

# A Brief History of Miasmatic Theory

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While the idea that bad or corrupt air is the cause of illness and disease dates at least to ancient Greece, the use of the term “miasma” to describe this concept appears to date from the seventeenth or eighteenth centuries.

## The Ancients: The Origin of the Theory

The *Encyclopedia of Public Health* states that miasmatic theory “dates at least from classical Greece in the fourth or fifth century B.C.E.”<sup>2</sup> The Greek physician Hippocrates (c. 460-377 B.C.E.) believed bad air to be the cause of pestilence—or, more accurately, believed bad air was equivalent to pestilence.<sup>3</sup> Vitruvius, in his *Ten Books on Architecture*, warns of the dangers of various kinds of bad air—exhalations from marshes, pestilential air, and unhealthy vapors—but does not use the term “miasma”.<sup>4</sup> Greco-Roman physician Galen (c. 130-201 C.E.) expanded upon the theory of bad air, tracing individual susceptibility to the balance of humors in the body.<sup>5</sup> This idea was influential during the Middle Ages as an explanation for contagion—why some contracted plague while others did not.<sup>6</sup>

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<sup>1</sup> This paper was written in August 2007 in the capacity of a graduate research assistant to Assistant Professor Rebecca Williamson at the University of Cincinnati.

<sup>2</sup> Last, John M. 2001. “Miasma Theory.” *Encyclopedia of Public Health*. Ed. Lester Breslow. New York: Macmillan Reference: 765.

<sup>3</sup> Byrne, Joseph P. 2004. *The Black Death*. Westport, CT: Greenwood Press: 42

<sup>4</sup> Vitruvius. 1960. *The Ten Books on Architecture*. Translated by Morris Hickey Morgan. New York: Dover Publications, Inc.

<sup>5</sup> Byrne 2004: 44.

<sup>6</sup> *Ibid.*

### The Middle Ages: Corruption of the Air

The concept of bad air was the primary explanation for disease in general, and the plague in particular, during the Middle Ages and into the Renaissance. However, it appears that the term “miasma” was not yet in use to describe this theory. Instead, Medieval writers referred to “corruption of the air,” “pestilential air” or “putrefaction of the air” (the latter primarily referring to the *process* by which air became corrupt). This conclusion is based on a review of a number of primary sources. Specifically, “plague tractates”—pamphlets dating from 1348 onward written to inform the general public about the causes of, remedies to, and prevention of the plague—provide a relatively clear picture of the knowledge and terminology of the time.<sup>7</sup> At least 281 plague tractates have been identified, of which 77 were written before 1400 and about 20 were written within five years of 1348.<sup>8</sup>

Master Jacme d’Agramont, a physician of Lerida in Catalonia, Spain, wrote the first known plague tract in April of 1348. Jacme believed that most maladies came from pestilential or corrupt air.<sup>9</sup> His tract goes into great detail on the various qualities of air and processes by which air can become corrupt.<sup>10</sup> According to Winslow (1948), “This concept [of pestilence as corrupt air] is generally basic in all of the plague tracts. It goes back to Galen’s definition of pestilence as a disease arising from corruption of the air [...].”<sup>11</sup> The report of the Medical Faculty of the University of Paris is dated the same year. It states: “The present epidemic or pest comes directly from air corrupted in its substance.”<sup>12</sup> The report recommends the use of incense and fragrance, which “hampers putrefaction of the air, and removes the stench of the air and the

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<sup>7</sup> Winslow, C.-E. A., and M. L. Duran-Reynals. 1948. “Jacme d’Agramont and the First of the Plague Tractates.” *Bulletin of the History of Medicine* 22 (1948): 747.

<sup>8</sup> *Ibid.*

<sup>9</sup> d’Agramont, Jacme. 1348. *Regimen of Protection Against Epidemics or Pestilence and Mortality*. Lerida, Spain. Translated by M. L. Duran-Reynals and C.-E. A. Winslow. *Bulletin of the History of Medicine*, 23 (1949) p. 57-89.

<sup>10</sup> Winslow 1948: 755.

<sup>11</sup> Winslow 1948: 756.

<sup>12</sup> Medical Faculty of the University of Paris 1348, as quoted in Winslow 1948: 756. An alternate translation reads: “We believe that the present epidemic or plague has arisen from air corrupt in its substance, and not changed in its attributes” (Horrox 1994: 160).

corruption [caused by] the stench.”<sup>13</sup> Spanish-Arab physician Ibn Khatimah wrote a tract in 1349 in which he states: “[...] the immediate cause [of plague] is usually the corruption of the air, which surrounds people and which people inhale.”<sup>14</sup> Khatimah states that this process of putrefaction could be recognized by its “foul vapor”.<sup>15</sup>

Later writings use substantially similar terminology. The 1365 treatise of John of Burgundy refers to corrupt and pestilential air.<sup>16</sup> The British Parliamentary statute of 1388 prohibited the dumping of “dung, offal, entrails and other ordure into ditches, rivers, waters, or other places” explicitly because it lead to corrupt and infected air, which caused “many illnesses and other intolerable diseases”.<sup>17</sup> Renaissance architect Alberti wrote in 1450 of the importance of sewers in “preserving the wholesomeness and purity of the air”<sup>18</sup> but does not use the term “miasma”.

Various scholars attributed the corruption of the air to various causes.<sup>19</sup> The most common immediate causes were decaying organic matter (including vegetable matter, animals, and human corpses)<sup>20</sup> and “exhalations” from swamps, marshes, and stagnant water.<sup>21</sup> Other explanations include winds (especially southern winds) that transported corrupt air from another locality<sup>22</sup> and (less commonly) earthquakes that released poisonous gasses trapped inside the earth<sup>23</sup> (e.g., anonymous German treatise). Often these events were attributed to the alignment of the planets<sup>24</sup> and/or supernatural reasons or divine wrath.<sup>25</sup> Whatever the cause,

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<sup>13</sup> Medical Faculty of the University of Paris. 1348/2004. *Compendium de epidemia*, Book 2. Translated by Jeffrey Williams. In *The Black Death*, by Joseph P. Byrne. Westport, CT: Greenwood Press: 160.

<sup>14</sup> Khatimah, Ibn. 1348/2004. *Tahsil al-gharad al-qasid fi tafil al-marad alwafid*. Translated by Patrick Gann, 1927. In *The Black Death*, by Joseph P. Byrne. Westport, CT: Greenwood Press: 155.

<sup>15</sup> Khatimah 1348/2004: 156. Note that I was working from an English translation of Khatimah’s text, which means that the terminology may not be original.

<sup>16</sup> John of Burgundy. 1365/1994. *Treatise on the Black Death*. Translated by Rosemary Horrox. In *The Black Death*, ed. by Rosemary Horrox. Manchester; New York: Manchester University Press: 185.

<sup>17</sup> A. Luders, et al. 1810-28. *Statues of the Realm 1101-1713*, 11 vols. London. As quoted in Horrox 1994: 205.

<sup>18</sup> Alberti, Leon Battista. 1450/1988. *On the Art of Building in Ten Books*. Translated by Joseph Rykwert, Neil Leach, and Robert Tavernor. Cambridge, Mass.: MIT Press: 113-114.

<sup>19</sup> Byrne 2004: 43.

<sup>20</sup> For example, Jacme d’Agramont (1348). See also Winslow 1948: 756.

<sup>21</sup> For example, Ibn Khatimah (1348). See also Winslow 1948: 757.

<sup>22</sup> For example, Jacme d’Agramont (1348). See also Winslow 1948: 757.

<sup>23</sup> For example, see German treatise (unknown author) in Horrox 1994: 177.

<sup>24</sup> For example, see the report of the Medical Faculty of Paris (1348). See also Winslow 1948: 756.

<sup>25</sup> For example, see Jacme d’Agramont (1348). See also Winslow 1948: 757.

disease was attributed to corruption of the air. This belief persisted for centuries: similar reasoning accompanied the Great Sanitary Awakening of the mid-1800s.<sup>26</sup>

### The Enlightenment: The Term “Miasma”

The *Chambers 21st Century Dictionary* dates the word “miasma” to the 17th century. It is a Latin term derived from the Greek word for “pollution”.<sup>27</sup> The term seems to have been popularized by—if not coined by—Giovanni Mari Lancisi, whose 1717 work *De noxiis paludum effluviis (Of the poisonous effluvia of malaria)*<sup>28</sup> was cited by later physicians as the source of the term “miasm” or “miasma”.<sup>29</sup> While the Library of Congress contains an un-translated copy of this work, I could find no closer copy to confirm his use of the word “miasma”.

### Nineteenth Century: Germ Theory

Miasmatic theory maintained its currency through the middle of the nineteenth century, even as evidence mounted for germ theory. The former was used to explain many diseases, including tuberculosis, malaria, and cholera.<sup>30</sup> Miasmatic theory enjoyed support from powerful institutions and individuals, among them Dr. William Farr, the assistant commissioner for the 1851 London census, who believed miasma to be the cause of cholera.<sup>31</sup> Skeptics were in the minority in the 1850s. In an 1851 address to the Medical Society of North Carolina, Charles Earl Johnson argued that miasm could not be the cause of disease. He prefaced his argument with this statement: “I know that in advancing this opinion, I am impinging upon the current prejudices and dogmas of the schools, and, perhaps, upon the opinions of most, if not all, of the

<sup>26</sup> Winslow 1948: 757.

<sup>27</sup> “Miasma.” *Chambers 21st Century Dictionary*. 2001. Xreferplus. Available at: <http://www.xreferplus.com/entry/1214627>. Last visited: 20 June 2007.

<sup>28</sup> “Malaria” comes from “mala aria” meaning “bad air” (“Miasma Theory.” *Encyclopedia of Public Health*. Ed. Lester Breslow. Thomson Gale, 2002. eNotes.com. 2006. Available at: <http://health.enotes.com/public-health-encyclopedia/miasma-theory>. Last visited: 23 June 2007.)

<sup>29</sup> See, for example, Charles Earl Johnson (1851), who asks “[...] have not medical men, from the days of Lancisi down to the present time, used the term miasm or malaria, as a sort of convenient cloak for covering up their real want of information upon this subject [...]?” (10).

<sup>30</sup> *Encyclopedia of Public Health*, 2002.

<sup>31</sup> UCLA School of Public Health Department of Epidemiology. 2001. “Competing Theories of Cholera.” Available at: <http://www.ph.ucla.edu/epi/snow/choleratheories.html>. Last visited: 5 August 2007.

medical gentlemen here assembled.”<sup>32</sup> An influential 1849 essay by British physician John Snow entitled *On the Mode of Communication of Cholera* argued that cholera was water-borne<sup>33</sup>—an opinion that supported the competing germ theory.

Germ theory was further developed by Louis Pasteur in the 1860s and Robert Koch in the 1870s.<sup>34</sup> It soon prevailed over miasmatic theory.

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<sup>32</sup> Johnson, Charles Earl. 1851/2002. *An address before the Medical Social of North Carolina at its second annual meeting in Raleigh, May 1851*. Chapel Hill, NC: Academic Affairs Library, University of North Carolina at Chapel Hill. Electronic resource: 10.

<sup>33</sup> UCLA School of Public Health Department of Epidemiology. 2007. “John Snow.” Available at: <http://www.ph.ucla.edu/epi/snow.html>. Last visited: 5 August 2007.

<sup>34</sup> Abedon, Stephen T. 1998. “Germ Theory of Disease.” Available at: <http://www.mansfield.ohio-state.edu/~sabedon/biol2007.htm>. Last visited: 5 August 2007.

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