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## The effect of the environment on the physical appearance and mood of humans from the perspective of philosophers

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**Abstract:** This paper seeks to examine the thought of philosophers about the influence of the environment on humans' physical, mental and moral habits, as well as how these philosophers used this influence to categorise individuals according to their habitat. As such this research begins with Herodotus and Hippocrates, and briefly discusses Plato, Aristotle, and seven medieval philosophers belonging to Jewish, Christian, and Islamic religions (Al-Kindi, Eriugena, Al-Farabi, Ibn Sina, Ibn Tufail, Averroes, and Moses Maimonides). Also, this study investigates Montesquieu from the seventh century, eight modern thinkers from the 19th through the 21st centuries, determinism (Carl Ritter, Ellen Churchill Semple, and Ellsworth Huntington), geography of possibilism (Vidal de Blacche, Lucian Febwer, and Cari Sauer), bioregionalism (Richard Evanoff), and meteorology (Frederik Nebeker). Lastly, this study concludes that all aforementioned 19th philosophers agreed that the environment influences human behaviour and physical condition.

**Keywords:** Aristotle; Averroes; Moses Maimonides; Montesquieu; Ellen Churchill Semple; Richard Evanoff.

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## 1 Introduction

Philosophers have studied the relationship between human beings and the environment to establish evidence of environmental impact. The majority of studies have confirmed the presence of this influence on both human behaviour and the evolution of the body's structure.

The field of philosophy has seen significant progress in works that focus on the impact of the environment on human beings. During the time of ancient Greece, this subject was studied by Herodotus (484–425 BC), Hippocrates (460–375 BC), Plato (429–347 BC), and Aristotle (384–322 BC); in the medieval period, it was the focus of work by Al-Kindi (801–873 AD), John Scotus Eriugens (815–877 AD) Al-Farabi (872–950 AD), Ibn Sina (980–1037 AD), Ibn Tufail (1105–1182 AD), Ibn Rushd (1126–1198 AD), and Moses Maimonides (1135–1204 AD).

In this paper, I investigate the fundamental thoughts of some Greek and medieval philosophers and how they developed in contemporary times by scholars who study the influence of the climate on laws by taking Montesquieu's *The Spirit of Law* as an example. Then, I examine geographers who have studied environmental determinism (Carl Ritter, Ellen Churchill Semple, and Ellsworth Huntington), possibilism geography (Vidal de Blacche, Lucian Febwer, and Cari Sauer), bioregionalism (Richard Evanoff), meteorology (Frederik Nebeker) and some scientific evidence that demonstrates the environmental impact on the appearance, mood and behaviour of the human body to support the philosophers' perspective.

The work of such philosophers and other scholars has resulted in the identification of a number of broad categories of environmental ethics theory.

## 2 Methodology

The methodology of this study is built based on enhancing the relationship between humans and the environment to achieve the sanctity of life and then realise the sanctity of the environment.

This study is observational, not experimental. Its design comprises two basic aspects, namely, the theoretical framework and the evaluation of scientific evidence that demonstrates the environmental impact on the appearance and mood of the human body and on human behaviour. These methods are described in sufficient detail, and the fundamental thoughts of some Greek and medieval philosophers and how they developed in contemporary times by scholars who study the influence of the climate on laws are investigated. Moreover, some geographers' thoughts that support the philosophical perspective are examined. These methods lead to the development of some of the following significant results, while other findings are found at the conclusion of this paper.

- 1 Hippocrates was the first physician who believed in the environmental origins of diseases, which was in opposition to the ancient Greek superstition that diseases originated from the gods. He was like Thales in being the first philosopher who rejected the traditional explanations of the world's origin when he asked the first philosophical question: what is the essential substance from which all things originate? The Arche is water, as Thales stated.

- 2 Herodotus, Hippocrates, Plato, and Aristotle all thought that human nature is divided based on its habitats.
- 3 Greek culture continued to influence beliefs during the medieval period, although the philosophers of this time expanded their discussions concerning the environment to cover not only its impact on the mode and the structure of the body but also language and a number of other social issues and ethical systems.
- 4 In contemporary times, some scholars supported the effect of the environment on humans from other angles such as Montesquieu who confirmed the effect of climate change on the nature of law. Additionally, the environmentalism trend emphasises that people's physical, mental and moral habits are directly due to the influence of their natural environment. Possibilism refers to the ability of humans to select available environmental opportunities such as climate, terrain and land and then determine them through social conditions.

### **3 Perspective of philosophers**

#### *3.1 Greek philosophy (Herodotus, Hippocrates, Plato, and Aristotle)*

Soft men come from soft lands: this is the Herodotus's myth that spread in the American West and the East since the earliest years. This statement means that there is a connection between people and the land where they live. Herodotus suggests "this physical softness when discussing how the environment, in this case the climate, affects Egyptian and Persians skulls" [Kennedy et al., (2016), p.10]. He maintained that Egyptian men have strong heads while the Persians have weak heads due to the amount of the sunshine effecting them. Egyptians shave their heads and their skull is thickened in the sun, whereas the Persians wore felt hats to protect themselves from the sun. For this reason, their skulls developed differences. The Persians' skulls become weak and soft but the Egyptians' skulls were hard and strong. Hence, the environment in which they lived determined their bodies and customs. Here, we do not try to determine which one comes first (customs or environment). However, we can state that the environment and cultures can shape people's identity. For instance, in Herodotus' example, a skull is an ethnic trait since all Egyptians have strong skulls but all Persians have weak ones.

Furthermore, in one chapter in his book entitled *People and Environment in Archaic and Classical Greek Thought*, Kennedy (2016) used three ways to explore the relationship between environment and ethnicity, namely, myths of metals, autochthony, and environmental determinism. These three myths are explained as follows:

- 1 Myths of metals: According to Hesiod, five genes exist: gold, silver, bronze, half-gods, and iron. The human being is created Olympian gods from earth and other natural elements. These five 'races' of mortal men reflect their qualities in life and death.
- 2 Autochthony: Athenians came from the very soil of Attica and the gods, and were the only Greeks to have always inhabited their land [Kennedy et al., (2016), pp.15–16].

Moreover, Athenians laws were built based on the idea that the Athenians were pure people. In the classical time, a racial citizenship meant purity of descent. Athenians believe that they were exclusive and privileged people. Also, citizenship of Athens granted was granted to those born of two citizen parents. Hence, Athenian blood was superior to non-Athenian blood.

Additionally, non-Athenians were deemed as less loyalty, weakening the city and being hardly good citizens. Based on this, the autochthony tied every Athenian to the land and filled the gap between citizens and their land.

- 3 Environmental determinism: The Hippocratic “Airs, Waters, Places (AWP) is the most explicit presentation of the relationship imagined between identity and environment. Though, in some ways, it is the most elusive.” [Kennedy et al., (2016), p.19]. In this regard, the premise is that the climate and geography shapes human physiology and character. Two examples support this premise. The first example is cities with hot winds, where the water is salty near the surface, and it is hot in the summer and cold in the winter. The impact on the people living in this environment is that they have heads full of phlegm and their bodies are rather flabby. The second example is that cities with cold winds have cold and bitter water, the bodies of the people living there is vigorous, lean, bilious and their heads are hard. This signifies that the location of the cities is linked with the quality of the water and its impact on human health.

To discuss further, we will consider the impact of geographic location on European and Asia inhabitants. In Asian Minor, the environment (considering its temperate, warm, dryness of the climate) leads to milder and more even tempered people. Moreover, Asian people are caused to become tall and uniform in build, slavish and pleasure-seeking. Everything in Asia is by far more beautiful and larger. Asian peoples are less warlike and more prone to living under a monarchy which caused by their environment. Also, “People who live where Europe and Asia meet in the north, however, are fundamentally different: because of the climate moves between extremes of cold and hot and the topography of the land is varied, the physical appearance and character of the people who live in the north varies greatly. These characteristics make Europeans less responsive to monarchical governments and more independent”, [Kennedy et al., (2016), p.20] as Hippocrates stated.

Hippocrates also studied the relationship between the environment and the human body with the aim of establishing the natural origin of diseases, which was in opposition to ancient Greek superstition and the belief that diseases originated from the gods. As Vasiliadis noted, Hippocrates asserted that disease was not – as believed by the ancient Greeks – a punishment from the gods. In addition, he separated religion and medicine and believed in the environmental origins of diseases and, thus, the importance of a ‘healthy mind in a healthy body’ [Vasiliadis et al., (2009), p.6].

Hippocrates is considered to be the founder of ancient Greek medicine, and his medical oath – which focuses on the integrity of the profession, benevolence and human dignity in the practice of medicine (Jotterand, 2005) – is accepted even today. Hippocrates followed Asclepius’s guidance for the natural treatment of disease and stated that “medicine should be practised as a scientific discipline based on the natural sciences, diagnosing and preventing diseases as well as treating them” (Kirsten et al., 2009). This led him to observe the impact of nature on the structure of the human body; for example,

he observed that this impact caused the people living in mountainous areas to be tall and possess a powerful physique and a courageous nature, while the inhabitants of the dry plains and their adjacent areas were shorter and demonstrated lower levels of experience, skills and courage.

In his text, *Laws*, Plato considered the same issues as Hippocrates from a different perspective and indicated that the body acts according to its mode, whereby its negative mode (such as hot or cold weather) has a negative impact on the soul, but a mild climate has a positive impact. He argued that the main influences on the body are water and food as follows:

“...some places are subject to strange and fatal influences by reason of diverse winds and violent heats, some by reason of waters; or again, from the character of the food given by the earth, which not only affects the bodies of men for good or evil, but produces similar results in their souls.” (Plato, 2006)

Thus, Plato identified a relationship between the quality of food and water and the soul, with the soul governing human behaviour. Plato focused on ethics (the philosophical goal), while Hippocrates focused on treatment (the practical goal).

This view began to lose influence as Plato's status declined. In his text, *Physics*, Aristotle identified the concept of the environment and related it to other natural concepts, such as the 'universe' and 'corruption' (Charlton and Hussey, 1999). He promoted the ideas of Hippocrates and divided human nature according to habitat, specifically, he characterised the inhabitants of cold regions (such as Europe) as bold, brave and inexperienced and described the inhabitants of the plains of Asia as possessing experience and skills but being less courageous. He depicted the Greeks as possessing a combination of the characteristics of European and Asian peoples.

“Those who live in a cold climate and in Europe are full of spirit, but wanting in intelligence and skill; and therefore, they retain comparative freedom but have no political organization and are incapable of ruling over others. Whereas the natives of Asia are intelligent and inventive, but they are wanting in spirit, and therefore they are always in a state of subjection and slavery. However, the Hellenic race, which is situated between them, is likewise intermediate in character, being high-spirited and intelligent. Hence, it continues free and is the best-governed of any nation, and, if it could be formed into one state, would be able to rule the world.” [Aristotle, (1999), p.161]

However, according to modern scientists, the current reasons for the differences among people are heritage and environment. Furthermore, in one chapter of his book entitled *National Styles in Science: A Possible Factor in the Scientific Revolution?*, Henry (2010) attempted to use differences in national rather than biological patterns, as is evident in the seventeenth century at the time when a new way of doing science was being developed in Western Europe. He further stated “it would be wrong, as well as politically incorrect, to assert that there are natural differences between peoples of different nationalities. Certainly there are no significant biological differences between the English and the French, say. Nevertheless, just as each of us is shaped by our own individual life histories, so the people of a nation are shaped by the history of their country” [Livingstone and Withers, (2010), p.43].

### 3.2 Medieval philosophy (Al-Kindi, Eriugena, Al-Farabi, Ibn Sina, Ibn Tufail, Averroes, and Moses Maimonides)

Greek culture continued to influence beliefs during the medieval period, although the philosophers of this time expanded their discussions concerning the environment to cover not only its impact on the mode and structure of the body but also language and a number of other social issues and ethical systems.

One medieval philosopher and physician was Al-Kindi. In his two books, *The Reason of Universe and Corruption* and *The Letter of Reason*, he followed the views proposed by Plato, including the impact of the body's mode on the soul.

He argued that individual modes were produced by the environment, for example, people living in hot climates had dark skin, as this is the colour of something burned in fire, and their hair was curly, as in the manner of hair placed close to a fire. He meant that the colour of the human body is related to the effects of the sun on human skin. He also considered that the hot weather made such populations angry and characterised them by a lower level of economic development. In contrast, he characterised the population of cold regions by physical characteristics that included small eyes, lips, and noses with white or fair skin due to the cold weather that concentrated their heat in their hearts, which led them to become respectable and patient. Finally, he viewed the population of the middle countries as possessing moderate temperaments and morals, strong thoughts, and the capability to conduct research and discussion (Al Kindi, 1978; Klein-Franke, 2020).

Al-Kindi was not only a philosopher but also a physician, and he authored more than thirty books in the field of medicine. He developed a mathematical scale to quantify the strength of a drug and a system based on the phases of the moon that allowed a doctor to determine in advance the most critical days of a patient's illness. Thus, he used his environmental knowledge to treat patients, in which he was partly influenced by Galen and Hippocrates.

Although Al-Kindi followed Plato's views on the impact of the environment on the body's mode, he did not follow Aristotle's division of nations according to their intelligence.

John Scotus Eriugena was one of the leading philosophers of the Medieval Ages, who analysed nature and looked at nature from different angle. Aside from that, Bertrand Russell dubbed him as the most astonishing person of the ninth century based on his ideas on the nature. Moreover, he developed the definition of the nature to include all kinds of things, i.e., things existing in beings, and things nonexistent in being,

This definition divides nature into a set of four types or divisions that include both God and creation. All four of these divisions are understood as God, and presented as the beginning, middle, and end of all things. The following are the four division of the nature:

“(1) Nature which creates and is not created. This is God, the Source and Principle of all things. (2) Nature which is created and creates. This is the world of primordial causes or Platonic ideas. (3) Nature which is created and does not create. This is the world of phenomena, the world of contingent, sense-perceived things. (4) Nature which neither creates nor is created. This is God, the term to which all things are returning.” (Turner, 1909)

Therefore, the meaning of nature for Eriugena is synonymous with reality, as well as with God. Also, nature is the world of primordial causes, or ideas. Moreover, ideas are subject

to plurality, change, imperfection, and decay. Lastly, not only man, but everything else in nature is destined to return to God.

In *On the Perfect State* (Al-Fārābī, 1985) and *Aphorisms of the Statesman* (Al-Fārābī, 1961), Al-Fārābī developed the ideas of the Greek philosophers and stated that nations are characterised by two natural aspects, namely, natural creativity (the colour of their skin) and natural behaviour (ethics), which reveal such populations as natural inhabitants. Furthermore, he argued that these two natural aspects are caused by the impact of hot water vapour rising from the earth. The third aspect of nations that he identified was their humanity as expressed through their language. This was a new concept expressed by Al-Fārābī (1968) as an addition to the impact of the environment on humanity.

However, the environment effects language, diversity and the tone of voice. In the desert, for example, people speak with loud voices and use body language and gestures because there is a large amount of open space, whereas in towns, people use quieter voices because they live in smaller spaces.

In *The Book of Healing* (Ibn, 1952), *The Canon of Medicine* (Ibn, 1987) and *Heaven and Earth* (Al-Rawi, 2002), the philosopher and physician Ibn Sina studied the influence of the environment on human beings. He focused on identifying the reasons for healthy bodies, the shortening of life and skin colour, with the support of numerous examples. He argued that hot and wet climates, along with high and low sea levels, influence the bodies of human beings, including the different aspects, behaviours, motivations, and diseases found in different nations.

In addition to the views discussed above, three new ideas were produced by Ibn Tufail (1105–1182 AD), Averroes (1126–1198 AD), and Moses Maimonides (1135–1204 AD). Ibn Tufail dismissed the previous views of Greek and medieval philosophers. In *Hayy Ibn Yaqzan*, he asserted that the nature of humanity plays a more important role than the environment plays. The island used in his story (Hayy Ibn Yaqzan) is one of the Indian islands. It is beneath the equator with fresh air and sun, and he positioned it to compare with all the lands in the world.

Furthermore, he believed that only human beings have the ability to create civilisations and culture and to inhabit any area in the world, regardless of location. He also stated that human beings can control their own habitat without being ruled by the effects of weather (either hot or cold) (Tufayl, 1972).

Although Ibn Rushd (Averroes) followed the views of Aristotle and Ptolemy, he expressed his own opinions concerning the effect of weather on human behaviour and beliefs. In his book, *On the Heavens*, Ibn Rushd argued that no human beings lived on the earth below the equator or in lands that experience extreme cold because of the lack of any reason for the urbanisation and colonisation of these areas. Furthermore, he claimed that he established this idea not only through the work of Aristotle and other Greek philosophers but also through his own views according to his personal observations (Endress, 1995).

Moses Maimonides was a philosopher, jurist, physician, and the foremost intellectual figure of medieval philosophy. He was also a friend and student of Ibn Rushd. He considered the issue of the environment from a different perspective, focused on the relationship between the body and the soul and argued that this relationship is part of a single whole. He viewed the soul as the guide of the body and claimed that it consists of five virtual parts, each of which is responsible for a specific type of human activity. His explanation for the treatment of disease did not follow the views of Hippocrates (to

identify the natural origins of disease). Instead, he claimed that effective disease treatment lay “in observing the commandments and improving one’s ways, morals and conduct up to their highest levels, towards all of the world’s creatures” (Mizrahi, 2011). He believed that this could be obtained by reading the Torah, understanding the worship of God and observing good values and virtues; he maintained that “all of these build the frameworks that maintain mental health and strengthen man’s abilities to develop skills for maintaining bodily health. The body and soul are one, which is the basis of the Rambam’s philosophy of health and medicine” (Mizrahi, 2011).

### 3.3 *Influence of the climate on laws (Montesquieu)*

Charles-Louis, The Baron de Montesquieu (1689–1755), discussed in his book, *The Spirit of Laws*, the effect of climate change on the nature of laws. He stated that “great heat enervates the strength and courage of men; and that, in cold climates, they have a certain vigour of body and mind which renders them patient and intrepid, and qualifies them for arduous enterprises” [De Secondat, (2001), p.349]. This state is not only between different nations but also even in different parts of the same country, according to hot or cold living areas. His examples included China and Korea; he indicated that people in North China are more courageous than people in South China, and South Korea has less courageous people than North Korea has. Montesquieu divided people in two categories, namely, the slaves and the brave. The slaves are people who live in hot climates, while the brave are people who live in cold climates.

“This has been found true in America; the despotic empires of Mexico and Peru were near the line; and almost all the little free nations were, and still are, near the poles. This is an effect which springs from a natural cause.” [De Secondat, (2001), p.350]

Montesquieu advised great princes to make a proper choice regarding the location of their empires. The proper seat of an empire is in the north because the south faces the danger of losing to the north, but leaders who fix their empire in the north may easily preserve the south.

Regarding laws, he stated that there is a great relationship between laws and the manner of nations to procure their subsistence. The laws of nations regarding trade and navigation are much wider than the laws regarding people working to cultivate the earth. The laws for people working to cultivate the earth are much greater than the laws for people who subsist by their flocks and herds, and the laws for people who keep flocks and herds must be greater than the laws for people working in hunting [De Secondat, (2001), p.363]. Most new studies have confirmed relationships between the environment and crime, suicide, madness and physical and mental health.

### 3.4 *Environmentalism (determinism) (Carl Ritter, Ellen Churchill Semple, and Ellsworth Huntington)*

Environmental determinism refers to “the idea that climate, geography, or other environmental factors cause people to look and behave the way they do” [Kennedy et al., (2016), p.29]. This theory appeared in Hippocratic work (*Airs, Waters, Places*) and also in Herodotus’s texts (Histories and Ethnographic) that follow them. The ethnography of health is a concept describe Greek writer use of ethnic. At the same time, they link the

good health with Hesiod's idea of golden race which "neither grows old nor suffers physical ailments" [Kennedy et al., (2016), p.29].

Based on the researcher's knowledge, good health is one of the most important contributions of ancient Greek writers, as they paid attention to most people around the world. Hence, one can agree with them that good health is not only the result of the certain environment accidents such as climate, but also caused by the ecological environment, relationships between humans and the rest of nature.

Although environmental determinism is an ancient phenomenon but in contemporary times, there has been a new geographical direction to study the effects of the environment on human beings. This direction has been built according to philosophers' perspectives. This trend is known as environmentalism or environmental determinism, which means that people's physical, mental and moral habits are directly due to the influence of their natural environment. The main hypotheses focus on heat and barometric pressure. Heat makes people in the tropics lazy, while the changing barometric pressure makes people in temperate latitudes more intellectually agile. Most societies live in river valleys because of soil fertility, and they work in agriculture. In addition, the weather impacts the use of livestock; hot weather is not suited to milking cows, but it is suited to rearing cows for meat, because cows produce less milk in hot weather. Similarly, sheep are bred for their meat and not for their wool in warm areas. Ants stop their activities during the winter but are active during the spring, which is a direct result of the environment. In addition, barley, oats, wheat, beets, and potatoes are planted in cold and temperate environments.

In the first part of the book *Geography and Revolution*, Peter Dear discuss space, revolution, and science. Moreover, he gives the geographical determinism more consecration than historians or social scientists. For this reason, he analyse the characteristics of locations based on revaluation. Although revaluation has different meanings, at the beginning he identified the term to mean that "inevitability, as opposed to contingency, is the enemy of the historian's project, a truth that has always given trouble to Marxist historians" [Livingstone and Withers, (2010), p.28].

Additionally, when historians analysed the category of revolution with respect to whether it is science or something else, revolution "still has life besides its role as an analytical category."

Several corresponding examples include the French Revolution, Russian Revolution, Glorious Revolution, American Revolution, and Chemical Revolution of Lavoisier. Hence, "there are revolutions as historical actors' categories, where the use of the word, as well as its contemporary meanings, form an object of study in themselves" [Livingstone and Withers, (2010), p.30].

Also, in the 18th century, the Copernican Revolution took place, which was referred to as the English Civil War (English Revolution) in the twentieth century. Furthermore, a lot needs to be discussed regarding 'revolutions' as cultural-historical 'facts on the ground' [Livingstone and Withers, (2010), p.30].

The famous scientists who follow this trend are Carl Ritter, Ellen Churchill Semple and Ellsworth Huntington.

Carl Ritter (1779–1859) believed that geography is a type of physiology and comparative anatomy of the earth. Thus, he connected organic life with geography and history. Rivers, mountains and glaciers have functions and physically frame the basis of man, that is,

“From a geographical point of view, the world becomes to us the common home of our race, the theatre, not of the operations of nature in the most unrestricted sense, but the arena for the development of human life and history. The whole animate and inanimate creation is tributary, looked at geographically, to the fashioning of the destiny of man.” [Ritter, (1865), p.9]

He focused on the organic connection between man and earth. The earth is the home for the growth and development of the mind and spirit, and man must use the earth for this purpose: the development of his mind. Man receives physical and spiritual aspects from the earth at birth, which refers to heritage aspects of which he becomes increasingly more conscious.

Man is a central point of the earth, and without the earth, the races of men could not claim his attention. Ritter developed the concept of organic unity used by Alexander von Humboldt and asserted that geography is simply not possible without an interrelationship with organic life.

Ellen Churchill Semple (1863–1932) was influenced by the works of Charles Darwin and was inspired by her mentor, Friedrich Ratzel. She specified that human activities are determined by the physical environment. According to her, the following are four key ways by which the physical environment makes this determination: first, by direct physical effects such as a climate and altitude; second, by psychical effects such as culture, art and religion; third, by economic and social developments such as resources and livelihoods; and fourth, by the movement of people around natural barriers and routes such as mountains and rivers.

“Man is a product of the earth’s face. This means not merely that he is a child of the earth, dust of her dust; but that the earth has mothered him, fed him, set him tasks, directed his thoughts, confronted him with difficulties that have strengthened his body and sharpened his wits, given him his problems of navigation or irrigation, and at the same time whispered hints for their solution.” (Colby, 1933)

Semple believed in a new theory that philosophers had not addressed before. She stated that mankind originated in the tropics but gained full maturity in the temperate regions of the world.

“As the tropics have been the cradle of humanity, the temperate zone has been the cradle and school of civilization. Here, nature has given much by withholding much. Here, man found his birth-right, the privilege of the struggle.” (Colby, 1933)

In contemporary times, in his book entitled *Putting Science in its Place*, Livingstone (2010) conclusively showed how spaces and places of knowledge work and why they matter. From the reception of Darwin in the land of the Maori to the giraffe that walked from Marseilles to Paris, Livingstone stated that place does matter, even in the world of science. For example, “to understand the history of medicine, or religion, or law, then, we must necessarily grasp the geography of medical, religious, and legal discourses” [Livingstone, (2010), p.11]. Moreover, he drew attention to the relationship between science and its geographical location. In this regard, place is essential in generating knowledge and is as important as its consumption. Ideas travel between places from person to person, and from culture to culture, but migration is not the same as repetition. If theories are to be understood in the context of the period and place in which they arose, their reception must also be temporal and spatial. But how does science have geography?

All the dimensions of science have places, ideas and institutions, theories and practices, and principles and performances. For instance, let us look to the laboratory as a place of knowledge. One can ask then the following questions “Who manages this space? What are its boundaries? Who is allowed access? How do the findings of the laboratory’s specialist space find their way out into the public arena?” [Livingstone, (2010), p.12].

As such, the microgeographic of the laboratory is involved in every stage of scientific knowledge acquisition, what is known, how knowledge is obtained, and ways in which it is secured, are all closely related to the sites of science. Similarly, Livingstone, deemed the human body as a site of scientific inquiry “not only for medical research but also as itself a measuring device, which is also engage our interest. Throughout, we will find scientific claims that sound universal but turn out to be situated, theories that seem transcendent but are profoundly embodied” [Livingstone, (2010), p.15].

At the same time, Ellsworth Huntington (1876–1947) had a mission to determine the effect of climate on human beings by following geologic structure, topographic form, and the history of the climate to know how it has shaped man’s progress. In addition, his climatic determinism adopted the West’s leading of the world and the projection of its future dominance. “Human energy on the basis of climate is supposedly very high in the British Isles, France, Northern Italy, Central Europe, the Baltic States and Southern Scandinavia, and in the central-eastern belt of the USA” (Kreutzmann, 2004). Huntington’s approach was a holistic one; he declared that

“A complete study of geography must consider not only the external habits of plants, animals, and men in relation to their environment but also human character and methods of thought in so far as they are directly or indirectly, the product of physical condition.” (Kreutzmann, 2004)

### 3.5 *Possibilism geography*

Paul Vidal de La Blache (1845–1918) was the first French geographer to develop the concept of possibilism geography to explain the relationship between the environment and human beings. Possibilism refers to the ability of humans to select available environmental opportunities such as climate, terrain and land and then determine them through social conditions. For example, a person who lived on the coasts of the sea developed navigation by himself. Nature did not provide him with boats; instead, he used his creativity to produce what the coastal environment required.

People also built dams and channels and established transportation links and settlements; thus, they affected their environment because of its capabilities and through their technological developments. The environment is not only a natural concept but also a cultural landscape. The types of human clothes are affected by weather. People wear heavy clothes in cold weather, freer clothes in moderate weather, and looser clothes with hats in hot weather. People build their homes according to the nature of the land on which they live; homes on land prone to earthquakes need specific conditions compared with homes on the coasts and in the valleys.

According to these reasons, the trend of possibilism rejected the trend of environmentalism, which considered human activities to be explained within the control of man over the environment.

Cari Sauer (1889–1975) attended Semple’s lectures, but he came to view the idea of the environmental determinants of human behaviour as scientifically unfounded and even morally questionable. Sauer (2008) felt that the evidence supported a view that did not

hold nature constant but regarded ‘the scene’ of human action (that is, the human-environment relationship) as constantly changing.

A person is not a slave to his environment and does not act on the basis that he or she is a child of the earth or that his or her inevitable image is especially geographical, as argued by Semple. Instead, people have developed capabilities and skills that are increasingly influenced by scientific progress that leads to increased human control of and restraint on their environment.

Thus, possibilism is considered to be a distinct approach to the geographical knowledge that is directly opposed to geographical determinism.

### 3.6 *Bioregionalism (Richard Evanoff)*

This new geographical doctrine or view purports that human activities should be constrained by geographical or ecological boundaries rather than by political or economic boundaries. These boundaries include some environmental features such as watersheds and soil land terrain.

Evanoff (1936–2020), in his book, *Bioregionalism and Global Ethics*, identified his central argument that an ethic should be concerned with at least three goals, namely, promoting ecological sustainability to allow humans and nonhumans to live, achieving social justice, and maximising human well-being. His goals correspond to the three poles of Steiner’s model of a human ecological triangle,

“Which delineates three main forms of interaction: those between the individual and the ecological context (self and nature); those between the individual and the socio-political context (self and society); and those between the socio-political context and the ecological context (society and nature).”  
(Evanoff, 2010)

Bioregionalism is also a cultural phenomenon because it is determined by the knowledge of the local population and its solutions. Peter Dear (1958–present) refers to two things as follows:

- 1 mapping and revolution
- 2 knowledge and space.

Based on his thoughts, mapping is a practice that provide historical reality on terms of place, locality, and geography. Some historians used maps to see revolutionary changes. Also, ideas changes social organisation in spatial regions. Rudwick’s map is a classic example which shows central London, residences of Darwin, and many other pioneering geologists around 1840, as well as the locations of scholarly meeting places that were central to their lives.

Furthermore, Rudwick’s maps add dimension to what can be learned from the correspondence of these geologists, including Darwin’s extensive correspondence. Knowing not only who Darwin knew and interacted with, but also the physical proximity of these different people and the places where they gathered, emphasise the physical reality of their intellectual lives.

This means that is not metaphorical space, but geographical space, and it reveals how it affects of people’s thoughts.

Also, Rudwick’s Darwin map exemplifies another point concerning the relationship between knowledge and space. The ideas might seem to have appeared from, say,

Darwin's mind, according to an idealist, intellectualist reading. However, to make sense of them historically, one has to see how they could become constituted among the group of people indicated on the map, a constitution defined by the physical constraints and facilitations that the map displays.

One of the central puzzles in science studies is the question of how scientific ideas can seem universal "locally created knowledge must be exported to many local sites, being reproduced in each, and only in that way is the illusion of universality created" [Livingstone and Withers, (2010), p.35].

Additionally, it is a strong argument on how geographical space play an important role to producing universal knowledge.

### *3.7 Calculating weather to show its effect on human activities, i.e., meteorology (Frederik Nebeker)*

In 1995, Frederik Nebeker published his book entitled *Meteorology in the 20th Century* to show how meteorology developed through human history. He emphasised three traditions in meteorology, namely, weather observations, the actions of the atmosphere, and predicting wind and rain. These traditions comprise an ancient practice, as ancient Babylonians and Greeks performed all three practices. Approximately three thousand years ago, Babylonians performed these three meteorological acts, while Aristotle was concerned with wind direction. In modern times, new instruments (thermometers and barometers) have been used to measure weather. Rene Descartes, Edmond Halley, and others have "speculated on the causes of winds; and almanacs made weather prognostications widely available" (Nebeker, 1995). During the twentieth century, scientists continued to use these three activities in empirical and theoretical ways; the empirical manner refers to recording observations of the weather and then making predictions from these records, while the theoretical manner explains atmospheric phenomena and the prediction of the weather.

"The activities of observer, natural philosopher, and forecaster were of course related, and the term (meteorology) has always encompassed all three. However, in the course of the ninth [sic] century, as the number of people doing meteorology increases, the empirical, theoretical, and practical activities became more distinct." (Nebeker, 1995)

From time to time, the connections among these three traditional elements have become stronger and more unified, as seen in their relationship with electronic computers. As a result, currently, weather changes have become scientific phenomena that are considered in all daily activities and in future human activities.

## **4 Conclusions**

- 1 This paper discussed a number of scientific theories and myths in which human history imagined the relationship between identity and the environment. They all support their thoughts by examples regarding how an ethnic group shares physical features and characteristics due to their environment. This leads to these specific people being connected with their specific land, as the land impact human appearance and behaviour. Also, climatic locations are superior and others inferior.

- 2 Regarding whether the question that philosophers and thinkers have asked about identity is a racial or ethnic question, the researcher believes it is not. Rather than stating that it is ethnic, let us analyse these theories and myths to see how the environment affects people's physical features and behaviour, and then observe how identities are formed based on the influence of the environment. This paper follows this direction.
- 3 The scientific awakening of the Greeks and the development of medicine in the Hippocratic tradition gave rise to theories of geographical and climatic determinism that went beyond placing monsters and wonders at the extreme geographical limits.
- 4 It was not always clear to the ancients and now to us what is considered as a distinguishing characteristic. Should peoples be distinguished by their physical features, language, religious practices, choice of government, etc.?

The Greeks and their intellectual heirs in the medieval world as well as contemporary philosophers viewed environment (e.g., land, climate, geography, and man-made setting) as a key factor in defining identity an individual's identity.

- 5 The ideal environment to produce ideal people is still a controversial issue in human history. Moreover, it is related to the world centre and what the centre of the world is? Each culture has tried to become its own centre with different features. Despite that, there are no reasonable grounds to support ancient environment theories. However, these theories have continued to be used and adapted especially in Greece and even in the Mediterranean and ancient china.
- 6 Environmental determinism is an old theory. This theory means that people's appearance, habits, customs, and health all stem from the land in which they originates. This idea is found in "Hippocratic treatise *Airs, Waters, and Places*, in which the author considers environment first as a force governing health, and as a force shaping ethnic and cultural difference" [Kennedy et al., (2016), p.2]. This theory is seen as a kind of 'proto-social Darwinism' that ranks people on a scale of superior to inferior, according to their normative standard of purity.

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