

EPIDEMICS AND PANDEMICS

Epidemics and Pandemics

Philosophical Perspectives

MICHELE NICOLETTI AND ALESSANDRO PALAZZO

BREPOLS

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8. Zoonosis

▼ **ABSTRACT** This contribution has two main objectives. The first is to isolate and define a particular trait of the COVID-19 pandemic, namely its zoonotic character, in order to evaluate its importance in relation to other characteristics of this global health crisis. The second is to consider how the widespread awareness of the zoonotic character of the pandemic can change the view that the human species has of itself – its ‘perceived identity’, so to speak. Finally, we will try to understand whether the relationships, both practical and axiological, that the human species has with non-human animals can be influenced by this identity transformation.

1. Introduction

Like every age of crisis, the contemporary pandemic includes, alongside changes in the historical and material conditions of the human beings involved, certain factors of redefinition of their self-perception. Moreover, since COVID-19 is a global crisis, this redefinition can lead, or at least contribute, to a profound re-signification of the perceived identity of the human species as a whole. Among the different perspectives assumed by philosophers in the history of Western thought, the approach developed by the German philosophical anthropology in the twentieth century is one of the best equipped to grasp changes of this kind. This stream of continental philosophy includes three main thinkers (Max Scheler, Helmuth Plessner, and Arnold Gehlen),¹ as well as two other philosophers (Ernst Cassirer and Susanne Langer) who, at least partially, can be assimilated to it.² The interdisciplinary ability of German philosophical anthropology to investigate, on the one hand, the human species as a

¹ See Max Scheler, *The Human Place in the Cosmos* (Evanston: Northwestern University Press, 2009); Helmuth Plessner, *Levels of Organic Life and the Human* (New York: Fordham University Press, 2019); Arnold Gehlen, *Man. His Nature and Place in the World* (New York: Columbia University Press, 1988).

² See Ernst Cassirer, *Gesammelte Werke* (Hamburg: Felix Meiner Verlag, 2001–), XXIII: *An Essay on Man. An Introduction to a Philosophy of Human Culture* (2006); Susanne Langer, *Mind: An Essay on Human Feeling*, 3 vols (Baltimore–London: The John Hopkins University Press, 1983), II.

natural form of life, spread across the entire surface of the Earth, and, on the other, the variety of its symbolic, cultural, and identity forms of existence can be found in many contemporary authors. One of them is Yuval Noah Harari, as we shall see, who considers the human species as a life form that is wholly natural in its origins and evolution and, at the same time, peculiar in terms of the life forms it has developed through the cultural elaboration of the possibilities offered by the environment.³

Moving from this theoretical background, this contribution aims to achieve two key goals. The first is to define and ‘isolate’ a particular trait of the COVID-19 crisis — i.e., the zoonotic character of the pandemic that triggered it. The second is to study the implications of the zoonotic nature of the pandemic in the two directions we have recognized as pertinent to philosophical anthropology. On the one hand, we will discuss its transformative potential towards human identity, with particular regard to the possibilities of changing the image humans have of themselves and of modifying their axiological reference points; on the other, we will try to unearth some concrete environmental and bioethical implications of this transformation process of the anthropological identity. The multifaceted relationship between human beings on the one side, and non-human animals on the other, will be our guiding thread in this recognition of the contemporary self-perception and experience of the world.

2. Definition and First Approach to the Topic

Zoonoses are ‘human infectious diseases caused by pathogens shared with wild or domestic animals’.⁴ According to a monographic issue that *The Lancet* dedicated to the topic in 2012, more than 60% of infectious diseases affecting humans derive from pathogens we share with domestic or wild animals.⁵ In addition to COVID-19, these diseases include rabies, Ebola haemorrhagic fever, HIV (at its first appearance), toxoplasmosis, severe acute respiratory syndrome (SARS), type A influenzas, Rift Valley fever, and many others. The pathogens that cause them are often enzootic (i.e., permanently present) in animal populations. After their transversal passage in the human species — an event called cross-species transmission, or spillover — they can become endemic in the human species or disappear after short periods. This depends on many factors, which range from the level of transmissibility inside the human species to the duration of the asymptomatic incubation period (in the case of COVID-19, both factors favour the circulation of the pathogen on a global scale). A relevant element of zoonoses is the presence of vectors, i.e., organisms that transmit the pathogen from the animal population in which it is enzootic to humans. Based on this criterion, zoonoses can be divided into vector-borne and non-vector-borne diseases. To the former belong malaria, dengue, Lyme disease, and many other

3 Yuval N. Harari, *Sapiens. A Brief History of Humankind* (London: Vintage, 2019).

4 William B. Karesh and others, ‘Zoonoses 1. Ecology of Zoonoses: Natural and Unnatural Histories’, *The Lancet*, 380 (2012), pp. 1936–45 (p. 1936).

5 Karesh and others, ‘Zoonoses 1. Ecology’, p. 1936; see also Kate E. Jones and others, ‘Global Trends in Emerging Infectious Diseases’, *Nature* 451 (2008), pp. 990–94.

pathologies; to the second AIDS, Ebola, COVID-19, and others. Both types of zoonoses can result in endemic diseases — for the diseases of the first group, when their vectors are very common and/or difficult to eradicate; for those belonging to the second group, when the pathogens that cause them develop a high human-to-human transmission capacity. Zoonoses can arise from pathogens belonging to all *taxa* that can enter *Homo sapiens*' microbiome: viruses, bacteria, fungi, protozoa, etc. Those that evolve into pandemics, however, are mainly due to viruses.⁶

From this first description, it is clear that zoonoses must be understood as inter-specific processes involving at least two life forms (the pathogen and the host); in many cases, however, the biological species involved are three: the pathogen, the vector, and the host. Therefore, since it seeks to grasp the complexity of living systems, the ecological perspective proposes itself as a valid stance for studying zoonoses; not surprisingly, the term 'eco-epidemiological' is rapidly spreading in the specialized literature on zoonoses.⁷ On the epistemic level, an initial consequence is that an adequate consideration of the phenomenon has to rest on the awareness that, inside an ecosystem, the effects of every intervention are often non-linear and difficult to predict (see below, in section 4.3.1, the discussion of a particular kind of zooprophyllaxis involving human intervention on the interspecies balance). Furthermore, the eco-systemic consideration of zoonotic diseases is particularly relevant since it requires the assessment of the impact of a particular type of host, i.e., humans, on the rest of the ecosystem. Many cases of zoonosis are, in fact, linked to the form taken by the human activities of gathering, breeding, or transforming natural resources. As we shall see, the mosaic-like deforestation of tropical forest areas, in order to make room for crops, creates the ideal situation for contact between wild animals (such as bats) and domestic animals, which then transmit the pathogens to humans.⁸ To give another example, the use of antibiotics in intensive farming has a selective effect on the pathogens, which, therefore, reach the human beings in variants that are already resistant to drugs.⁹

Alongside the medical and eco-systemic perspectives (and closely intertwined with them), a third standpoint is involved in understanding zoonoses: the perspective of the humanities (where we include history, cultural anthropology, geopolitics, and geo-sociology). The humanities are particularly fruitful when it comes to understanding the conditions of the transformation of a local zoonosis into a pandemic. A particularly clear and effective example of the contribution these disciplines can make to the study of zoonoses is David Quammen's account of the origins of the AIDS

6 Stephen S. Morse and others, 'Zoonoses 3. Prediction and Prevention of the Next Pandemic Zoonosis', *The Lancet*, 380 (2012), pp. 1956–65 (pp. 1957–58).

7 Huai-Yu Tian and others, 'How Environmental Conditions Impact Mosquito Ecology and Japanese Encephalitis: An Eco-epidemiological Approach', *Environment International*, 79 (2015), pp. 17–24; Elvira Matassa, *Zoonosi e sanità pubblica. Un approccio interdisciplinare per un problema globale* (Milano: Springer Italia, 2017), pp. 11–13.

8 David Quammen, *Spillover. Animal Infections and the Next Human Pandemic* (London: Vintage Books, 2013), p. 157.

9 Karesh and others, 'Zoonoses 1. Ecology', p. 1940.

pandemic. Relying on research by Michal Worobey and others,¹⁰ Quammen identifies — in a biopsy report from 1908 — the first evidence of the presence of HIV-1 in the population of Kinshasa. Research on primates shows that the primary source of HIV-1 was probably a chimpanzee; the spillover did not need vectors (HIV-1 is not a vector-borne disease) and it probably occurred by direct contact between the blood of a chimpanzee killed for food and a wounded human being (possibly a hunter). Where the humanities step in is not here, but in understanding what happened later, between 1908 and the global diffusion of AIDS in the 80s. With an anthropologist's viewpoint, Quammen highlights the role of the transformation of the practice of prostitution from forms similar to concubinage (which were traditional in Congolese society) to the commercialization of sex on a large scale in the second half of the twentieth century. This transformation, in turn, relies on the urbanization model resulting from the previous colonial history in Congo and Cameroon. Other factors in Quammen's account can be approached through the humanities: the mass health policies carried out by the colonial authorities between 1921 and 1959, which aimed to fight trypanosomiasis and venereal diseases but led to the common practice of the re-use of syringes;¹¹ in the 1960s, as a consequence of the decolonization process, the presence in Congo of Haitian teachers, who later returned to Haiti carrying the virus with them; and finally, the Haitian migration towards the United States. Although some passages remain incomplete and the discussion is still open about the relative weight of the various factors, it is clear that many of the factors that made the HIV-1 a zoonotic pandemic belong to fields such as the history of medicine, the sociology and anthropology of sexuality, colonial and post-colonial studies, migration studies, etc.

3. Philosophical-Anthropological Implications

This paper arises from the conviction that also philosophy, and in particular, philosophical anthropology, can make a valuable contribution to the understanding of some key aspects of zoonoses, and especially of the COVID-19 pandemic. These aspects are mainly linked to transformations in the identity of such subjects (the human beings) that can experience the pandemic also on a symbolic level. This pandemic, in other terms, is a crisis that has to be not only medically overcome, but understood as a possible self-perception shift. In the following two sections I will try to highlight two COVID-related fracture lines in the identity of contemporary human beings.

¹⁰ Michael Worobey and others, 'Direct Evidence of Extensive Diversity of HIV-1 in Kinshasa by 1960', *Nature*, 455 (2008), pp. 661–64.

¹¹ Here the author refers to Jacques Pepin and Annie-Claude Labbé, 'Noble Goals, Unforeseen Consequences: Control of Tropical Diseases in Colonial Central Africa and the Iatrogenic Transmission of Blood-borne Diseases', *Tropical Medicine and International Health*, 13. 6, (2008), pp. 744–753.

3.1. Species Identity

The first question to tackle is what kind of identity we are dealing with. We are not referring to a hypothetical ontological basis, or essence of identity, which would be the substratum for other personality traits (according to the metaphysical model of the soul). The perspective adopted here is rather a pragmatic one. We will consider as the core of the personal identity the trait (or traits) of the self that the individual *perceives* as characterizing what (s)he is. This kind of re-perceived identity is what human beings try to grasp and define when faced with the question ‘who are you?’ — a question that, albeit fundamental on the existential level, does not necessarily imply a metaphysical theory on the general essence or basis of identity. In her/his spontaneous response to this question, each human being will usually privilege one of the many possible layers of identity: be that familiar, professional, national, or religious. Even in the dimension of perceived identity, indeed, there can be hierarchies, based on the individuals’ familiar and cultural context and on the biographical events experienced by them. Even inside a model of identity in which the traits of the self are free from ontologically fixed hierarchical relationships, there are some traits that exert hegemony and others that are rather subordinate. In other words, in the answer to the question ‘who are you’, one identity layer plays the role of a substratum for the others (it is one thing to answer, ‘I am a Protestant German’; another is ‘I am a German Protestant’).

On the basis of this model, in which personal identity is seen as a biographical construction that freely employs the materials of the self- and world-experience, our focus falls on the fact that, among the many possible layers of identity, there is also our identity as a biological species. Most people are aware they belong to the *Homo sapiens* species; some also know that *Homo sapiens* is not the unique species within the genus *Homo* but coexisted, to limit ourselves to two examples, with *Homo neanderthaliensis* up to 30,000 and with *Homo floresiensis* up to 13,000 years ago. This layer, however, rarely rises to the status of supporting core of the lived identity — that hegemonic substratum that, in answering the question ‘who are you?’, bears the other qualifications. In most cases, species identity remains in the background of personal identity and does not exert any influence on individual choices, which are largely entrusted to other layers and value networks (familiar background, cultural traditions, religious affiliations, etc.). Religion, in particular, continues to be an influential source of meaning, to which many people refer, at different levels of self-awareness, in seeking the answer to questions of identity. In the traditional paths of identity construction, in other words, the awareness of belonging to the *Homo sapiens* species remains abstract and inactive; it does not become a source of values and purposeful behaviours. The kind of challenges human beings have to face today, however, demands not only a sober and scientific consideration of the place of *Homo sapiens* in the ecosystem but also the placement of the species identity into the core of contemporary personal identity.

3.1.1. On the Notion of the Immune Self

In order to define the approach we have chosen, it is appropriate to make two clarifications. The first one is the distinction between the proposal of the integration of the species identity into personal identity and the notion of the immune self, much discussed in the last fifty years in philosophy of biology and philosophical anthropology.¹² The notion of the immune self is based on the analogy between personhood, or selfhood, and the immune system; this analogy aims to propose a view of personal identity as a holistic and self-organized system for the selective inclusion of alterity. In reality, depending on the different authors, the notion includes both aspects: microbiome, and the symbolic and value elements of the personality. The self, in other words, is seen as a dynamic filter of external forces and elements, both at the microbiological level, and at the level of personal identity.

It is interesting to note that the elaboration of this position also requires a reinterpretation of the functions of the immune system itself — which appears now as a sense organ, capable to discriminate and ‘decide’ what has to be included in the self.¹³ The main task of the immune system, in other words, is no more the ‘insular’ defence against external pathogens, but the institution and preservation of a healthy microbiome, of a dynamic internal ecology. Given that microorganisms very often come from other biological species, it follows that the microbiological part of the self is zoonotic by nature. In their synthetic reconstruction of this shift of paradigm, at least as far as continental philosophy of biology is concerned, Bartłomiej Swiatczak and Alfred Tauber move from Claude Bernard’s ‘insular construct’ of the organism’s immune system; according to the authors, Bernard’s ‘depiction of the immune self as disconnecting the organism from its surroundings harmonized with a particular Western cultural experience of seeing “ourselves as entities, separate from the rest of the world — as containers with insides and outsides”’.¹⁴ On the basis of the common opposition towards the overestimation of the organism’s separation, Swiatczak and Tauber identify a series of authors whose arguments seriously affect the model of ‘insularity and autonomy’.¹⁵ Some of them (Michel Foucault, Susan Sontag, Donna Haraway, Giorgio Agamben, Roberto Esposito, and Peter Sloterdijk) pursue the intent of a postmodern deconstruction of subjectivity; others, less known, try to re-centre on relationality the contemporary philosophy of biology (Richard Lewontin, Gérard Eberl, Angelina M. Bilate, and Juan J. LaFaille;¹⁶ to the aforementioned

12 See Alfred I. Tauber, *The Immune Self. Theory or Metaphor?* (Cambridge: Cambridge University Press, 1994).

13 Enzo Soresi, *Il cervello anarchico* (Milano: UTET, 2013), p. 48.

14 Bartłomiej Swiatczak and Alfred I. Tauber, ‘Philosophy of Immunology’, *The Stanford Encyclopedia of Philosophy*, ed. by Edward N. Zalta, available at <https://plato.stanford.edu/archives/sum2020/entries/immunology/> (last accessed 11/09/2021). For the internal quote see George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago-London: University of Chicago Press, 1980), p. 58.

15 The hendiadys recurs several times in Swiatczak and Tauber, ‘Philosophy of Immunology’.

16 For a concise review of the most relevant publications of the mentioned authors, from the point of view of the immune self theory, see the ‘Bibliography’ section in Swiatczak and Tauber, ‘Philosophy of Immunology’.

authors Lynn Margulis should be added, due to her relevance in evolutionary studies on symbiosis and the intraorganic biome)¹⁷.

If the reinterpretation of the function of the immune system (from insularity to the management of the organism's internal ecology) is scientifically valid,¹⁸ the recourse to the concept of the immune self to think about personal identity must, however, be taken with caution. On the one hand, we must be aware that, at least in the twentieth century if not earlier, many other relational conceptions of identity had already been proposed; think only of Didier Anzieu's *The skin-ego* (1985), in which the self was compared to another dynamic system managing the interchange with the outside: the skin.¹⁹ On the other hand, it should not be forgotten that a theory of personhood linked to the model of the immune system remains based on a metaphor, or, at best, on an analogical transposition;²⁰ it is, therefore, exposed to many epistemological risks. With regard to the ontological specificity of its fields of application, the main risk of this notion remains that of a leap in level: a category that is valid at a physiological and intraorganic level cannot be transposed directly to identity dynamics of a political, social, or cultural kind.²¹ Ultimately, a greater awareness of the immune components of identity can prepare, integrate, or strengthen the self-perception in terms of species identity, but it cannot be its core.

3.1.2. Against Reductionism

The second clarification of the approach we are putting forward here is about the way we can refer to the species *Homo sapiens* in the making of personal identity. What needs to be clarified is whether the foundational reference to the species identity in the construction of personal identity does, or does not, hide reductionist intentions. Following the reflection of Nicolai Hartmann, we can understand by reductionism the tendency to see in the processes of a determined level of reality 'nothing but' derivative, or epiphenomenal forms of lower level processes.²² In the case of the

17 Lynn Margulis, *Symbiosis in Cell Evolution: Microbial Communities in the Archean and Proterozoic Eons* (New York: W.H. Freeman, 1993).

18 This is shown by the promising developments in the medical field of fecal transplantation; see, in this regard, Yosuke Kurashima and Hiroshi Kiyono, 'Mucosal Ecological Network of Epithelium and Immune Cells for Gut Homeostasis and Tissue Healing', *Annual Review of Immunology*, 35 (2017), pp. 119–47.

19 Didier Anzieu, *The Skin-ego* (London: Karnak Book, 2016).

20 This epistemological problem was clearly outlined already at the beginning of the debate on the notion of the immune self; see Alfred I. Tauber, *The Immune Self. Theory or Metaphor?* (Cambridge: Cambridge University Press, 1994).

21 The initiator of the debate, Alfred Tauber, shows that he is well aware of this problem in Alfred I. Tauber, 'Immunity in Context: Science and Society in Dialogue', *Theoria: An International Journal for Theory, History and Foundations of Science*, 31. 2 (2016), pp. 207–24. From the epistemological point of view, Nicolai Hartmann's idea of the ontological autonomy of the different layers of being remains central here, especially in the transitions from the organic to the psychic layer and from the latter to that of social and cultural formations; see C. Brentari, 'The Role of the Missing Reason: the Search for a Stratum-Specific Form of Determination in Nicolai Hartmann's Theory of Life', in *New Research on the Philosophy of Nicolai Hartmann*, ed. by Keith Peterson and Roberto Poli (Berlin-Boston: De Gruyter, 2016), pp. 65–80.

22 Nicolai Hartmann, *New Ways of Ontology* (Chicago: Henry Regnery Company 1953), p. 89.

reference to species identity, many possibilities of reductionism open up: first the idea (typical of the Darwinism of the late nineteenth and early twentieth centuries, but certainly not of contemporary evolutionism) that every species-specific trait has to be directly functional to the survival and reproduction of the members of the species. This is not the right place to outline the process of thought by which evolutionism overcame the naive functionalism of its first phase. It is enough to remember that concepts such as Susanne Langer's 'tolerant evolution'²³ or Stephen Jay Gould's 'exaptation'²⁴ allow us to think about the spaces of autonomous development that evolution grants to biological species. In this perspective, language, imagination, culture, art, rituals, and the search for sense of philosophers and scientists, etc., appear as the particular path that the species *Homo sapiens* has taken to interact with its environment — a natural expression of cognitive biodiversity which, in addition to allowing survival in even very hostile sectors of the planetary environment, opens up wide spaces for further knowledge and self-expression. In short, the possible traits of the species identity may include a wide range of cognitive, cultural, and ethical elements — in stark opposition to the narrative of the survival of the species at the expense of other species and the environment. The contact with a nature as intact as possible, for example, is felt by an increasing number of individuals as a species-specific need — not a condition for 'survival', nor a nostalgic ideal, nor even a mere opportunity for recreation or 'elevation', but a crucial part of our being human.

3.2. COVID 19 and Species Identity

If it is clear that the proposed integration of species identity into personal identity does not aim at placing — as a founding value — the mere survival of the species, it is also evident that this re-orientation of identity will not be free from conflicts of other kinds. The aforementioned re-centring of the layers of personal identity around a new pole of hegemony, in fact, does not happen without individual and collective resistances. While the acute phase of the pandemic was underway, for instance, religious rites involving a lowering of the level of distancing (such as the bathing in the Ganges or the mutual shaking of hands in the Catholic rite) suddenly appeared in a different light. Under the pressure of prevailing collective interests, priorities were revised, and the health of the population overcame the symbolic and eschatological value of the rite — relativizing, in this way, the commonly assumed superiority of the values to which religious rites refer. The axiological alternative between the categories of 'health' and 'salvation' was shown in clear terms, for many for the first time.²⁵

Obviously, not only religious rites become problematic in times of pandemics — think only of the social practice of political voting. For our analysis of identity

²³ Langer, *Mind II*, p. 400.

²⁴ Stephen Jay Gould, *Challenges to Neo-Darwinism and Their Meaning for a Revised View of Human Consciousness*, (Cambridge University: Clare Hall, 1984), pp. 66–67.

²⁵ See section 5 of chapter 13 of this volume on how reactions to the pandemic have discredited some religious leaders.

conflicts, however, they are a very interesting case. The traditional claim for absoluteness of the religious dimension (and the consequent perception of rituals as mandatory) clashes with the cogency of anti-COVID regulations. When rites reminiscent of the belief in eternal life, or reincarnation, are suspended to safeguard the health of individuals, the meaning of the rite is relativized; its performative valence, so to speak, wins over its symbolic meaning. This kind of relativization pertains to the core values the rite refers to, which are often hegemonic in the construction of traditional personal identities. Not only that, given the global dimension of the pandemic, people have witnessed the same conflicts between religious-communal life and medical safety in every part of the world. This adds a new dimension to the individual processes of critical thought: if I approve the subordination to the sanitary norms of the rites of others' religions or confessions, I don't feel justified if I oppose the subordination of my rituals to the same prescription. In a long-term perspective, and in a more concrete form than the abstract awareness of religious and cultural plurality, the contemporary experience of the global subordination of the collective practices to the higher cause of the health of the population can stimulate a change in the collective self-perception of practitioners; when faced with the question 'what are humans', people could start to answer 'a species with rites and religions' (it is too early to say, and it is beyond the scope of this contribution, what this turning point might imply with regard to the truth value ascribed to religious beliefs).

Being an infection of zoonotic origin, COVID-19 can significantly strengthen the awareness of the (risky) closeness of human to non-human life forms. This awareness, in turn, is one of the possible ways of re-centring human self-perception around species identity. And, if species identity moves to the core of the self, a deep redefinition of the axiological priorities could follow, with a chain effect that may be explosive both inside personal identity, and on the social and cultural level. Self-perception in terms of species identity can imply the acceptance of a whole series of implications and corollaries: the contingency of the presence of humans on the planet Earth, the absence of teleology in hominization, the absence of special projects or destinies that would separate human beings from other life forms and human history from ecology, and the fact that death and extinction are the norm, and duration of life forms rather an exception.

If the anthropological turning point of self-perception in terms of species identity has not yet been achieved, the current pandemic has contributed to one of its preparatory steps, a more concrete awareness of our unity as a species.²⁶ All over the

²⁶ The German philosopher Jürgen Habermas recently felt the need to begin his analysis of the 'pandemic state of exception' from the firm statement that the Sars-CoV-2-related crisis concerns 'the members of the *homo sapiens* species [*der Species homo sapiens*] [*sic.*] all over the planet Earth' and is a 'war of species vs. species [*eine Kriegsführung von Species gegen Species*]' (Jürgen Habermas, 'Corona und der Schutz des Lebens. Zur Grundrechtsdebatte in der pandemischen Ausnahmesituation', *Blätter für deutsche und internationale Politik*, 66. 9 [2021], pp. 65–78 [p. 65]). Without over-interpreting Habermas' text, whose focus is not on species identity but on the debate on human rights and the role of the state, it is, however, significant to point out the lexical shift from the term *Gattung* (genus), which Habermas used in previous works (for example, about the implications of biomedical and genetic treatments on the self-understanding

world, people have experienced the same fight against the virus (and, later, against the same variants of the virus). Due to the unprecedented level of global digital interconnection, peoples from different backgrounds have established between their own experience and that of others, not abstract relationships, but precise, immediately transposable correspondences. They have witnessed the advance of the pandemic as one can do with a natural phenomenon on a smaller scale, such as a flood that engulfs neighbouring villages one after another, until it reaches their own. Although with different national and cultural styles and inside different governance systems, people have discussed the same containment measures. On the figurative level, the images of people wearing masks in every part of the world have managed to make concrete the idea of a common challenge that, by its very nature, must be addressed as a species — and without the distractions linked to the supposition of any higher destinations of humanity.

The traits of the pandemics that make of it a key event for the establishment of the species identity are the same that make inappropriate the analogy with war and the World Wars. If it is true that aggression and propensity to war are species-specific traits as well, it is also true that, contrary to the pandemic experience, they tend to build identity upon oppositional units. Using Erik Erickson's terminology, later taken up by Konrad Lorenz, war and intergroup aggression are both a condition and an effect of the human tendency to cultural pseudo-speciation. As we know, pseudo-speciation is a radical form of ethnocentrism that can be found in the self-perception of many pre-modern cultures; it consists in considering the members of one's own human group (a tribe, a nation) as the human species par excellence (in some cases, as among the Inuit, the very name of the population simply means 'humans'). Consequently, the members of other groups are potentially de-humanized. War, in other words, both exploits and enhances the tendency to ideological division and dehumanization of the enemy.

The enormous ethological importance of pseudo-speciation, however, should not lead to neglecting the prefix 'pseudo-' that makes up the term in question. Pseudo-speciation is a cultural analogue of biological speciation, not an unchangeable trait of the human species (that would compel human beings to predetermined behaviours). It affects self-perception, not 'nature', and can therefore be opposed by reinforcing alternative ways of constructing personal and collective identity. In a context of deeply changed global conditions, the tendency towards ethnocentric closure, which proved to be (relatively) effective in the past history of humanity, can be overcome by unifying collective experiences. COVID-19 may well be one of the latter. Some of the factors supporting this thesis have been mentioned above: the immediate transposability of individual experiences on the global scale, the consequent perception of a common task, and the increasing awareness that the challenge has to be faced by humans on the basis of the similarity of their life form.

of human beings), to the term *Species*. See, in this regard, Jürgen Habermas, *Auf dem Weg zu einer liberalen Eugenik? Der Streit um das ethische Selbstverständnis der Gattung*, in Id., *Die Zukunft der menschlichen Natur. Auf dem Weg zu einer liberalen Eugenik? Erweiterte Ausgabe* (Frankfurt a.M.: Suhrkamp, 2002), pp. 34–163.

4. Environmental-Ethical Implications

As discussed above, the ecological perspective is one of the most valid approaches to understanding zoonoses on a scientific level. Moreover, this standpoint offers numerous possibilities for reflecting on the moral implications of the human action towards the other components of the natural world. The assumption of a systemic perspective applied to zoonoses has, in other words, a great relevance for ethical-environmental thought and, in general, for the discipline of the human/animal studies. In this section we will indicate two lines of reflection that ecological analysis of zoonoses can offer.

4.1. *The Risks of Mosaic-like Penetration in Wildlife Areas*

First, the ecological perspective helps us to rethink the relationship between human animals and the resources of their environment. Many of the aforementioned studies on the spreading of zoonoses stress the role played by the transformations in land-use in the industrial and post-industrial age. As reported by Karesh and others, ‘many zoonoses can be linked to large-scale changes in land use that affect biodiversity and relations between animal hosts, people, and pathogens. Land modification, irrespective of reason, changes vegetation patterns, vectors and host species dynamics (e.g., abundance, distribution, and demographics), microclimates, and human contact with domestic and wild animals’.²⁷ The most favourable situation for the rising of zoonoses is where a growing population makes massive, but unplanned recourse to the resources of a habitat that is still largely intact and rich in biodiversity. The fragmentation of wild nature areas and the formation of mixed zones, in which small and large plots of cultivated land alternate with forest areas of different sizes, creates the ideal situation for humans and domesticated animals to come into contact with the vectors of pathogens (whose primary hosts are frequently wild animals).

To mention a concrete case study, this mosaic-like situation has led to the recrudescence of a particular type of malaria in Malaysia and Borneo. The disease is due to the unicellular parasite *Plasmodium knowlesi*, which belongs to the same subgenus as the more widespread *Plasmodium falciparum*. The parasite infects primarily the long-tailed macaque (*Macaca fascicularis*), the pig-tailed macaque (*Macaca nemestrina*), and the Sumatran surili (*Presbytis melalophos*). Infection occurs through mosquitoes belonging to two species, *Anopheles hackeri* in the Malaysian peninsular and *Anopheles latens* in Sarawak. As reported by Quammen, who refers to Janet Cox-Singh and Balbir Singh’s research, the massive transmission of *Plasmodium knowlesi* from the primary hosts to humans is due to the fact that, during the harvest period, the farmers of these areas spend the nights guarding the fields they have opened in the forest, trying to prevent the macaques from plundering them.²⁸ The increase in the

²⁷ Karesh and others, ‘Zoonoses 1. Ecology’, p. 1936.

²⁸ Janet Cox-Singh and Balbir Singh, ‘Knowlesi Malaria: Newly Emergent and of Public Health Importance?’, *Trends in Parasitology*, 24. 9 (2008), pp. 406–10; Quammen, *Spillover*, p. 157.

possibility of zoonoses, therefore, appears as one of the arguments that can be used to oppose unplanned mosaic-like deforestation.

4.2. *The Zoonotic Risk in the Historical-Anthropological Evaluation of Agriculture*

Second, the ecological and systemic consideration of zoonoses can stimulate a critical reflection on the form of life and the resource management adopted by *Homo sapiens* since the agricultural revolution (about 12,000–9,000 years ago). From James C. Scott's *Against the Grain*²⁹ to Noah Harari's *Sapiens*, many historians of the prehistoric age are seriously calling into question the traditional description of the passage from the hunter-gatherer phase of mankind, characterized by seasonal displacements over large territories, to the agricultural and urban phase of human history. 'The narrative of this process' — writes Scott programmatically — 'has typically been told as one of progress, of civilization and public order, and of increasing health and leisure. Given what we now know, much of this narrative is wrong or seriously misleading'.³⁰ Scott and Harari put forward numerous elements in favour of this thesis. The transition to agriculture would have impoverished both the diet and the variety of experiences of the members of the species;³¹ agriculture would have led to an increase in the number of populations, but at the same time would have worsened their average state of health and made them more susceptible to diseases;³² dependence on a single food source (the type of cereal grown) would have exposed human groups to a terrible risk, that of losing stocks and crops due to wars or extreme natural events.³³ Among these elements, the increased danger of zoonosis also plays a prominent role. If it is true that hunting and gathering also involved the possibility of contact with primary hosts and vectors, a lifestyle in close contact with domestic animals and in conditions of poor hygiene seems to have been much more favourable to the onset of diseases of zoonotic origin. Even with today's awareness of the ecological sources of zoonoses, infections due to pathogens' spillover from wild primary hosts to domestic animals, and then to humans, have certainly not ceased. In some cases, the situation is aggravated by the practice of intensive farming, which increases the spread of pathogens among animals and forces farmers to use antibiotic and antiviral drugs —

²⁹ James C. Scott, *Against the Grain. A Deep History of the Earliest States* (New Haven-London: Yale University Press, 2017).

³⁰ Scott, *Against the Grain*, p. 2.

³¹ Scott, *Against the Grain*, p. 86: 'Is it the case, for example, that like their domesticates, sedentary, grain-planting, domus-sheltered people have experienced a comparable decline in emotional reactivity and are less intently alert to their immediate surroundings?'; Harari, *Sapiens*, p. 58: 'The forager economy provided most people with more interesting lives than agriculture or industry do'.

³² Scott, *Against the Grain*, p. 21: 'A second great and unanticipated burden of agriculture was the direct epidemiological effect of concentration — not just of people but of livestock, crops, and the large suite of parasites that followed them to the domus or developed there'; see Harari, *Sapiens*, p. 60, p. 99.

³³ Harari, *Sapiens*, p. 59: 'By not being dependent on any single kind of food, they [foragers] were less liable to suffer when one particular food source failed'; see Scott, *Against the grain*, p. 63.

which, as is now known, have among their effects the selection of resistant strains of pathogens.³⁴

4.3. New Ways of Thinking about the Relationship between Human and Non-Human Species

This is not the place to propose a solution to the global reduction of the remaining ‘wild nature’ areas and the increasing invasiveness of human activities on the planet. These phenomena are linked on the one side to the models of economic growth, and, on the other, to the choices made by human beings about parenting; and both issues are too vast to even be sketched. What can be done, following a path opened by Hans Jonas in *The Imperative of Responsibility*,³⁵ is to show the inadequacy of the way many people still tend to think about the relationship between ‘nature’ and urbanized areas. As Jonas points out, in the Greek and Roman classic age, the city (including the agricultural area that surrounded it) was seen as an island of ‘civilization’ — that is: a portion of territory subjected to a high level of human transformation — in the middle of a vast ‘sea’ of untouched nature. If, on the one hand, this hermeneutic model celebrated the transformative capacity of human beings, on the other it was accompanied by the perception of the city as a fragile entity, constantly threatened by the return of nature (whose great power, after all, couldn’t even be scratched by humans).³⁶ After the industrial revolution, the increase in the transformative power of human technique (a power which reaches as far as the climatic conditions of the Earth), has made this hermeneutic model extremely dangerous. Narratives focused on the conquest of nature — similar to those that nourished the European imagination in the age of the geographic explorations and are still well attested in common sense — often underestimate the extension of the anthropized areas, keeping alive the illusion that, in a not better defined ‘elsewhere’, there would be wide areas of virgin nature. Moreover, the classical model usually overestimates the self-regenerative capacities of nature, its ability to recover after human interventions, thus hindering the sober and scientific consideration of the damages the latter bring with them.

Today, the model of the pre-modern world is unsuitable for grasping the real relationship between non-human nature and man-transformed areas. On the one hand, global climate change puts in doubt the residual legitimacy of the concept of ‘intact’ nature. Even if one wants to limit the scope of this concept to areas with a limited impact of human transformative action, still, however, the model Jonas attributes to classicism must be reversed — ‘islands’, today, are the wilderness areas, that have to be preserved through the concession of a special juridical status. The failure of the nature-culture dichotomy favours models centred on hybridization processes, mosaic-like configurations, species migrations, and interspecies contaminations

³⁴ Karesh and others, ‘Zoonoses 1. Ecology’, p. 1938, p. 1941.

³⁵ Hans Jonas, *The Imperative of Responsibility. In Search for an Ethics for the Technological Age* (Chicago-London: University of Chicago Press, 1984).

³⁶ Jonas, *The Imperative of Responsibility*, pp. 2–4.

— in short, on various forms of interaction between more-anthropized and less-anthropized ecosystems. The Earth appears as a changing network of territories of different species; due to climate change and human activities, their boundaries are subjected to a constant process of mixing and refusion, which, in many cases, prevents the achievement of long-term equilibria similar to those antecedent to the Anthropocene.

4.3.1. *In Praise of Complexity*

At this point, many of the threads that run through our reflection on zoonoses intersect. The re-centring of personal self-perception around species identity, in fact, should be accompanied by the awareness of the constant imbalance of contemporary interspecific relationships. Species identity, in other words, must not be considered as a definitive datum — as if there were some unrecognized anthropological features that could give *Homo sapiens* a secure ecological place, thus helping to find the way towards environmental sustainability. On the contrary, the adoption of the species identity perspective makes interspecific coexistence appear in the right light — that is, as a highly complex field. Every action of the human species is a risky intervention in a delicate network of contingent processes, interwoven with causal relationships that should be patiently unravelled before making decisions.

For instance, as remarked by A. Marm Kilpatrick and Sarah Randolph, in the fight against vector-borne diseases, the eradication of the primary hosts (one or more wild species) could appear as a viable solution. Also leaving ethical motivations aside, however, the adoption of the complexity paradigm helps us understand that the outcomes of these wildlife management operations are very uncertain. The decrease in the number of the primary hosts could lead to an increased density of the vectors feeding on each of them, with a possible growth in infections (if the few remaining primary hosts were infected). Likewise, the search for ‘dilution effects’ through the introduction of new primary host species could have unpredictable outcomes, according to the idea of the ecological cascade effect. As the authors point out, ‘feeding on additional alternative hosts sometimes results in increased vector densities, which could result in higher transmission even if a smaller proportion feed on people’.³⁷ In short, adopting and using an eco-epidemiologic approach, based on the paradigm of interspecific complexity, often means accepting that the outcomes of human interventions may not be linear.³⁸

³⁷ A. Marm Kilpatrick and Sarah E. Randolph, ‘Zoonosis 2. Drivers, Dynamics, and Control of Emerging Vector-Borne Zoonotic Diseases’, *The Lancet*, 380 (2012), pp. 1946–55 (p. 1953).

³⁸ The eco-epidemiological approach adopted in this contribution is characterized by a moderate level of holism and by the tendency to see in the human species the only actor capable of planning and adopting long-term strategies of global environmental restoration. Other models, that refer programmatically to James Lovelock and move from the view of the whole planet Earth as a symbiotic and self-regulating system, support more pronounced forms of holism. For a relevant application of this second type of holistic models to COVID-19, see Roberto Cazzolla Gatti and others, ‘Diversity lost: COVID-19 as

5. Concluding Remarks

In our analysis, the global experience of COVID-19 zoonosis has shown a great transformative potential towards the identity of human beings and their relationships with other animal species and with the environment. If a leading thread can be identified for the reflections we have put forward, it is the idea of the inversion of the ‘axiological sign’ of the status of human beings. Traditionally, the fact that human beings belong to a biological species was seen as a starting point to be overcome by history, or as an annoyingly limiting factor to be technically circumvented. The proposal of this contribution is the sober acceptance of the fact that humans are primarily members of the *Homo sapiens* species and that their history arises from a particular way of interacting with the environment: culture, our species-specific biodiversity.

This axiological inversion does not necessarily involve changes in the lines of action to be adopted. The search for treatments and vaccines to oppose zoonoses can continue with the same commitment whether we consider the biological condition and the consequent exposition to cross-species pathogens as a limiting condition (‘unfortunately, humans are *also* animals’), or whether we place species identity at the core of personal identity. In the face of broader tasks, however, which involve rethinking our way of inhabiting the Earth, the adoption of a species perspective as a hegemonic trait of the person could have decidedly positive effects. To use Arnold Gehlen’s anthropological lexicon, humans’ identity is mediated by the tasks of the moment; identity should neither be discovered nor defended, but built up in relation to collective needs. In the present moment of the history of *Homo sapiens*, the phase of pseudo-speciation seems to lie behind us; our needs, therefore, appear more clearly as the needs of one species inside an irreplaceable ecological environment. If it is so, then the construction of identity should follow this path, relativizing other layers of identity — the same for which humans, for millennia, have separated into groups and been willing to kill and die. At the present moment, while the pandemic is still running its course, the COVID-19 zoonosis is likely to constitute a species-unifying experience to a much greater extent even than the ecological crisis due to climate change. With regard to the latter, collective reactions range from denial to the search for local solutions, often in the guise of the nationalistic closure towards the outside. This is linked to different factors: the variability of the effects of climate warming (which, on a local scale, can even lead to temporary positive effects for some populations); the different severity with which different countries are affected by it; and the fear of migrations due to climate emergencies, etc. Yet, no perspective would be more adequate towards climate change than the one which stresses our species-specific ability to modify — and, implicitly, to preserve or re-equilibrate — its global environment.

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