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History of the Miasma Theory of Disease

by Ajesh Kannadan

(Honors Chemistry 1551)

Miasmatic theory of disease states that diseases were caused by the presence of miasma. Miasmas are poisonous emanations, from putrefying carcasses, rotting vegetation or molds, and invisible dust particles inside dwellings. Miasmas could be identified by its foul smell (Demaitre, 2004). From the time of ancient Greece till the mid of 19th century, it was believed that the miasma would enter the body and cause diseases like cholera and malaria. In the medical world the miasma theory was advanced over the time to explain many important diseases. Even the disease called malaria has got its name from miasma theory. In Italian mala means bad and aria means air and it stands as the one of the proof of existence of miasma theory in the ancients. In the mid of the 19th century the miasma theory was replaced by the Germ theory of diseases (Maia 2013).

The Greek physician Hippocrates (c. 460- 377 B.C.E.) believed that bad air could be the cause of any pestilences, the fatal epidemic. According to his beliefs, the bad air was equivalent to the pestilence (Sterner, 1). The ancient people believed the cause of any disease were some supernatural powers. There had been many explanations for disease related to supernatural powers. “In ancient and primitive medicine, disease was often seen either as a form of punishment sent by the gods, or attributed to demons, ghosts, and evil spirits. Because it was thought to be caused by supernatural agents, magic was part of its diagnosis and treatment (Biomedicine and Health).” Hippocrates rejected the supernatural explanation of diseases and came with idea that the illness was caused by the patient’s environment. He proposed that the bad air, which is poisonous is the main cause of disease. His idea was accepted around the world by many and found in writings of ancient civilization (Sterner, 1). The theory was later called the miasma theory of disease and helped the growth of medical science. This theory is centered around the bad air or miasma, the unpleasant surrounding. Greco-Roman physician Galen (c. 130-201 C.E.) expanded upon the theory of bad air by tracing how much the presence of bad air would harm the human body and concluded the cause of any diseases is the corruption of air (Sterner, 2). The idea of the theory of bad air influenced in the medical field as an explanation for contagion during the Middle Ages. In fact, the concept of bad air was the primary explanations of diseases during those periods. A physician of Lerida in Catalonia named Master Jacme d’Agramont wrote about the disease plague in April of 1348 and he believed that most of the diseases raised from the bad air or corrupted air sounding a person. In his writings he describes the various qualities of air and what causes the air to become corrupt to cause a particular disease in a human body (Sterner, 2-3).

In 1349, Ibn Khatimah, a Spanish-Arab physician wrote a tract which he states that the direct cause of any disease is the corruption of the air surrounding people or the air, which people inhale. In his tract, he says the corruption of the air could be recognized from its foul smell. People who lived before 19th century strictly believed in the bad air theory (Sterner, 3). For example, “the British Parliamentary statute of 1388 prohibited the deposition of dung, offal, entrails and other ordure into ditches, rivers, waters, or other places, because it resulted in the putrefaction and infection of the air, causing many illnesses and other intolerable diseases (Jowl, 2016).” Various scholars concluded the corruption of air caused by various causes. The most common cause of the bad air that caused the disease were from the decaying of organic matter.

Miasma theory had been successful to explain the reason, why cholera and other disease were very

common in the places, where there are a lot of foul smell due to the decaying of organic matter during the 19th century. The explanations raised from the miasmatic theory regarding the epidemic such as cholera and other diseases was avoiding the bad air or miasmatic air the caused disease. This all led to the sanitary reforms around the world. New practices were developed to reduce the spread of the disease and a new picture of disease transmission emerged. Also, it led to think of the germ theory of disease in many scientists. The improved sanitation system the decreased spread of cholera in U.K for limited period of time, but it was not a complete solution to solve the spread of cholera (Theodore, 2104).

In the mid of 19th century, the cholera was an epidemic and caused the death of many people in the U.K. The miasmatic theory could not make much decrease in the spread of diseases such as cholera, even though people took many precautions and avoided the bad air according to miasmatic theory. During that time, John Snow, one of the medical scientists in the mid of 19th century, came with the hypothesis that the main cause and spread of the cholera had not been bad air, instead, cholera could be spread in water, food or hand-to-mouth. Snow concluded that cholera was caused by a germ cell not by bad air. According his studies this germ was transmitted from one person to another person by drinking water. But snow's hypothesis was not accepted in the 1850s because he was not a member of the medical elite, also, it supported the germ theory by rejecting the miasmatic theory. William Farr was the dominant epidemiologist of the day in the mid of 19th century (Bingham, 2104). He firmly stated in his annual report on vital statistics in Great Britain in 1852 that "the inverse association of cholera mortality with elevation above sea level confirmed the miasma theory as its cause (Bingham, 2104)". Farr was able to reject the Snow's hypothesis that supported the germ theory (Bingham, 2104).

Many medical scientists supported the miasma theory to explain the cause of cholera, even though evidence mounted for germ theory. In London, The Water Supply (Metropolis) Act of 1852 required companies to move their intakes from the River Thames by 31 August 1856 to above the tidal flow at Teddington lock. England was affected the further outbreak of cholera by 1866. By this time Farr realized the direct cause of chorea had not been the bad air, it was spread thorough the contaminated water supply (Bingham, 2104). After that, the germ theory of disease was emerged and gradually it was able to replace the miasma theory by the second half of the 19th century. The germ theory of disease states that many diseases are caused by the presence and actions of specific micro-organisms within the body. In other word, diseases are caused and spread by the germs (Frerichs, 2002). According to this theory bad air is not the main cause of any disease, it is micro-organisms that spread the disease. These micro-organisms can be transited through mainly water, food, the contact with each other or the air. The germ theory was able to make clear understanding how disease was caused and spread in the society. This resulted in people moving away from the Miasma Theory to the Germ Theory. By the end of 19th century, the germ theory of disease became dominate over the miasma theory (Maia, 2013).

The miasma theory only stated the bad air or miasma was the main cause of every disease, but, according to germ theory, the diseases are spread and caused by the presence and actions of specific micro-organisms within the body through many mediums such as water, food, and contact. Therefore, miasma theory of disease was replaced by germ theory of disease by the end of 19th century.

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