Laura Meneghello

JACOB MOLESCHOTT
A TRANSNATIONAL BIOGRAPHY
Science, Politics, and Popularization in Nineteenth-Century Europe

[transcript] Histoire
This is the first academic biography of the scientist and politician Jacob Moleschott (1822-1893). Based on a vast range of primary sources in German, Italian, Dutch, French, and Latin, it not only sheds new light on the history of materialism in the natural sciences, but also shows the deep entanglement of science, politics, and popularization in 19th-century Europe. Applying new methods from cultural history and the history of science, Laura Meneghello focuses on processes of knowledge circulation, transnational mobility, and the role of translation in 19th-century science.

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Formalia and Acknowledgements

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I also thank all of the archivists who supported my research on Moleschott; a list of consulted archives is contained at the end of the book. In particular, Patrizia Busi (Biblioteca Comunale dell’Archigiannsio, Bologna) allowed me to use the catalogue of the Fondo Speciale Moleschott before it was officially available online; before that, a partial classification was kindly made available to me by Arianna Zaffini. Eva-Marie Felschow, Universitätsarchiv Giessen, gave me her advice regarding Moleschott’s correspondence with Justus Liebig. Paola Novaria (Archivio Storico dell’Università di Torino), and the archivists from the Archivio Centrale dello Stato in Rome offered me timely help despite my tight schedule. Silvano Montaldo and Pier Giorgio Montarolo (both University of Turin) provided access to other sources, respectively from the Museo Cesare Lombroso and from the Archivio Angelo Mosso. Further, I am thankful to the IPP (International PhD Programme, Giessen) for having granted me financial support for proofreading, to Friedrich Lenger for supporting my application, and, of course, to Melissa Favara for patiently proofreading my manuscript: it was always a pleasure working with her.

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All translations contained in this book are mine, unless otherwise indicated.

All quotes in languages other than German, French, and Latin, are translated into English in the text; however, I have cited them in the original language in the footnotes, in order to preserve the multilingualism of Moleschott’s biography and the plurality of languages involved in this transnational account of European history of science. Cities’ names are translated into English in the text, but appear in their original variant in the bibliographic data. In the source quotations, I have maintained the original orthography.

The signature of the sources from the Fondo Speciale Moleschott, Biblioteca Comunale dell’Archiginnasio, is the one respectively valid when I viewed the manuscripts; in the cases when the signature is that of the present classification in the online inventory, this is characterized as “(new)”. In any case, through the new catalogue one should be able to find even the documents with older signatures without problems. The literature is cited according to a slightly modified version of rules of the Chicago Manual of Style. The titles by Jacob Moleschott, listed at the end of the book, tend to completeness and therefore also include a few titles that are not mentioned in the chapters: this part of the bibliography rather serves as a reference for an overview of Moleschott’s writings, and I explicitly refer to it at some point of the book.
Introduction:
Jacob Moleschott as Transnational Actor in European Cultural History

OBJECT AND RESEARCH QUESTION

“[T]hat forehead encompassed a huge deal of human knowledge; from logarithms to music, from physics to psychology, to the most specific branches of practical medicine […] Oh [his faith] was not the faith of our fathers, who made us happier perhaps, but slaves of the present and then of the past… It was the faith of a great rebel, a rebel in science and in the arts, in religion and in politics.

It was the faith of a modern Capaneus,¹ redeemed by the love for truth, who believed to be called – and perhaps that was an illusion – to change humanity’s destiny. […] He was more than a genius, often passing on human generations, like a luminous but fatal meteor; he was an idea, he was the apostle of the modern idea, which we will unfortunately not be able to see realized, but of which you, the young generation, shall finally see the dawn.”²

¹ According to the Greek legend, Capaneus was a son of Hipponous and was one of the Seven against Thebes; he possessed enormous strength, but also arrogance: due to the latter, he was killed by Zeus while he was invading Thebes. Cf. René Nünlist (Basle), “Capaneus.” Brill’s New Pauly. Antiquity volumes ed. Hubert Cancik and Helmuth Schneider. Brill Online, 2015. Reference. Universitätsbibliothek Giessen. November 29, 2015. http://referenceworks.brillonline.com/entries/brill-s-new-pauly/capaneuse608490. First appeared online: 2006. Thereby Lombroso attributed to Moleschott positive qualities such as courage and strength, but also possibly less positive ones such as that of having too high an esteem of oneself and, due to one’s overestimation, pursuing illusory aims. Similarly to Prometheus, Capaneus can be considered as an embodiment of ὕβρις.

² Cesare Lombroso, La mente di Moleschott. Da una conferenza tenuta all’Università di Torino il 9 giugno 1893. Archivio di Psichiatria, Scienze Penali ed Antropologia criminale,
These words resonated in the halls of the University of Turin on June 9, 1893, when the bronze bust of Jacob Moleschott by the sculptor Ettore Ferrari was uncovered, about three weeks after Moleschott’s death. The speaker was Cesare Lombroso, the founder of criminal anthropology, who saw himself as the heir of Moleschott’s scientific thought. The sculptor, Ettore Ferrari, was the same artist who created the statue of Giordano Bruno in Campo dei Fiori, in front of which Moleschott gave two speeches – one in Dutch and one in Italian, respectively in May and June 1889 – on the occasion of its inauguration. Ferrari was, in a way, the official sculptor of unified Italy, promoting its national ideology and its secular (and mostly anti-clerical) heroes.3

But who was Jacob Moleschott, actually? If Ettore Ferrari was the sculptor of his bust, then we might infer that he himself had become a figure in the pantheon of Italian national heroes. But what was his involvement in the program of Italian national ideology? And, above all, where did he come from, and which path did he follow before achieving such a position in the secular and nationalist Italian pantheon? How did it happen, in other words, that a physiologist, who became an Italian citizen only in 1867, came to occupy such a position?

In fact, Jacob Moleschott was not born an Italian, but a Dutch citizen: he was born in ’s-Hertogenbosch in 1822 and died in Rome in 1893. He had a very international, that is to say, European career: he studied medicine in Heidelberg and, after having worked for two years as a physician and assistant in the lab of the chemist Johannes Mulder in Utrecht, he became Privatdozent at the University of Heidelberg. When the government of Baden did not appreciate his attempts to spread materialist theories in his courses on anthropology and in his popularizing writings, he lamented

14 (1893), 6: 1-4; the passages here reported are on pages 1 and 4: “quella fronte inquadra va un’immensa parte dello scibile umano; dai logaritmi alla musica, dalla fisica alla psicologia, ai rami più speciali della medicina pratica [...]. Ah! non era la fede soave dei nostri padri, che ci rendeva più felici forse, ma schiavi del presente e poi del passato… Era la fede di un grande ribelle: ribelle nella scienza, nell’arte, nella religione e nella politica. Era la fede di un Capanec novello, redento dall’amor del vero, che si credeva, ed era forse illusione, chiamato a mutare i destini degli uomini [...]. Egli era più che un genio, che spesso passa sulle generazioni umane, come una meteora luminosa ma fatale; egli era un’idea, egli era l’apostolo della idea moderna, che noi purtroppo non vedremo attuata, ma di cui, voi giovani, finalmente vedrete l’albore.” The speech was also published in Jacob Moleschott, Per gli amici miei. Ricordi autobiografici, trans. Elsa Patrizi-Moleschott (Palermo, Milano: Sandron, 1902), 332-339.

that he was not granted the “freedom of teaching” (*Lehrfreiheit*), and he left the University of Heidelberg. Later, he taught at the University of Zürich, until he was finally appointed Professor of Physiology at the University of Turin in 1861. He became Senator of the newly established Italian Kingdom in 1876 and Professor at “La Sapienza” in Rome in 1878. Together with Carl Vogt (1817-1895) and Ludwig Büchner (1824-1899), Moleschott is considered one of the most representative materialist scientists of the nineteenth century.4 Moleschott himself never took care to define the term “materialist science”, and, especially in his Italian writings, rather used the expression “scienza positiva”, that is, the natural sciences as they were conceived by positivism, as empirical and experimental.

His life, spanning most of the nineteenth century, was contemporary with many important historical processes and events, as well as substantial structural changes; as we will see, not only are these relevant for the understanding of Moleschott’s life and career, but Moleschott was himself a significant actor in these very processes. This study is, therefore, a contribution to their history that focuses on the concrete microlevel of actors, discourses, and practices of knowledge transfer, rather than on the abstract macrolevel of structures and ideas.5

First, for the history of science, the nineteenth century is not only the time of the establishment of biology and physiology as scientific disciplines, but also a period of specialization, institutionalization and professionalization.6 In biology, several currents opposed each other, disagreeing on the problem of teleology and on the conception of organic life. This conflict can be summarized as the conflict between materialism on the one hand, rejecting any non-material principle as being at the basis of organic life, and vitalism on the other hand, defending the existence of a vital force.

4 The correspondence between Carl Vogt, Ludwig Büchner, Jacob Moleschott, and the monist and popularizer of Darwinism Ernst Haeckel has been published by Christoph Kockerbeck (ed.), *Carl Vogt, Jacob Moleschott, Ludwig Büchner, Ernst Haeckel: Briefwechsel* (Marburg: Basilisken-Presse, 1999).

5 On science as a cultural practice, cf. Moritz Epple and Claus Zittel (eds.), *Cultures and Politics of Research from the Early Modern Period to the Age of Extremes*, vol. 1 of *Science as Cultural Practice* (Berlin: Akademie Verlag, 2010), as well as Steven Shapin, *Never Pure: Historical Studies of Science as if it was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority* (Baltimore: John Hopkins University Press, 2010), 14, who defines science as a “historically situated, embodied […] set of practices”.

(Lebenskraft) which would distinguish the organic from the inorganic realm.\(^7\) Second, industrialization reached countries such as Germany and Italy, bringing deep changes in their social structure, as well as in the panoramas of urbanization; this, in turn, implied an increase of hygienic problems and, as a reflex, brought the problem of poverty and of precarious hygienic conditions to the attention of the experts (both scientists and politicians).\(^8\) At the same time, the processes of food importation, conservation, and processing, which were made possible by economic change and technical developments, were the preconditions for conceiving nutritional theories implying the consumption of large quantities of animal proteins, especially of meat. Significantly, some of the scientists who, like Moleschott, theorized a diet based on animal proteins, were also well aware of the relations between nutrition and political economy, such as Johannes Mulder; others, such as Justus Liebig, foresaw the success of transnational companies processing and importing meat from South America. Both Mulder and Liebig were aware, on the one hand, that lower meat prices would mean greater meat consumption in Europe, and on the other hand, that precisely a greater meat consumption would stimulate a higher production, greater import, and thus lower meat prices.\(^9\) Third, the affirmation of the middle class (which was related to the abovementioned economic and social changes due to industrialization) and literacy implied the formation of a vast audience for the media developing at that time,


above all journals and newspapers. As we will see, Moleschott was himself a typical representative of the European bourgeoisie, sharing and reproducing its norms and practices, its structures and its habits.\(^{10}\) Fourth, increasing literacy and a larger middle class were the precursors for the rise of scientific popularization as mass popularization: in the nineteenth century, there was a huge increase in printed media that reproduced, spread, and popularized scientific knowledge, presenting it as the empirical foundation of an enlightened worldview.\(^{11}\) As I will argue, Moleschott contributed to this great popularizing enterprise during his whole life, adapting his popularizing strategies to the different social contexts in which he lived and worked. Fifth, this was the time of secularization, inspired by the ideas of the Enlightenment, but also triggered by social phenomena, such as urbanization and the increasing bureaucratic power of the state (which was e.g. holding registers of births and marriages).\(^{12}\) Sixth, it was the time of nationalism, which, together with the ideals of democracy and liberalism, was one of the leading political ideas of the century.\(^{13}\) This was evident in the recently formed nation-states of Italy and Germany, as well as in the revolution of 1848 and in the years preceding it (which correspond to the time when Moleschott studied in Heidelberg, as well as with the start of his *Privatdozentur*). This went hand in hand with secularization, since nationalism created a pantheon of secular heroes


\(^{11}\) Cf. Angela Schwarz, *Der Schlüssel zur modernen Welt: Wissenschaftspopularisierung in Grossbritannien und Deutschland im Übergang zur Moderne (ca. 1870-1914)* (Stuttgart: Steiner, 1999), as well as Andreas W. Daum, *Wissenschaftspopularisierung im 19. Jahrhundert: bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Öffentlichkeit, 1848-1914* (München: Oldenbourg, 1998); as an example of popularizing journals cited by Daum, we can mention *Die Natur* (co-founded by Moleschott’s father-in-law, Otto Ule), as an example of journals not exclusively popularizing the natural sciences but addressing the middleclass with broader topics, *Die Gartenlaube*.


and myths, which divinized the idea of the nation-state.\textsuperscript{14} Seventh, the ideals of freedom of research and academic freedom, as well as of the independence of research from political power, were considered to be central to the modern university.\textsuperscript{15} These aspects are very important with regard to Moleschott’s self-representation as a scientist, to his conception of science and scientific research, as well as to his idea of the university as an institution. The latter became evident in 1854, when he left the University of Heidelberg, as well as later on, in the 1880s, when he contributed to the debates on the reform of the Italian university system. In Germany and in Italy, the two countries where Moleschott worked for the longest time, his career developed in narrow contact with the political and social milieu, and he himself was, so to speak, always in the middle of important socio-political changes, not only participating, but actively contributing to them. I will try to understand Moleschott’s life and work in the framework of all of these processes, which characterized the second half of the nineteenth century, namely: newly-established nation-states and emerging nationalisms, economic liberalism and bourgeois ethos, the “Humboldtian ideals” of freedom of research and teaching, the secularization of European society, scientific popularization, and the emergence of the press as a mass medium. Moleschott was himself both informed by these historical developments and informing them as an actor of historical, political, and social change: not only as a Senator in Italy, but even long before, in Heidelberg as a teacher and as a student, he already engaged in the formation and popularization of nationalist ideas. As we will see, the popularization of science went hand in hand with the diffusion of political ideas.

The aim of the following work is to study Moleschott’s life-path also as a means to a better understanding of the abovementioned central phenomena in nineteenth-century European history, focusing precisely on the relation between science and politics; popularization, the third element in the subtitle, can be considered as the link between the two former elements. It was namely through popularization that science and politics joined their efforts for the sake of a common, national interest. In Moleschott’s work, science was never popularized without reference to higher ethical and political values (libertarian values such as democracy and equality, but also utilitarian values such as efficiency and economic profit), and political (nationalist) ideas were never popularized without the help of scientific concepts. In this way, highly ideological and emotional attitudes were justified with the help of scientific ideas, thus as rationally and empirically founded. As we will see, all of Moleschott’s speeches and lectures delivered in Italy can be understood as a form of popularization.


The most striking particularity of Moleschott’s career is, to be sure, its transnationality: not only did he study abroad, not only did he become a politician, but he worked in several countries and, before moving for the seventh time, he became a member of the Italian Senate. As a person, Moleschott had the remarkable ability to adapt his theories, his style, and his research to new national and social contexts. Therefore, he is a perfect example of the transnational mobility of a scientist in the nineteenth century. In this sense, I consider the “mobilities turn” in cultural studies and sociology to be as central for the history of science. At the same time, some of my findings among Moleschott’s unpublished letters show that the processes of migration and adaptation in his career were not just determined by chance, but that instead he reflected on them and consciously chose to migrate in order to fully develop his intellectual potential and to increase his academic and political “capital”. The main thesis that is supported by my findings is that science and politics were deeply entangled in processes of nation-building in the nineteenth century, and that precisely transnational actors like Moleschott played a central role in these processes, both through their international networks and through their roles as cultural brokers, mediators, “quasi-ambassadors”, go-betweens, and translators.

Thus, this study is the first academic biography of Jacob Moleschott, one which is not based exclusively or almost exclusively on his autobiography and which is not limited to an internal analysis of his German writings, but which instead takes into account a great number of unpublished sources as well as his later work, in particular his Senate speeches and his university lectures, assessing them through a contextualizing and comparative approach. What has been done in the research on Moleschott and on materialism so far, and which approaches have inspired my own work, will be the object of the next section.

17 The concept of “go-between” has gained increasing importance in recent research not only in cultural studies, but also in the history of science. Cf. for instance the edited volume by Simon Schaffer, Lissa Roberts, Kapil Raj, James Delbourgo (eds.), The Brokered World. Go-Betweens and Global Intelligence, 1770-1820 (Sagamore Beach: Science History publ., 2009). For the concept of “quasi-ambassador”, cf. Martin Kohlrausch, Building Europe on expertise: innovators, organizers, networkers (Basingstoke: Palgrave Macmillan, 2014), 159.
STATE OF RESEARCH, THEORY AND METHOD, STRUCTURE

Surprisingly, the life and work of such a striking natural scientist, who moved from one country to another with extreme adaptability (both on the personal level and on the general level of his scientific and political ideas), has barely found a place in historical research so far. The publications that have appeared until this moment, including Gregory’s book on *Scientific Materialism in 19th-century Germany*, have considered Moleschott as part of the greater movement of “scientific materialism”.18 In the German Democratic Republic, Dieter Wittich has edited and annotated part of his major popularizing work, together with pieces from Carl Vogt’s and Georg Büchner’s popularizing books, understanding them, in line with Marx and Engels, as “Vulgärmaterialisten” and critically examining their theory of knowledge from the perspective of Marxism-Leninism.19

The articles and monographs completely dedicated to Moleschott are very few: the most recent ones are to be found in the *Giornale Critico della Filosofia Italiana* (2011), where some of the contributions of the conference held in Bologna in 200920 have been published as journal articles.21 Among these contributions, Alessandro Savorelli’s offers an interesting perspective on Moleschott’s thought in the cultural and philosophical context immediately following the Italian unification. Besides that, Giorgio Cosmacini has dealt with Moleschott from the perspective of the history of medicine and the history of ideas in his contribution in the *Annali della Storia d’Italia* in 198022 and, in 2005,23 in a biography in Italian which, however, almost exclusively focuses on Moleschott’s own autobiography and on Lombroso’s translation of the

18 Gregory dedicates chapter IV, pages 80-99, of his book to Moleschott; besides him, the other “materialists” who are the object of the book are Ludwig Feuerbach, Heinrich Czolbe, Ludwig Büchner and Carl Vogt.
Kreislauf des Lebens, lacking any source-critical approach. In 1985, Udo Hagelgans published a short monograph (a dissertation as Dr. med.) on Moleschott’s scientific work from the perspective of the history of medicine, asking the question of the extent to which his findings are confirmed or refuted by successive research and thus assessing his work from the perspective of contemporary research in medicine and biology. In the 1860s, Walter Moser had also published a short monograph on Moleschott, based on his autobiography, on his German popularizing books and on some documents from Zürich university archives. Finally, van ter Laage published a book on Moleschott in Dutch in 1980, which presents an overview of his life and work, as well as the assessment and summaries of some letters from his Nachlass in Bologna and from the correspondence with the Dutch scientists Izaac van Deen and Franciscus Cornelis Donders.

In my Master’s thesis, I have already dealt with Moleschott’s thought at some length and based on archival material; however, my approach was very different from that of the present work. In “Jacob Moleschott and the Conception of Science in the 19th Century: Scientific Materialism as ‘Totalizing’ Worldview”, I have interrogated the sources mainly from the perspective of the history of philosophy and the history of ideas; however, I have also taken into account the context of nationalism and the political and social environment of unified Italy, as well as the scientific context of the debates on vitalism and materialism. I have come to the conclusion that Moleschott had a “totalizing” worldview of the natural sciences, including into the domain of science, religious, ethical, and philosophical issues.

In the present book, I consider Moleschott’s life and work by embedding them in the social and cultural history of the second half of the nineteenth century, as well as in the transnational networks of scientists, scholars, and politicians he belonged to. In this case study on a nineteenth-century scientist, scholar, and politician, the main research questions concern the interaction and entanglement of science and politics,

25 Udo Hagelgans, Jacob Moleschott als Physiologe (Frankfurt am Main: P. Lang, 1985).
26 Walter Moser, Der Physiologe Jakob Moleschott (1822-1893) und seine Philosophie (Zürich: Juris-Verlag, 1967). It was originally presented as “Inaugural-Dissertation zur Erlangung der Doktorwürde der Zahnheilkunde der Medizinischen Fakultät der Universität Zürich” and consists altogether of 55 pages.
28 Laura Meneghello, “Jacob Moleschott and the Conception of Science in the 19th Century”.
as well as transnational knowledge transfer and circulation. In the chapter on translation, I show how the circulation of knowledge took place, how its actors communicated, and how it was dependent, for a great deal, on translation and negotiation processes. The entanglement of science and rhetoric, or of science and politics, the importance of style for the circulation and transmission of scientific ideas, the mingling of private, professional and public spheres, which are theorized by Bruno Latour, are here exemplified through concrete case studies regarding the life of a scientist who has been one of the protagonists of such processes. As far as the transnationality of scientific cooperation and scientific networks is concerned, there could not be a better biography than Moleschott’s to illustrate this point – even and above all in the framework of nationalist ideology. In fact, Moleschott’s activity as a popularizer, a politician, and a member of international associations of scientists shows that engagement in nationalist issues did not exclude, but rather presupposed transnational networking.

This makes clear why, in the case of Moleschott a biographical perspective is not only justified, but also proves to be the perfect way to exemplify central issues in current research in cultural studies and in the history of science – even after the criticism expressed by ethnologists, sociologists and post-modernism, which questions


the very representation and conception of life as a linear narrative, as a coherent whole having its own sense (both as significance and direction, as argued by Bourdieu), unity, and totality. I take their critiques seriously, trying to deconstruct the unity, sense, and linearity given by Moleschott to the account of his own life; especially, I will attempt to make clear where it is likely that Moleschott interpreted his own life-path in the light of its later development, or purposefully represented it in a certain way because the reader would expect him to represent it in that way. This regards above all the representation of Italy as the necessary destination for his career, as well as the description of his love for the Italian culture and language as being deeply rooted in his life: both pertain to Moleschott’s construction of his own Italian national identity.

A biographical perspective that is critical of Moleschott’s own autobiography (and, thus, of all secondary literature which uncritically takes up Moleschott’s own representation of his life), seems to be the best approach not only for representing the career of a nineteenth-century scientist in its political, social and ideological context, but also for letting the transnationality of his career and the transdisciplinarity of his fields of expertise emerge. In fact, biographies have the inestimable value of showing precisely the intermingling of roles, or the concentration of powers, in one life story. As we will see, through such a perspective it is possible to observe the entanglement of private and public aspects, of transnational collaboration and nationalist ideology, of science and politics in one single life and career. Saying it with Bourdieu,

one can conceive of Moleschott as the bearer of multiple “capitals”, which he never really kept separated, but rather “concentrated”, especially during specific phases of his career: the social, scientific, political, and familial capital went hand in hand. Moleschott’s uniqueness is precisely his ability to “accumulate” these different sorts of “capital” and to “concentrate” them in his hands, having apparently no difficulty at all in combining their different “logics”. In other words, Moleschott managed not only to transfer knowledge (scientific expertise, as well as practical and administrative knowledge, if we think about the university system or hygienic rules) between different national, political, and social contexts, but also to translate between different “fields” of knowledge and practice. This was also the condition for his great mobility and adaptability. It is in this sense that Moleschott can be considered, first of all, as a mediator and a translator (not only between languages, but also in the broad sense of “cultural broker”). In order to comprehend Moleschott’s figure as a translator (in both a narrow, i.e. literal, and a broad sense), I refer to research on translation (Translationsforschung). In recent years, translation studies have made clear the significance of the very activity of translation for cultural and knowledge transfer, showing that translation not only implies a change in the form of the transmission, but that it also shapes the content of the message, as well as the languages involved in this process.

Moleschott’s biography can be best understood if one applies the theories of “travelling concepts” and “translation” on multiple levels: first, Moleschott was himself a translator; second, his work was translated into several languages and its reception in Europe and in the world depended on its translation (e.g. his Kreislauf des Lebens was translated by Cesare Lombroso). Third, he essentially contributed to knowledge transfer between several European countries at once; fourth, he showed great compatibility with basically any social system he came in contact with: even

35 For the concepts of capital sociale, politique, symbolique, scientifique, cf. Bourdieu, Raisons pratiques.

36 For a theoretical framework, cf. Doris Bachmann-Medick (ed.), The Trans/National Study of Culture: A Translational Perspective (Berlin, Boston: De Gruyter, 2014). The concept of “cultural broker”, originating from the field of anthropology and ethnology, has become commonly used also in historical studies on cultural transfer and mediation in recent years: cf. e.g. Marc von der Höh, Nikolas Jaspert and Jenny Oesterle (eds.), Cultural Brokers at Mediterranean Courts in the Middle Ages (Paderborn: Fink, 2013).


his departure from Heidelberg and his conflict with the University and Ministry in 1854 was sublimated and completely removed in the speech he gave in May 1886 for the five-hundredth anniversary of the University. Fifth, this led to his role as cultural mediator and official delegate (for and in different countries at once); sixth, Moleschott also had the ability to translate transversally from “capitals” and “fields” (in the sense of Bourdieu) into other “capitals” and “fields”.39

In the whole book, I have adopted a transnational approach to my research:40 even when focusing on a particular location in which Moleschott’s career took place, on one of his roles or, in Bourdieu’s words, on a particular “placement” or “déplacement”, I have always attempted to compare it with other, successive or previous moments in his life and career and with other roles. In this sense, in each chapter, I consider Moleschott’s life and work not only synchronically, but also diachronically; at the same time, I do not consider the stations of his life as being rigidly separated from each other, but I always try to understand them in the context of other events and other places.

Finally, the object of the following work is the cultural and social history of a scientist and popularizer, scholar and politician in the nineteenth century, whose transnational career did not interfere with his adherence to the principles of nationalism: to the contrary, his international networks allowed his engagement in nationalist issues. Whereas there is enough literature on the construction of Italy as a nation and the ideology connected with it,41 this is seldom related to a biography,42 and even

39 Cf. Bourdieu, Raisons Pratiques, 88: Bourdieu identifies each “événement biographique” as implying “autant de placements et de déplacements dans l’espace sociale, c’est-à-dire, plus précisément, dans les différents états successifs de la structure de la distribution des différents espèces de capital qui sont en jeu dans le champ considéré”.


42 With some exceptions, especially in the biographies of politicians, e.g. Christopher Duggan, Francesco Crispi.
more seldom to the biography of a scientist.\textsuperscript{43} The present work seeks to show the contribution of a scientist to the process of nation-building, in particular in the Italian context.\textsuperscript{44} Whereas this issue has already been dealt with from the perspective of concept-transfer from biology to politics,\textsuperscript{45} I approach the issue of the interaction between science and politics in the newborn Italian nation-state through analyzing Moleschott’s career. The fact that, from 1876 on, he was both a scientist and a politician, does not imply that I shall only focus on the period after 1876 in my analysis of the interaction between science and politics: to the contrary, I will show that his political engagement as a scientist and as an expert dates from early in his career (specifically, he engaged in the Italian nation-building well before his official appointment as Senator).

As the title suggests, the present work is not concerned with “materialism” as a current in nineteenth-century natural sciences and philosophical thought, but on a specific actor in the landscape of nineteenth-century natural sciences, nationalism, politics, and popularization. Moreover, it is not concerned with the material culture of the laboratory in Moleschott’s scientific practice, or the conditions of experiments, or on the relations between actors and networks in the lab, for the simple reason that the sources are very scarce and do not display any specificity.\textsuperscript{46}

\begin{itemize}
\item \textsuperscript{43} Cf. for instance Rainer Brömer, \textit{Plastidules to humans. Leopoldo Maggi (1840-1905) and Ernst Haeckel’s naturalist philosophy in the Kingdom of Italy}; with an edition of Maggi’s letters to Ernst Haeckel, vol. 14 (2009) of \textit{Annals of the history and philosophy of biology} (Göttingen: Univ.-Verl., 2011) (here, the issue of nationalist ideology could have been dealt with more prominently) and Constantin Goschler, \textit{Rudolf Virchow. Mediziner, Anthropologe, Politiker} (Köln, Weimar, Wien: Böhlau, 2002).
\item \textsuperscript{46} The reports of some experiments, partly written down by Moleschott, are conserved in the Archivio Angelo Mosso (Università di Torino, Sezione di Fisiologia del Dipartimento di Neuroscienze). On the history of Moleschott’s \textit{Nachlass}, specifically of the Fondo Moleschott in Bologna and the criteria for its inventory process, cf. Patrizia Busi, “Moleschott
Popularization does constitute one of the main topics of the book: Moleschott’s career is characterized by the constant presence and deep impact – both on his own academic and political career, as well as on the audience of readers and, more broadly, on the whole national society through his advice as a governmental expert – of popularization.\(^{47}\) Gender research and theory,\(^{48}\) even though not a central topic in my book, is nevertheless relevant: first, I consider Moleschott’s wife, Sophie Strecker, as an essential actor not only in his personal and familial life, but also and above all in his scientific career, highlighting her role in shaping both the intellectual environment (through her work as a poet and translator) and the material conditions of Moleschott’s work (financially enabling the establishment of his own laboratory). Second, the reception of Moleschott’s thought and nutritional theory was partly fostered by women – or, better, through publications written by women for women, in such disparate domains as the moral implications of his worldview and the application of his nutritional theory to everyday cooking.\(^{49}\) Third, Moleschott himself engaged in the issues of women’s rights, specifically the right to vote and the right to
practice one’s profession. In this respect, Moleschott’s biography, although being the biography of a male scientist, offers the possibility to illuminate the women’s role in the production and reception of scientific knowledge, as well as in the entanglement of science and politics exemplified by Moleschott’s activity.

The current biography is based on archival material, including Moleschott’s drafts of his unpublished and unfinished work, the “Anthropologie”, as well as on his work in the field of scientific popularization, his lectures, his public speeches, and the speeches he gave at the Italian Senate. On the one hand, I consider them in their political and historical context, tracing the origin of Moleschott’s ideas and comparing his work with that of other European scientists in the nineteenth century. On the other hand, I analyze their content and form in detail, including rhetorical imagery. My methodological approach involves both a close reading and a broad reading, both discourse analysis and the embedment of the texts in their broader cultural, social, and political context. I thus refer to the methods of cultural history, entangled history (histoire croisée), and historical comparison. Only in the combination of these different theoretical and methodological approaches is it possible to comprehend Moleschott’s life and career in its full significance.

In what follows, I will highlight the overall structure of this work and the function of its single chapters. The structure articulates in two main parts, respectively corresponding to the early stages of Moleschott’s career, and to his Italian years as an established and nationally as well as internationally renowned scientist and, later on, as a politician. Each part is not isolated from the other parts; to the contrary, they are connected with each other, e.g. through comparisons with former and future developments of his career, or through the reference to theories that influenced Moleschott’s thought at an earlier stage of his life. Moreover, each of these main parts first deals with some information about the most important events of Moleschott’s

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biography and their contexts, in order to concentrate, later on, on a detailed analysis of specific texts and documents. Such a combination of close and broad reading aims at understanding Moleschott’s thought in its cultural and ideological context, his biography in his social and political context, and his texts and speeches in the context of contemporary discourses and references to the classics. Chronologically, the first part starts with Moleschott’s family and its cultural background, it goes forth with the years of his education and of his university studies, with the relatively short period as a physician and as assistant in the laboratory of Johannes Mulder in Utrecht, with the time of his great German popularizing works when he was a Privatdozent in Heidelberg, his leaving the university, and his new start in Zürich. The second part deals with Moleschott’s appointment as Professor of Physiology in Turin, with his gradual but relatively fast naturalization culminating with the citizenship he received in 1867, his political career at the Senate from 1876, and correspondingly, his transfer to the University of Rome two years later. Geographically, the first part relates to the Netherlands, Germany, and Switzerland, whereas the second part focuses on the Italian nation-state, specifically on the cities of Turin and Rome. Interestingly, both Turin and Rome were respectively the capital cities of the Kingdom when Moleschott started to live and work there. Apparently, Moleschott was looking for the center rather than for the periphery.

Let us summarize the topic of the next chapters, their research question as well as their function in the overall structure of the book in more detail. In the first chapter, dealing with Moleschott’s life from its beginnings in ’s-Hertogenbosch, his education and his studies, the central topic is the reconstruction of his familial and educational, cultural and religious background, which will enable us to better comprehend his conception of nature, of science, and of society. Later in this chapter, we will follow the development of Moleschott’s early career, from the beginnings as a translator between Dutch and German, then as a physician in Utrecht, to the Privatdozentur in Heidelberg. The second chapter deals with the aspects of his thought which he mainly developed in his German popularizing writing, concerning the conception of science and of nature, as well as his theory of nutrition, with special attention to its social implications and to the role of proteins. As we will see, these issues will be important in order to understand his Senate speech on the abolition of the grist tax thirty years later. I will argue that the “tree of knowledge” was the idea at the basis of his conception of the relation between scientific disciplines (especially of the interactions between the natural sciences and the humanities), whereas the key concept of Kreislauf plays a central role in Moleschott’s organicism and therefore in his conception of biology as well as in his theory of nutrition. As it turns out, Moleschott’s conception of science included ethical, political, as well as philosophical and religious issues. Examining the entanglement of epistemic and ethical values, I show the centrality of the concept of “humanity” both for Moleschott’s conception of science and for his political and social engagement, which should be understood in the framework
of nineteenth-century liberalism and nationalism. In the third chapter, I will deal with Moleschott’s new beginning in Zürich after having decided to leave the German university, focusing on his opening lecture, as well as on his contacts with European revolutionaries in exile in Switzerland. The next chapters deal with the second phase of Moleschott’s life, from 1861 to 1893, starting with the appointment to a professorship at the University of Turin and ending as a nationally renowned and socially engaged politician, professor at the University of Rome, honorary professor at the University of Turin, member of several academies, societies and international associations. The fifth chapter analyzes in more detail the issues that his work as an academic and as a politician concerned in Italy. These have never really played a role in the publications on Moleschott so far (with the exception of single passages from certain speeches), and the “Italian” phase of his career has always been only very briefly dealt with in the accounts of his life. In this section, the main sources will be Moleschott’s public speeches (including his Senate speeches) and his lectures, integrated with information derived from his correspondence and the unpublished drafts from his Nachlass. First, I will show the continuity between the idea of science expressed in Moleschott’s lectures and the idea of research and of the university he defended at length during several Senate speeches on higher education: this is one of four examples of how Moleschott applied his ideas to the political field – joining in this way his “capital” (in the sense of Bourdieu) as a scientific expert with his “capital” as a politician. I thereby focus on the role of science in the process of nation-building, analyzing the debate on secondary education and Moleschott’s role in the transfer of knowledge from other European countries to Italy (especially insofar as the influence of the German educational system is concerned), dealing with central questions in the configuration of the educational system such as the institution of laboratories and the “Philosophical Faculty”. Second, I will focus on Moleschott’s contribution in the debate on the introduction of physical education in school (1878), considering it as a

51 E.g. Gregory, Scientific materialism in 19th-century Germany, 99; van ter Laage, Jacques Moleschott: een markante persoonlijkheid in de negentiende eeuwse fysiologie?, 103-139, Moser, Der Physiologe Jakob Moleschott (1822-1893) und seine Philosophie, 26-28, Adele Patriarchi, Jacob Moleschott ed il materialismo dell’Ottocento (Roma: Pellicani, 1997), 64-71. The fact that this period has been taken into consideration only briefly and mostly superficially, even though it constitutes the most important phase of Moleschott’s career and covers almost the whole second half of his life (thirty-two years: thereby Italy is the place where Moleschott spent the longest period in his life), is surely due to the fact that his own autobiography is interrupted right before the beginning of this period. Published sources are definitely not enough in order to understand and describe the development of Moleschott’s life, thought and career during the last thirty years of his life, and one must take into account Senate reports and unpublished correspondence.
way of educating the young Italian population and introducing them to common values, national feelings, hygienic standards, and disciplinary rules: also on this occasion, his arguments as a politician were supported by scientific theories. Third, I will show how his and Johannes Mulder’s nutritional theories were the basis of his arguments in favor of the abolition of the grist tax. Finally, in the sixth chapter I will deal with Moleschott’s contribution in the field of cultural politics (in the broad sense of the word “cultural”), represented by his engagement in scientific associations, as well as by his public speeches: for instance, the speeches he gave on the occasion of the inauguration of the statue for Giordano Bruno in 1889 are an example of his engagement in secularizing cultural politics. Moreover, I consider hygiene and cultural politics as further spheres in which Moleschott’s idea of science and of its function in the society (that is, its “civilizing mission”) shaped institutions and political decisions. In all of these fields, I will focus on the popularizing value of Moleschott’s contributions, as well as on his usage of both his expertise52 as a scientist and of exempla and sententiae from ancient culture. The main research question will center on Moleschott’s engagement (as a scientist, as a politician, as a citizen) in the formation and diffusion of the institutional and ideological background of the nation-state.

In the seventh chapter, I will focus on Moleschott’s speeches on criminal anthropology and on the reform of Italian penal law: on the one hand, these are also part of the application of scientific theories to society, as they have been dealt with in the preceding chapter. On the other hand, the elements of criminal anthropology present in the speech are already a product of Moleschott’s disciple Cesare Lombroso; therefore, this chapter constitutes a link to the next chapter, dealing with the reception of Moleschott’s theories in Lombroso’s criminal anthropology. I will thereby analyze both Moleschott’s speeches at the opening and at the conclusion of the conference on criminal anthropology held in Rome in 1885 and his Senate speeches on the reform of penal law. In particular, in these two chapters I will consider the role played by Moleschott as a scientist, a member of academia, and a politician, in shaping the “education of the Italians”53. In fact, after the political unification of Italy in 1861, the so-called “real unity” was still to be achieved: the population of the newly established nation-state was wildly diverse, and the economic, cultural and social differ-


53 I have presented a paper on this topic at the conference “Educating Italy (1796-1968 ca): Local, national and global perspectives” at the Italian Cultural Institute in London, December 4-5, 2015, and I am grateful for the interesting discussions.
ences were a great obstacle to the governing of the country. The formation of a national consciousness and national sentiments was primarily achieved through education; however, the role scientists played in this process has not been sufficiently studied yet.

The eighth chapter concerns the reception of Moleschott’s thought by Cesare Lombroso: through a “translational” approach, I will deal with the reception of materialism in criminal anthropology and the highly important role played by translation in the origin, as well as in the reception, adaptation, and transformation of Moleschott’s ideas in Cesare Lombroso’s criminal anthropology. Moreover, I will focus on Moleschott’s own role as a translator and mediator, considering both his work as a translator in the strict sense, the translations of his main works into other languages, as well as Moleschott’s engagement in processes of “cultural mediation” between nation-states. The inclusive attitude which we have observed with regard to his conception of science is mirrored by Moleschott’s own conciliating attitude and his abilities as a mediator and a translator (both in the narrow and in the broad sense). Thus, this chapter is a contribution to translation studies because it shows a concrete example of cultural translation and traveling concepts in the natural sciences: whereas cultural and translation studies have mainly focused on theoretical aspects so far, dealing with metaphors as traveling concepts and their potential as analytical concepts, concrete studies on how concepts actually traveled are still largely missing. Here, I show how the process of translation took place: in the case of the translation of Moleschott’s Kreislauf des Lebens by Cesare Lombroso, I trace the processes of negotiation of single concepts; in the case of Moleschott’s role as a delegate, I illustrate the function of a nineteenth-century scientist and politician as cultural broker. The same is true for the chapter on the reform of higher education, where I underline Moleschott’s role as a mediator and an expert between German and Italian systems of university education and organization. At the same time, the process of popularization can also be considered as a process of translation, more precisely as a double one: on the one hand, knowledge is spread among a much broader audience, and on the other hand, scientific language is made understandable for a larger audience. It is

54 I thank Doris Bachmann-Medick for her feedback and suggestions after reading the chapter on translation. The following theoretical remarks are inspired by our discussion on June 9, 2015, as well as by her keynote lecture on “Migration as Translation” held at the GCSC on April 28, 2015.

in this context that science meets literature, and that style becomes an essential element in the transmission of scientific ideas and the worldview relating to them.

Finally, in the closing sections I will draw some conclusions on what Moleschott’s biography teaches us about the interaction between science and nationalism in the nineteenth century, as well as on the coexistence and cooperation of nationalism and international networks. Moreover, I will assess Moleschott’s life as the life of a natural scientist who became a politician in a foreign nation, and who substantially contributed to its ideological and structural building. Whereas mobility was quite common among students and scholars in the nineteenth century, it is characteristic for Moleschott’s case that his career was, starting from his school years, so transnational, and that in the third country (or fourth, considering Prussia and Baden as two separate states, as they actually were at the time of Moleschott’s stay in Cleves and in Heidelberg) he moved to, he became a public and political personality. Thus, I will look back at the changing forms of scientific popularization during his career and consider his Italian speeches and lectures as a development of Moleschott’s popularizing strategies and their adaptation to a new social context. Through the approach of memory studies (Erinnerungskultur), I will explore the celebrations held in his honor and show how he was transformed into a hero after his death, becoming part of both a national and a scientific pantheon.

**Sources and Archives**

The absence of Moleschott as a research object in recent historical research (in social and political history as well as in the history of science) can be partially explained if we consider the great variety of languages in which the main sources are written. These mirror Moleschott’s own international career, as well as his love for classical culture (or, perhaps, just his usage of it): they are written in Dutch, German, Italian, but also French (the international language, e.g. at conferences) and, to a lesser extent, English (some correspondence), Latin (Moleschott’s dissertation and the theses


he defended for his Habilitation) and some ancient Greek (especially some sentences in the speeches he gave at the Senate, as well as one of his notebooks). The Dutch sources are primarily constituted by his correspondence with other scientists and friends (especially Franciscus Cornelis Donders and Izaac van Deen), as well as with the members of his family in the Netherlands. Moreover, I have quoted pieces from Johannes Mulder’s popularizing works on nutrition and Donders’ opening lecture to show the continuity with Moleschott’s view on nutrition as he expressed it in some Senate debates, on the one hand, and with one of his own lectures, on the other hand; also, I refer to the Dutch version of his speech on Giordano Bruno given in 1889. The German sources are very extensive and include Moleschott’s autobiography (which has been translated into Italian by his daughter Elsa), his major popularizing books on nutrition, his handbooks for physicians, and the drafts of his planned but never completed magnum opus, the “Anthropologie”. Besides that, in his Nachlass there is a great deal of correspondence with scientists, family members (and the family of his wife, Sophie Strecker, in Mainz), and his friends and colleagues in Heidelberg and Zürich. Finally, his university lecture given in Zürich, as well as his minor biographical works on Herrmann Hettner and Georg Forster and his speeches held on official occasions in Germany (for instance, on the occasion of the five-hundredth anniversary of the University of Heidelberg) are in German. As we shall see in the last chapter, all of his Italian university lectures have been translated into German and published by Emil Roth in Giessen. A far as the Italian sources are concerned, these are, at this point, the least studied (with the exception of the translation of his autobiography): they include Moleschott’s university lectures, his Senate speeches, the correspondence with other scientists and politicians, the notes and drafts for his lectures, and other public speeches.

Moleschott’s Nachlass deserves a short introduction of its own: it is preserved in the Biblioteca Comunale dell’Archiginnasio in Bologna; however, Moleschott never worked in Bologna and had no particular relationship to the city or to its university. The Nachlass has been donated to the library by Irnerio Patrizi, whose first wife was Moleschott’s daughter Elsa, and who became Professor of Physiology in Bologna; the donation took place in 1936 and is testified by a letter partly written by Patrizi’s second wife, Anna Maria Andrenelli.58 Unfortunately, the Nachlass was partially destroyed during World War II, in January 1944,59 and the remaining documents have been mixed with other documents; this, added to the multiplicity of languages of the documents, has made the attempts to organize and make an inventory of the Nachlass particularly difficult, and explains, at least in part, why a (not yet complete) catalogue

59 Busi, “Moleschott nella biblioteca dell’Archiginnasio di Bologna”, 592.
has been published only in 2014. A great part of the archival research underlying this work had been carried out before the publication of the catalogue, on the basis of the partial inventory edited by Marcel Desittere in 1992 (consisting, sometimes, of a very detailed description of the documents he had viewed, however available only as loose sheets in nine boxes). Only at the time of my last archival research, in September 2013, was I able to utilize a proof version of the new catalogue. Instead, Moleschott’s library had been donated to the Academy of Medicine of Turin by his daughter Elsa and his son Carlo Moleschott in 1893; unfortunately, it was completely destroyed in July 1943, so that it is not possible to reconstruct precisely which books Moleschott possessed and which journals he read.

Thus, one should first of all be aware of the fact that the material which is available to us is both quantitatively limited, if compared to the material which was left by Moleschott himself after his death, and already filtered by many persons and through different processes. As Patrizia Busi observes, on the basis of two statements made by Moleschott, we can infer that he himself had an idea about how he wanted his papers and documents to be ordered, as well as of what he wanted to be available to the public, and of what instead should not become part of the “tradition” about him. First, regarding a collection of documents about his colleague Filippo Pacini, which had been collected by his daughter Elsa and which he wanted to donate to a public library, he stated that he did not want his friends to be shown in their bathrobes (“veste da camera”) and “in the secret laboratory of their thoughts”. Second, in his autobiography he described how he learned from Tiedemann in Heidelberg to keep an archive of his files and papers, adding that, even though this could seem to take too much time at the beginning, it would later allow for saving effort and time. Moreover, one should not forget that the Nachlass was donated to the

60 Since April 2014, the catalogue of the “Archivio di Jacob Moleschott” (also known as “Fondo Speciale Jacob Moleschott”) is available online at: http://www.cittadegliar chivi.it/pages/getDetail/idIUnit:1/archCode:ST0011#contenuto (last viewed June 20, 2017).

61 I thank the archivist, Patrizia Busi for having made it available to me as first user. Before 2013, my research in the “Fondo Moleschott” was based on the preliminary inventory by Arianna Zaffini, who was carrying out the editing of the catalogue, and on Marcel Desittere’s partial inventorization.


63 Busi, “Moleschott nella biblioteca dell’Archiginnasio di Bologna”, 590.

64 Busi, “Moleschott nella biblioteca dell’Archiginnasio di Bologna”, 596.

65 Moleschott, BCABo, FSM, B IV 5, quoted in Busi, “Moleschott nella biblioteca dell’Archiginnasio di Bologna”, 596.

66 Moleschott, Per gli amici miei, 79-80, quoted in Busi, “Moleschott nella biblioteca dell’Archiginnasio di Bologna”, 596.
library of the city of Bologna (a public institution) by Moleschott’s heirs during the
time of Fascism: this might have had some influence concerning the choice of the
material which the family Patrizi kept in their private collection (whose most im-
portant letters, conserved in Bologna in the collection of Ms. Raffaella Sacchetti,
have been published by Marcel Desittere)\(^{67}\) or the decision about some material
which should rather be destroyed or better not be handed over to a public library.\(^{68}\)

Further important archival sources for an assessment of Moleschott’s career are
constituted by his personal files at the University of Heidelberg, at the University of
Zürich, at the University of Turin, at the University of Rome (La Sapienza), and
among the personal files of the Ministry of Public Education, in the Archivio Centrale
dello Stato in Rome. Due to some damage that occurred during a fire and a flood (the
latter in 2001), the material left at the archives in Turin is not complete; the files at
the Archive of the Senate in Rome do not provide any additional information beyond
the Senate reports. Moreover, I have followed the traces of some of his correspon-
dence “spread all over Europe”,\(^{69}\) especially with the scientists and friends who were
very close to him (including Berthold Auerbach and Hermann Hettner, Deutsches
Literaturarchiv Marbach; Édouard Desor, Archives de l’État de Neuchâtel; Izac van
Deen and Cornelius Donders, Bijzondere Collecties, UB Amsterdam), or who had a
relevant role with respect to Moleschott’s scientific positions (e.g. Justus Liebig, at
the Staatsbibliothek München and in the Handschriftenabteilung, Universitätsbiblio-
thek Gießen). Finally, a very important source, especially for the second part of this
work, were the reports of the parliamentary debates Moleschott took part in; although
his most important contributions have been published separately as pamphlets by the
publishing house (typographers) of the Senate, the Senate reports contain unedited
material and allow for a broader understanding of Moleschott’s role in the debates.

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\(^{68}\) This could be the case with some material concerning Moleschott’s engagement in free-
thinkers’ societies, which were strictly forbidden at the time of Fascism.

\(^{69}\) Desittere, “Un carteggio privato”, 96; Busi, “Moleschott nella biblioteca dell’Archiginnas-
io di Bologna”, 592.