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# A biological prospect for the human population based on the views of Aristotle and Santayana in the context of the urban ecology discipline

 **Leman Nur Nehri**<sup>1</sup> 

## Abstract

*Cities are large workplaces where people gather and share the cumulative value they produce. Since humans are biological organisms, it is the human animal himself who creates the city. Urban areas are the concrete products of human populations, and they are multifaceted: From microbiomes to technological developments, from climatic changes to economic and social activities, the concept of the city encompasses many elements. An understanding of the human population in the cities is dependent on the concept of the self. Although cities exist as the collective product of the members of human populations, it is the perceptions of the individuals in the population towards the environment, themselves, and each other that make the city a whole unit. These perceptions have evolved over an evolutionary process and can be unified under the concept of self. In this article, I would like to propose several approaches that can be useful in overcoming these limitations, and therefore, I have attempted to construct a holistic view of modern urbanization using Aristotle's and George Santayana's views on life and the self.*

## Keywords

*Aristotle, Santayana, Biology, Urban Ecology, Human Population*

## Introduction

The world is on the verge of certain breaking points that have emerged from urbanization and climate change (Karl & Trenberth, 2003). Due to the changing climate, ecological relations are reoccurring; air and soil contents are changing, some keystone species are lost, and economic and sociological aspects of the human population<sup>2</sup> are being affected (Peñuelas et al., 2013; Tiedje et al., 2022; Baldwin, 2017; Karl & Trenberth, 2003; Satterthwaite, 2009; McCarthy et al., 2010). Urbanization and the increased size of the human population are impacting the biosphere by introducing some harmful chemicals to the air and water, destroying tropical forests for economic goals (Satterthwaite, 2009). Humans are influenced by these changes like other organisms (Baldwin, 2017). Various disciplines work on these circumstances, such as biology, ecology, chemistry, and sociology. In these circumstances, it is necessary to think about our approaches and treatments on these topics from the beginning, such as, what is the relationship between humans and the environment, what are the basic elements/principles of ecological thinking, etc. Urban ecology<sup>3</sup>, which is a modern discipline, has emerged in a world that faces certain challenges under these circumstances (Ramalho & Hobbs, 2012). The main focus of this discipline is to describe the city and its ecological relations (Pickett, 2012). The differences between this field and the classical ecological approach are raised from two main ideas: *the human population has a great effect on the biosphere and the ecological relations*, and *the city is a concrete biological area that represents the activities of the human population* (Pickett et al., 1997; Pickett, 2012). As a result, urban ecology tries to connect human activities with ecological thinking (Grimm et al., 2000).

I suggest that there is a need to think of the fundamental concepts of urban ecology in order to construct field practices more effectively. These ways should be compatible with real-life circumstances. Scholars have tried to fill this gap by including human aspects of the urban ecology discipline and constructing the ecology for the city paradigm (Pickett et al., 2016). This paradigm conceives the city as a work of the human population and evaluates the city concept by introducing some fundamental dimensions of

1 Corresponded Author, MSc, Ph.D. Candidate, Middle East Technical University, Biological Sciences, E-mail: lnerkan@gmail.com

2 Human Population: The community of humans.

3 Urban Ecology: The study of the city, from an ecological perspective (Wilfried at all, 2007).

human activities, like social and economic aspects, into the investigation mechanisms of the urban ecology discipline. This can be considered a divergence from the classical eco-biological view. In other words, with the new paradigms, cities are considered a kind of natural/biological entity that is formed by human organisms<sup>4</sup>. Moreover, cities are areas where some activities of the human population become concrete, like trading, culture, socializing, and ecological activities of humans (Ramalho & Hobbs, 2012). Therefore, these views are simply suggesting that the social-cultural and economic aspects of the city are also ecological aspects of the human population. There are many scientific efforts to bring to life these paradigms to construct human ecosystems in a broad range by realizing human components in the city ecosystem and the biosphere (Yang, 2020; Breuste & Qureshi, 2011; Breuste et al., 2013). Moreover, these efforts can be seen as changing the definitions of human organisms, the human population, and the city to construct a new urban-ecological perspective. Therefore, humans are seen as biological organisms that are capable of trading, socializing, producing, etc. They build cities as a form of these activities that become tangible, and all these activities directly affect the biosphere ecologically. Although these efforts are needed to make a comprehensive view of the cities, they lack fundamental thoughts about the connections between the city, humans, and the self, which is an umbrella term encompassing all human actions. To handle this problem, Aristotle's influential, practicable, and fertile ideas and approaches have a great potential to construct the preliminaries of both the urban ecology discipline and biological evaluations of the city ecosystem.

It can be said that studies on the place of human beings in the biosphere, including human factors, have found a place in the scientific arena, especially in disciplines such as urban ecology. Potential success could be achieved in this regard by applying Aristotle's remarks on the concept of life to understand the city within its ecosystem. The cities are concrete areas where human activities can be seen (Andersson et al., 2014). Moreover, due to human activities, cities ecologically affect the biosphere. If approaches change, it may affect the city both in form and shape, and the biosphere may also be affected by our city models. There are many efforts to construct a city that is compatible with the biosphere (Andersson et al., 2014). Aristotle, as a naturalist, emphasizes the issues of togetherness of life, trade between beings, and living as a community rather than living as an individual and intentionally life (Aristotle, 1994). To evaluate human creatures, he also stresses that this organism is a part of the entirety of life. Furthermore, the life of human organisms with human-related characteristics, which are different from other organisms, is handled by Aristotle on the topics of ethics, politics, and urbanization. I believe these thoughts can lighten our understanding of the problems that are emerging from modern world situations, like urbanization and climate change.

### Aristotle and Urban Ecology

Aristotle sees the universe as a whole soul, and he suggests that the soul is the composite action of being alive. Also, he constructed a worldview mainly based on *life*<sup>5</sup> and life-related issues, and his studies can be generally seen as investigations on life, which we call natural sciences or, in a specific manner, *biology*. There are certain kinds of literature on Aristotle that suggest that all their works are a composite of human life<sup>6</sup>. He was investigating all life-related topics for human beings in the fields of philosophy, physics, rhetoric, poetics, and biology. All the topics in his works, such as existence, morality, animals, and plants, can be considered reflections that emerged from the idea of living (Romanes, 1891). From this point of view, it can be argued that Aristotle uses biology and the biological perspective as a founding manner for his thought in general (Greene, 1976). Therefore, the ideas that are related to the great questions of *what is good, how to be a good man, and what is soul* are not merely philosophical or ethical investigations for Aristotle. His ideas on human and human activity are basically and initially related *to life*.<sup>7</sup> Hence, they should be seen as reflections of human life with their biological eyes. His philosophical and ethical provisions mainly come from a natural investigation of Earth (Wild, 2020). Due to such extensive biological research, he did not create an intangible view of the world or impalpable thoughts on concepts of ethics, politics, soul, etc. Instead, he constituted an ethos/system of values that is touchable, discernable, accessible, and gainable from every human being who tends to think, i.e., the biotic act of human beings. In conclusion, Aristotle's worldview regards the human organism and human population from a biological perspective, and then, since his definition of life is an example of the togetherness of all beings on the meaning of having a soul, without excluding characteristics of varied species, the constructed principles of ecological relationships between humans

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4 Human Organism: An individual human.

5 Life (Soul): The cause of a living organism, by providing life motion to a body (Aristotle, 1994)

6 Human Life (Human Soul): The human with the body and soul, and this combination of body and soul can act like a human, which is living (Aristotle, 1994).

7 To live: Having actions as a body with the soul. Every life is specific to its organisms, like whale life, bird life, plant life, or human life (Aristotle, 1994).

and other beings. In this context, we can see that the paradigmatic transformation of human beings and cities as the products of human activity and life, which is currently being attempted to be formed by the discipline of urban ecology, has already been established by Aristotle. In this paper, human beings will be regarded as natural organisms and urban concepts will also be considered natural results of human activities. For this aim, initially, Aristotle's ideas, which are mostly presented in *De Anima* and are related to life in general and -in a specific manner- human life, will be mentioned. Then, the applications of these views on modern topics will be discussed in the context of urban ecological and biological approaches. Aristotle's standpoint, which deeply influenced the tradition of philosophy, also can help us to construct the redefinitions of ecological relations, human-ecological relations, and principles of urban ecology discipline. After establishing a general concept of *life* with Aristotle's views, a specific standpoint on human life and cities will be attempted by using the views of George Santayana. What I suggest at this point is that Aristotle's worldview can be read from an ecological, even urban ecological perspective, since his thoughts have emerged from these two main premises:

Life is a common sharing among all creatures,<sup>8</sup>

All human activities are due to *the human soul*, which provides human life.

The concept of life in *De Anima* provides a basis for understanding the well-established question of modern science: *What is life?* Aristotle's teachings in *De Anima* seem to be a solid study of life in a biological manner (Olshewsky, 1976). He uses the word of the soul to equalize the meaning of that word to live: The dimensions of the soul are also dimensions of life. To have a soul or to live, two things are needed: motion and perception, which are the fundamentals of a living biological entity. The soul is the first competence (*entelekheia*) of a natural existence; if there is life, therefore there is a soul, too (McGinnis & Wisnovsky, 2004). He says: "*The soul is the principle of living beings.*" (Aristotle, 1994). Consequently, his questions, perceptions, evaluations, and classifications of the concept of the soul are strict investigations of life. When the question comes to *what is the soul*, he describes it with different analogies to explain that concept. For instance, he uses the similitude example of the eyes and says that if eyes were independent living things, the soul *was to see*. Therefore, the soul contains both the function and purpose of a living thing, which is the composite of the body and the soul. He also investigates the dimensions of the soul; in other words, he constructs a general scheme to describe life and life activities; only a body with a soul can perceive pain and pleasure; it can act to escape from pain and reach for pleasure. A body with a soul is capable of knowing, growing, feeding, imagining, reproducing, and dying.

Aristotle constructs a kind of trade between beings. He emphasizes that a living being needs other beings to exist; in other words, a naturally living entity needs other components of the universe to move and perceive, which are the main principles of having a soul - or having a life. He uses different kinds of examples to explain this principle; one of the examples is about hearing; there are two participants in that trade; one is hearing, and the other is noising. Thus, for the acts of a living entity, Aristotle made a two-dimensional conceptualization. Examples can be increased: organisms need objects and light to see, organisms need nutrients and water to feed, organisms need other organisms to communicate, etc. In short, organisms need other existences to be and to live. As a consequence, we can conclude that all beings, including human beings, rely on each other to exist, and therefore, all living things are dependent on other creatures - whether living or nonliving - to live. All these frameworks can be concerned in the area of evolutionary biology, which describes life under two parameters: survival<sup>9</sup> and fitness<sup>10</sup>. Therefore, all entities need others to survive and fit their generations into the future. In addition to these, in Aristotle's worldview, all organisms are regarded as different populations rather than individual organisms. Individuals exist, but this existence comes from the individual who belongs to a society/population. This sight of Aristotle pervades all the evaluations of him about life and specifically, human life.

When the topic comes to the question that *What is human life*, we have to look for the concept of the soul again. Aristotle describes the soul as all living organisms. Therefore, all aspects of the general soul also descriptions are valid for humans. Humans have similar aspects of the soul with other living creatures, as living beings have common soul characteristics, such as feeding, growing, reproducing, desiring, taking pleasure, suffering, etc. All these aspects are biological dimensions of a living organism, and they are found in animals, plants, and humans - which are a kind of animal. Besides the common sharing among living organisms, every living organism has its characteristics due to its specific soul; for

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8 Potential to live: Everything in the universe lives or has the potential to live or serves a function for life, therefore life is about all the universe, in a manner (Aristotle, 1994)

9 Survive: Continue to live or exist (Johnson et al., 2008).

10 Fitness: Reproductive success of the organisms (Johnson et al., 2008)

example, plants have plant souls, which makes them a plant. When the topic comes to the human soul, which is the aliveness of humans, he differentiates this organism through the aspects of human activities like politics and ethics. Just like plants are differentiated from other living creatures due to their morphologies, or to make photosynthesis, or other characteristics that are specific to the plants; human organisms are differentiated by ethics, politics, economy, culture, etc. The point is that: all activities of humans are natural and biological aspects of the homo sapiens. Therefore, every action and characteristic of the human being, including the abstract and non-physical aspects that differ from concrete and physical aspects, are involved in the human soul. For instance, abstract thinking, language, complex economic relations, social relations, cultural infrastructures, morals, and classifications on what is good for humans, etc., all are the different results of the actions of the human soul. In other words, they are about to live as human beings. They are biological aspects of the human organism, as neurological, behavioral, evolutionary, anatomical, morphological, and physiological aspects of the human organism. Therefore, they should be evaluated from a biological perspective. I think Aristotle's success in constructing a holistic view has come from this monolith view, which arises from life itself.

Aristotle explains the natural human organism in *Nicomachean Ethics*, which is a book different from *De Anima* that focuses only on the soul of the human being. In other words, he investigates the human soul/human life characteristics, which are different from other living beings as a different work. When talking about human organisms, Aristotle regards them as animals that can know things (Aristotle & Crisp, 2014). Therefore, one of the principles of the human soul is to be able to know. He begins *De Anima* with the justification of investigations on the concept of the soul, and that justification is based upon the nature of human beings' search for the truth via knowing things (Aristotle, 1994). Besides knowing, the human organism has different kinds of ethical aspects. For instance, happiness is considered an activity of the aliveness of humans (Aristotle, 1994) politics exists as an action of the vitality of the human population (Aristotle & Crisp, 2014; Aristotle, 1994). Aristotle concludes some points from these postulates; for instance, a politician must know the subject of the soul since the politician is laboring on top of city life, which handles all dimensions of human activities. In other words, a politician must know life itself, specifically human life.

Since all living organisms belong to societies/populations, as a living organism, humans should be primarily conceived as included in human populations. Every aspect/act of the human being, like ecological, political, and ethical actions, should be handled as a characteristic of the human organism, which should be conceived in the framework of the human population and the relations of humans within the population. Aristotle's approaches neutralize the meanings of ethical issues like good or bad or stingy; all these evaluations are linked with the biological existence of the human population. He searches for the nature of the human population by different aspects of human actions and characteristics; for instance, he deals with merit and investigates the phenomenons that are related to merit, like cowardice, bravery, beautifulness, stinginess, etc., to construct a life-related worldview. In conclusion, he constructs a teaching that *comprises all dimensions of the human population*.

Aristotle remarks that "Every city exists by nature" and "Man is by nature a political animal" (Ambler, 1985). The starting point of these remarks is based on the idea that cities are natural components of human existence because Aristotle conceives human activities as an entirety, and classifies these activities under the idea that human activities are made by a natural being-human. In other words, every aspect of human society and the human organism is in the framework of the idea that humans are biological organisms. Therefore, the acts and characteristics of the human population should be read from a biological/ecological viewpoint, as Aristotle does for the topics of ethics, politics, and the city. For instance, just as beavers make barrages or ants construct colonies, humans form cities. Moreover, this kind of view is ahead of modern-day efforts to construct interdisciplinary studies, since the starting point of Aristotle's worldview includes all human-made disciplines with their relations since all is about being human; but current interdisciplinary efforts try to associate different entities of human activities, seems like, human activities are separate from each other.

Since the city is a complex output of the actions of the human organism, and since in cities, human life and human activities become tangible, there is a need to evaluate a city from a biological starting point. But the problem is coming from the complementary efforts to integrate different activities of humans. Whenever we integrate human activity or human characteristics into a city ecosystem, as Pickett and his friends do, another dimension of the human population will be missing (Pickett, 2012; Pickett et al., 2016; 1997). The solution lies in the human descriptions and the city descriptions, and I suggest Aristotle made these descriptions in a way that they can be practicable. By changing our definitions and approaches from reductive and inductive ways to holistic ways, as Aristotle did, and accepting the city as a unit of the biological human population, we can handle the problems that come from changing



biospheres like urbanization or climate change. These biological perspectives of human and city concepts are prone to evolve through ecological perspectives, too. Aristotle's standpoint has real solutions between organismal trading and ecological relations that are based on this trade between creatures. If we want to introduce the human component into the ecosystem, as it has been tried in the various human ecosystem models (Machlis et al., 1997; Borer et al., 2000), I think this would be a problematic way to spend our effort due to our lack of definitions in this area. A more proper way can be proposed as follows: There is no need to introduce human components to the biosphere/ecosystem because humans are a part of this system both for existence and to live. And so, if we want to create cities that are compatible with the biosphere, we should conceive all human activities as natural activities, and we must realize that every aspect of the human being is naturally occurring and exists in ecological relations. For instance, Aristotle explains whether to do good or bad due to human nature, and these moral definitions are not separated from the biological human. These activities are also related to a real purpose: we might say that they serve to survive and fitness of the human population, which are biological descriptions of life. In other words, doing and intending good or bad should be considered biological acts, and since we are living in an environment, our acts are affecting others, and others' acts affect us biologically.

We can give an example of climate change to make concrete these ideas in a modern situation. In the climate change example, the world is changing faster than our adaptation to climate change (Orlove, 2005). Even though there are many regulations, new laws, and international agreements among countries, there is no general solution or adaptation of the human population to these changing climate circumstances (Dunn, 2002). The results show that the climate is changing, the ice on the poles is melting, the atmospheric C and CH<sub>4</sub> concentrations are increasing, the global temperatures are increasing, the coastal settlements are prone to submerge, the species are lost, the agricultural activities of the human population are affected negatively, the countries that live on with agriculture - like Bangladesh- are facing huge economic loss, the plant morphologies and anatomies are changed, the air and soil contents are evolving, etc. examples can be (Hanna et al., 2013; Schuur et al., 2015; Huq, 2001; Schneider, 2001). Lewontin says that under these circumstances, we should be positioned in a way that human organisms will not be harmed by these changes and stop useless concerns about protecting all living beings (Lewontin, 1992). But even if we try to do this, we have to know the whole working process of the biosphere to locate ourselves in the protection of these climate changes. At that point, Aristotle's starting point clears up this problem. As Aristotle stressed, all lives are everyday in the meaning of having a soul, namely, have a life, and to live; we should be in a trade with other beings. Without knowing the rules of trading, in modern words, without knowing the ecological relations and ecological components that we live together with, we cannot have a true position in a changing world.

The urban ecology discipline has great potential to construct the cities of the future. However, constructing a city has the same meaning as constructing human activities since cities are physical entities of human activities. Aristotle realized this fact. He equals the city with the humans (Aristotle & Crisp, 2014). For him, what is good for humans is good for the city, too (Aristotle & Crisp, 2014). Therefore, we need to think about human activities and try to revise human-environment relations. Aristotle provides great insight for evaluating human activities from a biological perspective. Therefore, his thoughts and ideas could be considered a starting point for the urban ecology discipline, which needs new definitions and principles on the topics of human, city, and city-human-environment relations. In the urban ecology discipline, there are some efforts to unify human activities ecologically. But the efforts in this area are not satisfactory. There is a need for a life-view in urban ecology to build a methodology and practical applications of the discipline. This view can be constructed only by seeing the ecosystem as a whole, and only after that, separating ecological components for our use. If we start from life itself, we can construct a view that helps our practical applications on urban ecology. Otherwise, proceeding with small steps and spending lots of effort on this type of progression, like trying to integrate human aspects one by one, can result in the generalized insolvency of modern-day problems such as climate change. Aristotle constructed a life view that meets these needs.

### **Santayana and the Self**

With Santayana's approach to the matter, it was possible to make a completely biological interpretation of the world, moreover still has a great appreciation of poetry, art, imagination, and religion, and they have not a minor place in his conceptualization of the human life but take up a significantly large space (Poetry Foundation, n.d.). Although Santayana starts from a skeptical point, as in Descartes' skepticism, his skepticism does not come to the point such as *I can even deny my existence*, as in Descartes (Flamm, n.d.); on the contrary, Santayana comes up with the *essence*, in that, the imagination is free, that was a moment of a great liberation to realize one can comprehend something that does not exist and still looks at it, entertain it and find what it means and what it says about human life in general

(Saatkamp & Coleman, 2002). By saying, "*The origin of beliefs and ideas, as of all events, is natural*", Santayana emphasizes that everything that is categorized as abstract or concrete in human life has a common ground. On this common unifying ground, he argues, "*Belief in substance, I have seen, is inevitable.*" (Santayana, 2003) and establishes nodes that will provide unity between all existence, including the human himself, his thoughts, existence, and the *self* (Cronan, 2004).

First of all, it should be said that Santayana followed a skeptical point in this methodology. He begins by doubting almost everything, but still, the implications of his skepticism are tangible, experiential, and observable. This situation is caused by his pragmatic attitude toward the world - his skepticism is blended with a pragmatist perspective, therefore, this pragmatic attitude also decides to what extent the convictions he arrives at as a result of doubts are included in human life and helping the maintenance of the human population. Because basically, humankind has existed through the ages thanks to this pragmatic attitude; with this attitude, humans have survived, left offspring, and continued their lineage. Therefore, distinctions that are made with a pragmatist attitude among the choices are essential for human life and its continuation. Santayana applies the same pragmatic attitude to innate things that people do not logically acquire by thinking. For example, humans, by nature, exist to believe, although this act of believing is not a logical orientation, humans need to continue their life as animal species, because according to Santayana, "*The origin of beliefs and ideas, as of all events, is natural.*" (Santayana, 2003). Moreover, for Santayana, the abstract extensions of humans - knowledge, ideas, belief- and even immaterial things, also lie in the realm of matter, like everything that exists: "*Belief in substance, I have seen, is inevitable*" (Santayana, 2003).

Santayana also deals with *the experience* in its natural context and also tells how the experience is embodied in the living thing. For Santayana, experience is not just a simple recollection of the memories, rather, it is an active and dynamic collection that the living thing constantly resorts to survive. Organisms use their experiences to grasp and tend to what is beneficial for them and to avoid what is useless and harmful (Santayana, 2003). Experiences are remembered and have an impact on the decision-making mechanisms of the organism to survive and fit future conditions. In this context, Santayana also raises the issue that knowledge is a belief mediated by symbols (G. Santayana 2003). In other words, according to Santayana, the rational thinking of humans is essentially a feature of the human-animal. Therefore, experience and knowledge impose a belief in a self, from which more experiences and knowledge can be accumulated in it. Moreover, the self is not a necessary emotional priority for any intuition, rather, it offers a nurturing ground from experience. That is, the self, or person, is an inference, a belief, and an unprovable dogma and this notion is a conclusion that has emerged from the experiences that are concrete processes that have active roles in the life of the organism.

However, it should be noted at this point that, according to Santayana, although there is an individual self, since everything is in integrity, the self is connected to its environment. There is a constant connection, flow, and unity between the interior and the exterior, between the organism and the environment. In this situation, although a deduction of selfness -which is a dogma- has been made, it makes it necessary to consider everything that exists as a whole. *Everything that exists is natural.* Because of this unity, the relationships of the parts of the universe, including each self in the universe, are as natural as life itself. This situation makes it both necessary and possible to consider humans as animals. There is constant communication and interaction within each singularity that exists in this unity. Naturally, the subject can know the object to which the subject is directed and can master the dimensions of the object. The things that enable this act of knowing are the essences of matter.

Santayana embodies these two dogmas that can shed light on the entire realm of being: "*...two additional dogmas which I have accepted: first, the dogma that I am a being far deeper than my substantial discourse, a psyche or self; and second, the dogma that this substantial being is in dynamic interplay with a whole enviroing system of substances on the same plane with itself.*" (Santayana, 2003). Thus, while constructing a concept of self, Santayana also draws the boundaries of the self and due to keeping everything that happens between a dynamic interplay outside the self, so that Santayana can deal with the self and environment as a whole. Santayana, instead of establishing an intricately complex system of metaphysical thinking to define the concept of self; defines the self as an active subject who is natural, comes from nature, can act individually, can be aware of the essences of the objects and events around it and can be in a relationship with its environment. However, Santayana uses self and psyche interchangeably, for him to be a self is to have a psyche (G. Santayana 2003). Therefore, by not making a deep distinction between these two concepts, he points out that the psyche can be handled in a very concrete and naturalistic way. In this way, it allows the psyche to have a biological basis as well, to be handled in a way that is included in the relation of matter, although it may seem like a very unnatural and non-material concept.

When we look at all this methodology, what Santayana put forward can also be seen in science: Even if various theories and laws are reached with the scientific method, all the propositions of science are far from being certain (George Santayana 2021). Moreover, all scientific endeavors are based on an animal faith at its core: humans, as an animal, have to survive, so they have an initial belief that they can know the environment and can act on it. When this belief is combined with experience, it also creates a belief that people can shape natural phenomena and their environment by manipulating them. Therefore, one can talk about scientific action by giving a systematic state to all these beliefs and processes that have been going on since the beginning of humanity. The basis of all this confidence is animal faith (G. Santayana 2003) For Santayana's propositions from a biological perspective, it can be also said that he has a very accurate view in describing the functioning of natural processes. Every living thing works to create the next generation by reproducing and the basis of evolution is based on the continuation of life as a result of variations (Arber 2000). In other words, every living thing, that is, every self, must communicate with other matters while maintaining its integrity. Every living thing is naturally included in the unity, it must survive and produce generations in this unity. It can be seen that each of these processes naturally exists in the self with more than one animal faith: the living organism must, first of all, feel a grudge against the environment so that it can find food and reproduce.

Vitality gives different individualities and unity as context changes. For instance, there are contextual differences between treating the cell as a singular agent and a human being as a singular organism. Definitions and namings change as going from the small universe to the big universe. However, speaking on a human scale, the source of all these denominations is the self itself. The human self actively gives names to its environment, categorizes the beings and matter around it, defines it, observes its properties, and disposes of the matter. He also dreams, thinks, produces abstract concepts, develops language, and makes art. All these processes are natural features of the human self that belong to humans. The human organism's sensory inputs limit its perception of its environment, and it tries to keep the population of the human organism alive with the thinking and technology opportunities it has developed within its borders.

Santayana's approach to vitality is in certain respects similar to Aristotle's approach to the soul. Aristotle's teaching is a vitality-based approach. In the texts of Santayana, similarly, he argues that all human aspects are related to animal origin. Thus, not only the self has an animal origin, but all the extensions of the self are directly related to this animal origin, and as a result, the self is also an animal. Santayana, while treating the self as psyche, presented a framework of meaning that would explain the whole existence, matter, and self rather than going into the details of the self and making it a science of psychology. Although he dealt with the science of psychology separately in his book *Skepticism and Animal Faith* (G. Santayana 2003), he still did not grapple with any useless detail that one cannot make sense of life as a whole. All this pragmatic reasoning has given him a concept that one can observe its actions, even if it is accepted as a dogma after all: the self. Naturally, any human action is based on an animal's faith. Technology can also be seen as a reflection of a form of action produced by the human self (Allen 2008). Human, by his nature, has to survive and continue their lineage, just like every other living organism. The emergence of technology in the evolutionary process can be seen as natural for a human being, who has lost its feathers in the evolutionary process, can stand on two legs, and has developed neurophysiological coordination (Allen 2008). Using Santayana's approach, one can also take a look at the holistic nature of technology by discovering the essence of other beings around them. It can be said that technology is not just a tool-using skill. Because technology is an extension of a human population that includes many historical aspects, and it is sometimes cumulative, and it sometimes jumps. Technological developments cannot be considered in isolation, because they have serious links with different extensions of human life (Su and Moaniba 2017). Many humanities such as economy, politics, environment, human relations, medicine, chemistry, and education are closely related to technology (Boekholt 2010; Su and Moaniba 2017). Naturally, the experiences that people have gained in all these different fields must be combined and embodied as an instrumentalization and culture. At this point, it can be said that the human self collects the different experiences of life as an integrating ground, and produces technology with the help of the essences, discovers its relations with matter and phenomena. It can be said that it is possible to see natural human action in all processes of technology since the instincts of protecting the population, surviving, and producing generations are supported by technology. In other words, it may be possible to see the movement areas of the human self in the natural environment by analyzing technological developments.

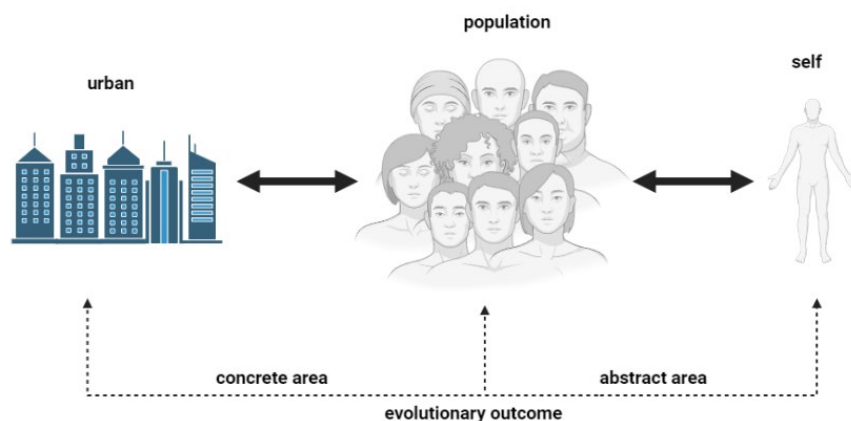
Although the discussions of very fundamental concepts such as self, psyche, and individuality go back to ancient times in the philosophy of biology, it can be said that the discovery of a heritable genetic material and the concepts of microbiota have a serious place in modern discussions for these concepts (Turnbaugh et al., 2007). The concept of microbiota has long been a cornerstone in the biological

discussion of individuality and self (Rees et al., 2018). Before it was known that the microbiota was so effective on organisms, the concept of self was discussed with the discovery of DNA as genetic material. However, the fact that genetic material does not conflict with the cell theory and does not disrupt the integrity of the cell, on the contrary, is meaningful within the cell, which may lead DNA to a somewhat less problematic position when compared to the microbiota (Gimbert & Lapointe, 2015). Likewise, since microbiota is a description of other living cells – fungi, bacteria, and viruses – living in an organism, the concepts related to microbiota and how it affects the integrity of the organism have been the subject of serious curiosity. Experiments on this subject have found that other microbes living in the body have many functions: for example, in synthesizing various vitamins, in immune responses, in obesity, in many diseases, and even in mood (Manor et al. 2020). Therefore, the fact that these living things, which we consider as a single organism, affect the organism to such a degree, reveals the idea of how accurate it is to consider the organism as a singular self. This also makes it an ambiguous area where the boundaries of the self - or organism - end and begin, because every organism is in constant interaction with its environment, so it constantly receives and introduces microbes from the environment (Kundu et al. 2017). In this continuous and dynamic environment, it is difficult to draw a boundary to define the self and to describe its interaction with the environment (Rees, Bosch, and Douglas 2018). Santayana's approach, on the other hand, may reveal a biological self-perception that could not be created despite the big data of the modern world and the results of numerous experiments. Because, in Santayana's view, the concept of Self appears as a deduction where skeptical and pragmatic thinking methods are blended, rather than a concept of self that is tried to be formed based on empirical data. However, the great thing here is that this dogma is not an inference that has no counterpart in substance but remains in pure thought. Because the self is an integrating factor that is in an active relationship with its environment, therefore it can be aware of the essences in the environment and can reach the knowledge of existence with these essences. But most importantly, although all these processes involve all the complexity of life, they do not have a super-material nature, they exist due to matter, and also they are extensions of matter. All abstractions that can be described such as doubting, making inferences, thinking abstractly, knowledge, etc., actually belong to human beings, they are processes arising from the fact that the human-animal has an animal basis. The acceptance of the self as a dogma by the human mind is also progress presented as a natural process for the human animal's mind to survive and perpetuate the generation. The human-animal, as an animal, must rely on nature, its environment, and its existence and also the concept of so that it can live.

### Conclusion: Merging The Two Views into One to Comprehend Modern Cities

I suggest that there is a concrete connection between the city and the self. Our concept of self is the main thing that determines the urban area, the basic energy of action, and the worldview that determines all the other elements (Figure 1). If we want to understand cities, we need to understand the self.

Figure 1. The evolutionary outcome of the self as cities.



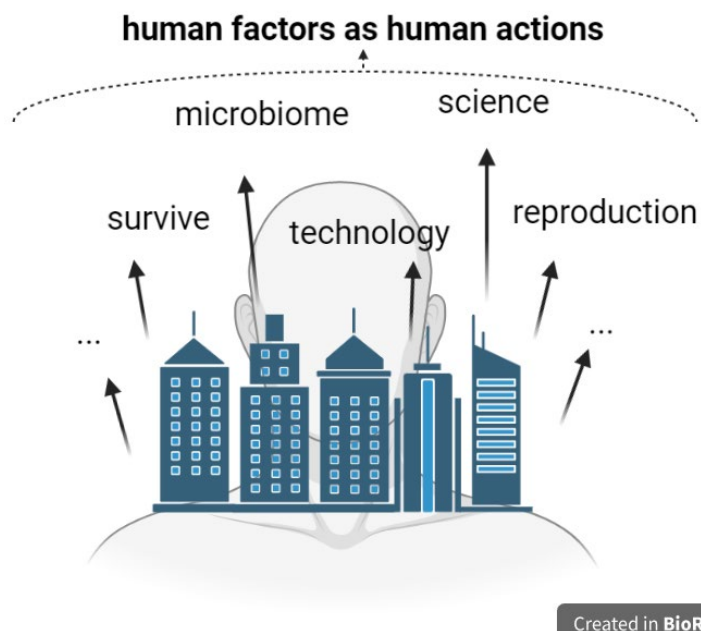


One example involves developing policies based on the shared perspectives of Aristotle and Santayana, which emphasize understanding humans not as separate entities from nature but as beings existing within and arising from it. Actions taken by humans, like those of other living and non-living entities, should be recognized as leading to natural outcomes. For instance, while sustainability typically considers criteria such as biodegradability, permanence, and the use of natural materials, the human factor must also be integrated into the concept of sustainability. Human existence, actions, and interactions with other living beings must be assessed within this framework because humans are not separate from nature but, like all others, an integral part of the ecosystem. Therefore, future planning and designs must account for all known living and non-living components of the ecosystem. For example, when using a chemical substance, its benefits to humans and its known effects on certain organisms should be analyzed through more holistic combinations. This would enable future predictions that are more inclusive and foster methods that incorporate human actions as part of the ecosystem rather than excluding humans from the equation. Such an approach would result in comprehensive strategies that embrace both the human and non-human aspects of the natural world.

The interplay between Aristotle's idea of the human being as an integral part of the natural world and Santayana's focus on the self provides a profound foundation for rethinking urban planning and policy development. Aristotle's perspective emphasizes the interconnectedness of human actions with the broader ecological system, suggesting that humans, like other living and non-living entities, are inseparable from the natural processes they influence. This aligns seamlessly with Santayana's view of the self, which considers human identity as deeply rooted in its surroundings and shaped by cultural and environmental contexts. Together, these ideas offer a framework for urban planning that not only acknowledges the ecological and social dimensions of human existence but also prioritizes designs that foster a deeper connection between individuals and their environments. For instance, policies informed by this synthesis could advocate for urban spaces that support both ecological sustainability and personal well-being, such as green areas designed to enhance community interaction and individual reflection, while maintaining ecological balance. The concept of the "self" as a measurable unit in urban ecology offers intriguing possibilities for bridging philosophical theory and practical application. Drawing from Santayana's emphasis on the self as intertwined with cultural and environmental contexts, this idea can be translated into urban ecosystems by recognizing individuals as dynamic components of the ecological fabric, whose behaviors and interactions influence and are influenced by their surroundings. For instance, integrating the "self" into urban ecological studies could involve analyzing human interactions with green spaces, their impact on local biodiversity, or the psychological benefits derived from urban design.

That is to say, as a starting point, we should evaluate the human aspects in a holistic view, rather than trying to integrate them. But before this, we have to shape our worldview based on the fact of living. Since modern-day problems like urbanization, climate change, poverty, and crimes are occurring in this life, we have to know *what is life*, its components, and aspects of life. All urban-related factors can be considered as a whole only if the self of each individual within the human population is accepted as the starting point. However, for us to take the self out of the abstract realm and bring it to a concrete reality, we must first decide on the parameters by which the self is to be evaluated. For this, the shortest and most measurable method is to construct the self-concept based on actions (Figure 2). The relevance of the various factors that we observe in cities to the self can be taken out of the philosophical ground and into the scientific ground of action only if the self is defined in terms of actions. Therefore, the multi-component structure of cities exists in a measurable unity thanks to the unifying nature of the self.

**Figure 2.** Human factors in the cities are the outcomes of the actions of the human population, which is created by the sum of individual selves. Therefore, the self becomes a basic definition to represent humans as a whole dynamic entity in the environment and urban areas.



The combination of Aristotle's ability to treat life as a whole and the concepts of self pointed out by Santayana can form an integral basis for understanding city systems. Many other similar views can be integrated into this system, but the choice of cities as the main field of observation also means defining a real field for the practical application of these views. Of course, whether or not this proposal can be realized depends on disciplines working together, but the more important fiction that will determine the outcome is the unification and mobilization of intellectual grounds on a common denominator. In summary, the main point I am trying to reach is that the understanding of human mobility and the dynamic positioning of this mobility within the ecosystem integrity depends, first of all, on rebuilding our definition of the self. The unity provided by Aristotle's views on life, cities, and human beings, when combined with Santayana's views that unify human actions, can provide a solid paradigmatic basis for understanding urban systems and by this, a realistic intellectual ground can be created to find solutions to modern-day problems related with cities.

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