

# On issues concerning the European syphilis epidemic of the late 15th to early 16th centuries

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## Abstract

Syphilis is one of the most common and significant diseases among sexually transmitted infections. Despite prolonged study of the disease, a number of questions concerning its pathogenesis, particular features of its clinical progression and also its origin remain the subject of discussion to the present day. Until now, there has been no single point of view on the cause of the syphilis epidemic in Europe at the turn of the 15th to 16th centuries, and European and American theories for the origin of syphilis are backed by an approximately equal number of scientists. Supporters of each of the theories put forward reasoned arguments and historical evidence. At first glance, it may seem that these theories are mutually exclusive and that recognizing one of them leads to an automatic rejection of the other, but this is not so. The American and European theories do not contradict but complement each other. According to the authors of this article, the American theory reflects one page in the long history of the evolution of syphilis. An analysis of the facts presented by each theory’s supporters suggests that syphilis in Europe and around the world, including in America, has existed since ancient times. As a result of evolution, in accordance with different environmental conditions, the population of syphilis pathogens differed from one another in different geographic zones. In this regard, an unusual population of *Treponema pallidum* brought by Columbus, sailors to Europe became the cause of mass cases of severe and rapidly spreading syphilis.

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## Keywords

syphilis, medical history, Columbus, America, Europe, the epidemic situation

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Syphilis is one of the most prevalent sexually transmitted diseases. Despite the prolonged study of the disease, a number of questions concerning its pathogenesis, the features of its clinical progression and its origin remain the subject of discussion to the present day. There has been no consensus on the cause of the syphilis epidemic in Europe at the turn of the 15th century. The differing European and American theories on the origin of syphilis are held by approximately equal numbers of scientists, each putting forward reasoned arguments and historical evidence to support their views. At first glance, it may seem that these theories are mutually exclusive, but in fact, they complement rather than contradict each other. According to the authors of this article, the American theory represents only one page in the long history of the evolution of syphilis. An analysis of the

facts presented by each theory’s supporters suggests that syphilis in Europe and around the world, including in America, has existed since ancient times. As a result of evolution, in accordance with different environmental conditions, the populations of syphilis pathogens have differed from one another in different geographic zones. An unusual strain of *Treponema pallidum* brought by Columbus’s sailors back to Europe caused a severe and rapidly spreading syphilis epidemic.

Syphilis, as one of the most prevalent sexually transmitted diseases, remains at the centre of attention of venereologists and related specialists. Despite the long period that the disease has been studied, many questions concerning its pathogenesis, the characteristics of its course and its origin have yet to be fully elucidated. One topic of discussion remains the emergence of

syphilis in Europe at the turn of the 15th century. The main theories addressing this question – European and American – have approximately the same number of supporters who each put forward strong arguments in favour of their own points of view. The European camp argues that syphilis in Europe has existed for a long time (Hensler 1762; Proksch 1889; Rokhlin and Rubasheva 1934; Borzov 1936). They cite the attestations of ancient doctors – Celsus, Galen, Hippocrates – on the pathology of the skin, mucous membranes and internal organs similar to those of syphilitic lesions; ancient writings of Asia and the East which describe diseases resembling syphilis, and the results of archaeological excavations, in which detected lesions of the skeleton are regarded by many as syphilitic. Proponents of the American theory of the origin of syphilis point out that the emergence of the syphilis epidemic in Europe coincides with the return of Columbus's sailors from America, and also that European physicians were unaware of syphilis before the expedition (Montejo 1863; Bloch 1907; Bashenin 1955; Gromashevskiy 1965; Astvatsaturov 1971).

In the early 1960s, a theory of the origin of syphilis in Africa emerged, according to which the disease originated as an endemic treponematosis in Central Africa during the Neolithic Era and evolved in accordance with the development of human society: from non-venereal in the countryside, tropics and subtropics to the venereal in the city (Cockburn 1961; Hudson 1963). According to this theory, the causative agents of tropical treponematoses and syphilis should be considered different variants of the once widespread progenitor treponema.

At first sight, these theories may seem mutually exclusive. How can we combine them and reconcile the facts cited by their respective proponents? The analysis of pathology carried out by F. Burnett provides an interesting perspective (Bernet 1964). In his opinion, a disease is not static: its clinical course changes over time, and the disease evolves. A gradual mutual adaptation of macro- and microorganisms occurs, driving the microorganism into the saprophytic state, in which the infectious agent can exert only a weak damaging effect upon the host organism. I.V. Davidovsky, F.A. Simon and S. Nicole maintain a similar point of view (Davidovskiy 1933; Simon 1857; Nicolle 1939). According to V.M. Zhdanov, "the living conditions of the hosts are of decisive importance for the evolution of the parasite, and the rate of its evolution and its properties depend upon this" (Zhdanov 1964).

The duration of evolution varies in different microorganisms. F. Burnett notes that, for example, mankind is aware of the evolution of microorganisms such as herpes simplex virus and the causative agent of poliomyelitis (the course of which lessened in severity even before the introduction of vaccination) (Bernet 1964). Any microorganism can undergo such changes, gradu-

ally adapting to the host's organism. The fact that the decrease in virulence was noted only in some species of microorganisms shows only the different rates of their evolution. Regarding syphilis, Cardinal Pietro Bembo notes in his *History of Venice* that the severity and strength of the disease weakened significantly (Bembo 2011). The decrease of the severity of syphilis in the first decades of the 16th century, in comparison with the situation at the beginning of its outbreak, is also evidenced by Girolamo Fracastoro and other authors (Fracastoro 1984).

This evolutionary process can periodically be interrupted by larger or smaller increases in the pathogenicity of causative agents of various diseases, which may be due to a change in the habitat of the microbe. Its entry into a more auspicious environment can rapidly increase its severity (for example, the diseases of developed countries have been extremely severe in aborigines.)

In this respect, syphilis is not an exception. It may have originated many millennia ago, perhaps in Africa, and gradually spread across the globe. Due to the geographic isolation of certain areas (Haiti, for example), and the unique conditions of life of the external environment as well as the inhabitants, the evolution of the local spirochaetae population differed from that of populations in other geographic areas. As a result, there might be a gap in the pace of evolution or a decrease in the pathogenicity of *treponema pallidum*, or the population of syphilis causative agents, still decreasing in pathogenicity, would acquire new traits during its development, while losing some of its former traits.

In each of these cases, the spirochaete population differed from the spirochaetes of other geographic areas. The spirochaete population would not cause the local populace any unusually painful symptoms, as they were accustomed to the disease, but if representatives of these strains of *treponema pallidum* were transferred to another geographic area, into another external environment, the new host's reaction would be pronounced. L-forms of *treponema pallidum* do not cause the host organism any noticeable painful symptoms, but if it is transferred to a new host - for example, into rabbits that have not yet developed immunity – they become "aggressive" and virulent and cause the development of active syphilis (Collart 1962). This, apparently, explains the emergence and severity of the syphilis epidemic in Europe, coinciding as it did with the return of the Columbus expedition, whose members could have brought such an "unknown" spirochaete from one of the American islands (Haiti).

Therefore, we can draw the following conclusions. Syphilis has existed for a long time. It was known in Europe even before the Columbus expedition. The cause of the syphilis epidemic in Europe in the 15–16th centuries was, apparently, the strain of *treponema pallidum* introduced by Columbus's sailors. A similar

point of view is expressed by M.V. Milich when he refers to an “additional dose” of infectious material. The socio-economic conditions at the time served as fertile soil for the development of the epidemic (Milich 1987). The combination of these two factors explains the unusual severity and rapid spread of infection. The theories of the origin of syphilis considered in this article do not contradict, but in fact, complement each other, and the

American theory deals only with one of the episodes in the history of syphilis.

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