Is Human Society an Organism Made of Many Animals?

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Abstract. Social organism theories of the past have defined human societies as "biological organisms", similar to animals or plants. This present work draws from the recent technological breakthroughs in both biology and astronomy to define the worldwide human society as a "multizoa organism", i.e. an organism made of many animals. The paper then puts forth the idea that as a multizoa organism, human society is subject to some of the same biological processes that apply to other organisms, such as the natural cycles of growth, feeding and reproduction, the principles of evolution through natural selection, and the dangers of evolutionary pressures. Finally, it argues that war can be understood as a multizoa disease that decreases the chances of a society to survive in its environment and reproduce, thus providing a purely biological reasoning against the use of warfare.

1. Introduction

Since the dawn of recorded history, a pervasive metaphor has permeated across cultures and ages in the quest to understand society: That of the social organism. This is the idea that human society could be considered an organism in its own right, similar to a plant or an animal. Arguably one of the earliest records of this is to be found in Hinduism's division of society's members into four major castes, which, according to the origin myth behind it, come from the body parts of a deity.[1] In the West, the roots of the social organism theory school of thought can be found as early as Plato and his vision of the body politic, where he likens a just state to a just soul.[2] Aristotle also makes use of the metaphor in his work, stating for example that a proper functioning of the whole state is required for the well-being of the people, since "If the whole body be destroyed, there will not be a foot or a hand".[3] The metaphor of the body politic continued through to the Middle Ages, where it was used by scholars such as Oresme, who stated that "The state or kingdom, is like a human body".[4] In our era, the social organism theory has played a notable role in sociology, from its roots with Auguste Comte, who used it extensively in his work and called society a "collective organism"[5] through to Herbert Spencer, who famously referred to society as the "social organism"[6], and all the way through to Emile Durkheim and other sociologists.[7] Closer to the 21st century, a notable iteration of the social organism theory is to be found in the work of Lovelock and Margulis on the Gaia hypothesis, which proposes that the entire planet is a system-like organism that self-regulates.[8]

Social organism theories were not without their detractors, such as Max Weber, who believed that an overuse of the analogy between biological organisms and human society could actually be detrimental, and advised against it.[7]

Nevertheless, all major additions to the social organism school of thought took place before the advent of many modern technological tools available since the end of the 20th century that look both at organic life, as well as at human society. These tools include the Hubble telescope, the increased refinement of in vivo microscopy, the framework of systems biology, and so many others. This work builds upon the massive breath of knowledge about both cellular life as well as about human society produced by these tools to formulate a novel social organism theory.

Human society as a biological organism

What is human society? The dictionary lists "society" as being a collection of individuals that live as members of a community.[9] Here, we propose that human society can be best understood as a multizoa organism[*] – an organism made of many animals. Linguistically, "multizoa" is a compound word. "Multi-" derives from the latin "multus", which means many, and "zoa" derives from "zoon", the latin plural for animals. So "multizoa" etymologically means "*many animals*". The word draws a parallel to "multicellular", which is how organisms made of many cells are defined biologically. This similarity is not unintentional, for, as we shall see, multicellular and multizoa organisms share many features, in general terms.

The organic aspect of human society is easiest to see from space. Using satellite footage of human society, our worldwide society appears similar to be a bioluminescent moss-like organism growing on Earth's surface, and that's what a multizoa organism looks like from afar (Figure 1a). If we zoom in, we can see that this organism is made of people (Figure 1b), other plants and animals (Figure 1c), and things people made, like buildings, roads and cars (Figure 1d).

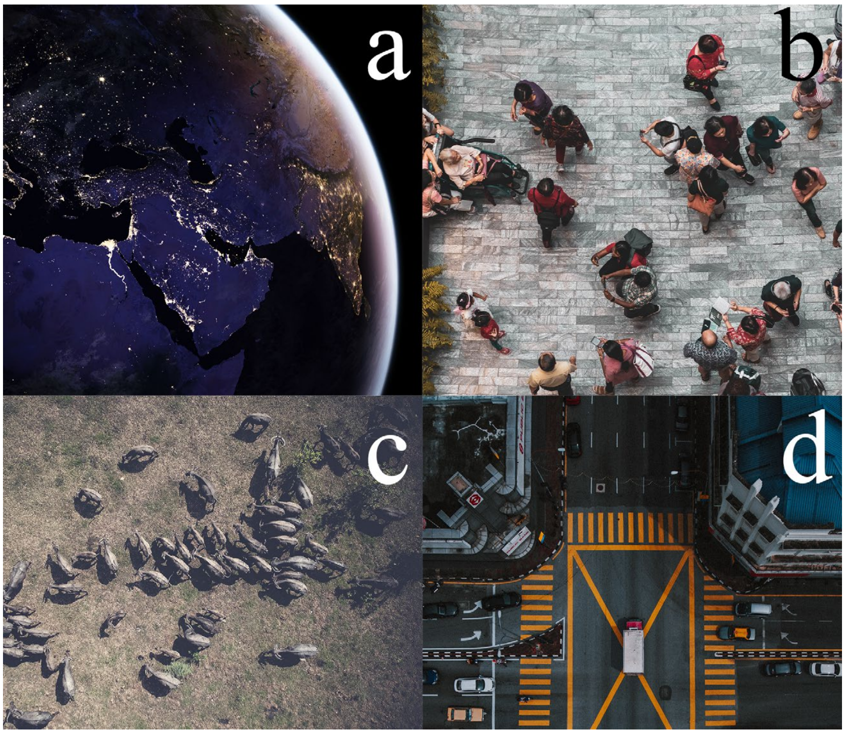

Figure 1. Human society's composition. Figure 1a - Human society from afar. Figure 1b – Human beings. Figure 1c - other animals and plants. Figure 1d - roads and cars.

[*] Spelled [muhl•tee•zoh•ah].

This is not unlike the perception and make-up of a multicellular organism, like an animal or a plant. Let's take the human body as an example. From afar, a human body looks like one entity (Figure 2a). Zoom in however using a microscope, and we can see that in reality, the body is made up of human cells (Figure 2b), bacteria (Figure 2c) and things that human cells make, like the collagen in joints (Figure 2d).

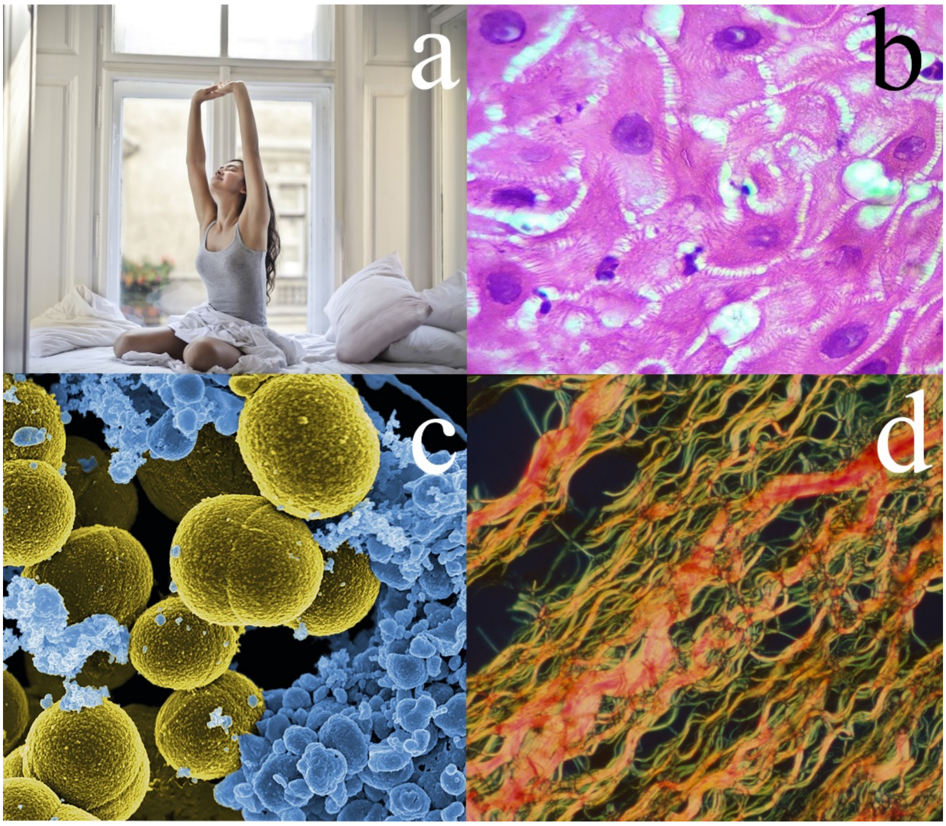

Figure 2. A human's composition. Figure 2a. A human from afar *2b*. Human cells (Keratynocites) *2c.* Bacteria 2d. Things cells make, like collagen.

The fundamental structural and functional unit of multicellular organism is the cell. Likewise, the fundamental structural and functional unit of multizoa organisms is considered the human. That's not to say that multizoa organisms can survive without animals or plants – indeed, multicellular organisms can scarcely survive without bacteria, which fulfils such essential roles as breaking down food and helping with digestion.[10] Likewise, multizoa organisms are very much dependent upon the animals and plants that are included in its body, but its basic unit remains the human, for reasons that will be explored.

As a multizoa organism, human society's body stretches wherever humans live. This means that its body can be found on virtually every surface landmass of Earth, especially where the climate conditions are ideal for human survival. Thus, areas with temperate climates see a much higher density of people, whereas areas which have extreme temperatures, such as deserts or Earth's poles, sees a much lower human density. Crucially, multizoa theory considers the worldwide human society living on the surface of Earth as a single multizoa organism[†], mainly due to the process of integration and interdependence that has been brought about by technological development. This integration and interdependence can be observed from a number of angles – from the physical, such as the constant and high-volume transportation of goods and people between countries around the world,

[†] Rarther than a collection of separate organisms occupying different areas of Earth's landmass.

or the speed at which a pandemic can spread globally; To the informational, such as the speed at which news can spread from one corner of the globe to another, the emergence of globally circulating languages, or the global popularity of particular artworks such as movies, music, and other pieces of media. Therefore, this paper will use the term “human society” to mean the worldwide human society spanning the entire globe.

The following section will proceed to list some of the basic physiological processes that human society displays as a multizoa organism.

2. Multizoa physiological processes

As a multizoa organism, human society does a lot of what multicellular organisms do, only at a much larger scale.

Human society feeds:

In 2018, approximately 85% of the world’s energy came from fossil fuels.[11] This energy is extracted from the ground using specialized machinery, which can be seen as forming human society’s root system (Figure 3). Of course, other nutrients are essential to human society’s survival, such as water, as well as animal- and plant-derived nutrients. However, without fossil fuels to supply the world’s energy right now, society would not be able to support the processing, transportation and consumption of all of the other nutrients, as well as its underlying humans, and it would essentially break down and collapse. Therefore, it can be said that human society feeds, and its main source of energy comes from fossil fuels.

Figure 3. Oil wells can be considered part of human society's root system.

Human society breathes:

In 2013, human society consumed approximately 41 Gt of oxygen.[12] Oxygen is essential for the survival of the biological component of human society, as well as for the processing of fossil fuel energy, and would not be able to survive without it.

Human society grows:

The human population of human society has grown from 1.65 billion in the year 1900 to approximately 7.7 billion in 2019.[13] The occupied landmass of human society has also grown significantly, from 2.52 billion hectares in the 1900 to about 5 billion hectares in 2015. Currently, the entire landmass of Earth occupied by humans amounts to about 50% of the entire habitable landmass of Earth.[14] Interestingly, only about 2 percent of that habituated landmass accounts for the world's urban land, which includes cities and towns. The rest is used for agriculture, like cropland and grazing.

The growth of human society shows no signs of stopping, with an estimated 11.8 billion people projected to live by 2100, and with land use predicted to increase as well.[15]

Human society is on track to reproduce:

One of the defining goals of human society in the 21st century seems to be that of establishing a colony on another planet. Multizoa theory recognizes the establishment of such a colony as multizoa reproduction. Creating a new city on Earth, although potentially beneficial for human society, is not considered multizoa reproduction, but rather an addition to human society's body, due to the subject of integration and interdependence outlined above. More specifically, a new city anywhere on the planet would be subject to that same process of integration and interdependence that the rest of human society experiences to one degree or another. In contrast, a colony on another planet would be largely independent from its parent society, due to the sheer distance between any two planets. For example, it takes a radio message an average of 12.5 minutes to travel from Earth to Mars or vice-versa, depending on how far they are from each other in orbit due to speed of light limitations.[16] This means that although there might be information transmission taking place between the two planetary societies, the information being created and transmitted within one society would not be readily available to the other society (e.g. they would not share the same internet), but rather would have to be actively communicated to the other society, similar to how two people communicate their thoughts to one another via active speech. Also, the proposed technology for physically travelling between Earth and Mars would mean anywhere from one month to several of travelling through inhospitable space.[16]

This means that the two societies – the Earth-bound one and the Mars-bound one will grow independently of one another, both physically and in terms of information transmission, and anthropological evidence shows that when two human populations are separated and allowed to develop independently, they develop different customs, values, technologies, ideals, etc.[17] This would make the population of people on the two different planets two different multizoa organisms, that might have some amount of information transmission and travel between them, but that would be by and large separate.

3. Utility of multizoa theory:

Within this section, we will be looking at some of the ways in which multizoa theory fits humans and human society into the larger biological context. This list is by no means exhaustive, but rather aims to provide a brief overview of the subject.

Multizoa phylogeny

By defining multizoa reproduction as establishing of colonies on other planets, multizoa theory hints at the existence of a potential multizoa phylogenetic tree, similar to the cell-based phylogenetic tree initially traced by Darwin (Figure 4a). Right now the only multizoa organism found in this phylogenetic tree is human society (Figure 4b), however if human society establishes colonies on other planets, and they too establish other colonies, and so on, billions of years from now we may get different multizoa species, and all of them would be able to trace their lineage back to human society (Figure 4c). We might go so far as to say that this multizoa phylogenetic tree could come to contain different kingdoms, just like the multicellular phylogenetic tree contains different kingdoms as well – For example, the multizoa organisms rooted on the surface of planets could be considered plant-based multizoa organisms, so part of the kingdom *multizoa plantae*, whereas constructed starships that contain a large body of individuals could be considered animal-based multizoa organisms, so part of the kingdom *multizoa animalia*. Quite possibly, this phylogenetic tree would also come to contain previously unimagined multizoa organisms (Figure 4c).

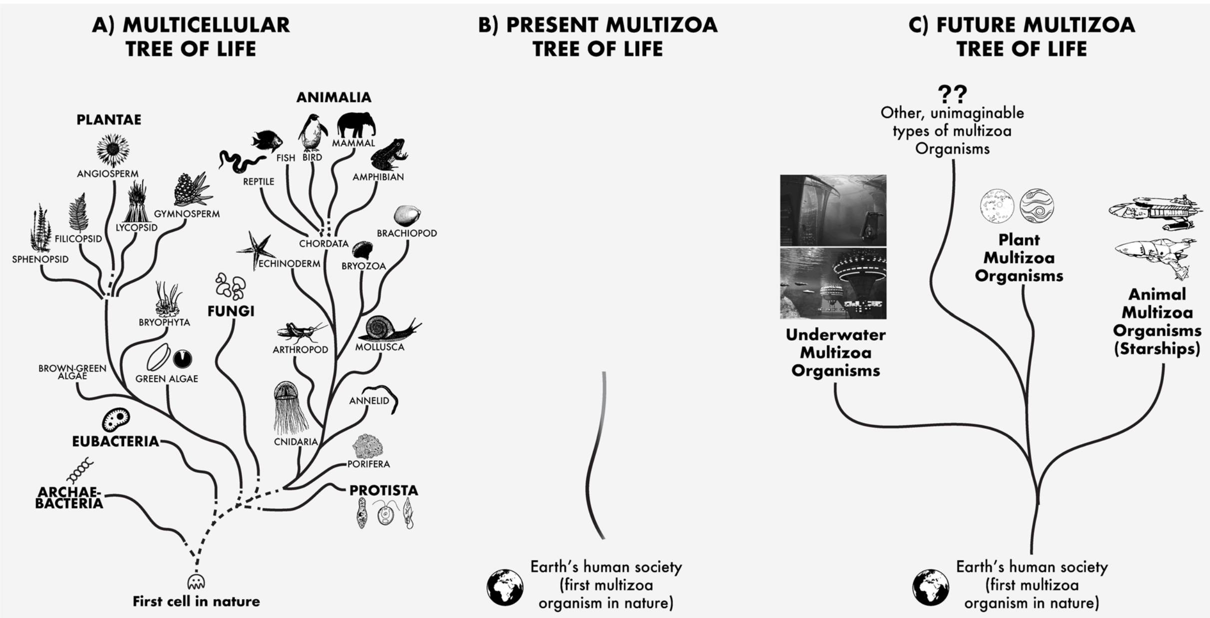

Figure 4a. Multicellular phylogenetic tree. *4b*. Present multizoa tree of life. *4c*. A potential future multizoa tree of life, which contains plant-based multizoa organisms, animal multizoa organisms, and water-dwelling multizoa organisms. This is an example, since the actual multizoa phylogenetic tree might end up looking completely differently.

In other words, billions of years of multizoa reproduction might come to populate the universe with a varied display of life, in the same way that billions of years of cellular and multicellular reproduction came to populate Earth with a plethora of lifeforms, and our human society finds itself at the base of this process, which is an altogether awe-inspiring position to be in.

Multizoa heritability

Multizoa theory postulates that multizoa organisms “inherit” the traits of their parents, in a way not unlike multicellular organisms do. Evidence for this can be gathered from human migrations that took place in the past – for example, when the Europeans settled in America, they brought with them the technologies, plants, animals, and social organization that was predominant in Europe, and with time adapted them to the new land.[18] Colonies established on other planets would, in a similar way, be founded using the technologies that derive from their parent multizoa organisms, would contain plants and animals coming from their parent multizoa organisms, and would have a social organization not unlike that which was predominant in their parent organism – at least at first, before they get adapted and streamlined to the particular environment the multizoa organism would grow in.

Multizoa mutation

Multizoa theory postulates that multizoa organisms could “mutate” during their foundation, due in large part to the different environments that they would grow in, which would make certain traits as they are expressed in their parent organism unsuitable for them. For example, Mars is a planet wholly different from Earth – its low atmospheric pressure would make a person’s blood literally boil without a space-suit, night time temperatures go below those found at the Antarctic, there is no water in liquid form on the planet’s surface, and high radiation poisoning due to a lack of atmosphere to protect from the sun’s rays would cause cancer.[19] This means that a multizoa organism would need to develop a different set of “multizoa abilities” to survive on Mars rather than on Earth, from radiation protection to atmospheric manipulation to acquiring water to converting raw materials into energy – all of which would most likely lead to different multizoa “traits”. For example, the Martian multizoa organism might rely on atomic energy much more than Earth, and much less on fossil fuels. If then the Martian colony would come to reach sexual maturity and itself establish a colony on another planet, it could pass on the “traits” that allow it to use atomic energy to its daughter multizoa organism.

Multizoa selection pressures

Multicellular organisms face a number of threats coming from their environment. Sometimes, a predator attempts to hunt them down, like for example when a cheetah hunts down an antelope, or when a lizard hunts down a cricket. Other times, something unexpected happens in an animal’s environment, like a volcanic eruption, or a forest fire, or a flood, destroying their habitat. And other times, it’s a pathogen infecting their bodies, which leads to disease. Within classical biology (i.e. biology that refers to cellular and multicellular organisms), such threats are known as selection pressures, and not all multicellular organisms survive them – a cheetah catches antelopes some of the time, volcanic eruptions kills of animals and plants, and diseases can be fatal. Those multicellular organisms that do survive and are able to reproduce pass on their characteristics to the next generation, spreading their characteristics through the species population. Selection pressures are seen as crucial in the process of multicellular evolution that produced the dazzling display of life seen on Earth today.[20]

With human society as an example, we can see that like multicellular organisms, multizoa organisms face a number of pressures from their environment that may threaten their survival. These include multizoa diseases – for example, the bubonic plague wiped off more than half of Europe’s population in the 1300s.[21] And natural disasters, such as the 2004 Indian Ocean tsunami which killed hundreds of thousands of people in 14 different countries.[22] Planets have been known to go through dramatic changes that could threaten the very survival of any multizoa organism which inhabits it. For example, Earth has been known to go through periods of massive changes in the distant past, such as for example dramatic changes in climate, and mass extinction events where a large percentage of Earth's multicellular organisms perished.[23] Our human society did not exist during those times – many of these events took place before the earliest records of *Homo Sapiens*, which date to about 150,000 years ago [24] – however if these natural catastrophes did occur in conjunction with the existence of any multizoa organism, it would present a very real threat to that organism's existence.

With the development of multizoa reproduction, and the establishment of multizoa organisms on planets that are less hospitable to multizoa life than Earth, such multizoa selection pressures will only be more of a threat to the survival of newly developing multizoa organisms, and will likely play a leading role in determining which multizoa organisms survive to pass on their "traits" and which do not.

Multizoa evolution through natural selection

The three mechanisms explained previously, namely heritability, mutation, and selection pressures, form the foundation of the theory of evolution through natural selection that is the cornerstone of biology as it is applied to multicellular organisms.[25]

The theory of evolution through natural selection states that as organisms reproduce, they pass on their genetically inherited traits. Organisms sometimes suffer mutations during reproduction, which, if they make them more adapted to their environment, give them a greater chance to survive and to reproduce.[20] In the subsections above, we see how this applies to multizoa organisms. As human colonies would be established on other planets, it's not hard to imagine how the "traits" of some of these colonies would end making them better adapted to their new planetary environments than others, which would make them better able to survive in their environment and reproduce, thus passing on the multizoa "traits" which made them successful onto the next generations of colonies.

Of course, the mechanism by which traits are recorded and are made heritable within multizoa organisms differ from those of multicellular organisms – whereas multicellular traits are recorded genetically, multizoa traits are recorded culturally and through various mediums – text, video, etc. Nevertheless, we can see how the general process still applies to both types of organisms.

The process of multizoa evolution through natural selection could be seen as fundamental in the development of the multizoa phylogenetic tree described in the first subsection of this chapter (Figure 4c). Those multizoa organism that managed to survive in their environment, successfully reproduce and pass on their traits would have become part of this tree, while the rest would present evolutionary dead ends.

War – a multizoa disease

Another area in which applying multizoa theory breeds new understanding is that of large-scale human conflict. The dictionary defines war as "a conflict carried on by a force of arms, as between nations or between parties within a nation; warfare, as by land, sea, or air".[26]

However, by taking the multizoa perspective whilst looking at the effects of war from space, we can quickly draw the conclusion that war is akin to a multizoa disease. For example, Figure 5a shows the war damage caused in Syria, Damascus, whereas Figure 5b shows the damage caused by psoriasis, an autoimmune disease experienced by humans that attacks skin cells. In biology, a disease is a condition that, fundamentally, damages cells and the tissues they create. In a similar manner, war can be seen as a multizoa condition that damages humans and the structures they create, such as buildings, machinery, etc. Because war is caused by one sub-population of human society damaging another sub-population and the area they inhabit, war is a close correlate to autoimmune diseases, such as psoriasis, lupus and cancer. Autoimmune diseases are defined as diseases in which the body's immune system attacks the body itself, and that's what happens during war to human society's body – one sub-population of its humans attacks another sub-population.

Importantly, within classical biology, diseases of any kind make organisms immuno-compromised, which lowers the biological fitness of the organism (i.e. its ability to survive in its environment and reproduce) and increases the chances that it will succumb to the selection pressures mentioned above when they arise, including predation, environmental catastrophes, and so on.

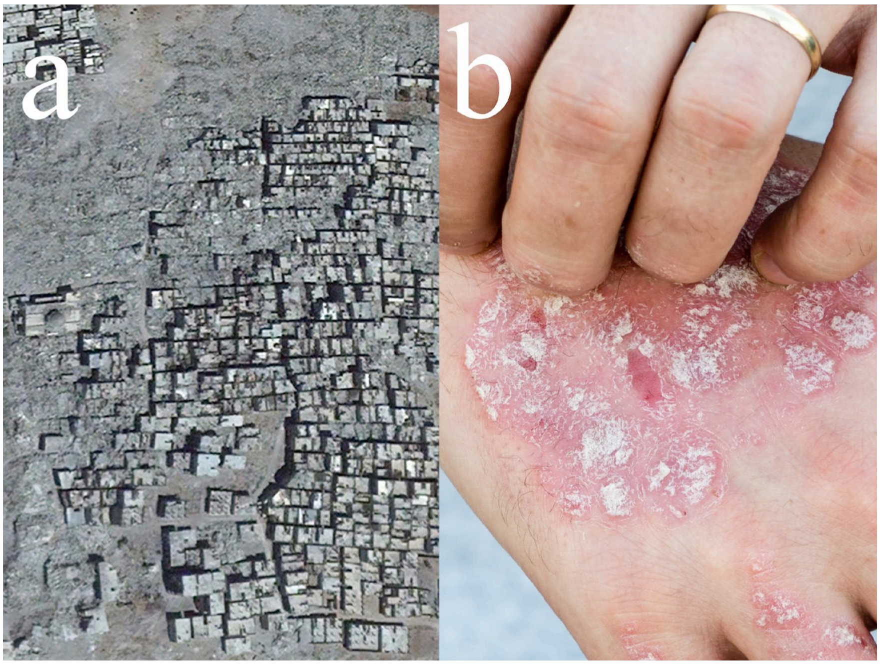

Figure 5a. War-damaged Yalda neighbourhood in south central Damascus in 2013. Image credit: Google, Maxar Technologies. Figure 5b. Skin damage caused by the autoimmune disease psoriasis.

By applying this knowledge to multizoa organisms, multizoa theory postulates that war leaves human society immuno-compromised, which would leave it more susceptible to multizoa selection pressures when they arise, be it changes in Earth's climate, environmental catastrophes or other unexpected natural events.

As a consequence, multizoa theory offers a purely objective and biological perspective for why wars should not be instigated and fought by any nation, anywhere.

4. Multicellular and multizoa organisms – Similarities and differences

Vision – An example of similarity

Some of the similarities between multizoa and multicellular organisms are truly striking. For example, it is a well-established fact that the images we consciously perceive as vision are not in fact the raw visual footage falling on the retina.[27] If we were to perceive the images that come through the eye directly as they fall on the retina, we would have a blurry, upside down image that constantly shifts due to the eye's micromovements, with a blind spot in the upper visual field of each eye where the optic nerve crosses the retina, with more color in the middle of the visual field than in the periphery, etc. (Figure 6a). In other words, it would not be the clear, full color image of our surroundings that we consciously perceive. However, what happens is that the neurons which specialize in processing visual images constantly "process" the images coming from the retina – they invert the image to have it right-side up, they mask the blind spot, they remove the microsaccades of the eye, they fill the visual periphery with color, and so on, to provide the full-blown images that you are now perceiving as you are reading this text.

In a similar way, the stunning images that we normally see of deep space, taken by telescopes such as Hubble are not the raw images taken by the telescopes themselves.[28] For example, Hubble images are post-processed in a number of ways by the astronomers, including combining a number of Hubble images, coloring them – the original images are greyscale – removing artefacts, and performing a series of other tasks on them before they are released to the public (Figure 6b, Figure 6c). As NASA put it, "Creating color images out of the original black-and-white exposures is equal parts art and science".

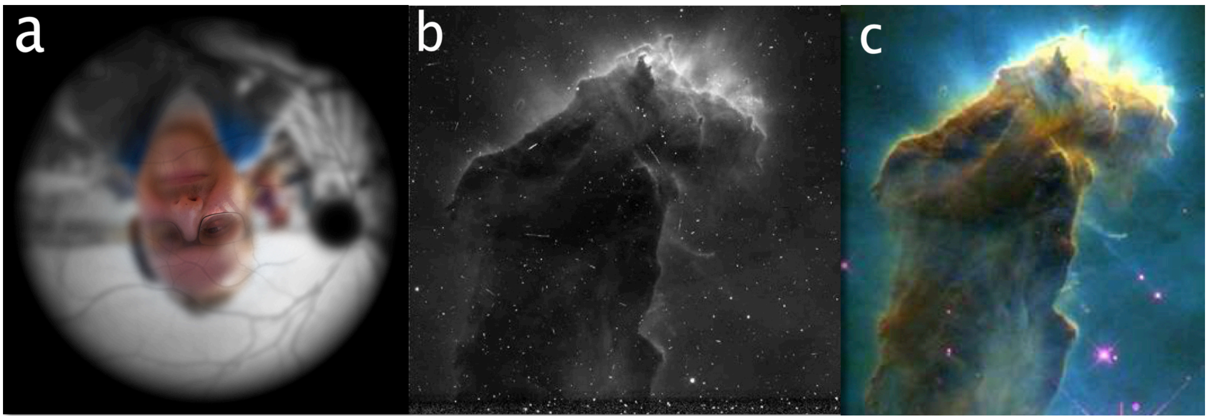

Figure 6a. A simulated image of how a retinal image would look like before being processed by neurons. Notice the upside-down angle, the color in the middle with black and white in the surrounding area, the visible blood vessels, and blind spot in the lower right (what would be the upper left for the non-inverted image). Compare that with the right-side up, full color, non-distorted images you consciously perceive at the moment.[29] *Figure 6b*. A section of the Pillars of the Earth image taken by Hubble, before being processed. Notice the black-and-white palette, the artefacts that dot the picture, the lack of detail. Image credit: NASA. *Figure 6c.* The same section 6b of the Pillars of the Earth, but after it was carefully processed by astronomers and shared with the public. Notice the full color, the emphasis on certain features of the image not existent in image 6b, and the lack of artefacts. Image credit: NASA.

So, we can say that in both cases, the visual images captured by the organism's visual organ (i.e. eye in the case of humans, telescopes in the case of human society) are first processed by their fundamental units (i.e. cells in the case of humans, humans in the case of human society) before being distributed throughout the organism (i.e. becoming conscious in the case of humans, becoming popular in the case of human society). Of course, the temporal and spatial order of magnitude differs between the two organisms – it takes a much shorter time for cells to process the images captured by the retina then it does for humans to process the images captured by the Hubble telescope. Also, the distances involved when it comes to cells and the retina are much shorter than the distances involved for telescopes and humans.

Nevertheless, the fact that we can express the same general process in a language that applies to both organisms is a testament to their striking similarity.

Basic unit individuality – an example of difference

Still, it is worth pointing out that there are notable differences between multicellular and multizoa organisms. Perhaps one of the most poignant for multizoa theory is the fact that the individual humans that make up multizoa organisms have a strong sense of individuality, one that is not found in the individual cells which make up multicellular organisms. That does not mean that cells do not display ingenious behavior individually.[30] [31] But this sense of individuality inherent in humans is unlike anything seen in the cellular kingdom. For example, there is no such thing as "popular cells" within the body that all other cells know about, like there are popular people within human society, from politicians to actors to singers. This diverging feature has two potential implications:

1. The intergenerational process of multizoa evolution through natural selection might favor the survival and reproduction of societies that are more collective rather than individualistic, thus eliminating individualism over time. An example such a collectivist multizoa organism could be a society where the popular works of art created by people would be completely anonymized, so as to strip them of any individualist connotations.

2. Human individuality might play a role in the selection of particular "multizoa traits" during the process of multizoa evolution through natural selection in the Universe that have no parallel to multicellular "traits" and their evolutionary trajectory. For example, a multizoa organism that empowers that individuality in its humans might be evolutionarily successful in certain multizoa environments, something that has no parallel in the context of multicellular organisms.

This example aimed to show how a clear difference between multicellular and multizoa "traits" could be dealt with in the context of an evolutionary theory that encompasses both types of organisms.

5. Conclusion

This paper aimed to introduce the concept of human society as a multizoa organism, i.e. an organism made of many animals, and to provide a brief overview of some of the applications of multizoa theory. Crucially, it did not aim to exhaust the list of applications, but rather to lay the groundwork for their future exploration.

Instead of having human society and Earth be part of a single organism as the Gaia theory proposes, multizoa theory defines human society as a plant-like multizoa organism that is rooted on Earth's surface. However, that does not minimize the extreme importance of the planet in human society's survival. As a plant's survival depends on the health of the soil it is planted in, so too does a plant-like multizoa organism depend on the health of the planet it is 'planted' in. The process of evolution through natural selection on Earth has led to the development of plants that have an intimate relationship with the soil that they are surrounded by, where they continually replenish it with nutrients just as they extract the nutrients that they need, and that may be an evolutionary lesson for multizoa organisms – no known stationary plants destroy the soil that they are in, and that may just be because the process of multicellular evolution through natural selection has deemed such a "trait" maladaptive. This could suggest that human society as a multizoa organism may be most successful in its survival and reproduction during the process of multizoa natural selection by treating Earth in a sustainable way.

In emphasizing the unitary nature of the worldwide human society, multizoa theory does not seek to diminish the importance of each individual human which makes it up. On the contrary, the health of a multizoa organism is dependent on the health of each person that is part of that organism, just like the health of a multicellular organism is dependent upon the health of the cells which constitute it. Moreover, multizoa theory proposes that the intelligence of a multizoa organism is partly predicated upon the autonomy of its underlying people, upon the number of people within the society that have their basic necessities met unconditionally, and are free to explore other activities. This is based on the parallel with neurons in the associative cortices, which are thought to be responsible for the higher-order thinking processes within the human brain.[32] Within classical biology, intelligence is thought to be an important factor in determining the ability of an organism to survive selection pressures and to reproduce, and the same may apply to multizoa organisms. These are just some of the ways in which multizoa theory values the life of each individual person that makes up a society.

Finally, from a metabiological perspective, the similarity between multicellular and multizoa organisms cannot help but bring to mind the concept of self-similarity. A self-similar unit is one that is exactly or mostly similar to parts of itself.[33] Going one step above (or rather, below), there is also self-similarity between individual cells and the multicellular organisms that form it. After all, the name given to the specialized structures within cells is "organelles", since they are reminiscent of the organs of multicellular organisms. Individual cells have been shown to display primitive forms of virtually all features of multicellular organisms, including sensory processing via vision, intelligence, social cohesion, and others.[33] Self-similarity is a property of fractals, which have previously been associated with other natural phenomena.[35] With the addition of multizoa theory, we can now trace self-similar patterns between biological entities that exist at three different orders of magnitude– cells, which are made of interdependent molecules, multicellular organisms, which are made of interdependent cells, and multizoa organisms, which are made of interdependent humans. This self-similarity is approximate rather than exact, since there are features which distinguish the biological units that exist at each order of magnitude. Nevertheless, it is a feature prominent enough to warrant attention, and perhaps to encourage further investigation.

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