step recruitment process where scholars from any discipline must obtain a "National Scientific

[17] In recent years, articles focused on history, thematic sections, and entire special issues have become a frequent feature of many specialized scientific journals in Italy. Examples include (but are not limited to) *Acque Sotterranee, Italian Journal of Groundwater; Rendiconti Online della Società Geologica Italiana; Quaderni di Botanica Ambientale e Applicata; Theoretical Biology Forum; and Atti della Società Italiana di Scienze Naturali.*

[18] Noteworthy examples include the journals *Intersezioni*; *Studi Filosofici*; *Rivista di Filosofia*; *Annali della Scuola Normale Superiore di Pisa. Classe di Lettere e Filosofia*; *Giornale Critico della Filosofia Italiana*; *Archivio di Filosofia*; *Bruniana & Campanelliana*; *Bollettino della Società Filosofica Italiana*; *Azimuth*; *Il Protagora*; *Scienza & Filosofia*; *Paradigmi, Rivista di Critica Filosofica*; and the already mentioned *Rivista di Storia della Filosofia.*

[19] Law 240/2010.

Qualification" (*Abilitazione Scientifica Nazionale*) before applying for associate and full professorships—and, in practice, even for research and lecturer positions.

The National Agency for the Evaluation of Universities and Research Institutes (ANVUR), established in 2006 and modeled after France's AERES-HCERES[20] and the UK's REF,[21] became the cornerstone of this new structure. Having been charged with the task of managing scientific qualifications, ANVUR formed a committee for every "Competition Sector" (each one, including one or more academic disciplines such as history *and* the philosophy of science) and introduced a system for evaluating candidates based on strictly quantitative criteria. To this purpose, the 190 Competition Sectors were grouped into 14 disciplinary "Areas." These, in turn, were grouped into two categories: hard sciences (or "bibliometric" Areas), to be assessed through bibliometric analysis,[22] and the so-called "non-bibliometric" Areas (i.e., humanities and social sciences), whose different publication and citation practices typically make the use of measurement-based systems much more problematic, and thus require an approach with a more qualitative focus.

Such an approach already exists, of course—it is the traditional peer-review process. Still, ANVUR opted for another method. Ostensibly hybrid, but essentially quantitative, it is based on the calculation of three indicators:

1. number of books published;

2. number of book chapters and articles in "scientific" journals recognized by ANVUR;

3. number of articles in top-ranked ("Class-A") journals.

To support this procedure, ANVUR released an official list of "Class-A" journals for each academic discipline, and another list of "scientific" journals which were deemed relevant to each non-bibliometric Area. Consequently, having published in one or more of the journals included in these lists became a decisive criterion for a candidate's success.[23]

Needless to say, since its inception this system has triggered a myriad of furious debates, quarrels, appeals, awkward amendments, and conflicting judgments and counter-judgments—so many, in fact, that it would be impossible to report them here.[24] I shall just mention what I consider one of the most enlightening analyses of this issue: Massimo

[20] Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur.

[21] Research Excellence Framework.

[22] More precisely, through the measurement of three indicators: number of articles, number of citations, and h-index.

[23] For more detailed information on the evaluation criteria adopted by ANVUR, see http://abilitazione.miur.it/public/index.php?lang=eng; http://www.anvur.it/attivita/classificazione-delle-riviste/ (accessed November 28, 2018). For some interesting remarks on this controversial issue, see Jelena Branković, Manja Klemenčić, Predrag Lažetić, and Pavel Zgaga, eds., *Global Challenges, Local Responses in Higher Education* (Rotterdam/Boston/Taipei: Sense Publishers, 2014), pp. 202–206; Giovanni Abramo & Ciriaco A. D'Angelo, "An assessment of the first 'scientific habilitation' for university appointments in Italy," *Economia Politica*, 2015, 32/3:329–357; Luca Lanzillo, "Bibliometrics and 'core journals' in the Humanities: an Italian case study," *Qualitative and Quantitative Methods in Libraries*, 2015, 4:595–602.

[24] ROARS (https://www.roars.it), a very popular website among Italian scholars and scientists, features a wealth of information about this topic.

Mazzotti's "Listing wildly," an article published in *Times Higher Education* in 2012.[25] Mazzotti's essay provides a perfect explanation of why quantitative assessments and the use of absurdly rigid disciplinary boundaries are detrimental to interdisciplinary research and to those fields, such as the humanities, that should be evaluated on a qualitative basis.

Actually, the metrics frenzy is not just an Italian problem, but a global one. In recent years, the general academic movement towards the use of metrics in the social sciences and humanities has sparked a heated debate worldwide. This trend has found its clearest expression in Europe, with the attempt carried out in 2007 by the European Humanities Foundation to rank journals in the humanities using quantitative criteria.[26] However, the same problem in Italy is aggravated by endemic factors that make it particularly severe and much more than just a "technical" problem. For, as Mazzotti pointed out, the reaction of the academic community to the new rules was (and still is) far from unanimous: instead of taking "a leading role in designing meaningful parameters," Italian professors have acted "as a fragmented set of interest groups, whose response [. . .] varied from an uncritical endorsement of the new system to entrenched mistrust of any kind of research evaluation whatsoever."[27]

What lies behind their behavior holds the key to understanding why and how the new recruitment system has caused severe distortions in the way bibliographic records are selected and valued in Italian academia—including, *ça va sans dire*, the history of science. In fact, academics in Italy have acted as a "fragmented set of interest groups" for a very simple reason: *that is exactly what they are*.

The current recruitment method has in fact become a clumsy attempt to restore merit by replacing "untrustworthy colleagues with trustworthy numbers," and by turning "untrustworthy committee members into mere operators of the bureaucratic machine."[28] Unfortunately, this has only exacerbated an already broken peer-review system: what was conceived as a tool for making objective evaluations has become the perfect weapon in the hands of academic lobbies, which have found a new and discreet way to bypass merit and employ a system of favoritism to promote scholars. As soon as the committees in charge of drafting journal lists were formed, dominant professors influenced the composition of the journal lists to favor the work of their protégés. At the same time, publishing an article in many Italian journals became an increasingly difficult challenge for many capable, but unwelcome, candidates. The first and most spectacular consequence was that many lists swelled with a deluge of local bulletins, religious periodicals, educational and touristic

[25] Massimo Mazzotti, "Listing Wildly," Times Higher Education, 2012. The article is accessible at: https://www.timeshighereducation.com/features/listing-wildly/421723.article?storycode=421723 (accessed November 28, 2018).

[26] This resulted in the publication of the (now withdrawn) European Reference Index for the Humanities (ERIH). In a joint editorial published in 2009, the main international journals in the history of science, technology, and medicine replied to this proposal with a sharp and unanimous refusal, and demanded their removal from the ERIH rankings. Something similar happened recently in Italy, where many journals of philosophy issued a joint document urging ANVUR to radically revise its evaluation system. On this topic, see also Christine Appel, "European Reference Index for the Humanities (ERIH) and Metrics," *Editors' Bulletin*, 2008, 4/1:3–5; and David Pontille & Didier Torny, "The controversial policies of journal ratings: evaluating social sciences and humanities," *Research Evaluation*, 2010, 19/5:347–360.

[27] Mazzotti, "Listing Wildly."

[28] *Ibid.*

magazines, and with perplexing yet unquestionably intriguing titles such as *Rivista di Suinicoltura* ("Journal of Pig Breeding"), *Perfumer & Flavorist, Olivo e Olio* ("Olive tree and Oil"), or *Yacht Capital* (a magazine on luxury boats).[29]

Recently, the lists have lost a bit of their imaginative charm. Several journals were expunged following furious protests from candidates across the country, while others have disappeared simply because they had become unnecessary for the success of "certain" candidates. In any case, this system has had a deleterious effect on scholarly careers and scholarship alike. In the humanities, including the history of science, the combination of quantitative assessment criteria and academic cronyism has continued to distort the way publications are perceived and valued in Italy. In fact, journal articles (especially those published in "Class-A" journals) are far more important in the eyes of ANVUR than other research products such as, say, book chapters or conference proceedings; and this is true *regardless of their quality*.

The bibliographical implications of this phenomenon are as clear as they are unsettling. There are, of course, many philosophical and historical journals in Italy that contain excellent research work. However, publishing an essay in a high-ranked journal does not necessarily make it good—especially in a context like Italian academia, where clientelism and nepotism are rampant. Visibility, no matter how great, is hardly a good indicator of excellence: and even less so when the game is rigged.

This situation has strongly affected the way that I have collected works for the *Isis Bibliography*. There are many brilliant, innovative, and even peer-reviewed contributions in edited volumes (often published by independent scholars and by non-academic institutions) that have not received the attention and appreciation they deserve for the simple fact that they have little or no relevance when it comes to an academic career. Thus, in searching for Italian language items I have looked beyond the metric-based methods of assessing scholarship in order to search for excellence elsewhere.

Textual criticism, for example, is a well-known and very solid scholarly tradition in Italy. Historians of science have benefited enormously from this discipline: among the 98 *Edizioni Nazionali* ("National Editions") promoted and supported since the second half of the 19th century by the Italian Ministry of Culture, there are the Complete Works of central scientific figures like Leonardo da Vinci, Galileo Galilei, Antonio Vallisneri, Lazzaro Spallanzani, and many others.[30]

The wealth of information made available through critical editions of scientific sources, both published (books, pamphlets, journal articles, etc.) and in manuscript form (field and/or laboratory notebooks, epistolary documents, and so on), is of vital importance to

[29] *Ibid.* In the specific case of Area 11 (Historical, Philosophical, Pedagogical and Psychological Sciences), remarkable examples included journals like *Insegnare Religione* ("Teaching Religion") and *Animazione Sociale* ("Social Entertainment"). For more detailed information about the "crazy lists" issue, see the following posts from the ROARS website: http://www.roars.it/online/le-riviste-scientifiche-dellanvur-dal-sacro-al-profano-e-dalle-stellealle-stalle/; http://www.roars.it/online/sesso-droga-e-chiesa-le-pazze-riviste-anvur-sempre-piu-pazze-episodio-2-della-trilogia/; https://www.roars.it/online/soft-drinks-noccioline-profumi-eros-mugnai-ed-anche-la-protezionecivile-appendice-al-terzo-capitolo-sulle-riviste-pazze-dellanvur/ (accessed November 28, 2018).

[30] In this regard, see the National Editions official website, http://www.librari.beniculturali.it/it/edizioni-nazionali/index.html.http://www.librari.beniculturali.it/it/edizioni-nazionali/index.html (accessed November 28, 2018).

the worldwide community of historians of science. Unfortunately, in Italy this branch of scholarship has been gravely affected by the new academic recruitment system. The preparation of a critical edition is a time-consuming and energy-draining endeavor that requires years of interdisciplinary training and philological, linguistic, historical, and scientific research, and—last but not least—a relatively stable academic position. And yet, since the distorting effects of the assessment parameters introduced by ANVUR make works such as monographs or critical editions no more important than articles published in "Class-A" journals, few young scholars invest their time and energies in wearying, difficult, and (academically) unrewarding long-term projects, despite the high scholarly merit that these projects produce. Therefore, critical editions in the history of science are becoming increasingly less popular, less common, and less funded.

Of course, textual criticism remains one of the finest expressions of Italian scholarship, and its presence in the IsisCB deserves to be adequately strengthened. During the past two years, the critical edition works published by the (still in-progress) National Edition of Antonio Vallisneri have been collected in their entirety by the IsisCB. The National Editions of other Italian authors (such as Galileo or Spallanzani) are only partially represented in it, and it is my intention to collect them there in the future.

This unfortunate situation helps us to understand why in Italy a lot of original and interdisciplinary works in the history of science are produced by "external" scholars like teachers, librarians, research fellows working in international institutions, archivists, retired professors, and museum curators who—by choice or by chance—conduct their research in collaboration with Italian academics but outside of Italian academia. Also, this explains why many libraries, learned and/or scientific societies, national editions, foundations, and museums[31] are so important in fostering the cross-pollination of disciplines, methods, and ideas. Curiously, many typical fruits of such interactions (conference proceedings, edited books, and historical articles often published in "off-list" scientific journals)[32] are precisely the kind of works deemed less important or off-topic by the academic recruitment rules. Thus, they tend to be "less visible" to the many international colleagues who are accustomed to focus predominantly or exclusively on the academic

[31] Noteworthy examples are the Fondazione Giorgio Cini in Venice; the Accademia Roveretana degli Agiati in Rovereto; the Centro Studi Lazzaro Spallanzani in Scandiano; the Edizione Nazionale Vallisneri in Milan; the Biblioteca Leonardiana and the Museo Leonardiano in Vinci; the Centro di Studi Muratoriani in Modena; the Fondazione Leon Battista Alberti in Mantua; the Accademia dei Concordi in Rovigo; the Accademia Galileiana in Padua; the Fondazione Bruno Kessler in Trento; and many others. Usually, the websites run by these institutions contain a wealth of information about current and forthcoming publications, as well as many useful links to partner organizations (including universities) and publishers promoting and supporting history of science and/or interdisciplinary humanities projects. Another key instrument for finding Italian publications in this field is Torrossa (http://www.casalini.it/#torrossa), a full-text search engine run by the Casalini Libri, a company which supplies publications to libraries. Finally, we need to mention the *Bibliografia Italiana di Storia della Scienza* ("Italian Bibliography of the History of Science"), promoted and edited by the Museo Galileo from 1982 to 2011. Although this precious resource ceased publication, it is still available online as part of the cumulative database of the Museo.

[32] Among the many examples from the IsisCB, see: Maria Teresa Monti & Marc J. Ratcliff, eds., *Figure dell'invisibilità: le scienze della vita nell'Italia d'antico regime* (Florence: Olschki, 2004); Generali & Ratcliff, eds., *From Makers to Users*; Paola Manzini & Roberto Marcuccio, eds., *Bonaventura Corti, Naturalista, Educatore, Meteorologo* (Florence: Olschki, 2008); Pierre Caye, Romano Nanni, and Pier Daniele Napolitani, eds., *Scienze e rappresentazioni* (Florence: Olschki, 2015); and Vito Rovigo, ed., *Il fiume, le terre, l'immaginario: L'Adige come fenomeno storiografico complesso* (Rovereto: Edizioni Osiride, 2016).

context[33] But, as we have seen, visibility can be a very deceptive criterion for defining good scholarship—especially in Italy.

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In this note, I have tried to explain why the bibliographical peculiarities that characterize the history of science in Italy cannot be fully understood without first delving into the philosophical, ideological, political, cultural, and social factors that have shaped and are shaping the discipline in this country. The overlapping of different scholarly traditions, legislative changes, academic malpractices, and scattered excellences has left deep and distinctive marks on the Italian scene. Light and shadow have intertwined to form a contradictory and entangled pattern of quality and mediocrity, and this often makes it difficult to keep good and bad scholarship apart.

And yet there is still plenty of good scholarship in Italy, and in exploring this intricate setting I searched for what, in my opinion, are the best works in the history of science that have been produced in recent years. My attempt has been to provide a balanced collection of publications focused on a wide range of subjects and time periods. Special (although not exclusive) attention has been devoted to documents such as critical editions of source texts, edited volumes, and conference proceedings that are often the kinds of work in which Italian scholarship excels, but are typically underrepresented in the *Isis Current Bibliography*. Also, I have made room for many interesting and interdisciplinary articles from less known and/or off-topic, but worthy, journals that tend to go unnoticed by historians inside and outside Italy. I sincerely hope I have been able to provide readers with useful insights into this rich and complex context.

[33] Of course, edited volumes and conference proceedings are not the only kinds of work in the history of science produced by "external" scholars: a number of important monographs have also been written recently. See, among many examples: Benedino Gemelli, *Aspetti dell'atomismo classico nella filosofia di Francis Bacon e nel Seicento* (Florence: Olschki, 1996); Marta Stefani, *Corruzione e generazione. John T. Needham e l'origine del vivente* (Florence: Olschki, 2002); Antonio Becchi, *Q. XVI. Leonardo, Galileo e il caso Baldi: Magonza, 26 marzo 1621* (Venice: Marsilio, 2004); Generali, *Antonio Vallisneri: Gli anni della formazione e le prime ricerche*; Cesare S. Maffioli, *La via delle acque (1500-1700). Appropriazione delle arti e trasformazione delle matematiche* (Florence: Olschki, 2010); Giuseppe Ongaro, *Wirsung a Padova, 1629-1643* (Treviso: Antilia, 2010); Giulia Rispoli, *Dall'empiriomonismo alla tectologia. Organizzazione, complessità e approccio sistemico nel pensiero di Aleksandr Bogdanov* (Rome: Aracne, 2012); and Romano Nanni, *Leonardo e le arti meccaniche* (Milan: Skira, 2013).