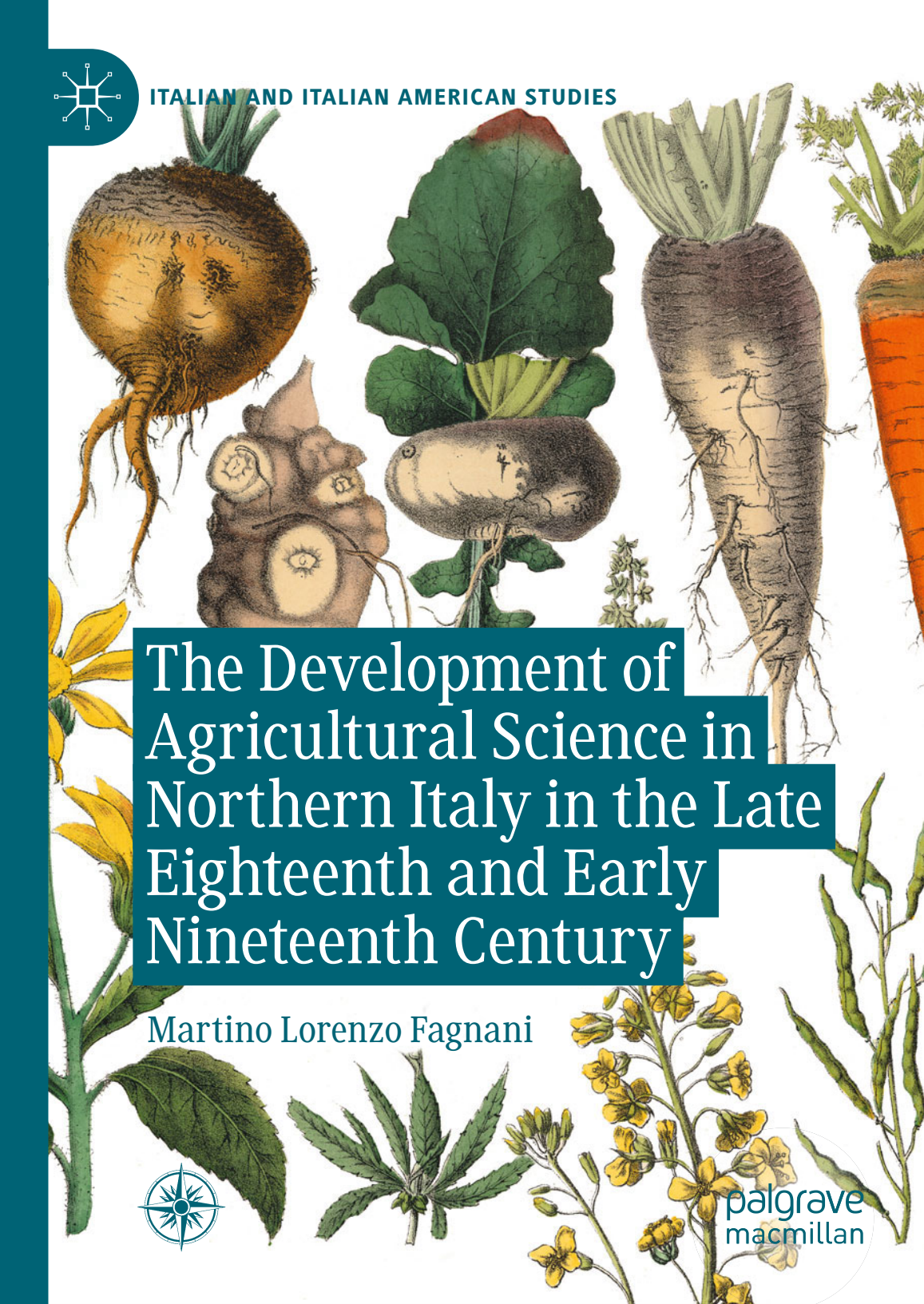

ITALIAN AND ITALIAN AMERICAN STUDIES

The Development of Agricultural Science in Northern Italy in the Late Eighteenth and Early Nineteenth Century

Martino Lorenzo Fagnani

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Acknowledgments

This book is the fruit of many years of work. The core of its content derives from my doctoral research at the University of Pavia, in which I analyzed the evolution of agricultural science in Italy, France, and the Iberian Peninsula in the latter half of the eighteenth century and the first two decades of the nineteenth century. My studies led me to live for a long time in Madrid, to explore the archives of many scientific and cultural institutions in Italy, Spain, and France, and to reconstruct a knowledge network of international scope. But this book would never have seen the light of day if I had not had the opportunity to discuss the results of my research in numerous contexts both during my doctoral work and as a postdoctoral researcher, receiving advice on how to improve them and suggestions for supplementing them with the works of other experts on these subjects and in associated branches of historical science.

I presented the results of my work at the 2019 and 2022 conferences of the European Rural History Organization in Paris and Uppsala, respectively, at the European Social Science History Conference in 2021, the Summer School in Economic History organized in August 2021 in Susa by the Université Panthéon-Sorbonne, the Université Toulouse-Jean Jaurès, the École Pratique des Hautes Études, the Archives Nationales of Paris, and the Centre National de la Recherche Scientifique of Paris, at the conference *L'Italia della pasta: produzione, consumo e culture in età medievale e moderna* organized by the Centro Interuniversitario di Studi e Ricerche sulla Storia delle Paste Alimentari in Italia (CISPAI) in

Campobasso in September 2021, at the *Storia e Scienza* conference organized in October 2021 by the Società Italiana di Storia della Scienza, at the Frontier Research in Economic and Social History (FRESH) Meeting in Lund in November 2021, at the convention *Il "militare" nelle Italie di Napoleone: società, cultura e istituzioni* organized in December 2021 by the Archivio di Stato di Torino and by the Fondazione Luigi Firpo—Centro di Studi sul Pensiero Politico, at the conference *Attraverso la Storia* organized in Bologna in April 2022 by the Società Italiana per la Storia dell'Età Moderna, and at the conference of the European Society for Environmental History organized in Bristol in July 2022.

During these years of research, I have had the privilege of immersing myself in the history of science, the history of ideas, and economic history with many highly competent people, to whom I am deeply indebted. I would like to begin by thanking my supervisors in the Department of Humanities of the University of Pavia, Davide Maffi and Alessandra Ferraresi, who have been a great source of inspiration in my research from the beginning. I have benefited greatly from long discussions with them on the topics of my doctorate; their teachings, historiographic methodology, and exceptional human qualities have been of enormous value to me over the years.

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Pavia
January 2023

Martino Lorenzo Fagnani

Chronological Table of the Main Political and Institutional Events Referenced in the Book

1753

The *Accademia dei Georgofili* is founded in Florence to promote the development of the agricultural sector in the Grand Duchy of Tuscany.

1761

A chair of Agriculture is organized at the University of Padua, in the Republic of Venice.

1762

The *Società di Agricoltura Pratica* (Society of Practical Agriculture) is created in Udine, in the Republic of Venice. In later years, it serves as a model for other agricultural institutions founded in the Republic.

1765

August: The new Holy Roman Emperor is Joseph II of Habsburg-Lorraine. He is also declared co-regent of the Habsburg Monarchy by his mother Maria Theresa of Austria, who is the actual ruler.

July: The new Duke of Parma, Piacenza, and Guastalla is Ferdinand I of Bourbon.

1768

March: The Academy of Sciences and Fine Letters is created in Mantua.

The University of Parma is reformed by Prime Minister Guillaume du Tillot; plans begin for modern teaching of botany.

In the Republic of Venice, a network of institutions begins to form to strengthen the agricultural sector.

1770

The Academy of Sciences and Fine Letters of Mantua gains an agricultural branch.

The Botanical Garden of the University of Parma is established.

1773

February: The new king of Sardinia is Victor Amadeus III of Savoy.

The Botanical Garden of the University of Pavia, in the Duchy of Milan, is established.

1774

Work begins in the summer to create the Botanical Garden of the Gymnasium of Brera in Milan.

October: Classes begin at the new veterinary school in Padua (the *Collegio Zooiatrico*) attracting students from the Republic of Venice and other Italian regions.

1776

December: The Patriotic Society is created in Milan with the goal of improving agriculture, animal husbandry, and manufacturing.

1780

February: The new Duke of Modena and Reggio is Ercole III d'Este.

November: Death of Maria Theresa of Austria.

1783

The Academy of Sciences of Turin is established on the foundations of a pre-existing institution.

1785

May: The Agricultural Society of Turin is founded.

1789

The French Revolution begins.

1790

Joseph II dies and is succeeded by his brother as Leopold II.

1791

A school of *veterinaria minore* (training in simple surgical operations and the treatment of the most common diseases in horses, cattle, and sheep) is opened at the old lazaret in Milan.

A school of veterinary medicine is established at the University of Modena by order of the Duke Ercole III d'Este.

1792

Leopold II dies and is succeeded by his son as Francis II.

September: France ceases to be a monarchy and becomes a republic.

1793

June: The *Muséum National d'Histoire Naturelle* (National Museum of Natural History) is officially established in Paris as an institution for preservation, research, and teaching. The *Jardin des Plantes* founded in the 1630s is part of the new institution and continues to have a pivotal role in the circulation of plant species and botanical knowledge in Europe and the colonies.

1795

October: The *Institut National des Sciences et des Arts* (National Institute of Sciences and Arts) is established in Paris with the aim of advancing scientific research and technical experimentation (together with the humanities); in the following years, it will serve as a model for establishing similar Institutes in other cities of Frenchified Europe.

1796–1797

Victories in northern Italy by French troops led by Napoleon Bonaparte; many of the Ancien Régime States are replaced by new "Sister Republics".

September 1796: The Patriotic Society of Milan is closed down.

1797

June: The Cisalpine Republic is established with Milan as capital.

October: With the Treaty of Campo Formio between France and Austria, the territories of the centuries-old Republic of Venice are divided between the two powers.

1799

April: The Cisalpine Republic is dissolved following the defeat of the French army in Italy by Austrian and Russian troops.

1800–1801

Napoleon Bonaparte, now First Consul of the French Republic, defeats the troops of the Second Coalition and restores French dominance over much of northern Italy.

The Cisalpine Republic is restored and its territory enlarged.

In 1801, the Pastoral Society of La Mandria is founded in the town of Chivasso by members of the Piedmont landed nobility; it is mainly dedicated to merino sheep breeding.

1802

January: After the *Consulte de Lyon*, the Cisalpine Republic becomes the Italian Republic with Napoleon as President.

September: Piedmont is annexed to the French Republic. In the Cisalpine Republic, Law No. 75 provides for agrarian societies in all departments.

October: Death of Ferdinand I Duke of Parma, Piacenza, and Guastalla.

November: Decree no. 117 institutes the teaching of agriculture in the departmental *licei* (upper secondary schools).

1803

The National University Curricular Plans of October 31 introduce the teaching of agricultural science at the Universities of Pavia and Bologna.

In Bologna, the University acquires areas for the establishment of the new Agricultural and Botanical Gardens, with work continuing over the following years.

1804

May: Napoleon is proclaimed Emperor of the French; France goes from Republic to Empire.

A veterinary school opens in Modena, in part continuing the old institution founded in 1791.

1805

March: The Italian Republic becomes the Kingdom of Italy.

May: Napoleon is crowned King of Italy in the Milan Cathedral.

June: The Ligurian Republic is annexed to the French Empire.

December: the Peace of Pressburg is signed between Emperors Napoleon Bonaparte and Francis of Habsburg-Lorraine. The Veneto and Friuli regions are annexed to the Kingdom of Italy, as well as Istria and Dalmatia.

1806

The Agricultural Garden of the University of Pavia is established.

May: Guastalla is annexed to the Department of the Crostolo, in the Kingdom of Italy.

November: The Berlin Decree issued by Napoleon implements the Continental Blockade against Great Britain.

1807

The veterinary school of Modena is closed.

1808

The old Duchy of Parma and Piacenza is annexed to the French Empire.

The new Veterinary School of the Kingdom of Italy is opened in Milan.

1809

The *Annali dell'agricoltura* starts in January, the most ambitious agricultural science and experimentation periodical of the Napoleonic Kingdom of Italy.

1810

December: Decree no. 301 unites all research centers in each city of the Kingdom of Italy in the new *atenei*, institutes in which agricultural science is lost among a plethora of disciplines. The project struggles to get started on a large scale and is partially interrupted by the fall of Napoleon in 1814.

1812

French invasion of Russia from June to December. The campaign has very negative political, military, and economic outcomes for the Napoleonic imperium.

1813

October: Napoleon's army is defeated at Leipzig, in Saxony, by the armies of the Sixth Coalition.

1814

April: Napoleon abdicates the thrones of France and Italy; Austrian troops occupy Milan.

In autumn, the major powers of Europe gather at the Congress of Vienna with the aim of setting out how France will be treated after the Revolution, the reign of Napoleon, and the related wars; how to reconstruct national frontiers; and how to restore many of the former rulers.

1815

June: Napoleon is definitively defeated by the armies of the Seventh Coalition, after his return to power in France in March; he abdicates for a second time. The Final Act of the Congress of Vienna is signed, concluding many months of negotiations and summarizing the agreements among the signatories. In northern Italy, the territorial order prior to French rule is restored with some exceptions: for example, the territories of the former Republic of Genoa are incorporated into the Kingdom of Sardinia (House of Savoy), whereas the pre-1796–1797 Duchies of Milan and Mantua and the Italian mainland of the former Republic of Venice are united, along with few other territories, into the Kingdom of Lombardy-Venetia (House of Habsburg-Lorraine).

Contents

Abbreviations

Archives

AHN	Archivo Histórico Nacional, Madrid
AIL	Archivio dell'Istituto Lombardo Accademia di Scienze e Lettere, Milan
ANV, As	Accademia Nazionale Virgiliana, Archivio storico, Mantua
D.a.	*Dissertazioni accademiche*
C.a.	*Colonia poi Classe Agraria*
L.a.	*Lettere di accademici illustri*
ARJB	Archivo del Real Jardín Botánico de Madrid, Madrid
ASMi	Archivio di Stato di Milano, Milan
Studi p.a.	*Studi parte antica*
Studi p.m.	*Studi parte moderna*
ASMn	Archivio di Stato di Mantova, Mantua
ASPv	Archivio di Stato di Pavia, Pavia
U.	*Università*
BCMHN	Bibliothèque Centrale du Muséum National d'Histoire Naturelle, Paris
BNB	Biblioteca Nazionale Braidense, Milan
BUPv	Biblioteca Universitaria di Pavia, Pavia

Texts

AARI	*Annali dell'agricoltura del Regno d'Italia*
ASPMi	*Atti della Società Patriotica di Milano diretta all'avanzamento dell'Agricoltura, delle Arti, e delle Manifatture*

BLREP	*Bollettino delle leggi della Repubblica Italiana*, 1802–1804
BLRI	*Bollettino delle leggi del Regno d'Italia*, 1805–1814
DBE	*Diccionario Biográfico Español*, Madrid, Real Academia de la Historia, 2011–2013
DBI	*Dizionario Biografico degli Italiani*, Rome, Istituto dell'Enciclopedia Italiana Treccani, 1960–2020
GFCS	*Giornale di fisica, chimica e storia naturale* (from 1813 onwards *Giornale di fisica, chimica, storia naturale, medicina, ed arti*)
GI	*Giornale d'Italia spettante alla scienza naturale e principalmente all'agricoltura, alle arti ed al commercio*
MRAMn	*Memorie della Reale Accademia di Scienze Belle Lettere ed Arti di Mantova*
MSAP	*Mémoires d'agriculture, d'économie rurale et domestique publiés par la Société Royale d'Agriculture de Paris*
MSATo	*Memorie della Reale Società Agraria di Torino*
OSSA	*Opuscoli scelti sulle scienze e sulle arti*

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CHAPTER 1

Introduction

This book explores new territory in the international historiographical debate on the evolution of the State-science relationship during the Age of Enlightenment and the Napoleonic Era. It analyzes the actors and dynamics driving the evolution of agricultural science in the decades straddling the turn of the nineteenth century in the geographical context of northern Italy. Here, institutions, experts, and some landowners showed great creativity in participating in the European knowledge network, contributing to the development of agricultural science. While historiographic literature contains good deal of materials on the development of this science, the international dimension of northern Italian agricultural science has received relatively little attention. This book offers a first attempt to fill this gap.

1.1 State of the Art

Italian agricultural science quickly evolved between the 1760s and the 1810s. It began as the application of natural sciences, technology, and socioeconomics to the development of the rural sphere. Institutions, governments, scientists, and intellectuals sought to enhance agriculture, animal husbandry, and associated production, but also the well-being of rural communities, addressing issues such as nutrition, health, education,

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morality, and work ethic. By the 1810s, agricultural science had acquired a more distinct and autonomous profile. First of all, without having abandoned concerns for social support mechanism, it had stronger technical and scientific features grounded in research and experimentation. Furthermore, at the dawn of the Restoration, it had strengthened its status as a discipline worthy of teaching, making its way into public education. These developments were particularly evident in northern Italy, and especially in the Po Valley.[1]

What happened in the decades straddling the two centuries to allow the agricultural science of northern Italy to achieve an epistemological evolution of such magnitude? The governments of the regional geopolitical entities assembled and put into operation an unprecedented machine, placing science and technology at the service of their national economies, focusing in particular on strengthening agriculture, animal husbandry, and manufacturing. Also playing key roles in this system were new scientific institutions, experts with a cosmopolitan background, and entrepreneurial landowners. The important reciprocal influence among northern Italian regional States was complemented by interchanges with other States on the peninsula and with the international community of experts. Urban centers in the northern Italian regions welcomed foreign scientists and technicians who could make a valid contribution to agricultural science. They also hosted institutions for the enhancement of experiments and projects, holding competitions to evaluate the most original research proposals, exchanging seeds and specimens, and making original contributions to the international body of scientific knowledge.

The dynamics between the northern Italian centers changed together with the evolving political and institutional framework from the Old Regime through the Napoleonic imperium and onto the Restoration. While investment in agricultural research and experimentation was always present, the approach toward teaching changed significantly with the consolidation of the Napoleonic imperium at the beginning of the nineteenth century. This happened especially in the regions united under the geopolitical entity known as the Italian Republic (1802–1805) and later the Kingdom of Italy (1805–1814), with Milan as capital and national universities in Pavia, Bologna, and Padua.[2]

The development of agricultural science in the second half of the eighteenth and the early nineteenth centuries in northern Italy was not linear, was not disconnected from greater trends in Europe, and could not be likened to the filling of a void. While the Napoleonic experience and its

reception by Italian institutions and experts, the promotion of agricultural experiments, and an easier circulation of knowledge and plant and animal species certainly played an important role, it was part of a longer process that began decades earlier.[3]

At the same time, this system was based on the progress made in the eighteenth century, which was reinterpreted in light of new needs. As Peter Jones highlights in his *Agricultural Enlightenment*, Europe was the context for an "evolution of the 'encyclopaedic' spirit of the Enlightenment across the watershed of the French Revolution and the Napoleonic imperium", while "visions of total social transformation receded and were replaced with more pragmatic concerns".[4]

In-depth studies over the years have highlighted this trend in fields of research that are even more narrowly specialized than Jones's.[5] For example, Joseph Horan's studies focus on the cultivation and processing of cotton in southern Europe between the Old Regime and the Napoleonic Era.[6] As for the link between natural sciences and nutrition in the Old Regime, the Revolution, and the Napoleonic Era, Emma Spary's in-depth studies shed light above all on France and the institutions in Paris.[7] Sarah Easterby-Smith in her stimulating *Cultivating Commerce* deals with plant merchants and nurserymen in Britain and France, investigating their important role in the circulation of plant species and botanical knowledge in the late eighteenth and early nineteenth centuries.[8] Laurent Brassart analyzes experimentation in animal husbandry and agriculture, with particular emphasis on the role of the authorities in Paris in organizing the French network of botanical gardens, nurseries, and model farms and highlighting the development under Napoleonic rule of the scientific and technical knowledge accumulated in the Old Regime.[9]

Nadine Vivier's studies on the framework relating to landownership and rural organization are very important too.[10] Alice Ingold's writings on the points of continuity, resistance, and rupture in the public management of natural resources and on the regulation of water in nineteenth-century France are equally important.[11]

The development of Italian agricultural science was not completed in or limited to those decades but was part of a much broader epistemological process.[12] Naturalists and agriculturists maintained a particularly rich and articulated network of contacts throughout those years. In the Old Regime, for example, they both looked up to French *agronomes* and veterinarians and drew on Spanish botanical studies.[13] On its part, northern Italian socioeconomic thought was deeply influenced by

currents from abroad, such as physiocracy, cameralism, and mercantilism, as pointed out over the decades by a long-standing historiographic tradition, represented in Italy by some of the most important scholars, such as Carlo Capra, Pierangelo Schiera, Franco Valsecchi, Franco Venturi, and Corrado Vivanti.[14] The aggregate of these socioeconomic currents influenced administrations and institutions, changed the vision of agriculture and related productive fields, and inspired new applications of science and technology.

The English agricultural revolution also influenced the evolution of agricultural science in Italy. The English influence manifested itself above all through adapted translations of technical books, such as those by agriculturists Thomas Hale and Jethro Tull, but also via travels by Italian naturalists in England and English Grand Tours in Italy. And while not comparable to the interchange within continental Europe, there was also a significant exchange of species between Italian experts and English scientific institutions. Mauro Ambrosoli and Giuseppe Giarrizzo have studied the connections between England and Italy in the context of agricultural knowledge and economic thought, and in his *La civilisation de l'Europe des Lumières*, Pierre Chaunu acknowledged the influence of southern French but also Italian techniques on Jethro Tull's agricultural proposals.[15]

Another scholar who has addressed agricultural progress in Great Britain and the relationship between the State, science, and agricultural development there is Briony McDonagh.[16] Henry French and Mark Rothery are also important references for a more direct discussion of British rural society, its rich culture, and contradictions observed in agricultural progress.[17] While published in 1979, *Science and Colonial Expansion* by Lucile Brockway, discussing the role of the network of British botanical gardens in the construction of the British Empire, is still a source of inspiration for studying the relationship between State, science, and economy.[18]

In the Old Regime, governments and scientific institutions such as academies, universities, societies, and the major European botanical gardens played a central role in the circulation of ideas, technical knowledge, and plant species. Some recent studies have delved into their role in strengthening the agricultural and manufacturing sector in the Western World. The following collections include important contributions: *Worlds of Natural History*, edited by Helen Anne Curry, Nicholas Jardine, James Andrew Secord, and Emma Spary; *The Foundations of Political Economy*

and Social Reform, edited by Ryuzo Kuroki and Yusuke Ando; *New Perspectives on the History of Life Sciences and Agriculture*, edited by Denise Phillips and Sharon Kingsland; *The Rise of Economic Societies in the Eighteenth Century*, edited by Koen Stapelbroek and Jani Marjanen; *The State and Rural Societies*, edited by Nadine Vivier; *Colonial Botany*, edited by Londa Schiebinger and Claudia Swan; and *Cultures of Natural History*, edited by Nicholas Jardine, James Andrew Secord, and Emma Spary.[19]

Some of the most important studies on the relationship between State and science in the Western World have been authored by Andrew Ede, Lesley Cormack, James McClellan III, Harold Dorn, and John Gascoigne.[20] Paul Warde has performed an in-depth study of a particular area in this relationship, analyzing the role that sustainability played in the strategies of European countries during the Early Modern Period.[21] The more recent studies by Lavinia Maddaluno, focusing mainly on Italy, represent an important contribution to the historiographic framework.[22]

In the Napoleonic Era, northern Italy was one of the European areas most influenced by new policies in the field of agricultural science. On the importance of French institutions and policies in the European scientific network, historiography has produced important recent contributions, such as those by Laurent Brassart and Joseph Horan mentioned above. However, the influence on the development of agricultural science was not unidirectional, i.e., to Italy from France, the country of *agronomes* and post-1789 technocracy. Northern Italy also made an original and multifaceted contribution to both France and the rest of Europe.[23]

Recent Italian historiography cannot make similar boasts in spite of the fact that the Napoleonic imperium in Italy made significant contributions to developing agricultural institutions. While there is no shortage of important studies of agricultural science in the Italian Napoleonic Era, examining its roots in the Old Regime and its legacy for the nineteenth century—I mention studies by Mauro Ambrosoli and Rossano Pazzagli[24]—there is some lack of truly recent multifaceted and concerted work examining the role of northern Italian agricultural science in European scientific debate.

The bibliography includes some interesting collections of studies, such as: *Agricoltura come manifattura*, edited by Giuliana Biagioli and Rossano Pazzagli; *Istituzioni e cultura in età napoleonica*, edited by Elena Brambilla, Carlo Capra, and Aurora Scotti; and *Associazionismo economico e diffusione dell'economia politica nell'Italia dell'Ottocento*, edited by

Massimo Augello and Marco Guidi.[25] These important studies can serve as a starting point to analyze northern Italy's contribution to European agricultural progress, considering the dynamics of the knowledge network to which the northern Italian institutions and experts belonged.

In analyzing the great change in northern Italian agricultural science in the late eighteenth and early nineteenth centuries, this book joins an ongoing international debate on the many facets in the historical relationship between the State, science, and the rural sphere. It focuses on the role of Italy in the European context and the Italian contribution to shaping the concept of modern agricultural science, elements that have hitherto remained in the background in the international historiographical debate.

1.2 Structure of the Book

In analyzing northern Italian agricultural science in the decades in question and the relations with other European countries, this book focuses on primary sources—most of them unpublished—from Italian, French, and Spanish historical archives. The sources include government documents, reports from scientific institutions, correspondence between naturalists, agriculturists, intellectuals, and landowners, and teaching materials. The documentation is both printed (e.g., scientific and technical monographs and journals of the period) and handwritten.

The book is organized into this introduction (this chapter), four main chapters, and conclusions (Chapter 6). Chapter 2 "Institutions and State Policies" analyzes the role of academies, economic and agricultural societies, and universities and scientific gardens in the progress of agricultural science in the second half of the eighteenth and the early nineteenth centuries. At the same time, it considers the relationship of scientific and cultural institutions to governments, illustrating both points of contact and differences. The chapter begins with a wide-ranging perspective on the scientific and institutional framework of northern Italy and its relations with other countries, especially the Habsburg Monarchy and France, but to a certain extent also Spain and Great Britain. In particular, it compares the changes between the fragmented geopolitical context in the late Old Regime and the apparently more homogeneous situation in the Napoleonic Era. How much did institutions dedicated to agricultural science—and veterinary medicine to some extent—benefit from these changes and how much were they negatively affected?

To answer these questions, this chapter focuses on the circulation of economic and scientific thought and technical knowledge through certain circuits, such as dissertation competitions, periodicals, and monographs dedicated to agricultural studies. The result is an improvement thanks to the initiatives under Napoleonic rule. Of course, there were innovative and fertile knowledge networks already in the Old Regime, contributing to progress in agricultural science and its definition as an autonomous discipline.

For example, the dissertation competitions held by the Academy of Sciences and Fine Letters of Mantua from the mid-1760s to the mid-1790s attracted scientists, technicians, and intellectuals not only from all of Habsburg Lombardy, but also from other Italian States and even from France. They all submitted articles describing their experiments and research in agriculture and manufacturing, but also plans for machines that could improve work in the countryside and derivative industries, such as weaving.

Another excellent example representing a different dynamic was the periodical *Giornale d'Italia* which collected agricultural research, projects, and experiment reports in the Republic of Venice from the 1760s to the 1790s, facilitating communication among the network of agricultural academies founded in that area starting in the late 1760s. At the same time, it opened up discussions with experts and institutions from other Italian and non-Italian areas.

However, it was under Napoleonic rule that wider circuits were created to encompass a more varied geographical, economic, and agricultural sphere. For example, there were periodicals such as *Annali dell'agricoltura*, published from 1809 to 1814, which considered the progress and problems of agriculture, animal husbandry, and derived products in most of northern and central Italy, largely overcoming the geopolitical fragmentation that inevitably had constituted a limit in the eighteenth century. *Annali* and other similar periodicals, such as *Biblioteca di campagna* and *Giornale d'agricoltura*, allowed experts to communicate with each other, but at the same time promoted concrete progress by engaging landowners and farmers.

There were also complicated situations in the transition from the Old Regime to the Napoleonic imperium, where the outcome was not necessarily positive. The analysis of the relationship between the Academy of Mantua and the Habsburg authorities and later with the Napoleonic authorities is quite revealing in this regard, recording a clear decline at