

INFECTIOUS DISEASES IN HISTORICAL PERSPECTIVE: FRENCH POX *VERSUS*
VENEREAL SYPHILIS

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Infectious Diseases in Historical Perspective: French Pox *Versus* Venereal Syphilis

Abstract

Medical historiography has tended to almost automatically identify the disease that entered European medical and lay writings at the end of the 15th century as *morbis gallicus* with the present-day condition known as “venereal syphilis.” This identification, which goes back to the invention, in 1530, of the term syphilis as a synonym for *morbis gallicus* by Girolamo Fracastoro, has been retained by many 19th- and 20th-century medical historians, and there are many still today who, in looking at past medical and lay descriptions of that condition, have systematically practiced retrospective diagnosis of syphilis. In this work, I will claim that identifying today’s “venereal syphilis” with the *morbis gallicus* of the past is problematic because these labels involve diseases related to radically different medical frameworks — namely, the Hippocratic Galenic humoral paradigm and the bacteriological one — that are incommensurable with each other. Subsequently, I claim that, because of the lack of use of the term syphilis until the 19th century, Fracastoro cannot be considered but a historiographic artifact in the history of “venereal syphilis.”

1 Introduction¹

Medical historiography has tended to almost automatically identify the disease that entered European medical and lay writings at the end of the 15th century as *morbis gallicus* with the present-day condition known as “venereal syphilis.” This identification, which goes back to the invention, in 1530, of the term syphilis as a synonym for *morbis gallicus* by Girolamo Fracastoro (c. 1478–1553), has been retained by many 19th- and 20th-century medical historians, and there are many still today who, in looking at past medical and lay descriptions of that condition, have systematically practiced retrospective diagnosis of syphilis.

In this work, I will claim that identifying today’s “venereal syphilis” with the *morbis gallicus* of the past is problematic because these labels involve diseases related to radically different medical frameworks — namely, the Hippocratic Galenic humoral paradigm and the bacteriological one — that are incommensurable with each other.

2 Medicine and Disease in Historical Perspective

The twentieth-century successes of biomedicine have facilitated the naturalization of its representations of diseases and their causes not only in the Western world, but also throughout the rest of the planet, under the hegemony of its scientific culture. Indeed,

it is commonly assumed that such naturalized representations constitute the culmination of a long historical process through which modern biomedical research has reached the best understanding of human disease and nature, if not the only acceptable one.

This perception, which derives from the new medical practices established in the course of the 19th century, has had an enormous impact on the reconceptualization of human diseases. It also led to a subsequent reconstruction of medical history as a process of acquiring knowledge and practices leading to the present through a linear, progressive and inexorable way. Despite having ceased to be incontestable since the 1920s because of the imprint of different innovative trends in the human and social sciences,² it still persists, and has even gained new vigor in recent times in certain historical research areas, such as that on infectious diseases. Hence, the identity of past infectious diseases has continued, through the present day, to be a historiographic and epistemic question subjected to endless controversy.

Two major epistemic processes played an essential role in the paradigm shift that took place in Western medical tradition during the course of the 19th century: the replacement of an Aristotelian causal system by a Newtonian-Laplacian system, and the development of a new form of medicine based on experimental laboratory research. Then, university medicine belonging to the Old Regime societies was gradually replaced by a new “medical science” that was built and practiced in bourgeois societies according to the philosophical principles of scientific positivism.

“Old” medicine conformed to a pattern of practices related to disease and health, which began to develop in the 11th century with the reintroduction into Latin Europe of Roman law, Aristotelian philosophy, and the Hippocratic-Galenic medical tradition. Through successive reformulations in the course of subsequent centuries, this form of medicine maintained an indisputable dominance in Europe until the end of the 16th century. Moreover, in many respects, its conceptions (its views of causality and vitalist principles, among others) still continued to have a persistent influence in the early 19th century.

The new medicine consolidated its hegemony by leaning on natural sciences (physics, chemistry, and biology), a set of increasingly mathematized experimental disciplines that arose from the transformation of the social and intellectual conditions of the cultivation of natural philosophy at the beginning of the 19th century. For the first time in its rather long history, university medicine relied on unanimously assumed concepts

and methods, instead of being subject to agreements or disagreements among different schools and teachers. These constitutive features continue to be recognizable in current biomedical science.

3_Ways of Approaching the History of Syphilis

According to a common interpretation, the history of syphilis began in the mid-1490s with the irruption of *morbus gallicus* in Italy, followed by a rapid spread throughout Europe during subsequent years. Thus, though neither its geographical origins nor its precise onset date has yet been firmly established, it might be traced throughout the ensuing centuries until today. Since the European Enlightenment, both questions of origin and onset date have been the object of continuous — and often tart — controversy between defenders of the position that syphilis has an American origin, and those who claim that syphilis existed in the Old World long before Columbus arrived in the New World. In this ongoing debate, the most varied documentary proofs (medical and lay writings, iconography) and — increasingly since the late 19th century — material proofs (paleopathological remains) have been provided to substantiate the arguments through retrospective diagnosis. However, in claiming that present venereal syphilis was already known and described under several names before or after the Europeans' arrival in America, historians' contradictory conclusions have served only to keep alive the so-called dispute over syphilis.³

Beginning mostly in the 1960s, a second manner of approaching the history of syphilis has also been developed. This approach lies in studying the disease and the germ responsible for it in a broader biological and epidemiological context, that of the human treponematoses, by integrating the results from both paleopathological and historico-epidemiological research.⁴

A third approach leans on the assumption that, in looking at what we now call infectious diseases, we should distinguish between what may be called disease entities and the diseases themselves. As disease entities, infectious diseases took their present shape in late 19th- and early 20th-century western European medicine only because of the development of germ theory. By contrast, as diseases in themselves, they have existed for a much longer time. Moreover, infectious diseases cannot be regarded as natural beings in the same way as can the microbiological pathogens causing them,⁵ but instead should be considered a phenomena resulting from a dynamic interaction among specific hosts,

parasites, and environments in the course of time.⁶ Any such interaction having occurred in the past cannot be reproduced under experimental conditions, nor is it easy to reconstruct historically. Even assuming that the plurality of current approaches to the history of the disease is plausible and fruitful, I have chosen to follow this third approach which is based on social and cultural history, for my concern is primarily about how and why different social groups belonging to specific historical communities perceived and reacted to the outbreak and spread of transmissible conditions: in this case, the venereal disease.

I will thus deal with the history of syphilis by tracing the word “syphilis” and its changing medical meanings through the times. It means contemplating the disease entity called syphilis in the strict historical-cultural context in which it occurs, and from which alone it receives its true significance. This implies a renunciation of retrospective diagnosis of syphilis on the following three assumptions. First, every disease entity is an intellectual construction peculiar to some form of medicine. Second, every form of medicine is merely a historical variable in any human community. And third, an essential incommensurability exists between the ways in which university physicians conceived of infectious disease prior to the 19th century, and the manner by which the followers of new medical science — consolidated throughout that century — conceived of it. Indeed, the disease entity now known as venereal syphilis is a paradigmatic example at this point, as the Jewish-Polish microbiologist Ludwik Fleck (1896–1961) showed in a 1935 monograph which has received renewed interest since the late 1970s.⁷

To be precise, venereal syphilis only took shape in Western scientific medicine as a result of deep intellectual and social changes during the second half of the 19th and the first decade of the 20th centuries, most specifically via the germ theory. On the other hand, a wide historico-bibliographical survey on venereal diseases, verifies that the term syphilis, though invented by Fracastoro in the 16th century, did not become widely used until the late 18th or early 19th century.⁸ Thus, it is anachronistic both to refer to a disease entity named syphilis before that time, and to the disease entity closely related to or now called venereal syphilis before the late 19th or early 20th century.

Let us now consider the origins, emergence, and development of the concept of syphilis. Because of the above-mentioned reasons, the disease entity which began to be called *morbis gallicus* in late 15th-century Europe cannot be identified with syphilis,

but only the earliest identifiable conceptual ancestor of the disease entity today called venereal syphilis.⁹

4 The Construction of French or Venereal Disease in the Pre-bacteriological Era¹⁰

Around 1495, the phrase *morbus gallicus* (“French disease,” or *mal francese* in Italian) began to spread among medical practitioners as well as lay people in Italy to refer to a disease apparently unknown until then, which soon became a social and public health issue of the first order throughout Europe. Its victims, who belonged to all social classes, suffered intense pains in bones and joints as well as ulcers and pustules on skin and mucous membranes. The latter signs gave them a deformed and repulsive appearance, which led to social stigmatization.

Initially, disparate ideas began to circulate in Italy and other parts of Europe both about the nature of the scourge — then perceived as a new pestilence — and its causes: divine punishment, corruption of the air, evil heavenly constellations, inadequate life regime, and so on. The chronic and progressively disabling nature of the new disease gave rise to the development of a large number of social and healthcare responses of private and public nature, and generated processes of social inclusion/exclusion.

Morbus gallicus was also given other names, according to such varied parameters as its striking skin signs (*Große Blattern* in German, *great pox* in English); its supposed exogenous origin (*morbus Napolitanus*, *scabies Hispanica*, *morbus Christianorum*, *morbus Turcarum*); the social sectors wherein it proliferated (*morbus curialis*); the patron saint to whom the sick were entrusted (*male de Santo Job*); or the presumed novelty of the condition (*pu dendagra* or *patursa* [*passio turpis saturnina*]). While most of these names for the new disease were consistent with the authoritative views of the ancient Greek physician Galen of Pergamon (129–c. 201/216), the latter two neologisms emulated the naming practices of Roman natural historian Pliny the Elder (23/24–79), who proposed the name *mentagra* (i.e., chin disease) for the condition the Greeks called *lichenes* as well as the rather mysterious *gemursa*.¹¹ However, none of these alternative names reached anywhere near the popularity of the label “French disease” throughout different European languages.

The early acceptance of sexual contagion as its dominant mode of transmission way might explain that the new condition was also called “disease of the seed” (*mal del sement*) in the Crown of Aragon by 1500. And while popularized earlier among French

authors — probably in response to the infamous “French disease” label that had spread so quickly over the rest of Europe — designations like “venereal disease” (*morbus venereus*, *maladie vénérienne*) or “venereal plague” (*lues venerea*) only began to spread more broadly throughout Europe from the late 1520s onward.

Though the appellations *morbus gallicus* and *lues venerea* received equally high ranking among titles for the new disease during the 17th century, *lues venerea* surpassed the former label in popularity during the first half of the 18th century, and the use of *morbus gallicus* began a gradual decline in the medical world (though not in the literary one). In the 18th century, however, *morbus gallicus* referred — in the manner of the contemporary classifications of the animal and plant kingdoms — to a morbid “genus” with different species of “venereal diseases” (*morbi venerei*). The prestigious French royal physician and anatomy professor Jean Astruc (1684–1766) grouped them under two major headings in his influential, oft-republished work, *De morbis venereis*.¹² On the one hand, he referred to the “incipient venereal plague” (*lues venerea incipiens*), including “species” like “gonorrhoea” (*gonorrhoea*), “venereal buboes” (*bubones venerei*), and “warts” (*porri*). On the other hand, Astruc grouped within the category of “confirmed venereal plague” (*lues venerea confirmata*) a long list of conditions typical of a “generalized venereal disease” (*morbus venereus universalis*) that might appear everywhere in the diseased body.

Whether venereal disease was caused by an animated contagion (*contagium animatum*) in line with Girolamo Fracastoro’s successful systematization of Galenic ideas, or by a chemical poison in line with new fermentative theories held by some innovative doctors of that era, until the mid-18th century most European medical thinkers defended the unity of *lues venerea* on the basis of a specific “virus” (*virus venereum*).¹³ After 1750, however, this unified concept began to be challenged by a number of pathologists who — with the support of clinical observations, anatomical analyses, and inoculation experiments — began to question whether *lues venerea* was a single disease entity after all. As a result of this challenge, the expression *lues venerea* began to disappear from medical literature. While it did not vanish until the nineteenth century, it was gradually replaced by the plural phrase “venereal diseases” (*morbi venerei*), which had emerged at the beginning of the 18th century. At about the same time, specific denominations given to different “venereal diseases” (chancre, gonorrhoea, bubo, and syphilis, among others) started to appear with increasing frequency. From the early 19th century, the

number of medical works devoted to certain diseases among these — mainly gonorrhoea and syphilis — did not stop growing.

During the period 1750–1850, specialized hospitals emerged, including those for the treatment of venereal disease, and dermato-venereology was born as a medical specialty. Enlightenment controversy over *lues venerea* eventually concentrated on whether blennorrhagic discharge (usually called gonorrhoea) constituted a different disease entity, or just a peculiar clinical stage of *lues venerea*.¹⁴ The beginning of this process of disease differentiation may be found in the influential work *De sedibus et causis morborum per anatomen indagatis* of Giovanni Battista Morgagni (1682–1771).¹⁵ He found that patients with blennorrhagic discharge and no evidence of chancre rarely had a hidden chancre, which was supposed to provoke the discharge in the first place.¹⁶

In the following decades, physicians argued the single or dual nature of *lues venerea*. The controversy lasted well into the 19th century, in part because of a tremendous ambiguity in the vocabulary of venereal complaints. Though the term “syphilis” became almost dominant after the 1820s, it nonetheless sometimes appeared as an alternative to or complementary to “venereal disease.” Furthermore, the controversy over whether venereal disease was a single disease entity or several illnesses was only settled in the 1830s by French venereologist Philippe Ricord (1799–1889). During the seven years between 1831 and 1837, he developed a vast clinical and experimental program at the Paris Hôpital du Midi, including both the systematic use of *speculum uteri* and more than 2,500 auto-inoculation experiments on venereal patients with their own pus. One year later, he presented the results and conclusions in the *Traité pratique sur les maladies vénériennes, ou recherches critiques et expérimentales sur l'inoculation appliquée à l'étude de ces maladies*,¹⁷ demonstrating the existence of the *virus syphilitique*, and thereby definitively separating chancre and blennorrhagia (or gonorrhoea) from it. Moreover, Ricord distinguished primary lesions from others, and proposed the division of syphilis symptoms into primary, successive, secondary, transitional, and tertiary.

Ricord's concept of syphilis was reshaped over the course of the 19th century with the emergence of other sexually transmitted disease entities such as gonorrhoea, chancroid, lymphogranuloma venereum, genital herpes, venereal warts, and others, yet all of these were characterized according to clinical criteria, and none received its current “identity card” until its specific pathogen was isolated.

Gonorrhea and chancroid are two illustrative samples in this respect. Ricord, who had definitely separated chancre and blennorrhoea, asserted that the latter might be the result of local irritation, excessive sexual intercourse, or exorbitant sexual excitement. Albert Neisser (1855–1916) completed the clinical picture of gonorrhea in 1879, when he isolated its pathogen — the gonococcus. For its part, chancroid or “soft sore” (*ulcus molle*) emerged as a disease entity in 1852, when Ricord’s pupil Léon Bassereau (1810–1887) demonstrated by means of inoculation experiments that the two kinds of luetic chancre — one hard, painless, and unique; the other soft, painful and frequently multiple — resulted from exposure to a similar lesion. Yet, it was not until 1889 when August Ducrey (1860–1940) identified the bacillus responsible for chancroid.¹⁸

Finally, the concept of syphilis changed profoundly during the second half of the nineteenth century, when the disease became a major research area in western medicine. French venereologist Jean-Alfred Fournier (1832–1914) perhaps contributed most in developing the concept of syphilis during this period. He propounded the idea of latency in both acquired and congenital syphilis, established the relationship between syphilis and parasymphilitic affections (mainly *tabes dorsalis* and general paresis of the insane), and began social medical campaigns against the disease.

The syphilis pathogen, however, was not discovered until 1905, when Fritz R. Schaudinn (1871–1906) and Erich Hoffmann (1868–1959) first isolated it from a secondary lesion at Berlin Charité Hospital. In 1906, the collective work of August von Wassermann (1866–1925), Albert Neisser, Carl Bruck (1879–1944), and others made possible the first serologic procedure to diagnose syphilis: the complement-fixation test, later known as the Wassermann Reaction (WR). In subsequent years, *Treponema pallidum* was also found in tertiary lesions, verifying Fournier’s theory: in 1906, Karl Reuter found the pathogen in a syphilitic aorta, whereas in 1913 Hideyo Noguchi (1876–1928) proved its presence in brain tissue from patients suffering partial paralysis.

5_Venereal Syphilis and the Bio-evolutionary History of Human Treponematoses

Thus far, I have focused on the historical construction process of syphilis as a chronic infectious disease caused by the bacterium known as *Treponema pallidum*. This condition is part of the epidemiological group of “sexually transmitted diseases” (STDs) — formerly, the so-called “venereal diseases” — by virtue of its predominant mode of

transmission, since syphilis can be also communicated by other forms of contact, including intrauterine communication through the placenta. Now, I will dedicate some words to the biological and epidemiological history of syphilis in the broader context of human treponematoses.

The pathogen of syphilis is a bacterium belonging to the *Spirochetales*, an order described in 1855 by the German naturalist Christian Gottfried Ehrenberg (1795–1876) that has three pathogenic *genera* for humans and some other animals, namely *Borrelia*, *Leptospira*, and *Treponema*. *Borrelia* genus includes the pathogens causing Vincent’s angina (*Borrelia recurrentis*), relapsing fever (*Borrelia vincentii*), and Lyme disease (*Borrelia burgdorferi*); and *Leptospira* is the causal germ of human leptospirosis. *Treponema* genus, however, has a variety of pathogenic species and subspecies, among them the *Treponema pallidum* species (TP). This has four subspecies causing human diseases, namely (from oldest to newest), pinta (*TP subsp. carateum*), a skin disease that is endemic in Central and South America; yaws (*TP subsp. pertenue*), a disease of skin and bones occurring in rural populations of the humid tropics; bejel or endemic syphilis (*TP subsp. endemicum*), similar to yaws, but only occurring in warm, arid climates; and venereal syphilis (*TP subsp. pallidum*), a condition that may affect any bodily tissue including internal organs, and has no climatic restrictions.¹⁹ All four conditions are distinct each other in their age, clinical signs, and means of contagion, and their pathogens are undistinguishable from each other in morphological and serological terms (they elicit the same immunologic reactions) as well as susceptible to penicillin. Furthermore, though there is also a high degree of genetic similarity among all the TP subspecies, their genetic footprints are different.²⁰

Since the 1960s, the origin and evolution of human treponematoses were a fertile research field in which renowned scholars like E. H. Hudson (1890–1992), Thomas Aidan Cockburn (1912–1981), R. R Willcox (d. 1985), C. J. Hackett (1905–1995), and Alfred W. Crosby (1931–2018) contended each other in defense of different theories (New World *versus* Old World origin of venereal syphilis, unitarian *versus* non-unitarian cause for all venereal and non-venereal treponematoses), making most valuable contributions.²¹ Since the late 1980s, the development of molecular biology technologies, mostly “polymerase chain reaction” (PCR), has furthered research in the area. These new technologies have led to track traces of the *Treponema* genus in the broadest biological and epidemiological context of human treponematoses’ bio-evolution at a

worldwide scale; and the new results coming from the molecular genetic studies are being integrated with those from paleopathology and historical-epidemiology. The sequencing of the complete genome of *Treponema pallidum* about twenty years ago was a landmark in this new research stage on the biological and epidemiological history of venereal syphilis and human treponematoses.²² Rather interestingly, however, the old controversy on the Columbian versus pre-Columbian origin for syphilis continues to live on nowadays in the unfinished debate on the unitarian *versus* non-unitarian origin of treponematoses.²³

6_Fracastoro, Inventor of the Word “Syphilis”

At this point, the question remains as to the real role of such a glorified figure as Girolamo Fracastoro (1478–1553) in the history of syphilis. The contributions of this Italian doctor and polymath humanist, in this respect, are limited to having been the inventor of the word “syphilis,” and having allegedly proposed the theory of “animated contagion.”

Fracastoro put the name “syphilis” in print for the first time in the title of his work *Syphilis, sive morbus gallicus*,²⁴ an elegant Latin poem, in which he sang of the new and terrible disease of his time, exposing, with the help of various myths, his ideas about the nature, origin, causes, clinical signs, treatment, and prevention of it. The neologism derived from the name of the protagonist of the poem, the shepherd *Syphilus*, who Fracastoro presented as the first victim of this new scourge, sent by the gods to the infidels as punishment for having diverted from the cult of the Sun to King Alcitoo. Some years later, Fracastoro also used the expression *syphilis morbus* as a synonym for the new disease within his Latin medical work *De contagione et contagiosis morbis et eorum curatione*.²⁵

In this work, Fracastoro also exposed his view of “animated contagion” (*contagium animatum*), and applied it to most prominent communicable diseases of his time. In reality, Fracastoro’s view was a Renaissance-era systematic reformulation of the doctrine of the “seeds of disease,” which Galen had developed under great influence of Lucretius’s atomism.²⁶ According to this doctrine, such contagious diseases as were not transmitted by contact were spread by “seeds” (*semina*) present in and spread through the air. Fracastoro’s idea of “animated contagion” led the founding fathers of

microbiology to claim him as the forerunner of bacteriological theory, an *avant-la-lettre* bacteriologist on the path of a scientific genealogy which also includes other illustrious medical researchers and naturalists such as Anton van Leeuwenhoek (1632–1723), Francesco Redi (1626–1697), Lazzaro Spallanzani (1729–1799), and Ignaz Semmelweis (1818–1865).²⁷ By means of this historical genealogy, bacteriologists aimed to legitimize their “germ theory” of infectious diseases. The new theory postulated the existence of a biunivocal association between each infectious condition and a specific pathogen. This contrasted with the causal environmentalist views until then predominant in the field of medicine and public hygiene. These views associated infectious diseases with miasmatic particles that contaminated different media (air, water, soils, etc.) and caused the corruption of organic matter with a subsequent proliferation by spontaneous generation of microorganisms in putrefactive matter.

Therefore, in the history of “venereal syphilis” and the germ theory, Fracastoro, despite his fame, cannot be considered but a historiographic artifact. The cultural fortune of his poem *Syphilis, sive morbus gallicus* is just an excellent example of how a “false friend” — syphilis — found its way to call the core disease in dermato-venereology, a modern specialty that developed only in the context of 19th-century European medicine. Furthermore, Fracastoro’s current renown dates from the end of the 19th century, not before; finally, the numerous editions and translations of Fracastoro’s famous poem into various modern languages have likewise multiplied his impact.

7_Concluding Remarks

In this work, I have shown, through examining the case of *morbus gallicus* or venereal disease versus syphilis, certain complexities of historiographical and epistemic nature that are inherent to retrospectively diagnosing, in modern medical terms, historical diseases based on written historical sources. On the one hand, there is an incommensurability of past accounts of infectious human diseases — and more generally, internal conditions — with modern ones. Both these conditions are inscribed in different conceptual frameworks, while the rationality of the diagnosis is only understandable in terms of the applied theory, and disease and illness narratives frequently change meaning for their contemporaries.²⁸ On the other hand, as I showed in a previous work, labeling infectious diseases of pre-modern Europe using current biomedical terms in-

volves, at least, a double cultural translation, as historians tend to resort as complementary sources, to 18th- and 19th-century historical epidemiology treatises — often encyclopedic works — that were written prior to the bacteriological era.²⁹ Their authors (mostly physicians) have usually gathered huge documentary masses relative to the history of great infectious plagues — such as the black plague, smallpox, yellow fever, cholera, typhus, tuberculosis, and venereal diseases — in search of clues for better understanding the diseases of their current professional concerns, which they conceive from miasmatic (i.e., environmental, not bacteriological!) causative frameworks. In terms of historical analysis, the relevance of this can be neither ignored nor trivialized.

Moreover, new molecular biology technologies, particularly the PCR, are being applied with increasing profusion since the late 1980s to analyze genetic sequences preserved in the bones and teeth of human skeletal remains, in order to shed new light on identity of the diseases of past populations. Without a doubt, the critical and rigorous use of biomolecular technologies may provide valuable research evidence aimed at reconstructing, in current medical terms, the epidemiology of past human communities. Furthermore, the new findings, duly correlated with the information provided by other types of historical sources, may make it possible to substantially review humankind's historic and prehistoric past, including its diet and its prevalent diseases.³⁰ Yet scholars (historians, archaeologists, anthropologists, paleo-pathologists, and so on) do not always use these new technologies with their due methodological rigor: sometimes, they extrapolate the results in an abusive way, establishing conclusions that lack sufficient empirical basis. Other times, they raise excessive expectations about the reliability of genetic-molecular methods to set for a retrospective diagnosis of the pathogens involved in the past plagues.³¹ Thus, it is no wonder that debates recur between “believers” and “skeptics” as to whether any particular past disease was caused by one specific pathogen or another.³²

Last but not least, it is worth remembering that the identities of past plagues or pestilences cannot be addressed by merely identifying their presumed specific pathogens. The factors outlining the clinical and epidemiological peculiarities of infectious diseases in human communities are numerous, complex, and dynamic, insofar as infections are bioevolutionary expressions of parasitic interactions between living beings within specific natural and social environments, which are subject to innumerable

changes (climate, natural disasters, human action, and so on). The case of the human treponematoses may be exemplary of this point.

Endnotes

- ¹ This essay is based on the article “Syphilis” I published in *The Cambridge World History of Human Disease*, ed. Kenneth F. Kiple (Cambridge: Cambridge University Press, 1993), 1025–1033, <<https://doi.org/10.1017/CHOL9780521332866.196>>. The argument I am making in this essay engages with and builds on my prior research. Thus, I have reused parts of the contents of the article and, in particular, section _3 and _4 of this essay draw directly on that earlier text.
- ² Jon Arrizabalaga, “La conceptualización de las enfermedades en la historiografía médica contemporánea,” in *Lengua de la ciencia e historiografía*, eds. Cecilio Garriga Escribano and José Ignacio Pérez Pascual (A Coruña: Universidade da Coruña, 2016), 11–24.
- ³ Francisco Guerra, “The Dispute over Syphilis: Europe versus America,” in *Clio Medica* 13 (1978), 39–61.
- ⁴ R. R. Willcox, “Evolutionary Cycle of the Treponematoses,” in *British Journal of Venereal Diseases* 36.2 (1960), 78–91; C. J. Hackett, “On the Origin of the Human Treponematoses: Pinta, Yaws, Endemic Syphilis and Venereal Syphilis,” in *Bulletin of the World Health Organization* 29.1 (1963), 7–41; E. H. Hudson, “Treponematosis and Anthropology,” in *Annals of Internal Medicine* 58 (1963), 1037–1048; E. H. Hudson, “Treponematosis and Man’s Social Evolution,” in *American Anthropologist* 67.4 (1965), 885–901; Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, Conn.: Greenwood Press, 1972); Corinne S. Wood, “Syphilis in Anthropological Perspective,” in *Social Science and Medicine* 12 (1978), 472–484; Brenda J. Baker et al. “The Origin and Antiquity of Syphilis: Paleopathological Diagnosis and Interpretation [and comments and reply]”, in *Current Anthropology*, 29.5 (1988), 703–737.
- ⁵ Lawrie Reznick, *The Nature of Disease* (London and New York: Routledge & Kegan Paul, 1987).
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- ⁷ Ludwik Fleck, *Genesis and Development of a Scientific Fact* (Chicago: Chicago University Press, 1979).
- ⁸ J. K. Proksch, *Die Literatur über die venerischen Krankheiten von den ersten Schriften über Syphilis aus dem Ende des fünfzehnten Jahrhunderts bis zum Jahre 1889* (Bonn: P. Hannstein, 1889–1900).
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