

2014

New Science and Old Sources: Why the Ottoman Experience of Plague Matters

Nükhet Varlık

Rutgers University - Newark, varlik@andromeda.rutgers.edu

Follow this and additional works at: <https://scholarworks.wmich.edu/tmg>



Part of the Ancient, Medieval, Renaissance and Baroque Art and Architecture Commons, Classics Commons, Comparative and Foreign Law Commons, Comparative Literature Commons, Comparative Methodologies and Theories Commons, Comparative Philosophy Commons, Medieval History Commons, Medieval Studies Commons, and the Theatre History Commons

Recommended Citation

Varlık, Nükhet (2014) "New Science and Old Sources: Why the Ottoman Experience of Plague Matters," *The Medieval Globe*: Vol. 1 : No. 1 , Article 9.

Available at: <https://scholarworks.wmich.edu/tmg/vol1/iss1/9>

This Article is brought to you for free and open access by the Medieval Institute Publications at ScholarWorks at WMU. It has been accepted for inclusion in The Medieval Globe by an authorized editor of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.

**THE
MIEVEAL
GLOBE**



Volume 1 | 2014

INAUGURAL DOUBLE ISSUE

**PANDEMIC DISEASE IN
THE MIEVEAL WORLD**

RETHINKING THE BLACK DEATH

Edited by MONICA H. GREEN

ARC MEDIEVAL PRESS

Immediate Open Access publication of this special issue was made possible by the generous support of the World History Center at the University of Pittsburgh.

Copyeditor
Shannon Cunningham

Editorial Assistant
Ann Hubert

Page design and typesetting
Martine Maguire-Weltecke

Library of Congress Cataloging in Publication Data

A catalog record for this book is available from the Library of Congress

© 2014 Arc Medieval Press, Kalamazoo and Bradford



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Licence.

The authors assert their moral right to be identified as the authors of their part of this work.

Permission to use brief excerpts from this work in scholarly and educational works is hereby granted provided that the source is acknowledged. Any use of material in this work that is an exception or limitation covered by Article 5 of the European Union's Copyright Directive (2001/29/EC) or would be determined to be "fair use" under Section 107 of the U.S. Copyright Act September 2010 Page 2 or that satisfies the conditions specified in Section 108 of the U.S. Copyright Act (17 USC §108, as revised by P.L. 94-553) does not require the Publisher's permission.

ISBN 978-1-942401-04-9

www.arc-humanities.org

CONTENTS

List of Illustrations	vii
Introducing <i>The Medieval Globe</i> Carol Symes	1
Editor's Introduction to <i>Pandemic Disease in the Medieval World: Rethinking the Black Death</i> Monica H. Green	9
Taking "Pandemic" Seriously: Making the Black Death Global Monica H. Green	27
The Black Death and Its Consequences for the Jewish Community in Tàrrega: Lessons from History and Archeology Anna Colet, Josep Xavier Muntané i Santiveri, Jordi Ruíz Ventura, Oriol Saula, M. Eulàlia Subirà de Galdàcano, and Clara Jáuregui	63
The Anthropology of Plague: Insights from Bioarcheological Analyses of Epidemic Cemeteries Sharon N. DeWitte	97
Plague Depopulation and Irrigation Decay in Medieval Egypt Stuart Borsch	125
Plague Persistence in Western Europe: A Hypothesis Ann G. Carmichael	157
New Science and Old Sources: Why the Ottoman Experience of Plague Matters Nükhet Varlık	193

Heterogeneous Immunological Landscapes and
Medieval Plague: An Invitation to a New Dialogue
between Historians and Immunologists
Fabian Crespo and Matthew B. Lawrenz 229

The Black Death and the Future of the Plague
Michelle Ziegler 259

Epilogue: A Hypothesis on the East Asian
Beginnings of the *Yersinia pestis* Polytomy
Robert Hymes 285

FEATURED SOURCE

Diagnosis of a “Plague” Image: A Digital Cautionary Tale
Monica H. Green, Kathleen Walker-Meikle, and Wolfgang P. Müller 309

NEW SCIENCE AND OLD SOURCES: WHY THE OTTOMAN EXPERIENCE OF PLAGUE MATTERS

NÜKHET VARLIK

THIS IS A historic moment for plague historians and scientists. At present, a growing consensus in the international scholarly community identifies the Black Death as a pandemic of plague caused by *Yersinia pestis*.¹ This consensus marks the end of a long controversy over the pathogenic agent of the pandemic—a controversy that occupied the front stage of scholarship for decades.² Having left this behind, plague historians can now afford to explore new issues as well as revisit old questions with a fresh eye. They can draw from a wealth of research supplied by the “new science” of plague—by which I refer to the flurry of studies in the last decade or two in fields such as bioarcheology, microbiology, genetics, and epidemiology—and seek novel ways of integrating it into historical inquiry. In effect, this moment heralds the beginning of a new chapter in plague scholarship as it invites new avenues of inquiry (see Green 2014, in this issue). One such pathway worth pursuing is the task of calibrating the relationships between the new science of plague and the “old sources”—by which I mean the written sources historians are trained to use.

The new science and the old sources do not always concur, unless the historian makes an effort to make them speak to each other. With this in view, this essay will draw from the Ottoman experience during the so-

I owe a tremendous debt of gratitude to Monica Green, who has provided inspiration and encouragement throughout the process of writing this essay. I would also like to acknowledge Ann Carmichael, George Sussman, Carol Symes, Michelle Ziegler, and the anonymous reviewers of *The Medieval Globe*, with thanks for their invaluable comments and suggestions.

1 The consensus is firmly in place in the geneticist community. Multiple groups of researchers have confirmed *Y. pestis* as the causative agent of the Black Death (e.g., Haensch et al. 2010; Tran et al. 2011). Sequences of *Y. pestis* genomes have been reconstructed from the ancient DNA recovered from the Black Death cemeteries in London (Bos et al. 2011). Informed by recent scientific studies, a growing number of historians have acknowledged this consensus (e.g. Little 2011; Bolton 2013). For its significance in bioarcheology see DeWitte (2014, in this issue).

2 A concise presentation of the controversy can be found in Little 2011. Most recently, historian Samuel K. Cohn (2013) remains unconvinced that any currently existing strain of *Y. pestis* caused the Black Death.

called Second Plague Pandemic (i.e., the Black Death and its recurrent waves) and seek to highlight the critical importance of the historian's craft in working with sources that can shed light beyond the spotlight of scientific research. In order to demonstrate why the Ottoman plague experience matters for an understanding of the Second Pandemic, the essay will tackle two sets of intertwined problems. On the one hand, it will engage with a historical and historiographical discussion of why the Ottoman epidemiological experience has been imagined as the European alterity and how this legacy has obstructed this experience from being studied as part of the larger Afro-Eurasian disease zone of the Second Pandemic. My goal here is to underscore the Eurocentric nature of plague studies by demonstrating how spatio-temporal epidemiological boundaries were constructed in the scholarship. On the other hand, this essay will examine the Ottoman plague experience during the Second Pandemic with a view to offering observations and insights about the Ottoman disease ecologies that sustained plague. More specifically, three aspects of this experience are explored in detail: *persistence*, *foci/focalization*, and *patterns of transmission of plague*. My goal here is to illustrate how the new science of plague can be put in dialogue with historical sources.

Part I. New Science and Old Sources: Challenges and Opportunities

From where we stand today, some may believe that the new science of plague puts an end to historical inquiry.³ Because the new science can explain the pathogen and its genetic history, one may wonder why we still need to study the old sources. The reasons for this are to be sought in the very etiology of plague that involves a complex system of entanglements in which every organism (as host, vector, or pathogen) constantly interacts with other organisms, as well as the surrounding environment. Thus historians must now account for variations between the specific ways the disease manifests itself at local and regional levels. Such ecological and environmental variations make it all the more compelling to pay attention to the “local knowledge” of plague, in the form it appears in the historical sources.⁴

3 The recent engagement of the geneticist community in the debate seems to have been taken by some historians as a threat to the territory of their discipline and led them to react. A recent article written with that conviction has suggested: “Historians are uniquely qualified to assess the value and analyse the content of medieval primary sources and should not allow the glamour of science to make us forget our own expertise” (Pobst 2013: 814).

4 The emphasis on the “local knowledge” of plague and “plague experience” in

It is now clear that plague studies will have to transcend the boundaries of individual disciplines; adopting an interdisciplinary approach is practically inevitable. The student of plague therefore needs to face up to the stipulations of interdisciplinary work. For example, there is a pressing need to keep up with the all-too-quickly-changing findings of the scientific literature, especially in the fields of genomics and evolutionary biology. It is necessary to understand, interpret, and utilize the research findings supplied by allied disciplines and fields, ranging from climate history to bioarcheology. It also means reckoning with what appears to be a growing imbalance between the new science of plague and the old sources. Even if one leaves aside differences in content, the disparity between publication cultures in the sciences and in the humanities cannot be overlooked. The former prefers short, rapidly-produced, multi-authored technical notices that may seem impenetrable to the nonspecialist; the characteristics of humanist publications are almost the opposite (except, in some cases, for their degree of impenetrability). Motivated by different questions, concerns, and agendas, the historical and scientific scholarship of plague do not produce research that can be easily reconciled. How, then, can this new science be used in conjunction with historical accounts? How can the historian put them into dialogue? This imbalance becomes all the more challenging in those fields where the historical scholarship of plague is still relatively undeveloped. There is a wealth of primary sources pertaining to plague in non-Western languages, but it is still in manuscript form. Until these sources are edited, published, and translated in a manner accessible to researchers, our knowledge of past plagues will continue to suffer from this imbalance.

As a result, there remain a number of important gaps in the scholarship of historical plague epidemics that need to be filled. One is the Ottoman experience of plague during the Black Death and its recurrent waves. Judging from modern Ottomanist scholarship, the vast area that came under Ottoman control—stretching at its height from southeast Europe to the Persian Gulf and from the Black Sea basin to the Yemen—did not figure as a breeding ground for plague until the last centuries of the empire's history: the only extensive study covers the period between 1700 and 1850 (Panzac 1985).⁵ For the plague outbreaks before this era (i.e., from

this essay has benefited from the concept of “local biologies” developed by medical anthropologist Margaret Lock and the recent discussions of this concept in the context of global health. See, for example, Lock 1993 and 1995; Brotherton and Nguyen 2013.

5 Panzac's study has been largely ignored by mainstream historical scholarship. While it was unanimously recognized as a great accomplishment with respect to its

1347 to 1700), no systematic study has hitherto surveyed their temporal and spatial scope or effects, or even considered how the Ottoman epidemiological experience may be integrated into the broader history of the Second Pandemic in the Afro-Eurasian zone.⁶

This is curious because the spatial and temporal correspondence between the empire and the plague can hardly be ignored. Ottoman history almost squarely coincides with the time frame of the Second Plague Pandemic, and evidence suggests that Ottoman power and the plague coexisted for half a millennium, from the Black Death of the mid-fourteenth century to the mid-nineteenth century or so. Yet the ubiquitous presence of plague in the Ottoman world over that half millennium has remained mostly invisible in both historical and scientific scholarship. In what follows, we shall seek to disentangle the web of historical and historiographical problems that have obstructed the Ottoman plague experience from becoming visible. A critical reading of scientific and historical studies of plague sheds light on how European epidemiological imaginaries fashioned the Ottoman experience as the “other” by constructing spatial and temporal epidemiological boundaries; so it is to the construction of these boundaries that we turn now.

The Historical Fiction of Epidemiological Boundaries

The historical scholarship on the Black Death is largely Eurocentric. In this body of scholarship, Europe has occupied a privileged position, compared to other parts of the world that may have been at least as badly affected by plague, if not more so. Our current knowledge about the plague in East Asia, South Asia, Central Asia, the Middle East, and North Africa before the Third Pandemic is at best fragmentary and disconnected.⁷ As such, extant

documentation of the occurrences of plague outbreaks, their frequency, and methods of spread, its representation of the demographic and economic effects of plague was debated. Historians of the Ottoman empire and the Middle East have been especially critical of the absence of Ottoman sources (e.g., Owen 1986; Dols 1987; Issawi 1988; Fisher 1992). For its absence from European scholarship, see also below.

6 See, e.g., Ünver 1935; Panzac 1973, 1986, 1987, and 2009; Jennings 1993; Lowry 2003; Schamiloglu 2004; Kılıç 2004; Mikhail 2008; 2012; Shefer-Mossensohn 2009 and 2012; White 2010; Varlık 2011; Bulmuş 2012. For a study of the outbreaks between 1347 and 1600, see Varlık (forthcoming). For a call to study the Second Pandemic in this larger Afro-Eurasian disease zone, see Green (2014, in this issue).

7 Even though there are fine historical studies devoted to the epidemiological experience of these areas during the Second Pandemic, they are difficult to bring together in view of their temporal and spatial breadth of coverage. See, e.g.,

scholarship has cultivated a lasting impression that the Black Death was a European phenomenon and that the European epidemiological experience was to be studied *sui generis*. In this epidemiological imagination, non-European epidemiological experiences would only be worthy of scholarly attention if commensurate with that of Europe. In other words, the lacunae in historical plague scholarship are not haphazard; what was studied and what was not can be best understood in the light of European notions of public health and efforts for disease control that came in the form of quarantines, plague commissions, sanitary missions, and international conferences at the dawn of the modern era. Those areas whose plague experience was believed, in the twentieth century, to have been of direct relevance to that of Europe (and perceived as having an impact on European public health concerns) came under the spotlight of scholarship while others remained rather obscure.

The European epidemiological experience thus came to be understood within certain temporal and spatial boundaries, and both are reflected in the periodization of plague, a system that purports to be global but which actually situates Europe at the center and only captures European experiences. By now, it has become commonplace to study three discrete pandemics: the First Pandemic, known as the Justinianic Plague and its recurrent waves (541–c.750); the Second Pandemic, known as the Black Death (1346–53) and its recurrent waves that continued for several centuries; and the Third Pandemic that spread globally in a few years after its appearance in Hong Kong in 1894.⁸ Although the idea that the Plague of Justinian and the Black Death were two separate waves of epidemic

Hrabak 1957; Krekic 1963; Langer 1975; Dols 1977; Norris 1977; Alexander 1980; Schamiloglu 1993; Ansari 1994; Köstēs 1995; Manolova-Nikolova 2004; Anandavalli 2007; Stearns 2009 and 2011; Frandsen 2010; Buell 2012. Also see works cited in notes 5 and 6 above. For a study that ambitiously tries to offer a wider (but still Eurocentric) scope, see Benedictow 2004. For studies that have adopted larger or comparative perspectives, see Biraben 1975; Borsch 2005; Sussman 2011. There is also a substantial body of literature devoted to the First Pandemic, including but not limited to Biraben and Le Goff 1969; Dols 1974; Conrad 1981, 1982, and 2000; Christensen 1993; Stathakopoulos 2000 and 2004; van Ess 2001; Little 2007.

8 For this conventionally accepted periodization, see Little 2011. The term “pandemic” appears to have been used infrequently before 1894: Creighton (1891) references it only three times in over seven hundred pages: for example, “there are instances of what are called pandemics, or universal epidemics, of sickness. The Black Death was one such” (p. 397). Interestingly enough, it was the cholera and influenza pandemics that helped spread its use, and by 1918 the term had become common parlance (Morens, Folkers, and Fauci 2009).

activity was becoming common in the nineteenth century, it was not until the outbreak of plague in (British) Hong Kong and the discovery of the plague bacillus that these epidemics were retrospectively placed in a historical timeline. Twentieth-century epidemiologists and epidemiological historians alike seem to have subsequently adopted this schema.⁹ Nevertheless, this vision of past plagues can hardly be taken to represent the rhythm of plagues as experienced across the Afro-Eurasian zone. It offers little insight for the ebb and flow of epidemic waves in other areas, especially with regard to the “in-between” outbreaks.

The Ottoman case in particular seems to complicate this periodization, as it blurs the assumed boundaries between the end of the Second Pandemic and the beginning of the Third—just as it blurs a supposed distinction between West and East. After plague receded from Western Europe early in the eighteenth century, sporadic outbreaks continued to occur in Southern and Eastern Europe (e.g., 1743 in Messina, 1815 in Bari), in Russia (e.g., 1770–72 in Moscow), and more persistently in the Middle East until the nineteenth century. Those occurrences were noted in many late nineteenth- and early twentieth-century works (e.g., Simpson 1905: 36–39; Sticker 1908). Modern scholarship has also convincingly shown that plague persisted in the Ottoman empire and Russia (Alexander 1980; Panzac 1985; Robarts 2010). Nevertheless, the Great Plague of London (1665) and that of Marseille (1720–22) continued to be seen as marking the end of the Second Pandemic. Plague outbreaks in the eighteenth and nineteenth centuries, outside of Europe, were only recently recognized as being part of the Second Pandemic (Walløe 2008; Cohn 2008; Bolton 2013: 15).¹⁰

9 It appears for the first time around the turn of the twentieth century. For example, Simpson (1905) identified three pandemics: “The first [...] recorded to have originated in Pelusium in Egypt” (p. 5); “The second [...] later called the Black Death” (p. 21); and “The pandemic of the present day” (p. 6). Other early twentieth-century works used the term “pandemic” without a system of enumeration (e.g., Eager 1908; Sticker 1908), but by the mid-twentieth century this system of periodization seems to be in place (see e.g., Hirst 1953). However, it probably did not become conventional until the 1970s (Ziegler 1969: 25; Dols 1977: 14).

10 A similar pattern of persistence of plague can be observed between the First and the Second Pandemic, roughly in areas where the Ottomans would come to rule. These recurrent outbreaks also complicate the parameters of these earlier pandemics. See Dols 1974 and 1977: 13–35; McNeill 1976: 70; Conrad 1981. For a list of outbreaks in Anatolia under Seljuk rule (though the diagnosis of these outbreaks is not always clear), see Arik 1991. For a brief description of an outbreak in Tunisia in 1004–05, see Talbi 1981: 223. For a critique of the year 750 as the definite end of the First Pandemic, see Morony 2007.

The question of when the last outbreak of the Second Pandemic took place therefore seems difficult to answer based on extant sources and prevailing habits of thought. Plague continued in Ottoman areas until the mid-nineteenth century, if not longer, since recorded cases in Mesopotamia and the Arabian peninsula appear until the turn of the twentieth century (Simpson 1905: 38–39).¹¹ Especially in view of the fact that the Third Pandemic also made its appearance around the same time, the question of when the Second Pandemic ended may need to be re-evaluated with the help of scientific studies. In effect, it is possible that the strains of *Y. pestis* involved in the Second Pandemic are still with us today, as demonstrated in the example of a recent outbreak in Libya.¹²

Shifting our focus from temporal to spatial boundaries may also involve questioning what we think we know about plague's past. Once again, the Ottoman case is telling, and it underscores the degree to which the new plague science has maintained or reproduced these spatial boundaries. As noted above, the scarcity of historical studies on Ottoman plagues has rendered it invisible to practitioners of the new science. In the absence of historical studies to guide bioarcheological research, there is no evidence from former Ottoman areas comparable to what has been found for Western Europe.¹³ Obviously, this has implications for studying the genetic history of the pathogen. In the absence of aDNA specimens, the plague history of this particular area/era cannot be integrated into the narrative of the new science because the aDNA specimens of *Y. pestis* mostly come from excavations in Europe (France, Germany, Italy, England, and the Netherlands)—places close to centers of molecular biology, centers of information and calculation (Latour 1987).¹⁴ Reconstructing the phy-

11 Twentieth-century scholarship seems to have grown more confident about announcing the “end of plague.” For example, Pollitzer (1951: 478) hailed “the gradual disappearance of the disease first from Western and then from Eastern Europe until in 1841 Turkey, the last stronghold of the pest, became free.” Drawing from this scholarship, Panzac (1985: 446–517) also held that the last plague was in the 1840s. But at the turn of the twentieth century, news of plague in Istanbul was noteworthy enough to receive international coverage (*British Medical Journal* 1900, 1902a, and 1902b).

12 Recent genetics research on the 2009 Libyan outbreak has demonstrated that a branch of the *medievalis* strain (2.MED) was involved. This strain, independent of the Third Pandemic, could be one that was active during the Second Pandemic (Cabanel et al. 2013; Green 2014, in this issue).

13 Bioarcheology and aDNA research have only recently started being used in the field of Near Eastern studies. For a discussion of the state-of-the-field, including reasons for its belated development, see, e.g., Sołtysiak 2007; Baca and Molak 2008.

14 For a list of the areas of excavation, see “Toward a Molecular History of *Yersinia*

logenetic history of the pathogen depends on identifying modern *Y. pestis* isolates. Some of these specimens have been preserved since the late nineteenth century, others have been isolated more recently. The majority of these modern specimens come from places where plague is (or has until recently been) enzootic. Among these, a large number come from the United States, Russia, Mongolia, and China; fewer from India, Madagascar, Eastern and Central Africa, and elsewhere.¹⁵ For our immediate area of interest, only a small number of isolates from former Ottoman areas (including Turkey, northern Iraq, and western Iran) have been included in recent phylogenetic analyses and studied in relation to where they stand within the evolutionary subdivision of *Y. pestis*.¹⁶ Owing to this imbalance in data collection and analysis, the new science of plague—along with the historical scholarship that informs it—privileges some areas over others.¹⁷

This ongoing Eurocentricity of plague scholarship has been largely determined by research produced in the nineteenth and twentieth centuries—research with a strong colonial pedigree. On the eve of the Third

pestis,” available online at <<http://contagions.wordpress.com/2013/01/05/toward-a-molecular-history-of-yersinia-pestis-aha/>> [accessed September 19, 2014]. See also Haensch et al. 2010: fig. 1. Especially in view of regulations restricting the shipping of pathogenic specimens across national borders, specimens are currently extracted and processed in places close to the centers of molecular biology. For the most recent regulations issued by the World Health Organization (WHO) regarding the transport of infectious substances, see WHO 2012. According WHO’s protocol, *Y. pestis* is listed as a “Category A” infectious substance whose transport is strictly regulated.

15 For information on these isolates and their provenances, see the phylogenetic tree in Cui et al. 2013, reproduced in Green 2014, in this issue; also see Morelli et al. 2010.

16 2.MED1, isolated from this region, evolved sometime before 1775, i.e., before the Third Pandemic. 1.ORI3 is thought to have come from Madagascar during the Third Pandemic, most probably via the pilgrimage route (Morelli et al. 2010: fig. 1). Of the four *Y. pestis* isolates that were preserved in Turkey, three were defined as biotype *orientalis* (Golem and Özsan 1952). One of the four was known to have been isolated from a human case of plague in the Akçakale (Urfa) outbreak of 1947: a small plague outbreak in two Turkish villages on the Syrian border. In the months of February and March, a total of thirteen deaths took place out of a total of eighteen persons affected. This appears to be the last recorded outbreak of plague in Turkey.

17 Either resulting from current concerns about the disease’s reemergence and the assessment of its risks or due to privileging areas that can produce aDNA specimens, the “molecular politics” of *Y. pestis* reflect past and current global inequalities of health rather than representing the breadth and intensity of past plagues as experienced across different areas. For an insightful exposition of the “molecular politics” of HIV demonstrating how the global inequalities of the AIDS epidemic can be observed at the molecular level, see Crane, 2011.

Pandemic, European scientists were concerned with “unusual” plague activity in East and South Asia (Creighton 1891: 166–70, 172–73; Sussman 2011: 324). What they considered a new pandemic then signaled new opportunities for research: as soon as plague broke out in (British) Hong Kong in 1894, as noted above, scientists from different countries rushed there to study the epidemic on site; the discovery of the pathogen followed shortly. In 1896, plague was reported in British India (Bombay, then in Pune, Karachi, and Calcutta, soon to be followed by many major port cities across continents).¹⁸ This situation alarmed European colonial governments, which sent plague researchers and public health officials to the colonies. For example, a special committee was formed to investigate plague in India: observing the plague, producing laboratory experiments, and publishing their findings. The result was an immense body of scholarship that continued to develop over the course of the last century. Both historians and scientists are still dealing with the effects of this problematic legacy in one way or another.

From the Ottoman “Laboratory” of Plague to the Colonial Science of Plague

The body of knowledge drawn from the Third Pandemic, as much as it has informed current research, has also hindered it (Royer 2014). This plague science was the product of a certain configuration of power, which is still reflected in some critical assumptions about plague’s origins and spread. The legacy of colonial plague science also has important implications for the study of Ottoman plagues, because it retrospectively shaped the perception of Ottoman experience in historical scholarship. To understand how this occurred, we need to recognize that early modern observations of Ottoman plague had come to constitute a working knowledge of the disease in Europe. When the Third Pandemic broke out, this body of knowledge lost its primacy at the expense of colonial plague science, backed by the germ theory of disease. And yet, certain epidemiological assumptions drawn from European analysis of Ottoman plague continued to be used in modern scholarship.

Before the Third Pandemic, both scholarly and lay opinion in Europe maintained that the “seat of the plague” was the Near East, the “Orient” which, at that time, largely coincided with dominions of the Ottoman

18 For the origins and spread of the epidemic in China, see Benedict (1996: 1–130). For its global spread, see Echenberg 2007. For plague in India, see Arnold (1993: chap. 5).

empire (Sussman 2011: 324). From the late seventeenth and early eighteenth centuries onwards, Europeans observed that devastating plague epidemics were becoming less frequent on the continent. When Marseille witnessed what is regarded as the last major outbreak of plague in Western Europe, in 1720, this experience only confirmed the already widespread belief that the disease was being imported from the eastern Mediterranean port cities of the Ottoman empire, such as Constantinople (Istanbul), Smyrna (İzmir), and Alexandria (Takeda 2011: 115–17). The writings of early modern European travelers, merchants, diplomats, and naturalists had no small share in shaping this belief. But above all, we can point to the influence of a substantial number of Western European physicians who, after major plague outbreaks receded from Western Europe, went to Ottoman cities to observe plague, gather firsthand information, and write about their experiences.

Among the most prominent of these physicians were the Russell brothers from Edinburgh, who spent several years in Aleppo and published their observations on plague in the latter half of the eighteenth century.¹⁹ Similarly, Mordach Mackenzie, who worked as the physician of the Levant Company in mid-eighteenth-century Istanbul, regularly reported his observations about plague in the Ottoman capital (Mackenzie 1752 and 1764). Such accounts continued to be published in the nineteenth century.²⁰ For example, William Wittman, a Royal Artillery surgeon sent to the Ottoman empire following Napoleon's invasion of Egypt, published his observations on the plague in 1804. A more detailed testimony comes from A. Brayer, a French physician residing in Istanbul between 1815 and 1824, who composed a comprehensive two-volume work, which includes his observations on the causes, types, and treatment of plague (Brayer 1836).

The knowledge acquired in the Ottoman “laboratory” of plague appears to have been well received in Europe, since most of these physicians pub-

19 Alexander Russell worked as physician of the Levant Company in Aleppo from about 1740 to 1753. In 1756, soon after his return to London, the first edition of his *Natural History of Aleppo*—including a special section on plague—appeared in print, going through several editions afterwards. His younger brother Patrick followed in his footsteps, practicing medicine in Aleppo where he lived between 1750 and 1772. In 1791, he published his *Treatise of the Plague*, in which he included his observations during the outbreak of 1760–62 and 120 individual case studies in Aleppo. On the life and works of the Russell brothers, see van den Boogert (2010).

20 Two Italian physicians, Eusebio Valli and Antonio Pezzoni, who served in the Greek hospitals of Istanbul during an outbreak of plague in 1803–4, published their individual observations (Valli 1805; Pezzoni 1842 and 1847). See Sarı and Etker (2000) and Yıldırım (2010: 59); see also below.

lished their work promptly and some of those publications went into several editions and translations. Their impact on European scholarly circles is also discernible in the way that these authors used their knowledge to acquire recognition and advance their careers. For example, Alexander Russell's experience in Aleppo, advertised in his writings, helped him to be elected to the Royal Society of London. Later on, his brother Patrick also became a member. Mackenzie's account of the plague in Istanbul was not only published by the Royal Society, it also opened the doors of membership to him (van den Boogert 2010: 146). A more remarkable case in point is that of Charles Maclean, an English physician whose career stagnated until he traveled to the Ottoman capital in 1815 to observe the plague. His observations were swiftly published in London (Maclean 1817). Since plague had receded from Western Europe, this body of firsthand knowledge was especially valuable in promoting the empirical approach to medicine that was flourishing in early nineteenth-century England; hence the direct observations of physicians with overseas experience came to acquire more weight than theoretical knowledge (Kelly 2008: 569). It was in this context that cases from the Ottoman laboratory, that "last vestige of plague," continued to be observed, studied, and discussed—until the Third Pandemic broke out.²¹

When this occurred, the attention of European scholarship largely shifted from Ottoman areas to European colonies in South and East Asia. (The fact that plague had largely disappeared in the Ottoman empire by this time may have also contributed to this shift.) Nevertheless, certain assumptions about the origins, movement, and directionality of epidemic diseases which had been drawn from the Ottoman laboratory were now being transplanted into a colonial context. One such assumption was that the geographic origin of epidemics could be traced to remote areas, far away from centers of knowledge. The nineteenth-century English physician and medical historian Charles Creighton aptly observed:

According to the dominant school of epidemiologists it is always enough to have traced a virus to a remote source, to the "roof of the world" or to the back of the east wind, and there to leave it, in the full assurance that there must have been circumstances to account for its engendering there, perhaps in an equally remote past, if only we knew them. (Creighton 1891, 1:149; also quoted in Norris 1977: 10)²²

21 There were a series of international "sanitary" conferences from the mid-nineteenth century to the mid-twentieth, although their main focus was cholera rather than plague. The third was held in Constantinople in 1866 (Howard-Jones 1975).

22 In this era, discussion of plague's "origin" usually meant the geographic origin,

From this it followed that disease would spread in a particular direction and, not surprisingly, this spread was conceptualized as being unidirectional: plague flowed from “less civilized” places to the “centers of civilization.” Colonial anxieties thus found a scientific justification in this emphasis on the disease’s place of origin, which confirmed that there was something inherently wrong with such lands or peoples and that their contagion could affect civilized peoples and places.²³

While this framework could conveniently be adopted to explain plague epidemics outside of Europe, it was still difficult to explain past cases of plague in Europe itself. It was not easy to elucidate whether plagues had occurred there spontaneously due to local, regional, or underlying universal circumstances, or whether they had been transmitted from certain “endemic” areas outside Europe.²⁴ It may help to remember that throughout the early modern era, the European imagination of plague’s origin was being constantly replenished by news of plague from the port cities of the eastern Mediterranean, which led to durable associations between plague and the Ottomans. The implications were twofold. On the one hand, the European imagination dissociated itself from plague by projecting the locus of the disease somewhere outside; on the other, it fashioned the Ottoman empire as a plague-exporter, against which Europe had to protect itself. By the Enlightenment, this paradigm was ingrained in scholarly writings and popular opinion alike (Gordon 1999; Lammel 2010; Varlık, forthcoming)—even as the Ottomans ceased to be seen as a military threat in Europe, a turn typically associated with their defeat at the second siege of Vienna in 1683. As the empire’s landholdings in Europe shrank through the course of the eighteenth and nineteenth centuries, it came to be seen as a dead or dying body in the European geopolitics: “the sick man of Europe.” In the contemporary European imagination, the empire’s healthscape not only represented a sickened land and peoples but also an inability to deal with ill-health in a rational and orderly manner.

the “endemic focus,” not the biological origin of the “virus” later named *Y. pestis*.

23 For a discussion of how the site of the plague shifted from the landscape to the human body (the colonized body) in India, see Arnold (1993: 200–39).

24 For example, J. F. C. Hecker (1859: 17–19) attributed plague-causation to atmospheric changes that would have made “spontaneous plagues” possible everywhere, even in Europe. Towards the end of the century, physician Adrien Proust (1897: 113)—father of the celebrated French novelist—did not deny the possibility of spontaneous plagues in Europe altogether, but did not dwell on it much either (see also Panzac 2003).

Some of these nineteenth-century conceptions continue to be reproduced in historical scholarship of the twentieth century. For example, the absence of a known plague reservoir in modern Europe seems to have retrospectively erased that possibility from Europe's medieval past. Modern scholarship has treated plague as a temporary "invasion" or "alien" presence and has focused heavily on the effects of this "foreign" visitor, instead of examining plague's interaction with the natural and built environment. The enduring vision of the European epidemiological past is one of *difference* that singled it out from the rest of the larger disease zone (Carmichael 2014, in this issue; see also Bolton 2013: 34). Historical scholarship accordingly had to develop ways of explaining this difference. Most visibly, since the 1970s, plague scholarship has approached the Mediterranean world with epidemiological divisions in mind, such as "Christian vs. Muslim" or "Oriental vs. Occidental." For example, in his authoritative work on the history of plague, Jean-Noël Biraben posited a divide between regions he calls "north-occidental" and "south-oriental" and legitimized this bipartite view by citing differences in climate, fauna, and attitudes toward disease (Biraben 1975: 106).

Subsequent scholarship seems to have maintained epidemiological zones corresponding to those of the early modern period: that of the Ottomans (read: Muslims) and that of the Europeans (read: Christians), with religion as the single most dividing factor (see, e.g., McNeill 1976; Dols 1977; Panzac 1985).²⁵ These imagined divisions of epidemiological experience have resulted in separate histories of plague in Europe and the Middle East/Islamic world. Even in studies that encompass the Mediterranean, these divisions play an important role in explaining the very differences in the spread of plague and the responses it engendered. This bipartite epidemiological imaginary not only sustains essentialist binaries, it regards the Ottoman epidemiological experience as timeless, uniform, and thus unworthy of historical inquiry.

Part II: The Problem of Plague Persistence in Ottoman Lands

As noted above, plague persisted in Ottoman areas for at least half a millennium: a phenomenon that requires a closer look. By persistence, I refer to recurrences of plague in a given area, resulting from local, regional, or long-distance spread of the infection, either imported from outside or transmitted from local enzootic reservoirs. In studying the persistence

²⁵ Recent studies have shown that religion cannot be accepted as the sole determinant in responses to epidemic diseases (Stearns 2009 and 2011).

of plague, we are at the mercy of our sources. There was no systematic recording of plagues in the Ottoman empire before the eighteenth century, when Western diplomats started regular reporting to quarantine authorities in Europe.²⁶ For earlier centuries, the nature of the sources rarely affords observations on plague's persistence at the local level. First, there is the problem of plague's visibility. In its enzootic form (when the infection is transmitted between partially resistant rodent hosts and their fleas), there is no substantial rodent "die off," which makes it difficult to detect.²⁷ Only when the disease assumes epizootic and epidemic form, causing rodent and human mortality, can historical sources make plague visible to us. Second, only rarely do premodern accounts mention where plague came from, so as to enable us to trace the known (or suspected) origin. Even then, this reflects local rumors and reports, which may result from imprecise knowledge. Third, the importation of the infection to port cities as a result of maritime contacts with other infected cities makes it even more difficult to trace the origins of a particular outbreak. This is further complicated by the likelihood of the infection being introduced from multiple areas and/or through multiple channels. For any given outbreak, it is possible that we are looking at more than one strain of the pathogen circulating through different channels.

Indeed, what can be more confidently ascertained from the sources is that plague spread across the empire along complex sets of trajectories that developed and consolidated over the course of the fifteenth and sixteenth centuries (Varlık 2011). This resulted in the repeated exposure of Ottoman cities to the infection throughout the Second Pandemic, turning them into established centers of plague. For example, Istanbul witnessed at least 230 outbreaks during the Second Pandemic, recurring about 2.2 years on average over half a millennium. Similarly, Salonica witnessed outbreaks about 142 times over the course of the same period, about every 3.5 years on average. Other major urban centers of the empire, such as Alexandria, Cairo, Aleppo, Damascus, and Trabzon all experienced frequently recurring outbreaks (Varlık, forthcoming). It is possible that some of those cities sustained the plague on their own, independent from

26 It was mainly this body of documentation that Panzac (1985) used to reconstruct the Ottoman plagues of the eighteenth and nineteenth centuries.

27 Scientific studies inform us about the critical importance of rodent hosts and vectors for the maintenance of plague. As long as there is a sufficient number of rodents and fleas, plague seems to be maintained indefinitely in enzootic form (Gage and Kosoy 2005). Other ecological factors such as climate also matter significantly (Nakazawa et al. 2007; Stenseth et al. 2006; Ben Ari et al. 2011)

incoming infection—that is, they functioned as urban reservoirs of plague. Some Ottoman cities (or their immediate hinterlands) may have kept the disease alive from one epidemic season to the next, sustained by commensal rodents and/or ectoparasites.²⁸

At this point, it may be helpful to consider whether commensal rodents (specifically colonies of *Rattus rattus*) are capable of sustaining plague over time and can therefore function as temporary reservoirs. The ecological scholarship has placed greater emphasis on the role of ground-burrowing wild rodents in sustaining infection over the long term, and commensal rodents' ability to function in the same manner has not been sufficiently explored (e.g., Keim and Wagner 2009). Nevertheless, there are promising studies which suggest that plague can be maintained over long time periods in small commensal rat subpopulations, without any contact with wild rodents. For example, plague is calculated to persist for a hundred years in a commensal rat population of 60,000, without the need of importing new infection (Gage and Kosoy 2005; Keeling and Gilligan 2000a and 2000b). In other words, even if plague killed a certain population of rats, the infection could be kept alive for a long time. This research also suggests that plague would persist even if quarantine measures were in place, and thus has tremendous implications for explaining the historical persistence of plague in large urban centers such as Istanbul. This means that urban areas with significant commensal rodent populations may have become their own self-perpetuating engines of epidemic activity and as such served as temporary reservoirs of plague.

Plague Foci and the Process of Focalization

But even if urban reservoirs could independently sustain the disease, they were never isolated. On the contrary, early modern Ottoman towns were connected both to their immediate hinterland and to more distant areas through a complex network of maritime and overland routes. It was this set of connections that facilitated the circulation of plague within the empire and beyond it, since at least some of those connections linked the urban areas to rural plague reservoirs (foci). As mentioned above, areas where a sufficient number of wild rodents and ectoparasites live can maintain the disease indefinitely in its enzootic form. Hence, it is important to identify where such foci were located in the empire's vast reach.

²⁸ For example, Panzac (1973) showed that İzmir received the infection from its hinterland in the eighteenth century.

At present, we know of several plague foci in or around former Ottoman areas such as Libya, Yemen, Iran, the Transcaucasian and the north-west Caspian regions (WHO 1999: 16; Anisimov, Lindler, and Pier 2004). These were active plague reservoirs during the Third Pandemic, and perhaps even before. According to Panzac, the highlands between western Iran, northern Iraq, and southeastern Turkey, as well as the mountainous areas of Hijaz and Yemen were *permanent* plague foci that caused outbreaks in the eighteenth and nineteenth centuries. Panzac equally identified what he thought were *temporary* plague foci, including the western Balkans, Moldavia and Wallachia, Istanbul, the Anatolian peninsula, and Egypt (Panzac 1985: 105–33). However, he did not offer an explanation as to when each of these foci came to existence.²⁹

Identifying pre-eighteenth-century Ottoman plague foci is challenging. The fragmentary nature of modern *Y. pestis* specimens isolated from these regions does not allow us to determine how old the foci were and how long they remained active.³⁰ Plague science informs us that enzootic foci are not to be taken as timeless; rather they are dynamic entities that emerge, expand, shrink, or disappear over time. Myriad changes ranging from rodent migration to changes in their predator population, and from fluctuations in climate to modifications in landscape, can affect plague foci (Gratz 1999; Li et al. 2009; Karimova et al. 2010; Eisen and Gage 2012).³¹ All these factors make it necessary to pay attention to the circumstances that favor their formation, that is, the process of focalization—the process by which plague forms reservoirs in the natural environment to perpetuate itself, independent of imported infection.

29 Panzac (1985: 128–33) singles out the focus of Egypt (“le foyer égyptien”) as a nineteenth-century phenomenon. He postulates that plague had been an “importation” to Egypt until the 1820s when it went through a process of focalization. He noted that both permanent and temporary foci in or near Ottoman areas were concentrated in the highlands (Panzac 1985: 105–33). See further discussion below.

30 However, it is interesting to note that most of modern *Y. pestis* isolates of the biovar *medievalis* (2.MED) come from former Ottoman territories or its neighboring areas, such as Turkey, Iraq, Iran, and Libya. These scattered isolates seem to represent a genetically related cluster of strains even though they were isolated from different areas at different times. The links between these strains should be sought in the region’s history during the Second Pandemic, i.e., in the Ottoman plague experience. See for example Cabanel et al. 2013: fig. 4; Achtman et al. 2004: supplementary fig. 7. See nn. 12 and 16 above.

31 For a discussion of problems and biases involved in determining historical foci, see Ben Ari et al. (2012: 8200).

Since the beginning of the twentieth century, there was a certain understanding that at least some plague foci were situated in highlands. Writing in 1905, for instance, English epidemiologist W. J. Simpson suggested that plague originated in some highland areas such as in Assyria in the western Arabian peninsula and in the highlands of what is today southeast Turkey and northern Iraq: “[t]he endemic areas [. . .] are chiefly distinguished for their high altitudes.” But the reason he offered was more a cultural construct of highlanders’ customs than a real observation about the disease ecology of those areas that differentiated them from that of the lowlands. Simpson reasoned that plague occurred in those areas “for the poverty and filth of the inhabitants, and for the promiscuous manner in which the cattle, fowls, and domestic animals are permitted to live in close association with human beings, the former often occupying the same room as the latter” (Simpson 1905: 38, 117–18). About two decades later, the renowned Chinese epidemiologist Wu Lien-Teh regarded highland locations as “endemic” foci. In reference to the Kumaon and Garwhal areas of northern India, in the foothills of the Himalayas, for example, he wrote, “[t]his locality is highly situated and sparsely populated, most of the inhabitants [. . .] are poor and dwell promiscuously with their cattle” (Lien-Teh 1924: 292).

Looking exclusively for human cases of plague, these epidemiologists failed to see enzootic plague in these highland foci and the disease ecologies that governed them. Hence, no clear explanation (free of cultural bias) could be offered as to why focalization took place in highlands. Recent research from Madagascar has since shed light on the mechanisms that support this process. In this island’s ecology, plague is sustained in the highlands (above 800 meters) where flea vectors (*Xenopsylla cheopis* and *Synopsyllus fonquerniei*) are more abundant (Vogler et al. 2011; Andrianaivoarimanana et al. 2013). This research offers new insights for understanding the focalization of plague and the transmission of enzootic plague from the highlands to the lowlands (see also Green 2014 and Carmichael 2014, both in this issue). Certain types of landscapes across all continents favor a high number of rodent reservoirs and their fleas. Most plague reservoirs, including those located on higher altitudes, are found in places with “low annual precipitation, or where dry seasons inhibit the growth of thick woody vegetation and lead to the formation of deserts, semi-deserts and steppes (savannas, prairies, pampas and so on)” (WHO 1999: 13-14). Drawing from this, it is possible to discern the basic outlines of plague foci among diverse eco-regions across the reach of Ottoman domains. The mountain ranges of the Anatolian and Balkan peninsulas, as well as the neighboring highlands of the Caucasus and the Persian plateau, may be identified as areas with ecological factors suitable for the

focalization of plague, once introduced. As we shall see below, several rodent species—currently known to be plague hosts—inhabited these highlands, making them likely ecological zones for plague maintenance.

What remains to be identified is how the plague ecologies of the sparsely populated Ottoman highlands were connected to the densely populated lowlands. One possible link bridging these disease ecologies was the seasonal movement of pastoralist nomads of Anatolia and the Balkans between highland summer pastures and lowland winter encampments. The customs and economic activities of pastoralist nomads could have brought them in close contact with plague-hosting animals and their ectoparasites. An Ottoman document from 1571, reporting high plague mortality among the nomads, may be taken as evidence that plague's focalization had already taken a strong hold in the empire's highlands.³² Despite the general belief expressed in current scholarship, that nomads of Anatolia and the Balkans remained mostly free from plague (e.g., Schamiloğlu 2004; McNeill 2012), recent research on North Africa highlights not only their risk of contracting the disease but also of propagating it across considerable distances (Bitam et al. 2010; Ben Néfissa and Moulin 2010). A similar suggestion was made by the nineteenth-century French physician J. D. Tholozan (1874) with regard to the movement of nomads and the spread of plague in eastern Anatolia, western Persia, and Mesopotamia.

There were myriad ways in which nomads interacted with settled societies in the Ottoman domain, directly or indirectly. For example, nomads were not only indispensable for supplying raw materials for the textile and leather industries (e.g., wool, dyes, and hides), they were also involved in the process of producing carpets, rugs, and various other textile products. Similarly, they were the suppliers of transportation animals, such as donkeys, horses, mules, oxen and buffaloes, and camels—a known plague carrier (Faroqhi 1984: 49–50; de Planhol 1969). They would participate in harvests in western Anatolia, as migrant workers, or could serve in various military undertakings of the Ottoman state (Kasaba 2009: 31–35). Nomads came into contact with town-dwellers most repeatedly in the outskirts of Ottoman towns, where businesses such as tanneries, soap factories, and slaughterhouses were located, and low-income families and day laborers resided (Ayalon, forthcoming). These businesses attracted a great number of commensal rodents, exposed laborers to potentially infected materials, and thus functioned as possible gateways of infection leading to urban outbreaks.³³

32 Document from Mühimme Defteri, dated 14 March 1571, published in Yılmaz and Yılmaz (2006, 2: 60).

33 It is generally held that some professionals in premodern cities were at higher

Patterns of Plague Transmission

Recent research has demonstrated that a number of media and forms of mediation might be concurrently involved in plague transmission—especially during pandemics—along with the basic rodent host-vector-human transmission. For example, it has been shown that *Y. pestis* survives in flea feces, in post-mortem hosts, in soil, and in plants (Gage and Kosoy 2005; Drancourt, Houhamdi, and Ranoult 2006; Eisen et al. 2008; Ayyadurai et al. 2008; Easterday et al. 2012; Pawlowski et al. 2011). Also, it has been recognized that humans may become infected by plague as a result of consumption of infected food, wounds (such as those caused by animal bites or scratches), or exposure to airborne bacteria. With this in mind, there is a growing awareness of the need to complicate the patterns of plague transmission, with a recent plea being that “the epidemiology of plague must be seen in a much less diagrammatic manner than in the past” (Raoult et al. 2013: 19).

Similarly, historical scholarship on plague has very recently moved beyond an exclusive reliance on models of rodent-host-vector-to-human transmission. In particular, the recent turn in the humanities toward recognizing the role of animals and other nonhuman agents has stimulated novel avenues of inquiry in plague historiography (e.g., Catanach 2001; Stathakopoulos 2011; Campbell 2010 and 2011; Kelly 2013). A comparable change can be observed in Ottomanist historiography, which has informed recent studies of Ottoman environmental history (White 2011; Mikhail 2011, 2013a, 2013b). In particular, a recent case study of the 1791 plague outbreak in Egypt illustrates this trend well, by exploring plague’s connections to flooding, rodent behavior, and other climatic conditions, so as to situate it in its environmental context (Mikhail 2008, 2012). While it is imperative to recognize the role of human agency in the spread of plague, it is equally important to broaden our vision to the larger environment.

This is another problem for the historian: the ground-burrowing rodents of the early modern Ottoman landscape are barely visible in the sources.³⁴ An interesting piece of anecdotal evidence comes from the six-

risk of infection. Among these were butchers, bakers, millers, artisans of cloth and paper, by virtue of their handling meat, grains, and textiles, all instrumental media in the dissemination of plague. See Audoin-Rouzeau 2003: 233-8.

34 Further research is needed to clarify the taxonomy of rodents in the Ottoman landscape. A nineteenth-century Ottoman Turkish lexicon (Redhouse 1880) includes the following species: short-tailed field mouse (*arvicola arvalis*); jerboa (*dipus aegyptius*); water vole (*arvicola amphibius*); marmot (*arclomys marmotta*); lemming (*myodes lemmus*); and bank vole (*myodes glareolus*).

teenth-century German traveler Hans Dernschwam, who left a detailed description of an animal he saw in northwest Anatolia:

It is slightly larger than a mouse, smaller than a vole, with delicate and well-proportioned limbs. It looked like a hare. Its head, mouth, and ears were well-balanced; its back was rather long and elegant. It had a very long tail. The tail was like a lion's tail with a little ball on its end. It held up its tail in the air. This way it looked like an African monkey. (Dernschwam [1553–55]/1987: 307–08)

This depiction brings to mind the jerboa, which is known to be a plague carrier. Yet, it is difficult to identify what type of jerboa it may have been. Jerboas do not occur in this part of Anatolia today; only the *Euphrates jerboa* (*Allactaga euphratica*) can be found marginally in southeastern Turkey (Arslan et al. 2012). If this species were indeed a type of jerboa that inhabited Anatolia in the sixteenth century but is now extinct, it would be interesting to reflect on the relationship between the extinction of this animal and the disappearance of plague.

The seventeenth-century Ottoman traveler Evliya Çelebi (c. 1630–83/1996) documented the types of rodents he encountered, such as the bank vole, the ground squirrel, the water vole, and probably the Persian jird (*Meriones persicus*)—known to be a plague carrier.³⁵ Writing in the eighteenth century, Alexander Russell (1794, 2: 180–82) listed different species of rodents occurring in Aleppo at the time, along with their names in Arabic and Latin. Not seeing any reason to discuss commensal rodents, Russell simply noted: “There is nothing remarkable in the Rat, and the Mouse. Most of the houses are infested with them.” As for wild rodents, he mentioned the short-tailed field mouse, the dormouse, the hamster, the water rat, and the jerboa (which supports the above-mentioned observations of Dernschwam). Furthermore, an English traveler in Anatolia testified to seeing marmot-like rodents in Ilgın (modern day Konya, in Turkey) during a plague epidemic in 1836:

The plain swarmed with a species of burrowing animal about the size of a squirrel, which I had also seen in other parts of Asia Minor; but whether a species of marmotte, jerboa, lemming, or hamster, I could not ascertain. . . . Their colour is a light yellowish brown, and they abound in the southern provinces of Russia, where the variety or species is known by the name of “Rat des steppes.” (Hamilton 1842, 2: 189; cf. Panzac 1985: 123)

35 The Persian jird (*meriones*) has been identified as a “real reservoir of plague” by Baltazar et al. (1952), who believed that they were able to keep plague “permanently enzootic.” See also Green 2014 and Carmichael 2014, both in this issue.

This rodent species may be identified as the white-throated woodrat (*Neotoma albigula*), which no longer occurs in this part of the world (Wrobel 2006: 339). What is important to note here is that several rodent species documented by early modern sources are currently known to be plague carriers. The fact that most of those species have now become extinct in Anatolia and the Balkans, where plague no longer occurs, invites further questions. Whether those rodent species became extinct due to plague or by other causes, it may be valuable to consider this connection.

Along with rodents, a number of animals (e.g., cats, dogs, rabbits, camels, and goats) can become infected by plague and transmit it to humans (Fedorov 1960; Ell 1979 and 1980; Christie, Chen, and Elberg 1980; Salkeld and Stapp 2006; Raoult et al. 2013). Some premodern observers of plague may have noticed this phenomenon. One such testimony comes from the English physician Charles MacLean, albeit to mock and discredit such beliefs. In 1815, in Istanbul, he claims to have heard that “Of all quadrupeds, the shaggy horse, or horse with long hair, is alone exempt from contracting the infection of plague. Other animals, and birds of every kind, can receive, and communicate the infection” (Maclean 1817: 202). This point deserves some attention, because Maclean’s informants believed that a wide variety of animals were known to contract the infection and recognized their role as intermediaries in its transmission. At least one other nineteenth-century testimony identified a dog as a putative transmitter of plague. This keen observation comes from the memoirs of H. G. O. Dwight, an American missionary in Istanbul who lost his wife and son to plague during an outbreak in 1837. In one of his letters, Dwight noted that the dog of their neighbor—a family that had recently lost a child to plague—often came to their house yard to play with his youngest son, John, who later contracted the disease and died (Dwight 1840: 23). Such testimonies are rare, yet deserve further attention considering the notoriously large street dog population in Ottoman cities, above all in Istanbul. European travelers often commented on the street dogs of the Ottoman capital as a typical feature of the city until the modern era. Perhaps the best known of these accounts is that of the Italian writer Edmondo de Amicis (1896: 108–13), who noted that “the dogs constitute a second population of the city.”³⁶ This does not necessarily mean that dogs were the principal hosts to plague, but their presence may be taken

36 Their presence, however, came to be seen (at the turn of the twentieth century) as a sign of the Ottoman incapacity to regulate a sanitary urban space. For a discussion of street dogs of Istanbul and the efforts to eliminate them as a “measure of progress,” see Brummett 1995.

into consideration when thinking about the patterns of plague transmission in early modern Ottoman towns.

In addition, the role of mammalian carnivores (feeding on rodents, such as marmots, ground squirrels, and voles) may require further consideration. It has been noted that carnivores can act as transitory hosts, transporting infected arthropods between different rodent populations. Recent research also suggests that mammalian carnivores exhibit some characteristics as plague hosts that can sustain the infection in enzootic form (Salkeld and Stapp 2006). In the Ottoman landscape, these carnivores would include wolves, foxes, jackals, and hyenas. Although these species mostly avoided crowded human settlements, there are references to foxes and jackals sighted in the outskirts of Ottoman towns by early modern observers (Russell 1794, 2: 183–85). Perhaps more to the point is the infamous tendency of hyenas to dig up and desecrate graves. Hyenas were surprisingly common in parts of Eurasia (Meserve 2012), including areas governed by the Ottoman empire, and may deserve closer attention in the context of plague studies. One sixteenth-century testimony comes from the account of the Habsburg ambassador Ogier Ghiselin de Busbecq, who mentioned hyenas that dug up human bodies from graves in Anatolia. Busbecq (1554–62/2005: 48–49) notes that locals of that area placed heavy stones on top of graves to protect them from hyenas. Hyenas were also observed by the Russell brothers in Aleppo and its surroundings in the eighteenth century, where they were commonly known by the locals who sometimes caught them alive “in the hills at no great distance from town” (Russell 1794, 2: 186–88). It appears that the threat of hyenas was still known to the late nineteenth-century town-dwellers on the northern coast of Anatolia, as suggested by an official document.³⁷ Another example of a mammalian carnivore that fed on small rodents is the weasel. The fifteenth-century Spanish traveler Pero Tafur commented on the abundance of weasels—presumably the Egyptian weasel (*Mustela subpalmata*)—in Damietta both in the streets and inside the house (1926: 68). Even though the historical evidence is fragmentary, both intra- and inter-species interactions of carnivores are important for the local transmission of plague, especially in linking the plague ecologies of urban areas to their hinterlands.

37 According to this document, dated 1872, the population of the town Çatalzeytin, west of Sinop, claimed that “a hyena monster was stealing children from houses.” See “The Hyena Monster of Sinop and the Vagaries of Ottoman Population Accounts,” available online at <<http://www.docblog.ottomanhistorypodcast.com/2012/08/the-art-of-not-being-seen-hyena-monster.html>> [accessed September 19, 2014].

Even more significant is the case of animals that can potentially transport infected fleas over long distances and cause metastatic leaps of plague. These are predator birds that feed on rodents, including large birds of prey (such as hawks, falcons, and owls) and migratory birds (Benedictow 2004: 47). Sixteenth-century Ottoman plague treatises loosely observed a connection between the behavior of migratory birds and epidemics. For example, the plague treatise composed by İlyas bin İbrahim, an Iberian Jewish physician who came to Istanbul in the early sixteenth century, reports that outbreaks of disease were preceded by environmental events (e.g., earthquakes, astrological and meteorological events) and the flight of certain animals and birds (1894: 28). Increased visibility of certain species of burrowing animals and insects was also regarded as a sign of a coming plague.

The plague treatise of the sixteenth-century Ottoman theologian and biographer Ahmed Taşköprizade mentioned the arrival of migratory birds, especially that of the white stork, as a precursor to plague (Taşköprizade 1875; Ünver 1935: 70–71). This association between the arrival of migratory birds and that of the plague was a keen observation in the absence of the linking knowledge about the transfer of fleas. White storks (*Ciconia ciconia*) are predatory birds that feed on small rodents (such as voles, and possibly rats) in addition to various sorts of insects. They also feed at garbage dumps and nest on roofs, poles, and straw stacks, making them a prime candidate for carrying diseases (van den Bossche et al. 2002; Hubálek 2004; Malkinson et al. 2001 and 2002). Recent research also suggests that migratory birds can be a factor in disseminating plague-infected fleas (Heier et al. 2011). Furthermore, in the Ottoman case, the trajectories of their migration seem to have coincided with those of plague. The migratory route followed by the white stork from Europe to Southeast Africa crisscrossed the Ottoman lands from northwest to southeast, and largely corresponded to the main pilgrimage and caravan route in the eastern Mediterranean, before crossing over the Sinai peninsula to Egypt, Sudan, and further south into Africa (van den Bossche et al. 2002). Incidentally, this migratory route passed right over Istanbul and across the Bosphorus. Historical sources sometimes mention flocks of storks. For example, Hans Dernschwam ([1553–55]/1987: 44) notes seeing flocks of thousands of storks near Edirne in the mid-sixteenth century. This correspondence between the trajectories of migratory birds and that of pilgrimage and caravan routes seems to further complicate the pathways of plague's diffusion. Given both scientific and anecdotal evidence, it should be possible to surmise that migratory birds can be associated with metastatic leaps of the infection between remote and isolated enzootic foci and urban areas.

This does not suggest that they were the sole agents for transmitting the infection; rather this was one among many routes that helped circulate plague over land, sea, and air. This reminds us of the importance of expanding our vision to develop a “bird’s-eye view” of plague’s diffusion, in addition to envisioning its spread along trade routes or by other means that place human agency at the center.

Conclusion

Studying the Ottoman plague experience during the Second Pandemic offers three important insights. First, it underscores the critical importance of focalization. Such processes may be helpful in studying the plague experience of even those areas that are historically imagined to have received the infection from outside: for example, Europe. Second, it draws attention to the necessity of adopting more complex models of plague transmission, with a special emphasis on interspecies dynamics and the local species that serve as hosts, vectors, and as intermediaries. In order to better understand local plague ecologies, it may be invaluable to expand our vision to include a wider spectrum of rodent species and consider the role of domestic and commensal mammals, mammalian carnivores, predator and migratory birds in plague transmission. Third, it urges the elimination of old models of assumed/imagined epidemiological boundaries and trajectories that have been built on flawed historical constructs, such as those that have been inherited from nineteenth-century Eurocentric notions and colonial plague science. Instead, it highlights the importance of adopting more unified epidemiological perspectives for studying larger disease zones, such as the Afro-Eurasian zone during the Second Pandemic. The Ottoman epidemiological experience is not only eminently comparable to those other contemporaneous experiences, but also indispensable for a full understanding of plague in this larger disease ecology. Finally, the new plague science, as valuable as it is, should be considered as a set of guidelines in studying the plague. Historical sources suggest that the disease could manifest itself in different forms and have different effects, depending on local circumstances. As lesser-known epidemiological experiences are recovered from the past, this evidence will supply increased opportunities not only for the plague historian but for the plague scientist as well.

Bibliography

- Achtman, Mark, Giovanna Morelli, Peixuan Zhu, Thierry Wirth, et al. 2004. "Microevolution and History of the Plague Bacillus, *Yersinia pestis*," *Proceedings of the National Academy of Sciences* 101, no. 51: 17837–42
- Ágoston, Gábor, and Bruce Alan Masters. 2009. *Encyclopedia of the Ottoman Empire* (New York: Facts on File)
- Alexander, John T. 1980. *Bubonic Plague in Early Modern Russia: Public Health & Urban Disaster* (Baltimore: Johns Hopkins University Press)
- Amicis, Edmondo de. 1896. *Constantinople*, trans. by Maria Hornor Lansdale (Philadelphia: Coates)
- Anandavalli, Lakshmikanthan. 2007. "The Black Death in Medieval India: A Historical Mystery," *Tangents: The Journal of the Master of Liberal Arts Program at Stanford University* 6: 20–25
- Andrianaivoarimanana, V., K. Kreppel, N. Elissa, J.-M. Duplantier, et al. 2013. "Understanding the Persistence of Plague Foci in Madagascar," *PLoS Neglected Tropical Diseases* 7, no. 11: e2382
- Anisimov, A. P., L. E. Lindler and G. B. Pier. 2004. "Intraspecific Diversity of *Yersinia pestis*," *Clinical Microbiology Reviews* 17, no. 2: 434–64
- Ansari, B. M. 1994. "An Account of Bubonic Plague in Seventeenth Century India in an Autobiography of a Mughal Emperor," *Journal of Infection* 29: 351–52
- Arık, Feda Şamil. 1991. "Selçuklular Zamanında Anadolu'da Veba Salgınları," *Tarih Araştırmaları Dergisi* 15, no. 26: 27–57
- Arnold, David. 1993. *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley: University of California Press)
- Arslan, A., T. Yorulmaz, K. Toyran, İ. Albayrak, et al. 2012. "C-Banding and Ag-NOR Distribution Patterns in Euphrates Jerboa, *Allactaga euphratica* (Mammalia: Rodentia), from Turkey," *Mammalia* 76: 427–34
- Audoin-Rouzeau, Frédérique. 2003. *Les Chemins de la peste: le rat, la puce et l'homme* (Rennes: Presses universitaires de Rennes)
- Ayalon, Yaron. Forthcoming. "When Nomads Meet Urbanites: The Outskirts of Ottoman Cities as a Venue for the Spread of Epidemic Diseases," in *Plagues in Nomadic Contexts: Historical Impact, Medical Responses, and Cultural Adaptations in Ancient to Mediaeval Eurasia*, ed. Kurt Franz et al. (Leiden: Brill)
- Ayyadurai, S., L. Houhamdi, H. Leipidi, C. Nappez, et al. 2008. "Long-Term Persistence of Virulent *Yersinia pestis* in Soil," *Microbiology* 154: 2865–71
- Baca, M., and M. Molak. 2008. "Research on Ancient DNA in the Near East," *Bioarchaeology of the Near East* 2: 39–61
- Baltazard, M., M. Bahmanyar, Ch. Mofidi, and B. Seydian. 1952. "Le foyer de peste du Kurdistan," *Bulletin of the World Health Organization* 5: 441–72
- Ben Ari, T., S. Neerincx, K. L. Gage, K. Kreppel, et al. 2011. "Plague and Climate: Scales Matter," *PLoS Pathogens*, 7, no. 9: e1002160
- Ben Ari, T., S. Neerincx, L. Agier, B. Cazelles, et al. 2012. "Identification of Chinese Plague Foci from Long-Term Epidemiological Data," *Proceedings of the National Academy of Sciences* 109: 8196–8201
- Ben Néfissa, K., and A. M. Moulin. 2010. "The North African Plague and Charles Nicolle's Theory of Infectious Diseases," *Gesnerus-Swiss Journal of the History of Medicine and Sciences* 67: 30–56

- Benedict, Carol Ann. 1996. *Bubonic Plague in Nineteenth-Century China* (Stanford: Stanford University Press)
- Benedictow, Ole J. 2004. *The Black Death, 1346–1353: The Complete History* (Woodbridge: Boydell)
- Biraben, Jean-Nöel. 1975. *Les hommes et la peste en France et dans les pays européens et méditerranéens* (Paris: Mouton)
- Biraben, Jean-Nöel, and Jacques Le Goff. 1969. "La peste dans le haut Moyen-Âge," *Annales. Économies, Sociétés, Civilisations* 24: 1484–1510
- Bitam, I., S. Ayyadurai, T. Kernif, M. Chetta, et al. 2010. "New Rural Focus of Plague, Algeria," *Emerging Infectious Diseases* 16: 1639–40
- Bolton, J. L. 2013. "Looking for *Yersinia pestis*: Scientists, Historians and the Black Death," in *The Fifteenth Century, XII: Society in an Age of Plague*, ed. Linda Clark and Carole Rawcliffe, 15–38 (Woodbridge: Boydell)
- Boogert, Maurits van den (ed.). 2010. *Aleppo Observed: Ottoman Syria through the Eyes of Two Scottish Doctors, Alexander and Patrick Russell* (Oxford: Oxford University Press)
- Borsch, Stuart J. 2005. *The Black Death in Egypt and England: A Comparative Study* (Austin: University of Texas Press)
- Bos, K. I., V. J. Schuenemann, G. Brian Golding, H. A. Burbano, et al. 2011. "A Draft Genome of *Yersinia pestis* from Victims of the Black Death," *Nature* 478, no. 7370: 506–10
- Bossche, Willem van den, et al. 2002. *Eastern European White Stork Populations: Migration Studies and Elaboration of Conservation Measures* (Bonn: Bundesamt für Naturschutz [BfN]/German Federal Agency for Nature Conservation)
- Brayer, A. 1836. *Neuf années à Constantinople: observations sur la topographie de cette capitale, l'hygiène et les mœurs de ses habitants, l'Islamisme et son influence: la peste, ses causes, ses variétés, sa marche et son traitement: la non-contagion de cette maladie: les quarantaines et les lazarets* (Paris: Ballizard, Barthès, Dufour et Lowell)
- British Medical Journal*. 1900. "The Plague: Plague and Plague Measures in the Turkish Empire," *British Medical Journal* 2, no. 2086 (December 22): 1810–11
- British Medical Journal*. 1902a. "Literary Notes," *British Medical Journal* 2, no. 2167 (July 12): 142
- British Medical Journal*. 1902b. "The Destruction of Rats on Ship-Board," *British Medical Journal* 1, no. 2144 (February 1): 294–95
- Brotherton, P. Sean, and Vinh-Kim Nguyen. 2013. "Revisiting Local Biology in the Era of Global Health," *Medical Anthropology* 32: 287–90
- Brummett, Palmira. 1995. "Dogs, Women, Cholera, and Other Menaces in the Streets: Cartoon Satire in the Ottoman Revolutionary Press, 1908–11," *International Journal of Middle East Studies*, 2: 433–60
- Buell, Paul D. 2012. "Qubilai and the Rats," *Sudhoffs Archiv* 96, no. 2: 127–44
- Bulmuş, Birsen. 2012. *Plague, Quarantines, and Geopolitics in the Ottoman Empire* (Edinburgh: Edinburgh University Press)
- Busbecq, Ogier Ghiselin de. 1554–62/2005. *The Turkish Letters of Ogier Ghiselin de Busbecq, Imperial Ambassador at Constantinople, 1554–1562: Translated from the Latin of the Elzevir Edition of 1663*, trans. Edward Seymour Forster (Baton Rouge: Louisiana State University Press)

- Cabanel, N., A. Leclercq, V. Chenal-Francisque, B. Annajar, et al. 2013. "Plague Outbreak in Libya, 2009, Unrelated to Plague in Algeria," *Emerging Infectious Diseases*, 19, no. 2: 230–36
- Campbell, Bruce M. S. 2010. "Physical Shocks, Biological Hazards, and Human Impacts: The Crisis of the Fourteenth Century Revisited," in *Economic and Biological Interactions in Pre-Industrial Europe, from the Thirteenth to Eighteenth Centuries*, ed. Simonetta Cavaciocchi, 13–32 (Florence: Firenze University Press)
- Campbell, Bruce M. S. 2011. "Panzootics, Pandemics and Climate Anomalies in the Fourteenth Century," in *Beiträge zum Göttinger Umwelthistorischen Kolloquium, 2010–2011*, ed. B. Hermann, 177–216 (Göttingen: Universitätsverlag)
- Carmichael, Ann G. 2014. "Plague Persistence in Western Europe: A Hypothesis," *The Medieval Globe* 1: 157–191
- Catanach, I. J. 2001. "The 'Globalization' of Disease? India and the Plague," *Journal of World History*, 12: 131–53
- Çelebi, Evliya. c. 1630–83/1996. *Seyahatname*, ed. Robert Dankoff, Seyit Ali Kahraman, Yücel Dağlı, Zekeriya Kurşun, et al., 10 vols. (Istanbul: Yapı Kredi Yayınları)
- Christensen, Peter. 1993. *The Decline of Iranshahr: Irrigation and Environments in the History of the Middle East, 500 B.C. to A.D. 1500* ([Copenhagen]: University of Copenhagen)
- Christie, A. B., T. H. Chen, and Sanford S. Elberg. 1980. "Plague in Camels and Goats: Their Role in Human Epidemics," *Journal of Infectious Diseases* 141, no. 6: 724–26
- Cohn, Samuel Kline, Jr. 2008. "Epidemiology of the Black Death and Successive Waves of Plague," in *Pestilential Complexities: Understanding Medieval Plague*, ed. Vivian Nutton, 74–100 (London: Wellcome Trust Centre for the History of Medicine at University College London)
- Cohn, Samuel Kline, Jr. 2013. "The Historian and the Laboratory: The Black Death Disease," in *Society in an Age of Plague (The Fifteenth Century, XII)*, ed. Linda Clark and Carole Rawcliffe, 195–212 (Woodbridge: Boydell)
- Clark, Linda, and Carole Rawcliffe (eds.). 2013. *Society in an Age of Plague (The Fifteenth Century, XII)* (Woodbridge: Boydell)
- Conrad, Lawrence. 1981. "The Plague in the Early Medieval Near East" (PhD dissertation, Princeton University)
- Conrad, Lawrence. 1982. "*Tā'ūn* and *Wabā'*: Conceptions of Plague and Pestilence in Early Islam," *Journal of the Economic and Social History of the Orient* 25: 268–307
- Conrad, Lawrence, and Dominik Wujastyk. 2000. *Contagion: Perspectives from Pre-Modern Societies* (Aldershot: Ashgate)
- Crane, J. T. 2011. "Viral Cartographies: Mapping the Molecular Politics of Global HIV," *BioSocieties* 6: 142–66
- Creighton, Charles. 1891. *A History of Epidemics in Britain* (Cambridge: Cambridge University Press)
- Cui, Y., C. Yu, Y. Yan, D. Li, et al. 2013. "Historical Variations in Mutation Rate in an Epidemic Pathogen, *Yersinia pestis*," *Proceedings of the National Academy of Science* 110, no. 2: 577–82

- Dernschwam, Hans. [1553–55]/1987. *İstanbul ve Anadolu'ya seyahat günlüğü*, trans. Yaşar Önen (Ankara: Kültür ve Turizm Bakanlığı)
- DeWitte, Sharon N. 2014. "The Anthropology of Plague: Insights from Bioarcheological Analyses of Epidemic Cemeteries," *The Medieval Globe* 1: 97–123
- Dols, Michael. 1974. "Plague in Early Islamic History," *Journal of the American Oriental Society* 94: 371–83
- Dols, Michael. 1977. *The Black Death in the Middle East* (Princeton, NJ: Princeton University Press)
- Dols, Michael. 1987. "Review of Daniel Panzac, *La peste dans l'empire Ottoman, 1700–1850*," in *Medical History* 31: 109–10
- Drancourt, M., L. Houhamdi, and D. Raoult. 2006. "Yersinia pestis as a Telluric, Human Ectoparasite-Borne Organism," *Lancet Infectious Diseases* 6: 234–41
- Dwight, H. G. O. 1840. *Memoir of Mrs. Elizabeth B. Dwight, Including an Account of the Plague of 1837* (New York: Dodd)
- Eager, John Macauley. 1908. *The Present Pandemic of Plague* (Washington: Government Printing Office)
- Easterday, W. R., K. L. Kausrud, B. Starr, L. Heier, et al. 2012. "An Additional Step in the Transmission of Yersinia pestis?," *ISME Journal* 6: 231–36
- Echenberg, Myron J. 2007. *Plague Ports: The Global Urban Impact of Bubonic Plague, 1894–1901* (New York: New York University Press)
- Eisen, R. J., and K. L. Gage. 2012. "Transmission of Flea-Borne Zoonotic Agents," *Annual Review of Entomology* 57: 61–82
- Eisen, R. J., J. M. Petersen, C. L. Higgins, D. Wong, et al. 2008. "Persistence of Yersinia pestis in Soil Under Natural Conditions," *Emerging Infectious Diseases* 14: 941–43
- Ell, S. R. 1979. "Some Evidence for Interhuman Transmission of Medieval Plague," *Review of Infectious Diseases* 1: 563–66
- Ell, S. R. 1980. "Interhuman Transmission of Medieval Plague," *Bulletin of the History of Medicine* 54: 497–510
- Ess, Josef van. 2001. *Der Fehltritt des Gelehrten: Die "Pest von Emmaus" und ihre theologischen Nachspiele* (Heidelberg: Winter)
- Faroqhi, Suraiya. 1984. *Towns and Townsmen of Ottoman Anatolia: Trade, Crafts, and Food Production in an Urban Setting, 1520–1650* (Cambridge: Cambridge University Press)
- Fedorov, V. N. 1960. "Plague in Camels and its Prevention in the USSR," *Bulletin of the World Health Organization* 23: 275–81
- Fisher, Alan. 1992. "Review of *La peste dans l'Empire ottoman, 1700–1850* (Collection Turcica, 5) by Daniel Panzac," *Middle East Studies Association Bulletin* 26: 72–74
- Frandsen, Karl-Erik. 2010. *The Last Plague in the Baltic Region, 1709–1713* (Copenhagen: Museum Tusulanum Press)
- Gage, K. L., and M. Y. Kosoy. 2005. "Natural History of Plague: Perspectives from More than a Century of Research," *Annual Review of Entomology* 50: 505–28
- Golem, Bilal, and Kemal Özsan. 1952. "Türk Veba Suşlarında Biyoşimik Karakter Farkları," *Türk İjiyen ve Tecrübi Biyoloji Dergisi* 12: 29–51

- Gordon, Daniel. 1999. "Confrontations with the Plague in Eighteenth-Century France," in *Dreadful Visitations: Confronting Natural Catastrophe in the Age of Enlightenment*, ed. Alessa Johns, 3–29 (New York: Routledge)
- Gratz, N. 1999. "Rodent Reservoirs and Flea Vectors of Natural Foci of Plague," in *Plague Manual: Epidemiology, Distribution, Surveillance and Control*, 63–96 (Geneva: World Health Organization)
- Green, Monica H. 2014. "Taking 'Pandemic' Seriously: Making the Black Death Global," *The Medieval Globe* 1: 27–61
- Haensch, S., R. Bianucci, M. Signoli, M. Rajerison, et al. 2010. "Distinct Clones of *Yersinia pestis* Caused the Black Death," *PLoS Pathogens* 6, no. 10: e1001134
- Hamilton, William John. 1842. *Researches in Asia Minor, Pontus and Armenia* (London: John Murray)
- Hecker, J. F. C. 1859. *The Epidemics of the Middle Ages*, trans. B. G. Babington (London: Trübner)
- Heier, L., G. O. Storvik, S. A. Davis, H. Vilhugrein, et al. 2011. "Emergence, Spread, Persistence and Fade-out of Sylvatic Plague in Kazakhstan," *Proceedings of the Royal Society B: Biological Sciences* 278, no. 1720: 2915–23
- Hirst, L. 1953. *The Conquest of Plague: A Study of the Evolution of Epidemiology* (Oxford: Clarendon Press)
- Howard-Jones, Norman. 1975. *The Scientific Background of the International Sanitary Conferences, 1851–1938* (Geneva: World Health Organization)
- Hrabak, Bogumil. 1957. "Kuga u balkanskim zemljama pod Turcima od 1450 do 1600 godine," *Istoriski glasnik* 1–2: 19–37
- Hubálek, Z. 2004. "An Annotated Checklist of Pathogenic Microorganisms Associated with Migratory Birds," *Journal of Wildlife Diseases* 40: 639–59
- İlyas bin İbrahim. 1894. *Tevfikâtü'l-hamidiyye fî def'i'l-emrâzi'l-vebâ'iyye*, trans. Ahmedü's-Şami Ömeri (Istanbul University, Cerrahpaşa History of Medicine Library, MS 105)
- Issawi, Charles. 1988. "Review of *La peste dans l'Empire ottoman* by Daniel Panzac," *International Journal of Middle East Studies* 20: 115–16
- Jennings, Ronald C. 1993. "Plague in Trabzon and Reactions to It according to Local Juridical Registers," in *Humanist & Scholar: Essays in Honor of Andreas Tietze*, ed. Heath W. Lowry and Donald Quataert, 37–46 (Istanbul: Isis Press)
- Karimova, T. Yu, V. M. Neronov, and V. P. Popov. 2010. "Development of Views on Natural Focality of Plague," *Biology Bulletin*, 37: 725–32
- Kasaba, Reşat. 2009. *A Moveable Empire: Ottoman Nomads, Migrants, and Refugees* (Seattle: University of Washington Press)
- Keeling, M. J., and C. A. Gilligan. 2000a. "Metapopulation Dynamics of Bubonic Plague," *Nature* 407, no. 6806: 903–06
- Keeling, M. J., and C. A. Gilligan. 2000b. "Bubonic Plague: A Metapopulation Model of a Zoonosis," *Proceedings of the Royal Society of London. Series B: Biological Sciences* 267, no. 1458: 2219–30
- Keim, P. S., and D. M. Wagner. 2009. "Humans and Evolutionary and Ecological Forces Shaped the Phylogeography of Recently Emerged Diseases," *Nature Reviews Microbiology* 7: 813–21

- Kelly, Catherine. 2008. "Not From the College, But through the Public and the Legislature": Charles Maclean and the Relocation of Medical Debate in the Early Nineteenth Century," *Bulletin of the History of Medicine* 82: 545–69
- Kelly, Kathleen Coyne. 2013. "Flea and ANT: Mapping the Mobility of the Plague, 1330s–1350s," *Postmedieval: A Journal of Medieval Cultural Studies* 4: 219–32
- Kılıç, Orhan. 2004. *Eskiçağdan Yakınçağa Genel Hatlarıyla Dünyada ve Osmanlı Devletinde Salgın Hastalıklar* (Elazığ: Fırat Üniversitesi Rektörlüğü)
- Kōstēs, Kōstas. 1995. *Ston kairo tēs panōlēs: eikones apo tis koinōnias tēs Hellēnikēs chersonēsou, 14os–19os aiōnas* (Hērakleio: Panepistēmiakes Ekdoseis Krētēs)
- Kreic, B. 1963. "Europe centrale et balkanique," *Annales: Économies, Sociétés, Civilisations* 8: 594–95
- Lammel, Hans-Uwe. 2010. "Western European Perception and Representation of Plagues in Eastern Europe, the Ottoman Empire and the Near East, 1650–1800," in *Economic and Biological Interactions in Pre-Industrial Europe from the Thirteenth to Eighteenth Centuries*, ed. Simonetta Cavaciocchi, 399–421 (Florence: Firenze University Press)
- Langer, Lawrence N. 1975. "The Black Death in Russia: Its Effects upon Urban Labor," *Russian History* 2: 53–67
- Latour, Bruno. 1987. *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press)
- Li, Y., Y. Cui, Y. Hauck, N. E. Platonov, et al. 2009. "Genotyping and Phylogenetic Analysis of *Yersinia pestis* by MLVA: Insights into the Worldwide Expansion of Central Asia Plague Foci," *PLoS ONE* 4, no.6: e6000
- Lien-Teh, W. 1924. "The Original Home of Plague," in *Far Eastern Association of Tropical Medicine, Transactions of the Fifth Biennial Congress Held at Singapore, 1923*, ed. A. L. Hoops and J. W. Scharff, 286–304 (London: Bale & Danielsson)
- Little, Lester K. 2011. "Plague Historians in Lab Coats," *Past and Present* 213: 267–90
- Little, Lester K. (ed.). 2007. *Plague and the End of Antiquity: The Pandemic of 541–750* (Cambridge: Cambridge University Press)
- Lock, Margaret. 1993. "Cultivating the Body: Anthropology and Epistemologies of Bodily Practice and Knowledge," *Annual Review of Anthropology* 22: 133–55
- Lock, Margaret. 1995. *Encounters with Aging: Mythologies of Menopause in Japan and North America* (Berkeley: University of California Press)
- Low, Michael Christopher. 2008. "Empire and the Hajj: Pilgrims, Plagues, and Pan-Islam under British Surveillance, 1865–1908," *International Journal of Middle East Studies* 40: 269–90
- Lowry, W. Heath. 2003. "Pushing the Stone Uphill: The Impact of Bubonic Plague on Ottoman Urban Society in the Fifteenth and Sixteenth Centuries," *Osmanlı Araştırmaları* 23: 93–132
- Mackenzie, Mordach. 1752. "Extracts of Several Letters of Mordach Mackenzie, M. D. Concerning the Plague at Constantinople," *Philosophical Transactions (1683–1775)* 47: 384–95
- Mackenzie, Mordach. 1764. "An Account of the Plague at Constantinople in a Letter from Mordach Mackenzie, M. D. to Sir James Porter, His Majesty's Envoy Plenipotentiary at Brussels, and F. R. S.," *Philosophical Transactions (1683–1775)* 54: 69–82

- Maclean, Charles. 1817. *Results of an Investigation, Respecting Epidemic and Pestilential Diseases; Including Researches in the Levant, Concerning the Plague* (London: Underwood)
- Malkinson, M., C. Banet, Y. Weisman, S. Pokamunski, et al. 2002. "Introduction of West Nile Virus in the Middle East by Migrating White Storks," *Emerging Infectious Diseases* 8: 392–97
- Malkinson, M., Y. Weisman, S. Pokamunski, R. King, et al. 2001. "Intercontinental Transmission of West Nile Virus by Migrating White Storks," *Emerging Infectious Diseases* 7, no. 3 (supp.): 540
- Manolova-Nikolova, Nadja I. 2004. *Čumavite vremena (1700–1850)* (Sofia: IF-94)
- McNeill, J. R. 2012. "The Eccentricity of the Middle East and North Africa's Environmental History," in *Water on Sand: Environmental Histories of the Middle East and North Africa*, ed. Alan Mikhail, 27–50 (Oxford: Oxford University Press)
- McNeill, William H. 1976. *Plagues and Peoples* (New York: Anchor)
- Meserve, Ruth I. 2012. "Striped Hyenas and 'Were-Hyenas' in Central Eurasia," in *Archivum Eurasiae Medii Aevi*, ed. Th. T. Allsen, P. B. Golden, R. K. Kovalev, and A. P. Martinez, 199–220 (Wiesbaden: Harrassowitz)
- Mikhail, Alan. 2008. "The Nature of Plague in Late Eighteenth-Century Egypt," *Bulletin of the History of Medicine* 82: 249–75
- Mikhail, Alan. 2011. *Nature and Empire in Ottoman Egypt: An Environmental History* (Cambridge: Cambridge University Press)
- Mikhail, Alan. 2012. "Plague and Environment in Late Ottoman Egypt," in *Water on Sand: Environmental Histories of the Middle East and North Africa*, ed. Alan Mikhail, 111–32 (Oxford: Oxford University Press)
- Mikhail, Alan. 2013a. *The Animal in Ottoman Egypt* (Oxford: Oxford University Press)
- Mikhail, Alan. 2013b. "Unleashing the Beast: Animals, Energy, and the Economy of Labor in Ottoman Egypt," *American Historical Review* 118: 317–48
- Morelli, G., Y. Song, C. J. Mazzoni, M. Eppinger, et al. 2010. "Yersinia pestis Genome Sequencing Identifies Patterns of Global Phylogenetic Diversity," *Nature Genetics* 42, no. 12: 1140–43
- Morens, D. M., G. K. Folkers, and A. S. Fauci. 2009. "What Is a Pandemic?," *Journal of Infectious Diseases* 200, no. 7: 1018–21
- Morony, Michael G. 2007. "For Whom Does the Writer Write?" The First Bubonic Plague Pandemic According to Syriac Sources," in *Plague and the End of Antiquity: The Pandemic of 541–750*, ed. Lester K. Little, 59–86 (Cambridge: Cambridge University Press)
- Nakazawa, Y., R. Williams, A. Townsend Peterson, P. Mead, et al. 2007. "Climate Change Effects on Plague and Tularemia in the United States," *Vector-Borne and Zoonotic Diseases* 7: 529–40
- Norris, J. 1977. "East or West? The Geographic Origin of the Black Death," *Bulletin of the History of Medicine* 51: 1–24
- Nutton, Vivian (ed.). 2008. *Pestilential Complexities: Understanding Medieval Plague* (London: Wellcome Trust Centre for the History of Medicine at University College London)

- Owen, Roger. 1986. "Review of *La peste dans l'Empire ottoman, 1700–1850* by Daniel Panzac," *Bulletin (British Society for Middle Eastern Studies)* 13: 210–12
- Panzac, Daniel. 1973. "La peste à Smyrne au XVIII^e siècle," *Annales. Histoire, Sciences Sociales* 28: 1071–93
- Panzac, Daniel. 1985. *La peste dans l'empire ottoman, 1700–1850* (Leuven: Peeters)
- Panzac, Daniel. 1986. *Quarantaines et lazarets: l'Europe et la peste d'Orient, XVIIe–XXe siècles* (Aix-en-Provence: Édisud)
- Panzac, Daniel. 1987. "Alexandrie: peste et croissance urbaine (XVIIe–XIXe siècles)," *Revue de l'Occident musulman et de la Méditerranée* 46: 81–90
- Panzac, Daniel. 2003. *Le docteur Adrien Proust: père méconnu, précurseur oublié* (Paris: L'Harmattan)
- Panzac, Daniel. 2009. "Plague," in *Encyclopedia of the Ottoman Empire*, ed. Gábor Ágoston and Bruce Alan Masters, 462–63 (New York: Facts on File)
- Pawlowski, D. R., D. J. Metzger, A. Raslawsky, A. Howlett, et al. 2011. "Entry of *Yersinia pestis* into the Viable but Nonculturable State in a Low-Temperature Tap Water Microcosm," *PLoS ONE* 6, no.3: e17585
- Pezzoni, A. 1842. "Notice of Cases of Plague Contracted in the Lazeretto of Constantinople, in a Letter Addressed to Dr. Davy," *Medico-Chirurgical Transactions* 25: 167–91
- Pezzoni, A. 1847. *De la contagionabilité de la peste, fondée principalement sur les résultats obtenus par les quarantaines en turquie* (Constantinople: Impr. du Journal de Constantinople)
- Planhol, Xavier de. 1969. "Le boeuf porteur dans le proche-Orient et l'Afrique du nord," *Journal of the Economic and Social History of the Orient* 12: 298–321
- Pobst, Phyllis. 2013. "Should We Teach That the Cause of the Black Death Was Bubonic Plague?," *History Compass* 11: 808–20
- Pollitzer, R. 1951. "Plague Studies. 1. A Summary of the History and Survey of the Present Distribution of the Disease," *Bulletin of the World Health Organization* 4: 475–533
- Proust, Adrien. 1897. *La défense de l'Europe contre la peste: et la Conférence de Venise de 1897* (Paris: Masson)
- Raoult, D., N. Mouffok, I. Bitam, R. Piarroux, et al. 2013. "Plague: History and Contemporary Analysis," *Journal of Infection* 66: 18–26
- Robarts, Andrew. 2010. "A Plague on Both Houses? Population Movements and the Spread of Disease across the Ottoman-Russian Black Sea Frontier, 1768–1830s" (PhD dissertation, Georgetown University)
- Royer, Katherine. 2014. "The Blind Men and the Elephant: Imperial Medicine, Medieval Historians, and the Role of Rats in the Historiography of Plague," in *Medicine and Colonialism: Historical Perspectives in India and South Africa*, ed. Poonam Bala, 99–110 (London: Pickering & Chatto)
- Redhouse, Sir James W. 1880. *A Turkish and English Lexicon* (Beirut: Librarie du Liban)
- Russell, Alexander. 1794. *The Natural History of Aleppo. Containing a Description of the City, and the Principal Natural Productions in Its Neighbourhood; Together with an Account of the Climate, Inhabitants, and Diseases; Particularly of the Plague*, 2nd ed., 2 vols. (London: Millar)

- Russell, Patrick. 1791. *A Treatise of the Plague: Containing an Historical Journal, and Medical Account, of the Plague, at Aleppo, in the Years 1760, 1761, and 1762; Also, Remarks on Quarantines, Lazarettos, and the Administration of Police in Times of Pestilence. To Which Is Added, an Appendix, Containing Cases of the Plague; and an Account of the Weather, during the Pestilential Season* (London: Robinson)
- Sarı, Nil, and Şeref Etker. 2000. "19.yy. Başında İki İtalyan Hekimin Türkiye'de İlaç Araştırmaları," V. Türk Eczacılık Tarihi Kongresi (İzmir, May 25–26, 2000)
- Salkeld, D. J., and P. Stapp. 2006. "Seroprevalence Rates and Transmission of Plague (*Yersinia pestis*) in Mammalian Carnivores," *Vector Borne and Zoonotic Diseases (Larchmont, N.Y.)* 6: 231–39
- Schamiloglu, Uli. 1993. "Preliminary Remarks on the Role of Disease in the History of the Golden Horde," *Central Asian Survey* 12: 447–57
- Schamiloglu, Uli. 2004. "The Rise of the Ottoman Empire: The Black Death in Medieval Anatolia and its Impact on Turkish Civilization," in *Views from the Edge: Essays in Honor of Richard W. Bulliet*, ed. Nequin Yavari, Lawrence G. Potter, and Jean-Marc Ran Oppenheim, 255–79 (New York: Columbia University Press)
- Shefer-Mossensohn, Miri. 2009. *Ottoman Medicine: Healing and Medical Institutions, 1500–1700* (Albany: SUNY Press)
- Shefer-Mossensohn, Miri. 2012. "Communicable Disease in Ottoman Palestine: Local Thoughts and Actions," *Korot* 21: 19–49
- Simpson, William John Ritchie. 1905. *A Treatise on Plague, Dealing with the Historical, Epidemiological, Clinical, Therapeutic and Preventive Aspects of the Disease* (Cambridge: Cambridge University Press)
- Slack, Paul. 2012. *Plague: A Very Short Introduction* (Oxford: Oxford University Press)
- Sołtysiak, Arkadiusz. 2007. "Editorial," *Bioarchaeology of the Near East* 1: 1–3
- Stathakopoulos, Dionysios. 2000. "The Justinianic Plague Revisited," *Byzantine and Modern Greek Studies* 24: 255–76
- Stathakopoulos, Dionysios. 2004. *Famine and Pestilence in the Late Roman and Early Byzantine Empire: A Systematic Survey of Subsistence Crises and Epidemics* (Aldershot: Ashgate)
- Stathakopoulos, Dionysios. 2011. "Invisible Protagonists: The Justinianic Plague from a Zoocentric Point of View," in *Animals and Environment in Byzantium (7th–12th c.)*, ed. Ēlías Anagnōstákēs, Taxiarchēs G. Kollas, and Eutychia Papadopoulou, 87–95 (Athens: Centre for Byzantine Research, National Hellenic Research Foundation)
- Stearns, Justin K. 2009. "New Directions in the Study of Religious Responses to the Black Death," *History Compass* 7: 1363–75
- Stearns, Justin K. 2011. *Infectious Ideas: Contagion in Premodern Islamic and Christian Thought in the Western Mediterranean* (Baltimore: Johns Hopkins University Press)
- Stenseth, N. Chr., N. I. Samia, H. Viljugrein, K. Linné Kausrud, et al. 2006. "Plague Dynamics are Driven by Climate Variation," *Proceedings of the National Academy of Sciences* 103, no. 35: 13110–15

- Sticker, Georg. 1908. *Abhandlungen aus der Seuchengeschichte und Seuchenlehre* (Gießen: Töpelmann)
- Sussman, George D. 2011. "Was the Black Death in India and China?," *Bulletin of the History of Medicine* 85: 319–55
- Tafur, Pero. 1926. *Travels and Adventures, 1435–1439*, ed. Malcolm Letts (New York: Harper)
- Takeda, Junko Thérèse. 2011. *Between Crown and Commerce: Marseille and the Early Modern Mediterranean* (Baltimore: Johns Hopkins University Press)
- Talbi, Mohamed. 1981. "Laws and Economy in Ifrīqiya (Tunisia) in the Third Islamic Century: Agriculture and the Role of Slaves in the Country's Economy," in *The Islamic Middle East, 700–1900: Studies in Economic and Social History*, ed. Abraham Udovitch, 209–49 (Princeton: Darwin)
- Taşköprizade, Ahmed. 1875. *Risalah al-Shifa li-Adwa al-Waba'* ([Cairo]: al-Matba'ah al-Wahbiyah)
- Tholozan, Joseph Désiré. 1874. *Histoire de la peste bubonique en Perse; ou, Détermination de son origine, de sa marche, du cycle de ses apparitions et de la cause de sa prompte extinction* (Paris: Masson)
- Tran, T.-N.-N., M. Signoli, L. Fozzati, G. Aboudharam, et al. 2011. "High Throughput, Multiplexed Pathogen Detection Authenticates Plague Waves in Medieval Venice, Italy," *PLoS ONE* 6, no. 3: e16735
- Ünver, Süheyl. 1935. "'Türkiyede Veba (Taun) Tarihçesi Üzerine," *Tedavi Kliniği ve Laboratuvarı Mecmuası* 5: 70–88
- Valli, Eusebio. 1805. *Sulla peste di Costantinopoli del MDCCCIII; giornale* ([Mantova?]: Società tip. all'Apollo)
- Varlık, Nükhet. 2011. "Conquest, Urbanization, and Plague Networks in the Ottoman Empire, 1453–1600," in *The Ottoman World*, ed. Christine Woodhead, 251–63 (New York: Routledge)
- Varlık, Nükhet. Forthcoming. *Plague and Empire in the Early Modern Mediterranean World: The Ottoman Experience, 1347–1600* (Cambridge: Cambridge University Press)
- Vogler, A. J., F. Chan, D. W. Wagner, P. Roumagnac, et al. 2011. "Phylogeography and Molecular Epidemiology of *Yersinia pestis* in Madagascar," *PLoS Neglected Tropical Diseases* 5, no. 9: e1319
- Walløe, Lars. 2008. "Medieval and Modern Bubonic Plague: Some Clinical Continuities," in *Pestilential Complexities: Understanding Medieval Plague*, ed. Vivian Nutton, 59–73 (London: Wellcome Trust Centre for the History of Medicine at University College London)
- White, Sam. 2010. "Rethinking Disease in Ottoman History," *International Journal of Middle East Studies* 42: 549–67
- White, Sam. 2011. *The Climate of Rebellion in the Early Modern Ottoman Empire* (Cambridge: Cambridge University Press)
- WHO [World Health Organization]. 1999. "Plague Manual: Epidemiology, Distribution, Surveillance and Control" WHO/CDS/CSR/EDC/99.2
- WHO [World Health Organization]. 2012. "Guidance on Regulations for the Transport of Infectious Substances 2013–2014 (Applicable as from 1 January 2013)" WHO/HSE/GCR/2012.12

- Wittman, William. 1804. *Travels in Turkey, Asia Minor, Syria, and across the Desert into Egypt during the Years 1799, 1800, and 1801, in Company with the Turkish Army, and the British Military Mission. To Which Are Annexed, Observations on the Plague, and on the Diseases Prevalent in Turkey, and a Meteorological Journal* (Philadelphia: Humphreys)
- Wrobel, Murray (ed.). 2006. *Elsevier's Dictionary of Mammals* (Amsterdam: Elsevier)
- Yıldırım, Nuran. 2010. *A History of Healthcare in Istanbul: Health Organizations, Epidemics, Infections and Disease Control, Preventive Health Institutions, Hospitals, Medical Education* (Istanbul: Istanbul University)
- Yılmaz, Coşkun, and Necdet Yılmaz, (eds). 2006. *Osmanlılarda Sağlık*, 2 vols. (Istanbul: Biofarma)
- Ziegler, Philip. 1969. *The Black Death* (New York: Harper & Row)

Nükhet Varlık (varlik@andromeda.rutgers.edu) is Assistant Professor of History at Rutgers University-Newark in New Jersey. She studies the early modern history of medicine, epidemic diseases, and the rise of public health in the Mediterranean world. She is the author of several articles and her first book, entitled *Plague and Empire in the Early Modern Mediterranean World: The Ottoman Experience, 1347–1600*, is forthcoming from Cambridge University Press. She is also editing a collection of articles entitled *Plague and Contagion in the Islamic Mediterranean* (contracted by Ashgate Press). In conjunction with this research, she teaches courses on epidemic diseases in world history, with a particular focus on plague. In her teaching, she incorporates research findings from bioarcheology, genetics, and climate history. She is the recipient of an NEH Fellowship for study at the American Research Institute in Turkey, a Senior Fellowship from Koç University's Research Center for Anatolian Civilizations, and a Turkish Cultural Foundation Post-Doctoral Fellowship. She holds a PhD from the University of Chicago.

Abstract Reconstructing the Ottoman plague experience is vital to understanding the larger Afro-Eurasian disease zone during the Second Pandemic. This essay deals with two different aspects of this experience. On the one hand, it discusses the historical and historiographical problems that rendered this epidemiological experience mostly invisible to previous scholars of plague. On the other, it reconstructs the empire's plague ecologies, with particular attention to plague's persistence, focalization, and transmission. Further, it uses this epidemiological experience to offer new insights and complicate some commonly held assumptions about plague history and its relationship to plague science.

Keywords Anatolia, Black Death, Mediterranean, pandemic, periodization, hyena, *Ciconia ciconia*.

THE MEDIEVAL GLOBE

The Medieval Globe provides an interdisciplinary forum for scholars of all world areas by focusing on convergence, movement, and interdependence. Contributions to a global understanding of the medieval period (broadly defined) need not encompass the globe in any territorial sense. Rather, *TMG* advances a new theory and praxis of medieval studies by bringing into view phenomena that have been rendered practically or conceptually invisible by anachronistic boundaries, categories, and expectations. *TMG* also broadens discussion of the ways that medieval processes inform the global present and shape visions of the future.

Submissions are invited for future issues. Please contact the Editorial Board (medievalglobe@illinois.edu). All articles will be evaluated by the editors and by a double-blind peer review process. For more information about *TMG*, with further details about submissions and peer review policy, please visit the journal's website: www.arc-humanities.org/the-medieval-globe.html.



The mark of *The Medieval Globe* was designed by Matthew Peterson and draws on elements derived from six different medieval world maps.

Executive Editor

Carol Symes, *University of Illinois at Urbana-Champaign*

Editorial Board

James Barrett, *University of Cambridge*
Kathleen Davis, *University of Rhode Island*
Felipe Fernández-Armesto, *University of Notre Dame*
Elizabeth Lambourn, *De Montfort University*
Yuen-Gen Liang, *Wheaton College*
Victor Lieberman, *University of Michigan at Ann Arbor*
Carla Nappi, *University of British Columbia*
Elizabeth Oyler, *University of Illinois at Urbana-Champaign*
Christian Raffensperger, *Wittenberg University*
Rein Raud, *University of Helsinki & Tallinn University*
D. Fairchild Ruggles, *University of Illinois at Urbana-Champaign*
Alicia Walker, *Bryn Mawr College*