



## Girolamo Fracastoro and the invention of syphilis\*

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### Abstract

Girolamo Fracastoro wrote two works on syphilis: his famous poem, in which he gave a name to the disease, and a prose treatise. From the comparison of these works, in this paper we have identified the combination of several approaches as the main characteristic of his description. On the one hand Fracastoro followed the classical medical explanation that emphasized the corruption of the air in order to explain the origins of the disease. On the other hand, when referring to the forms of contagion, he stated clearly that the disease is contracted by direct contact with an infected person. It is possible then to talk of the 'invention' of syphilis by Fracastoro since he combined the information empirically collected, with the renaissance medical traditional perspective.

Keywords: Girolamo Fracastoro (1478-1553); syphilis; contagion; air propagation.

The Veronese physician Girolamo Fracastoro (1478-1553) has been traditionally considered as an emblematic figure in the history of medicine. His fame is greatly due to the allusion made to the existence of tiny seeds of diseases contained in his work written in 1546, *De contagione et contagiosis morbis et eorum curatione libri tres* (The three books on contagion, contagious diseases and their cure). The explanation of the transmission of these conditions was seen as a pioneering perspective in microbiology, a stand that was gradually qualified by the XX century historiography. Authors like Charles and Dorothea Singer (1917), Norman Howard-Jones (1977) and Vivian Nutton (1983, 1990) showed the existing distance between Fracastoro's ideas and the discoveries made by Koch and Pasteur, specifying the subtleties and, at the same time, peculiarities of the Renaissance author. As we will see, it is possible to present this approach starting with his analysis of syphilis.

Fracastoro wrote, as far as we know, two works on syphilis. In the first one, the well known poem "*Syphilidis sive de morbo gallico libri tres*" (Three books on syphilis or the French disease), he coined the name by which we now know the disease from the legend of a shepherd called Syphilus who had purportedly gotten the illness as a punishment for defying the gods. In the poem he described in literary style the violent irruption of the disease and the different cures applied at the time. The second work is a prose treaty of purely medical nature, in which the author specifies the characteristics of the contagion offering also some therapeutic recommendations (Frank, 2003).<sup>1</sup>

Even if both works deal with the same topic, form and content are substantially different. In order to analyze the existing connection between these treaties, we deem relevant to emphasize the importance of their dating, since clarity in this aspect allows the reconstruction of the evolution of the understanding of the disease and the prominence that Fracastoro gave to certain elements in different periods of his life.

According to Francesco Pellegrini (1939), the poem was conceived in about 1510 and 1512 and correction was probably concluded near 1526.<sup>2</sup> In 1525 Fracastoro sent a draft to the well known humanist Pietro Bembo, which shows his interest on the literary quality of the poem. The text was finally published in Verona, in 1530, by the Da Sabbio brothers.

While he made the last corrections to the poem, he started the drafting of his prose treaty. The dating of this work is much more difficult since it was not published by the author and the only existing manuscript seems to have been written by Fracastoro in different periods of his life (Pellegrini, 1955, p.182).

According to a reference in the treaty itself, we know that around 1525 he had finished at least part of the treaty (Pellegrini, 1939, p.125). In 1532 he wrote a letter to geographer Giovan Battista Ramusio in which he asks for some details about the description made by Paul of Aegina and Aëtius about elephantiasis and leper because, according to what he says, he had corrected his previous work on *morbus gallicus* and was preparing a new treaty on syphilis, this time a prose work (Porcacchi, Atanagi, 1571, fol.349v). In 1539 he was still interested in the subject, since he asked a friend to investigate on contagion and about the existence of Guaiacum – a tree that supposedly cured those who suffered from syphilis – in Hispaniola, the island discovered by Colón and on which Europeans had seen the disease for the first time (fol.365r).

We know then that not only he worked simultaneously in the poem and on the treaty, but that at least ten years later he was still interested in the precision of information contained in his work and in including the necessary corrections. It is precisely this long kept interest in the subject that explains the difficulty in dating the text.<sup>3</sup> This implies, at the same time, that when approaching Fracastoro's work the long periods of elaboration of his treaties and the possible changes of judgment about some aspect of them have to be taken into account.

Considering this element as a starting point of the comparison between the two texts on syphilis, we deem important to point out the theoretical process faced by Fracastoro in his intent to describing the disease, particularly in what refers to the forms of contagion.

In his first poem book, Fracastoro (1984, p.43-45) describes the dissemination of the disease in America and its arrival in the Old Continent saying:

Yet in the great ocean beneath the setting sun, where an unhappy race inhabits a world lately discovered, it arises everywhere and there is not a place where it is not commonly known. To such an extent can the causes of things and their initial development vary according to the sky and length of time. And that which over there the air and a suitable earth bear freely, here a long period of years has only just brought upon us.

It is interesting to note that the renaissance physician emphasizes the presence of syphilis in America, but does not establish any connection between the arrival of the disease in Europe and the beginning of travels between both continents. He merely says that it is unknown why there are differences in the outbreak in one space and in the other and that they would depend, rather ambiguously, of the sky and of the times. The cause for omitting an interpretation that might create a link between the syphilis outbreak in the European context with the contact with the American sufferers, lies in his vision of the beginning of the suffering. In fact, immediately after, Fracastoro (1984, p. 45) offers an explanation of the origin of the disease:

And when you notice that the seeds of this vast destruction cannot be in the bosom of the earth or in the sea, you must undoubtedly decide in your own mind and reckon that the seat and origin of the evil are firmly fixed in the very air, which pours in all directions round the whole earth, which infiltrates everywhere through our bodies, and is accustomed to send these diseases among the race of living creatures. For air is the father of all things and the author of their origin. This same element often brings serious illnesses to mortals, since its soft material has in many ways a natural tendency to putrefy, to be easily affected and to pass on the effects which it has received.

Fracastoro thus establishes that the origin of syphilis must be placed on the degeneracy of the air, which due to its subtleness is prone not only to this kind of variations but also favors the spreading and propagation of the disease. From these fragments it is possible to establish that in the period of writing the poem, that is during the first two decades of the sixteenth century, Fracastoro considered the corruption of the medium, which at the same time was independent of the relation with the American sufferers, as the fundamental explanatory element for the origin of the disease. The only direct allusion made by the renaissance author to the role of sexual contact in the disease comes up in three brief verses of Book II (Fracastoro, 1984, p.67): "Nevertheless, keep away from Venus, and above

all things avoid the soft pleasures of lovemaking – nothing is more harmful. Beautiful Venus herself hates the contagion, the young girls hate it.”

It is important to point out that this mention is inserted among a long list of advice to survive to the disease that includes, among other things, avoiding heavy sleep and worries. This means, therefore, that Fracastoro did not consider sexual contact to be a means of contagion, but rather that it worsened the condition of the infected subject. This kind of allusions were very common in medicine at the time, for example, we find the same recommendation in the treaties against bubonic plague, since an alteration in the balance of the body was considered dangerous. (Horrox, 2000, p.163).<sup>4</sup> This is confirmed by Fracastoro himself (1984, p. 41) in two verses of the first book when he undervalues direct contact as a means of contagion. He states: “We can show many who without touching anyone, with no intermediary, yet felt the effect of this same plague and have been the first to suffer.” Thus, the air became the main disseminator of the disease and the medium where it was preserved.

The variation of its state was interpreted by Fracastoro (1984, p. 51) as the result of the introduction of corrupt elements in it “The aether was contaminated by a discharge from the new disease. Gradually the tracts of the air and wide space received the plague, and an unusual putrefaction came into the empty air and carried contagion all over the sky”.

His explanation about the origin of the disease is totally based on the idea of the air as vehicle of corruption and illness, constituting the central aspect of the poem. The possibility of transporting something, not present in the air initially, is related in the writings to the concept of a vacuum, in such a way that that the seed of suffering is placed in an available space until finding a new body to penetrate: “Protect our unhappy lands, you powers above: I see a strange, filthy inundation carried through empty space, and great tracts of the sky putrefying” (Fracastoro, 1984, p.49). This principle of the infection, linked to the presence of strange and noxious bodies in the air, was not explained in greater detail by the renaissance physician in this work. In a certain way it constitutes a literary resource inspired in one of the fundamental referents of the Fracastoro poem, *De Rerum Natura* (On the nature of things) from Lucretius, in which notion of vacuum is widely used (Beretta, 2003). The purely rhetorical aspect of these references to vacuum is confirmed by the explicit negation of its existence at the beginning of the treaty *De simpatia et antipatia rerum* (On sympathy and antipathy of things), published in Venice in 1546 (Fracastoro, 2008). In its criticism to the atomist notion of the universe, Fracastoro quotes Galen as main authority, who in *De elementis secundum Hippocratem* (On elements according to Hippocrates) refutes the possibility of vacuum in nature. Following the Hippocratic notion of the elements, Galen (1996, p.97) concludes that these are not in a pure state, but adulterated by other bodies and mixed with them. From this reference it is possible to state that Fracastoro was not detached from the medical tradition when referring to the presence of seeds of the disease in the air, but by using language inspired on Lucretius he confirmed an approach widely spread in science at his time.

This theme presented in this early work will reappear later with stronger emphasis to become one of the most interesting aspects in the understanding of the diseases by the Veronese author. In chapter VII of the first chapter of *De contagione*, Fracastoro states that

corpuscles of diseases (*seminaria*) move in the air and this is the way in which these conditions are transported not only from one place to the other, but also from one patient to the other. Even though the general explanation about the propagation of disease is not contradictory with the one presented in the poem, the situation is different in the specific case of his conception of syphilis since its interpretation, centered in environmental factors, will take a new form. In the chapter dedicated to the disease, Fracastoro (1950) tries to give a turn to its explanation. He begins by insisting that the onset of the disease lies on a peculiar change in the arrangement of the sky and the stars that cause, in wide regions and spaces, a major alteration in the air, which at the same time would introduce the noxious principle in bodies (p.65). Nevertheless, he proposes direct contagion as a new alternative for transmission. According to him, the disease would have changed, with the passing of time, and the first arrangement present in the air would have ceased, limiting in this way, the routes of transmission of syphilis only to direct contagion between two individuals. He will go to greater depths in his explanation in the treaty dedicated only to the disease in which he will specify what is direct contact: "Contagion does not occur at a distance, as it could happen by infection in the air that the affected person breathes; neither may be transmitted through vehicles of contagion, such as dresses, linen or other things that have been in touch with the infected person, but it is only transmitted through direct contact" (Pellegrini, 1939, p.152).<sup>5</sup> And then he goes into detail as to why syphilis cannot be disseminated by these indirect routes by saying:

Because that which can be transmitted over a distance must be extremely subtle and acute, analogous to ether, as it happens with the plague: the affection that has abandoned the vehicle of contagion must be slow and subtle to hide in the porosities and be preserved for a long time. ... But what syphilis produces, due to the density of matter, is not penetrating, therefore is extinguished if not in direct contact (p.176).

In other words, together with the development of the idea of the seed in the disease, Fracastoro limited the role of the air in the transmission of the condition: the seeds of syphilis were spread through direct contact between two individuals, that is, without the necessary mediation of the air. As we see, in the second part of his life, Fracastoro observed some of the characteristics of the contagion of the disease. Based on this information he established that the air propagation did not constitute the final explanation of the transmission of the affection. In fact, and such as he had stated in his work about the contagion, he cared about identifying two stages. On the one hand he set the origin of the disease in the environment, which, according to him, allowed understanding the range of the affected physical space, and on the other hand, once the initial and extremely malign phase was overcome, he recognized a second moment in which the disease has been physically incorporated and it will only be transmitted by direct contact with the affected person, not necessarily sexual contact. It is precisely this duality that allows us to talk of the 'invention' of syphilis on the part of Fracastoro, inasmuch as he combines case studies with renaissance medical conceptions accepting in such a way the consequent complexity of his description of the disease.<sup>6</sup>

As heritage of the Hippocratic system, XVI century medicine understood disease as the loss of equilibrium of the four humors, a variation that was interpreted fundamentally

through diet and especially environmental factors, since the origin of diseases was understood as the incorporation of poisonous invisible substances present in the air. While towards 1530 Fracastoro remained faithful to this stand, emphasizing the putrefaction of the air as determining factor for the disease, in the two following decades he varied the core of his statement, moving towards the leading role of physical contact with an ill person as the cause of the transmission of the disease.

Vivian Nutton (1983) has very precisely reconstructed the medical tradition of the idea of the seed of the disease. As he signals, it has already been mentioned by Galen, Plutarch and Isidore of Seville. In fact, Fracastoro writes in the same classical Hippocratic framework. Even though he underscores his originality, it is possible to find important antecedents in his thoughts about the way the transmission of the disease occurs. It is precisely this agreement with the precedent science that leads Dina Czeresnia (1997) to state that the theory of contagion in Fracastoro in no way constitutes an enlightened vision of the conceptions that three hundred years later would come to dominate, since his interpretation of the phenomenon is far from the modern scientific theory, essentially due to the fact that it is not grounded on precise observation and on experimentation.

The existence of two explanations for the transmission of syphilis in Fracastoro constitutes, nevertheless, an interesting problem. Even if the language and the form of his notion about contagion correspond to the medical tradition, it is undeniable that the emphasis given to direct contact, more than being an assertion supported by theory, was rather born from experience. Richard Frank (2003) has suggested that the lack of direct allusions to sexual contagion in the poem lies essentially in the literary intention of the renaissance author and in his stylistic interest that explained the exclusion of this topic, since he intended to emphasize form rather than substance. This argument though, does not seem conclusive since Fracastoro, as we have seen, effectively refers to “the pleasures of lovemaking,” but in a context that, undoubtedly, reduces its role in the transmission of the disease. It seems rather that the emphasis on direct contact, as a propagation means, correspond to a later stage and – this is the point which we are interested in emphasizing – its inclusion in the explanation did not mean a denial of the air propagation of the disease but a combination of both alternatives.

The Veronese physician did not, at any moment, deny what had been established in the poem, but he proposed to insert it within a new explanation that would identify two different stages of the disease, considering the change of malignancy. In this sense, Fracastoro developed an interpretation of syphilis that adapted to observed facts, as well as to fundamental elements of the medical tradition of the time, thus ‘inventing’ a disease that would not escape to the Hippocratic explanatory principles. In fact, this opening in tradition constituted for centuries the main reason for its predominance: everything that seemed to question the basis of humoral medicine was incorporated by it through multiple factors, in such a way that any apparent criticism or innovating argument ended by being considered valid explanations but not denying what had been accepted for centuries. Fracastoro’s intent to elaborate a new definition of syphilis, combining empirical verifications with medical principles utilized at the time, is an example of the creation of this idea of affection.



It is precisely from these characteristics of the renaissance medical explanation that we believe that Fracastoro consciously elaborated a broad definition of the disease.

## NOTES

\* A preliminary version of this work was presented in the 9<sup>th</sup> History of Medicine Meeting, organized by the Pontificia Universidad Católica de Chile in October 16, 2008.

<sup>1</sup> Richard Frank has pointed out the differences in the analysis of syphilis between the poem and the prose writing. Although, in the second case, he only focuses on the work *De contagione et contagiosis morbis* (1546), omitting the manuscript treaty.

<sup>2</sup> The first edition of the manuscript was done by Pellegrini and published in Verona in 1939 under the title *Trattato inedito in prosa di Girolamo Fracastoro sulla sifilide* (Unpublished treaty in prose form Girolamo Fracastoro on syphilis). In Note 1 on page 182, the author explains that codex CCLXXV-1 of Capitolare Library of Verona contains separate pages that do not constitute one *corpus*.

<sup>3</sup> For a precise reconstruction of the dates in which Fracastoro wrote his works, even not considering a possible simultaneous writing of the prose treaty on syphilis and *De contagione*, see Nutton, 1990.

<sup>4</sup> In the 1348 Report of the Paris School of Medicine it was said, for example, that too much exercise, sex or baths meant a bad life style and constituted, therefore, a risk factor for contagion of the plague.

<sup>5</sup> All quotations in other languages have been freely translated.

<sup>6</sup> We have used the concept of case studies, considering its pre-modern character, that is, lacking in methodology and modern systematization. Fracastoro did not perform an in depth analysis of specific cases, rather he incorporated some empirical observations in his theoretical explanation.

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