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Pillars in the Foundation of Philosophy, Medicine, and Science

Zander Scherschel

HST 471 – Senior Thesis Seminar

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The world of medicine has experienced a continuous flow of evolution, starting from the beliefs in superstitions then going to herbology and finally arriving at a point in time where people can use machines to find out any issues. The equipment in the medical field is not the only thing that has improved, the medical professionals have improved as well. There are now paramedics who work on trying to stabilize the patient while they are on route to the emergency room. There are the nurses who are more than an assistant for a doctor, they are the backbone of a hospital. The nurses are the ones who take care of the patient for the majority of their stay in the hospital. Then there are the doctors who find out the cause of the patient's problem and start the process of treatment. The medical world has grown to the point where the term, "doctor", is too vague due to the numerous routes in the medical field. A doctor could be a pediatrician, neurologist, psychiatrist, gynecologist, or an anesthesiologist, like my dad. He would tell me stories about some of his cases, but he always makes sure that he does not violate HIPPA. After years of my dad telling me stories I have noticed something important: his dedication to his job. He put his patients first and he is always there for his colleagues. Another thing that I have noticed is that even when my dad is not at work, he is ready to take charge of a medical emergency if paramedics were still on route. My dad does not have to respond to medical emergencies outside of work, he does not have to help his colleagues, and does not have to go above and beyond for the patients. However, he believes that he should respond to medical emergencies, help his colleagues, and make sure that his patients are being taken care, not just because of the Hippocratic Oath, but he genuinely cares about his profession. Now, the Hippocratic Oath is something that almost all medical professionals take when they graduate from medical school and the oath has existed since Ancient Greece due to the philosopher, Hippocrates. Hippocrates is known as the "Father of Medicine", but he was not the only

philosopher to focus on science and medicine. There are three other philosophers who are also extremely important to the fields of philosophy, science, and medicine: Alcmaeon, Parmenides, and Empedocles. There are other philosophers who have contributed to the knowledge of science and medicine, like Erasistratus and Herophilus. However, it is Alcmaeon, Parmenides, Empedocles, and Hippocrates who are the pillars in the foundation of science and medical knowledge or education.

In modern times, the word “science” is everywhere and there are many different subjects in the scientific field, like physics, biology, chemistry, anatomy, and astronomy to name a few. However, it was different in the ancient world, because the word “science” did not exist until the fourteenth century.¹ In ancient history, these subjects, physics, anatomy, or astronomy, were considered to be part of the philosophical field. This means that medicine was connected to philosophy instead of science. Sadly, before Ancient Greece, the world of medicine was rather small, can easily be disregarded, or it was based on the supernatural. This can be seen in the beginning of the end of the early Mesopotamia period, where the Laws of Hammurabi² are introduced. However, the Laws of Hammurabi focused more on social reforms, but there was a small section about physicians and the patients. This small section has eight points and it does not focus on medicine at all. In fact, it only adds more pressure to the physician to be perfect. If a physician dealt with a man who had a severe wound or an abscess in his eye with a bronze lancet and the man died, the physician would lose his hand. However, if the man lived, he had to pay the physician ten silver shekels, but if the man was a client, then he only would have to pay five

¹ <https://www.merriam-webster.com/dictionary/science>

² Bailkey, Nels M. and Nels M. Bailkey. *Readings in Ancient History: Thought and Experience from Gilgamesh to St. Augustine*. 5th ed. ed. Lexington, Mass.: Lexington, Mass.: D.C. Heath, 1996. 32.

silver shekels. If a physician was treating a slave, the owner would pay the physician if the slave lived, and if the slave died, the physician would not be punished.³ The Laws of Hammurabi did not set any ethical or moral boundaries to the field of medicine, however it is just a small moment in the history of medicine. Then moving into Ancient Greece, at first medicine was shown in stories like *The Odyssey* where the characters would either get hurt or fell ill. The characters would do the basic first aid but then mainly prayed to the gods and goddesses to be merciful.

Section 1: The Two Who Started It All:

The first two philosophers that will be discussed in this paper will be Alcmaeon of Croton and Parmenides. These two philosophers may not have anything in common with each other at first glance, besides the obvious fact that they are philosophers in Ancient Greece. Alcmaeon's work is focused on the medical field and Parmenides focused on cosmology.

Alcmaeon of Croton. Due to the lack of information about Alcmaeon of Croton's personal life, historians only have a rough understanding of Alcmaeon's time frame, his location, and of his works. Historians like James Longrigg, Alberto Debernardi, and Pan. S. Codellas believed that Alcmaeon live during the sixth century B.C., and he lived in Croton, which is closer towards the bottom of Italy, and that he is considered to be a Pythagorean⁴. They also agree that he is extremely important to the medical field. Before Alcmaeon there was no written medical literature, so when he started writing his book and his theories, not only was his works are the earliest written Greek literature⁵, but people could read his words and thoughts to get a grasp on the mindset of the people at the time. In James Longrigg's book, *Greek Rational*

³ Ibid.

⁴ Longrigg James

⁵ Longrigg James

Medicine: Philosophy and Medicine from Alcmaeon to the Alexandrians, he focused on the importance of Alcmaeon's work. Longrigg wrote that Alcmaeon wrote a book, *On Nature*, which contains his theories of health. Alcmaeon started his book by explaining his theory of knowledge, "Concerning things unseen the gods possess clear understanding, but in so far as man can proceed by inference"⁶, and from this one sentence, Alcmaeon is stating that he knows that he would never know the whole truth about the world. However, the gods would be the only ones capable to fully understand the world and the people who live on it. Though, this does not mean that people cannot try to learn more about the world around them and understand more about humanity. Although, Alcmaeon wants to gain more knowledge, he wanted to find answers without using philosophy and only using empirical data. This did not last long since he ended using philosophy in the end. The next theory that he talks about deals with health, which turns out to be one of his influential theories. He discusses the best way to preserve health is "the equality [isonomia] of the powers – moist and dry, cold and hot – and the supremacy [monarchia] of any one of them causes disease; for supremacy of either is destructive."⁷ The human body is fragile and it needs stable conditions to stay healthy. That is important for people to find a way to counteract these conditions if one is more apparent than the other. This is why when someone gets too cold, they either add layers of clothes or stay close to a source of heat. Then when they get too hot, they can remove layers or maintain a distance from the heat. Alcmaeon adds that the "cause of disease is ... deficiency of nourishment; location of blood, marrow or the brain. Disease may come about from external cause; quality of water or local environment."⁸ Besides of having conditions being balanced, people need to aware of how they

⁶ Ibid., 51.

⁷ Ibid., 52.

⁸ Ibid., 52.

are taking care of their bodies, that everything to stay healthy requires a balance of their environment and bodies. However, health was not the only thing that Alcmaeon was interested in, he was curious about the internal organs.

Alcmaeon kick started the discussion and debates of the human body. He has more about vision than he does for any of the other senses. He said that “seeing takes place by reflexion in the diaphanous element,”⁹ that each eye contains a fire and a flash will occur when someone closes their eyes. It makes sense that Alcmaeon would believe had fire in their eyes and that there would be a flash when people close their eyes. There is a bunch of bright colors when people close their eyes and sometimes depending the way the light sources are arranged, it can create an image. Moving onto hearing, Alcmaeon mentions that the reason people can “hear through their ears because they have vacuums in them,”¹⁰ and when the sound makes its way through the ear, it creates an echo. The echo will find its way to the brain. When Alcmaeon talks about taste, he brings up how food can almost melt in a person’s mouth and the tongue almost acts like a sponge and sucks the particles. These particles will then go to the brain to be processed. As for the sense of smell, all that Alcmaeon mentions is that people smell through their noses and the air goes up to the brain¹¹, then he does not consider touch to be a sense. He links the senses back to the brain because he believed that the brain was in charge of intellectual activity. However, there are other philosophers who have a different idea and theories about not only the senses, but the human body as a whole.

⁹ John I. Beare, (John Isaac). *Greek Theories of Elementary Cognition from Alcmaeon to Aristotle*. Oxford: Oxford, Clarendon Press, 1906, 11-13.

¹⁰ *Ibid.*, 93.

¹¹ *Ibid.*, 131.

There is another philosopher that is important to mention before moving onto Parmenides and Empedocles: Thales of Miletus. Walter Terence Stace, author of *Critical History of Greek Philosophy*, mentioned that Thales is considered to be both the founder and father of all philosophy and that he founded the one of the earliest schools in history.¹² Even though historians believe that Thales did not write anything down¹³, his philosophy are important to the history of philosophy and science. Stace mentioned that so far historians only know of two propositions from Thales' philosophy and that the first one is that "all things is water, that all comes from water, and to water all returns."¹⁴ The second one is that earth is flat, however, this one is not as important as the first one. Thales is stating that everything comes from water and that everything is made up of water and while he is incorrect about everything being made up of water, this is extremely influential for philosophers and scientists. He was the first philosopher, that was recorded, to try to find answers that were based on the truth and not myths. Stace mentioned that Thales was the one to come up with the fundamental thought of the pre-Socratic era, which was under the multiplicity of the world there needs to be a single ultimate principle.¹⁵

Parmenides:

Parmenides was born roughly around 514 B.C. at Elea and he was considered to be part of the group of philosophers called the Eleatics. Stace mentioned that there is not a lot of information about Parmenides' personal life, but he also mentioned that just like Thales, people admired Parmenides for his intellect and his character. One person in particular held Parmenides

¹² W. T. Stace, (*W. A Critical History of Greek Philosophy* Project Gutenberg, 36.

¹³ *Ibid.*, 37.

¹⁴ *Ibid.*, 37.

¹⁵ *Ibid.*, 38.

in high regards and this person was Plato.¹⁶ Only fragments of Parmenides' works remain, but there are enough fragments to get a rough idea about his philosophy. However, there are issues with the fragments, Richard McKirahan, author of the section, "Signs and Arguments in Parmenides B8", in the book, *The Oxford Handbook of Presocratic Philosophy*, stated that "many of Parmenides' arguments are hard to make out: even on the best arrangement of the available sentences and clauses they are incomplete."¹⁷ Even though, Parmenides' arguments are difficult to figure out and his fragments are incomplete, historians have managed to figure out that Parmenides' work is a "philosophic didactic poem"¹⁸ that has two parts. Stace explained that the first part of the poem is called "'the way of truth'"¹⁹ and the second part is called "'the way of opinion'"²⁰. Stace's explanation of the first part is understandable, the world will always change and nothing is ever permanent. Things will exist and then it will not exist. Parmenides wanted to figure out if there was something that could be eternal among all the changes and this led to the concept of Being and not-being. Just like how Thales believed that everything came from water and everything would return to water, Parmenides believed that "the sole reality, the first principle of things is Being, wholly unmixed with not-being."²¹ According to Parmenides, Being does not change, it does not have a start or an end, and that Being has no past, present, or future. It will always exist. Parmenides also describes Being as "absolutely self-identical"²² and

¹⁶ James, Warren, *Presocratics*, Durham: Durham: Taylor & Francis Group, 2007. 77.

¹⁷ Patricia, Curd, Daniel W. Graham, Patricia Curd, and Daniel W. Graham. *The Oxford Handbook of Presocratic Philosophy*. Oxford; New York: Oxford; New York: Oxford University Press, 2008a.

¹⁸ W. T. Stace, (W. *A Critical History of Greek Philosophy* Project Gutenberg, a, 61.

¹⁹ *Ibid.*, 61.

²⁰ *Ibid.*

²¹ *Ibid.*, 62.

²² *Ibid.*

“does not depend upon anything else for its being and reality”²³. Stace pointed out that in Parmenides’ works, for the first time, the differences between Sense and Reason were made clear. Senses are the cause for not-being, the cause for false appearances of Being. Then Being and also the truth is revealed by reason.

After Stace finished talking about the first part of Parmenides’ work, he moves onto the second part, which is about the way of false opinions. However, unlike in the first part, Parmenides’ arguments in the second part is difficult to understand due to him contradicting himself. He tried to argue against other philosophers that he believed were spreading false truths by coming up with his own cosmological theory, that was meant to explain the “origin of that world of appearance and illusion”²⁴. However, this goes against his arguments in the first part of the poem. Parmenides tried to argue that the world of senses is made up of two opposites, like light and darkness or hot and cold. These differences need to find a balance because when there is more heat, there will be more life and more reality, but when there is more cold, there is more death and unreality.²⁵ This is where issues in his arguments became apparent, Parmenides said “that Being is the ultimate reality, occupies space, is finite, and is spherical”²⁶, but this is turning Parmenides’ idea of Being of concept into something that is materialist. By turning Being into an object, he moved away from idealism and turned to materialism, which goes against Being a concept, thought, or idea. However, Stace believed Parmenides only turned Being into an object to have an easier time to explain his concept. Stace also believed that Parmenides “became the father of both materialism and of idealism”²⁷, and Empedocles built his own thoughts on the

²³ Ibid.

²⁴ Ibid., 63.

²⁵ Ibid.

²⁶ Ibid., 64.

²⁷ Ibid., 67.

materialistic side of Parmenides' argument. Although, Stace also mentioned that Parmenides had no idea what materialism and idealism, because they were not developed at during his era, but they were developed with Plato. Stace considers Parmenides to be the father of materialism and idealism, but it is Plato that fully developed the concepts.²⁸ Sadly, Parmenides did not receive credit for being the father of materialism and idealism due to him not understanding his own arguments. However, Stace did not blame Parmenides for having messy argument since he stated "that even the greatest philosophers have sometimes failed herein... and that Parmenides is a great example for this. He began by propounding the truth that Being is the essential reality, and Being, as we saw, is a concept. But Parmenides was a pioneer. He trod upon unbroken ground. He had not behind him, as we have, a long line of idealistic thinkers to guide him."²⁹ This does make sense, it is a lot easier to come up with thought and different perspectives about a topic that has already been introduced. It is why Parmenides had an easier time explaining why Being was the primary source of all things, because Thales had introduced the topic. Parmenides did not need to introduce a new topic, all he needed to do was make a convincing argument, which he did manage to do in the first part in his poem. However, it is in his second part, where the issues began, he went from idealism to materialism. Parmenides turned his concept of Being into an object while he still tried to say that it was also an idea still. Stace said that "this is simply his failure to realise and understand his own principle"³⁰ which is something that his "successors, Empedocles and Democritus, seized upon this, and built their philosophies upon it"³¹ and there is not anything wrong with them building their ideas on Parmenides' thoughts, they would have to

²⁸ Ibid., 68.

²⁹ Ibid., 69.

³⁰ Ibid.

³¹ Ibid., 69-70.

work on making sure it made sense. Plato was another philosopher who used Parmenides' work to build his ideas, but unlike Empedocles and Democritus, there was time for other philosophers to make their own contribution to philosophy and science.

Section 2:

This next section is about Empedocles and Hippocrates and their works. Empedocles lived in the middle of the fifth century B.C and he was from Sicilian polis of Acragas.

Hippocrates was born on the island of Kos and around four hundred sixty B.C. These two philosophers built upon the works of Parmenides and Alcmaeon.

Empedocles: Now, moving onto Empedocles, who is an extremely important person as one of the pre-Socratic philosophers due to moving between religion and science also mythos and logos. Empedocles is also considered to be one of the greatest philosophical poets. Even though he is considered an exceptional poet, his works can be difficult to follow due to his chaotic organization. However, his thoughts and ideas were similar to another philosopher, Parmenides. One of Parmenides' essential thought was that "being cannot pass into not-being, nor not-being into being. Whatever it is, remains forever what it is,"³² and this is something that Empedocles agreed with. This means that a vase will never to be able to become a living organism and that a living organism will never be able to become a vase. Although, Empedocles agreed with this principle, he also agreed with another thought that went against Parmenides. This second principle was change cannot be denied³³, people cannot deny that they change through time and the world and everything in it cannot deny change. It might take some time for things to change, like a cliffside eroding away from rain, water, and if waves bash against it.

³² Ibid., 95.

³³ Ibid., 96.

Another thought from Parmenides was that elements cannot change, water cannot turn into fire, fire cannot turn into earth³⁴. Empedocles took this concept and made it his own through his own interpretation, this leads to his highly influential theory of roots. The roots are made up of the four elements: air, water, earth, and fire. He stands out from the Ionic philosophers, because they believe that matter can move itself, it has the power to move itself.³⁵ Empedocles completely disagrees with this idea, to him, matter is dead, it would not be able to itself. The only way that matter would be able move is if outside forces got involved. He thinks that there “two essential process of the world: mixing and unmixing”³⁶, but he calls these two processes love and hate. Normally, the words love and hate would be used to describe how a person might be feeling. Empedocles does not see it that way, to him, love and hate is a physical and material force.³⁷ He also recognizes attractions and repulsions in people and he considers these two things to be the manifestations in people due to the mechanical forces of love and hate in the world.³⁸

Empedocles taught others about his beliefs in forces of love and hate in the world and the world goes through a cycle. He refers to the world as a sphere, “But in the strong recess of Harmony, established firm abides the rounded Sphere, exultant in surrounding solitude,”³⁹ in this, Empedocles is saying that the sphere is better off being alone as long as harmony stays with the sphere. To achieve this harmony, there needs to be an equal amount of water, fire, air, and earth inside the sphere. However, harmony (or love) does not last forever, due to Strife (hate) trying to break through the sphere to reach the elements. Eventually, hate breaks through the surface of

³⁴ Ibid.

³⁵ Ibid., 97.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid., 97-98.

³⁹ William Ellery Leonard and Empedocles, *The Fragments of Empedocles*, edited by Leonard, William Ellery, Chicago: Chicago: The Open Court Publishing Company, 1908. 29.

the sphere and takes over all of the elements. This leads to love being pushed away from the sphere and unable to get back to the elements. Empedocles mentions that “after mighty Strife had waxen great within the members of the Sphere, and rose to her own honors, as the times arrived which unto each in turn, to Strife, to Love,”⁴⁰ when hate is in control of the sphere, the elements are separated. Though when love is able to come back into the sphere, the elements will mix again.⁴¹ Empedocles brought up the conquest of love and this can be found in *The Fragments of Empedocles*,

But hurrying back, I now will make return to paths of festal song, laid down before,
draining each flowing thought from flowing thought. When down the Vortex to the last
abyss had foundered Hate, and Lovingness had reached the eddying center of the Mass...
As much as Hate still held in scales aloft. For not all blameless did Hate yield and stand
out yonder on the circle's utmost bonds.

This fragment is just a small part of Empedocles' works that have been pieced together and it is unclear if he wrote more about Strife taking control of the sphere. It sounds like he is favoring one force over the other, even though these two forces will always exist and should be balanced. The forces of love and hate in the world is a part of Empedocles' theory of roots and this theory has a part in his thoughts of cosmology. This is where Empedocles gets confusing and can become hard to follow when reading his works. When reading about his thoughts and his concepts for cosmology, it is noticeable when other thoughts and concepts of a different topic when linked to cosmology, that the terms of the other topic are changed to make sense in the

⁴⁰ Ibid., 30.

⁴¹ W. T. Stace, (*W. A Critical History of Greek Philosophy* Project Gutenberg. 98.

field of cosmology. So, when his theory of roots is brought up in cosmology, the idea about the forces of Love and Strife should be put on a back burner.

In Empedocles' thoughts about cosmology, he believed that the roots should be distinct as well as being completely balanced due to the roots being the elements of the cosmos.⁴² When he is describing the roots of cosmology, he compares them to the gods, "And first the fourfold root of all things hear! White gleaming Zeus, life-bringing Hera, Dis, and Nestis⁴³ whose tears bedew mortality." It is important to note that Empedocles is comparing the elements to gods due to the elements being made up of immortal material that is used for people to use, but the core of the element will stay unchanged.⁴⁴ Another way to look at it is by focusing on the gods themselves. The gods can be considered to be the source of the elements due to gods never really changing. Then the gods' powers can be the immortal material that people use. It is interesting to note that along with his thoughts on cosmology and on life, that he brings up immortality. Then again, it is not surprising that Empedocles on immortality considering that it is reported that he said, "I come to an immortal god, no longer mortal, honoured by all,"⁴⁵ and not only was he of 'divine status', but he also accesses to the full truth.⁴⁶ However, this also had been reported that if this did occur, he was starting to get onto his death bed. He does relate eternity and time to life. He managed to achieve this by arranging three different levels of life in a certain order: "1.

⁴² Giannis, Stamatellos, *Plotinus and the Presocratics a Philosophical Study of Presocratic Influences in Plotinus' Enneads*, Albany: Albany: State University of New York Press, 2007a, 143.

⁴³ Leonard, William Ellery and Empedocles. *The Fragments of Empedocles*, edited by Leonard, William Ellery. Chicago: Chicago: The Open Court Publishing Company, 1908. 17.

⁴⁴ Giannis, Stamatellos, *Plotinus and the Presocratics a Philosophical Study of Presocratic Influences in Plotinus' Enneads*. Albany: Albany: State University of New York Press, 2007a. 143.

⁴⁵ James, Warren, *Presocratics*, Durham: Durham: Taylor & Francis Group, 2007, 146.

⁴⁶ Ibid.

Everlasting life of divine and imperishable principles at an immortal level. 2. Long lasting life of daimons and gods at level of soul. 3. Temporal short-life of mortals at the level of temporal becoming.”⁴⁷ When he refers to the temporal short-life, this is where his concept of the forces of Love and Strife come into play. That these forces can make people realize that having an immortal life is better than living as a mortal. Empedocles was fascinated by the gods, the concept of immortality, the elements, cosmology, and the soul, but he also was curious about the human body.

One of the things that Empedocles looked into about human anatomy was the senses, just like Alcmaeon. When he does talk about the senses, he was able to link his theory of roots with human anatomy. He firsts off with vision and he believes that “all bodies are formed by the four elements, earth, air, fire, and water.”⁴⁸ He continues with by mentioning his belief in that all bodies have a state where they are in physical communication and it is this notion that leads Empedocles to develop his theory of perception. He has the same beliefs as Alcmaeon as to why the eyes are able to have vision. Eyes contain a fire, but he adds more of the elements into his reasoning. That fire is in the inside of the eye, water is front of fire, and air and earth are in front of the water level. He also compares the eye to a lantern which makes sense due to the design of a lantern.⁴⁹ When Empedocles talks about hearing, he has more evidence than Alcmaeon, but if it was not Alcmaeon, Empedocles might not have evidence. He believes that hearing is cause air-waves moving against the inner ear. He also has more information about the sense of smelling.

⁴⁷Giannis, Stamatellos, *Plotinus and the Presocratics a Philosophical Study of Presocratic Influences in Plotinus' Enneads*, Albany: Albany: State University of New York Press, 2007a, 117.

⁴⁸ John I. Beare, (John Isaac), *Greek Theories of Elementary Cognition from Alcmaeon to Aristotle*, Oxford: Oxford, Clarendon Press, 1906. 14.

⁴⁹ Ibid.

He knows that air does not automatically go up into the brain, but it goes to the lungs. He also adds information about odors and how some can be nose wrinkling or some can be pleasant.⁵⁰

For the senses of tasting and touching, Empedocles did not have any thoughts on the two senses.⁵¹

Hippocrates: Empedocles and Parmenides focused more on the philosophy part of medical education, and while Alcmaeon got the ball rolling for the science of medicine, it was Hippocrates who truly expanded the field of medical science. His works are part of the Hippocratic collection. Now, it has been reported that Hippocrates was not the sole author of the entire collection. Francis Adams, the author of *The Genuine Works of Hippocrates*, made his first chapter, “Preliminary Discourse”, about the collection and which works was produced by Hippocrates. Adams argued that there are only thirteen works in the collection that Hippocrates published himself: *On Ancient Medicine*, *The Prognostics*, *The Aphorism*, *The Epidemics Books 1 and 3*, *Regimen in Acute Diseases*, *On Airs, Waters, and Places*, *On the Articulations*, *On Fractures*, *The Instruments of Reduction*, *The Physician’s Establishment (Surgery)*, *On Injuries of the Head*, *The Oath*, and *The Law*.⁵² However, the most influential works from Hippocrates is *The Oath*, *The Law (Canon)*, *The Epidemics Book 1*, and *The Prognostics*.

One of Hippocrates’ most influential works, *The Oath*, is the only work that has religion involved. Hippocrates started the Oath by swearing to the gods and goddesses, “I swear by Apollo the healer, by Aesculapius, by heath and all the powers of healing, and call to witness all the gods and goddesses that I may keep this Oath and Promise to the best of my ability and

⁵⁰ Ibid., 135.

⁵¹ Ibid., 161.

⁵² Francis, Adams, *The Genuine Works of Hippocrates: Translated from the Greek with a Preliminary Discourse and Annotations*, United States: W. Wood, 1886, 35-36.

judgement,”⁵³ and it is a serious promise. In Ancient Greece, the gods and goddesses were respected and feared, especially Zeus, who was known to be the most powerful god.⁵⁴ However, Steven Miles who wrote *The Hippocratic Oath and the Ethics of Medicine*, pointed out that Hippocrates and other physicians swore to Apollo, not Zeus. Apollo was the god of healing and when he had a human son, the son was taught medicine.⁵⁵ The next part of the Oath is “I will pay the same respect to my master in the Science as to my parents and share my life with him and pay all my debts to him. I will regard his sons as my brothers and teach them the Science, if they desire to learn it, without fee or contract. I will hand on precepts, lectures and all other learning to my sons, to those of my master and to those pupils duly apprenticed and sworn, and to none other.”⁵⁶ The first part of the first sentence, “I will pay the same the same respect to my master in the Science as to my parents,”⁵⁷, he is stating that he would not put his teacher over his parents, that he would show them the same respect. He promised that he held them in the same regard as he would for the gods and goddesses. In the second sentence, Hippocrates promised that he would continue learning and passing on that knowledge to next generation. At the end of the second sentence, he said, “if they desire to learn it, without fee or contract,”⁵⁸ Hippocrates did

⁵³ G. E. R. Lloyd, (G, John Chadwick, W. N. (W Mann, and Hippocrates. *Hippocratic Writings*, edited by G. E. R. Lloyd, (Geoffrey Ernest Richard), John Chadwick and Mann, W. N. (William Neville). [New] ed., with additional material, repr. in Penguin classics, ed, Harmondsworth; New York: Harmondsworth; New York: Penguin, 1983, 76.

⁵⁴ Steven H. Miles, *The Hippocratic Oath and the Ethics of Medicine*, Oxford; New York: Oxford; New York: Oxford University Press, 2004, 16.

⁵⁵ Ibid.

⁵⁶ G. E. R. Lloyd, (G, John Chadwick, W. N. (W Mann, and Hippocrates. *Hippocratic Writings*, edited by G. E. R. Lloyd, (Geoffrey Ernest Richard), John Chadwick and Mann, W. N. (William Neville). [New] ed., with additional material, repr. in Penguin classics, ed, Harmondsworth; New York: Harmondsworth; New York: Penguin, 1983, 76.

⁵⁷ Ibid.

⁵⁸ Ibid.

not force a student to pay or sign a contract in order to learn medicine. The third part of The Oath, “I will use my power to help the sick to the best of my ability and judgement; I will abstain from harming or wronging any man by it,”⁵⁹ Hippocrates promised that he would do whatever he could to help his patient. He would put his patient first, he would make sure that he would not add onto his patient’s suffering and that he would not make a patient suffer. In the fourth part, Hippocrates made it clear that he would not “give a fatal draught to anyone if I am asked, nor will I suggest any such thing. Neither will I give a woman means to procure an abortion,”⁶⁰ and the first sentence relates back to Hippocrates’ third part of The Oath. He did not want to harm his patients and that he would not kill a patient intentionally. Unfortunately, Hippocrates had to come to terms that he would not be able to save all of his patients. Steven Miles mentioned that remedies in Ancient Greece was ineffective and that almost “two-thirds of the patients described in the ancient Greek medical treatises died under the physician’s care,”⁶¹ but that did not stop Hippocrates. He did what he could to help his patients. He also was against doctor assisted suicide, he considered the act of helping a patient killing themselves to be a violation of his oath. The last sentence of the fourth part, “Neither will I give a woman means to procure an abortion,”⁶² Hippocrates would not kill a baby in the mother’s womb nor would help a mother find a way to kill her child. Steven Miles claimed that while “Greek society saw fertility and

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Steven H. Miles, *The Hippocratic Oath and the Ethics of Medicine*, Oxford; New York: Oxford; New York: Oxford University Press, 2004, 16.

⁶² G. E. R. Lloyd, (G, John Chadwick, W. N. (W Mann, and Hippocrates. *Hippocratic Writings*, edited by G. E. R. Lloyd, (Geoffrey Ernest Richard), John Chadwick and Mann, W. N. (William Neville). [New] ed., with additional material, repr. in Penguin classics, ed, Harmondsworth; New York: Harmondsworth; New York: Penguin, 1983, 76.

pregnancy as healthy and socially desirable, abortion was legal and frequently described,”⁶³ however, there were physicians, like Hippocrates, who concerned about the risks of abortions. They believed that “the risks of abortion to a woman’s health were recognized and fear,”⁶⁴ and that “abortions are more dangerous than births because it is impossible for an embryo to be aborted by medicine or by a potion or by food or by pessaries or in any way at all without applying force, and force is a painful thing. The risk here is that the womb will become lacerated or inflamed and this is dangerous.”⁶⁵ Due to the risks that physicians feared in Ancient Greece, Hippocrates considered that inducing an abortion to be a violation of his oath. The majority of The Oath referred to different situations that Hippocrates found himself treating patients and what he considered to be an appropriate way to treat patients. In the eighth part, “Whatever I see or hear, professionally or privately, which ought not to be divulged, I will keep secret and tell no one,”⁶⁶ Hippocrates stated that he would protect his patients and would not break their trust. This is rather important, because if a patient did not feel comfortable with Hippocrates as their physician, Hippocrates would not be able to find a remedy for them. In the last part, “I observe this Oath and do not violate it, may I prosper both in my life and in my profession, earning good repute among all men for all time. If I transgress and forswear this Oath, may my lot be otherwise,”⁶⁷ As long as he did not violate his oath, Hippocrates hoped to be physician as long as

⁶³ Steven H. Miles, *The Hippocratic Oath and the Ethics of Medicine*. Oxford; New York: Oxford; New York: Oxford University Press, 2004, 81-82.

⁶⁴ *Ibid.*, 83.

⁶⁵ *Ibid.*, 83.

⁶⁶ G. E. R. Lloyd, (G, John Chadwick, W. N. (W Mann, and Hippocrates. *Hippocratic Writings*, edited by G. E. R. Lloyd, (Geoffrey Ernest Richard), John Chadwick and Mann, W. N. (William Neville). [New] ed., with additional material, repr. in Penguin classics, ed, Harmondsworth; New York: Harmondsworth; New York: Penguin, 1983, 76-77.

⁶⁷ *Ibid.*

patients wanted him to be their physician. Hippocrates also accepted that if he ever did break his oath, he would accept the consequences.

The next influential work, is *The Law or Canon*, and Hippocrates described the type of person who should either be a student or a physician. He held the world of medicine in a high regard and was hurt by false physicians who tarnished the reputation of his profession. That is why he was strict with his requirements for students, he believed that in order “for a man to be able to be a real physician, he needs to have a natural disposition for it, the necessary instruction, favorable circumstances, education, industry and time.”⁶⁸ A student should be interested in the world of medicine of their own accord because he believed that it is more difficult for a student to learn about medicine when they are not interested. Hippocrates also believed that a student should be exposed to the world of science and medicine from a young age, so they have the guidance to become a physician. However, a student only can become a physician if they truly want to help others when they have injuries and illnesses. They are not allowed to be bias because “science and opinion are two different things; science is the father of knowledge but opinion breeds ignorance,”⁶⁹ physicians need to focus on the facts of a case and ignore their personal thoughts about a patient.

Hippocrates wrote the first and third book of *Epidemics*. In the first book, he did write about some specific cases and some of the diseases that he has observed during his career, but in the beginning, he described how the seasons and the climate had a negative connection to illnesses and diseases. He noted that in both winter and spring, people had contracted fevers and that some of the fevers lasted into the following season. He also mentioned that during the early

⁶⁸ Ibid. 78.

⁶⁹ Ibid.

spring, the people who had contracted fevers were often men, especially those who were athletes. Men who contracted *causus* often had “swelling near the ears”⁷⁰ and “had dry, unproductive coughs”⁷¹. If a man did have a fever, it was a slight fever. He did mention that women could contract *causus*, but it was uncommon. He moved onto summer, where one of the most contagious diseases appeared: consumption or tuberculosis. Hippocrates noticed that “patients who had long-standing consumption took to their beds,”⁷² but it often took time to fully diagnosis the disease due to the other illnesses and diseases that appeared in Ancient Greece. However, it was consumption that spread throughout Greece the fastest and it was deadliest disease that he has observed.

Before Hippocrates moved onto the specific cases, he described the other diseases that he has seen. The first one was ophthalmia which affected the eye and Hippocrates noted that ophthalmia was “accompanied by pain, moist discharge and without suppuration. Many people had small styes break out which gave them trouble. Most relapsed but were finally cured late in the year towards autumn,⁷³ but he does not anything else about the disease. He does move onto describing the different types of fevers: *causus*, diurnal, nocturnal, and continued fevers. Out of all the fevers, *causus* was the “least frequent of these fevers”⁷⁴ and the patients who were affected by *causus* did not have to suffer as much as those who were affected by continued fevers. Hippocrates talked about the symptoms of *causus* fevers, patients did not experience delirium and any type of bleeding. Usually, patients were cured of the fever by the seventeenth day and Hippocrates mentioned that he was not aware of any cases of *causus* where the patient

⁷⁰ Ibid., 102.

⁷¹ Ibid., 102-103.

⁷² Ibid.

⁷³ Ibid., 105-107.

⁷⁴ Ibid.

had died. He lumped quotidian, nocturnal, and irregular fever into one group and none of the fevers were pleasant for the patients. The patients had to deal with the fever for a long time and it did not matter if they stayed in bed or not. Hippocrates noted that the majority of cases, the patients would have the fever from the start of summer and it could last until winter. One of the symptoms of these fevers were convulsions, but children had a higher chance of seizing during these fevers. Fortunately, patients who had either quotidian, nocturnal, or irregular fever had a good chance of recovery, the only time that Hippocrates noted that patients died from these fevers was when they already had a deadly illness.

Hippocrates then moved onto continued fevers, and he said that continued fevers were “the worst, most protracted and most painful of all the diseases,”⁷⁵ and patients never had a chance to feel relief during the lulls in the fever. At first, the fever started off mild however it would continue to get worse as the days moved on. The patient would experience lulls in the fever where the patient could feel hopeful about recovery, but those hopes was quickly washed away as their fever would rise again. Hippocrates pointed out that during all the fevers, patients could experience “shivering fits at irregular times”⁷⁶ but patients who had continued fevers, these shivering fits were harmful to the patient. The patients struggled to stay warm and the insomnia that they experienced was followed up by the patients going into a coma. However, the most dangerous symptom of continued fever was the loss of appetite. When patients lost their appetite, their health was sure to deteriorate faster. Hippocrates noted that it was common to see patients who were suffering from continued fever to also experience dysentery, tenesmus, and diarrhea.⁷⁷ All the fevers and other diseases could be deadly, but with the exception of the consumption,

⁷⁵ Ibid., 107-108.

⁷⁶ Ibid.

⁷⁷ Ibid., 109-110.

continued fever caused the most fatal cases. At the end of Epidemics Book 1, Hippocrates wrote about fourteen cases, not all the cases ended well, some of his patients passed away.

Hippocrates starts *Prognosis* off by stating that physicians need to know the symptoms that the patients are experiencing in order to figure out what ails them. If a physician knows the patient's medical history, they will have an easier time with the diagnosing process. When they know all the information, they can figure out the remedy. However, Hippocrates pointed out that "it is impossible to cure all patients"⁷⁸ and that this is something that every physician needs to understand. This might seem harsh to hear, but it is unrealistic for a physician to expect that every patient that they come into contact with will get better. He continued by stating that "men die before the physician is able to bring his skill to grapple with the case – some owing to the violence of the disease die before they have summoned the doctor, some as soon as he arrives; some live one day, others a little longer – in view of this, an understanding of such diseases is needed,"⁷⁹ there will be some patients who have a chance of surviving a disease, but it is important that a physician does not give false hope to patients. Sometimes hope can be a cruel thing to families who have a loved one who is sick. A good physician will not only try to look after a patient's physical health, but they would also try their best not to negatively affect their mental and emotional state. If a physician told a patient and their family that they will make a recovery but if the patient died instead, the family would place blame onto the physician instead of the disease.

Hippocrates turned the rest of the *Prognosis* book into a guidebook, he first gave instructions on the signs that physicians need to watch out for. He first noted that a physician

⁷⁸ Ibid., 209.

⁷⁹ Ibid.

should look at a patient's face first. If a patient's face has a normal face, the physician needs to pay attention to any changes that occurred, like "the eyes sunken, the temples fallen in, the ears cold and drawn in and their lobes distorted, the skin of the face hard, stretched and dry, and the color of the face pale or dusky,"⁸⁰ if these changes did occur, the physician would ask about the symptoms that a patient could be experiencing. He would ask about insomnia, if the patient had severe diarrhea, or if he had insatiable hunger.⁸¹ If the patient had these symptoms, this would let the physician know that the patient was not experiencing a severe illness. However, if the patient did not have any of these symptoms but did not improve after twenty-four hours, then the patient has a serious disease and had a high chance of dying. Also, if a patient did have an illness and it took more than three days for the face to change, the physician needed to do another examination of the patient. Hippocrates wrote that while the physician does an examination of the body, they need to be paying particular attention to the eyes, because if a patient avoids "the glare of light, or weep involuntarily, or squint, or the one becomes smaller than the other, or if the whites are red or livid or show the presence of tiny dark veins, or if blariness appear around the eyes, or if the eyes wander, or project, or are deeply sunken, or if the whole complexion of the face be altered; then these things must be considered bad signs and indicative of death."⁸² The physician would have to pay attention how the patient slept, because if a patient slept with their eyes opened and it was not a normal occurrence, then it should be taken as a bad sign and could lead to death. If a patient was healthy, they would sleep on their side and be relaxed, however if a

⁸⁰ Ibid., 209-210.

⁸¹ Ibid.

⁸² Ibid.

patient had their “feet uncovered”⁸³ and their “hands and legs flung about at random”⁸⁴ then the physician would recognize this as a sign of recklessness.

Hippocrates moved away from sleep and focused on the lungs. If a patient experienced rapid breathing, they could be distressed or their lungs were inflamed. If a patient took deep breaths at long intervals, this was considered a sign of delirium.⁸⁵ A patient could have contracted a fever from a disease, but Hippocrates considered a fever along with a patient have the ability to take normal breaths was a sign of recovery. Of course, a patient had a fever, they would also have fits of sweating. Hippocrates also believed that when a patient experienced sweating on the most critical days of a fever, that it marks the end of a fever.

After this, Hippocrates moved onto the hypochondrium, and the hypochondrium refers to the upper abdomen that is below the ribs. The best condition for the hypochondrium is soft and smooth, however both the physician and the patient had to be careful if the patient started to experience pain in that area. If the patient started to experience throbbing, Hippocrates considered this to either be a sign of delirium or violent disturbance.⁸⁶ If the patient experienced painful swelling in the upper abdomen area, this was considered to be a bad sign. When swelling appeared at the beginning of an illness, this was considered to be a sign of a quick death, however if the patient lives longer than twenty days, pus should appear. If the pus is white, smooth, homogeneous, and is not foul-smelling then it was considered to be a good sign. However, if it is the opposite, as in the pus is foul-smelling and green, then the physician should take this as a bad sign.

⁸³ Ibid., 210-212.

⁸⁴ Ibid.

⁸⁵ Ibid., 212-213.

⁸⁶ Ibid., 213-214.

Hippocrates moves onto dropsy which occurs when there is swelling of soft tissues due to the accumulation of excess water, and Hippocrates made it clear that dropsy is never a good thing. Especially in the cases where dropsy is caused by an acute disease. Hippocrates notes that dropsy does not help with getting rid of a fever, that patients who experience dropsy are in a great amount of pain and can easily arrive on death's door.⁸⁷ When dropsy starts the abdomen and close to the loins, this could lead to the feet swelling and the patient could experience diarrhea. This also adds onto the pain that a patient could experience. Physicians needed to keep an eye on the patient's head, hands, and feet for most cases of illness, because they can show signs that a patient's health is getting better or worse. For instance, Hippocrates considered if the feet, hands, and head were cold as the belly and sides were warm as a bad sign. He believes that a healthy body would be warm all over.⁸⁸ A patient who experienced dropsy had a high chance of dying, because it affected both the upper and lower abdomen. Hippocrates does bring up fevers again and does go into more detail about some the symptoms a patient could have. Then at the end of *Prognosis*, Hippocrates pointed out that physicians "must be quick to think of the trend of any diseases that are epidemic from time to time, and the climatic conditions must not escape him"⁸⁹ but a physician needed to pay attention to the signs that appear in the climate around him. That symptoms would not change; rapid breathing would still be a symptom of distress or inflammation or someone sleeping on their side would still be healthy.

Prognosis is an excellent example of philosophy and medicine being connected. In the beginning, Hippocrates is referring to moral boundaries that a physician should follow. It also connects *Prognosis* with *The Oath*. The biggest part of *The Oath* is that the patient comes first

⁸⁷ Ibid.

⁸⁸ Ibid., 214-215.

⁸⁹ Ibid., 228-229.

not the physician. Hippocrates uses *Prognosis* as a guidebook for other physicians. It focused more on what the physician should pay attention to if any issues happen to the patient's internal organs, like if there was any issue with abdomen or the liver. Also, Hippocrates notes the different bad signs that can occur, for example urine. He says that when urine is white and smooth that this is a sign that the patient will recover and that the illness is not as serious.⁹⁰

Another situation where if the urine is white and smooth but even deposit appears at random times, then this is a sign that the illness will be prolonged and recovery is uncertain.⁹¹ If the urine is pink and has pink smooth sediment, this means that an illness will last longer but there is a better chance at recovery.⁹² However, if the urine is dark, foul-smelling, or even of a thicker consistency, then this should be read as a sign of death.⁹³ Hippocrates goes through descriptions of what vomit should look like if the patient is healthy, does not have a serious illness, or if the patient is on death's door. Towards the end of *Prognosis*, Hippocrates mentioned that physicians need to be aware of the patient's symptoms of any previous illnesses or any current illnesses, because if they know their patient's medical history, they could have an easier time with finding out the right diagnosis and the correct treatment.

Section 3:

How They are Connected. At first, it did not make sense how Hippocrates is a pillar for the foundation of philosophy or how Parmenides is a pillar for the foundation of medicine. These four philosophers focused on different subjects with small connections to the others. However, it is after analyzing their work when the connections become noticeable. The connection between

⁹⁰ Ibid., 216-217.

⁹¹ Ibid.

⁹² Ibid.

⁹³ Ibid., 217-218.

Parmenides and Empedocles is the most noticeable. It is that relationship of a leader and a follower that can be seen not only throughout history but also literature. Parmenides created the concept of Being and how it always exists and will remain the same, and it is this concept that is the primary source of everything. [cite] Empedocles both agreed and disagreed with Parmenides' concept. While Empedocles agreed that there is something that is the primary source of everything and that something will always exist and remain the same, he disagreed about Being is the primary source of everything. Empedocles believed that the elements, earth, water, fire, and air, are the primary source of everything. [cite] Empedocles and Alcmaeon are connected through their theories of perception. Alcmaeon believed that the senses exist because of the brain where Empedocles believed that the senses exist because of the elements. Another noticeable connection is between Alcmaeon and Hippocrates. They both focused on the health, diseases, and the human body. Hippocrates is connected to Parmenides by the concept of asking scientific questions to find answers. Empedocles is connected to Hippocrates by biology and the human body. Alcmaeon is linked to Parmenides through scientific questioning the world around them. Alcmaeon, Parmenides, Empedocles, and Hippocrates are connected through not only asking scientific questions, but also no longer relying on the supernatural for answers.

Why are They Important: Hippocrates is the easiest to explain about why he is important and how he is a pillar in the foundation of philosophy, medicine, and science. Hippocrates was not the first philosopher to explain medicine, no that is credited to Alcmaeon, but Hippocrates created the basis of the ethics in the field of medicine by his oath. This oath is still used today, even though it has gone through changes to fit the modern times. In his book, *Epidemics*, he noted the connections between the climate and diseases. He also had the first clinical studies in Ancient Greece where he was able to figure out what worked for a cure for

diseases, how to make patients feel a little bit better, or being able to note when the disease reached a point where medicine would not be able to help. He also developed the concept of the four humors, which people believed in until the nineteenth century. Alcmaeon was the first philosopher to directly refer to medicine and both the philosophy and science of health. He was the first to start mapping out the human body, which allowed Hippocrates to do his work. Empedocles added to the theory of perception that Alcmaeon started, and both of them were right and wrong. Empedocles was correct when he believed that the other organs are important to the senses while Alcmaeon was correct about the senses being linked to the brain. Parmenides and Empedocles both added to the field of cosmology and Parmenides was one of the first philosophers to separate reality from the supernatural. He started asking scientific questions and coming up with answers.

Conclusion:

When looking at modern science, philosophy, and medicine, then looking back at ancient history, it is very interesting. Medicine and science have changed a lot since the nineteenth century. These two fields experienced major advances and it is incredible to think about it. Society still believed in the four humours concept until the nineteenth century. It was in the twentieth century where space travel was possible, however, that might not have been the case if it was not for Parmenides, Empedocles, Alcmaeon, and Hippocrates. They built a foundation where these fields grew and improved over time and the philosophers that followed had an easier time with their concepts because these four had already started the process.

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