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COVID-19 Pandemic
Philosophical Approaches

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Abstract

The paper begins with a retrospective of the debates on the origin of life: the virus or the cell? The virus needs a cell for replication, instead the cell is higher on the evolutionary scale of life. In addition, the study of viruses raises pressing conceptual and philosophical questions about their nature, their classification, and their place in the biological world.

The subject of pandemics is approached starting from the existentialism of Albert Camus and Sartre, the replacement of the exclusion ritual with the disciplinary mechanism of Michel Foucault, and about the Gaia hypothesis developed by James Lovelock and supported in the current pandemic by Bruno Latour. The social dimensions of pandemics, their relation with the global warming which has led to an increase in infectious diseases, and the deforestation of large areas which have caused viruses to migrate from their native area (their "reservoir") are highlighted. The ethics of pandemics is approached from several philosophical points of view, of which the most important in a crisis of such global dimensions is utilitarianism which involves maximizing benefits for society in direct conflict with the usual (Kantian) view of respect for people as individuals.

After a retrospective of the COVID-19 virus that caused the current pandemic, its life cycle and its history, with an emphasis on the philosophy of death, the concept of biopower initially developed by Foucault is discussed, with reference to the practice of modern nation states od control of the populations and the debate generated by Giorgio Agamben who states that what is manifested in this pandemic is the growing tendency to use the state of emergency as a normal paradigm of government. Another interesting and much debated approach is the one generated by the works of Slavoj Žižek, who states that the current pandemic has led to the failure of the current "barbaric" capitalism, wondering if the path that humanity will take is a neo-communism. .

Another important negative effect is desocialization, with the conclusion of some philosophers that we cannot exist independently of our relationships with others, that a person's humanity depends on the humanity of those around him.

The last section is dedicated to forecasting what the world will look like after the pandemic, and there are already signs of a change of paradigm, including the sudden disappearance of the ideology of the "wall": a cough was enough to make it suddenly impossible to avoid the responsibility that every individual has towards all living beings for the simple fact that he is part of this world, and of the desire to be part of it. The whole is always involved in part, because everything is, in a sense, in everything, and in nature there are no autonomous regions that are an exception.

The COVID-19 pandemic seems to restore the supremacy that once belonged to politics. One of the virtues of the virus is its ability to generate a more sober idea of freedom: to be free means to do what needs to be done in a specific situation.

Introduction

COVID-19 has wreaked havoc worldwide, socially and economically. This pandemic has led to physical isolation, but also to an unprecedented removal of knowledge through the avalanche of fake news, misinformation and conspiracy theories. We have become more and more dependent on social media for information, but most of the time this information has nothing to do with the real situation, with the truth.

Plato's allegory of the cave in the *Republic*, (Plato 2008) presented as a dialogue between Plato's brother Glaucon and his mentor Socrates, narrated by the latter, is a conceptual tool to help the reader distinguish between appearance and reality, highlighting the influence of ignorance on our nature. Plato presents a group of people who have lived all their lives locked in a cave with a high wall in front. They can see nothing but the stone wall in front of them. Behind the wall burns a fire that provides enough light to project bright images of external objects on the walls of the cave. Those shadows are the reality of the prisoners.

The current epidemic isolation has brought us to the situation where the ordinary individual cannot distinguish truth from falsehood by reason. We are caught in a contemporary version of Plato's allegorical cave, in which natural reality is distorted and darkened by the shadows cast by the media, Facebook and other social networks, which constantly mislead us. Projected visions take us further and further away from the real world. Another kind of Matrix, (Wachowski and Wachowski 1999) in which the senses no longer help the correct analysis or critique of information, thus creating false perceptions without any connection with reality. And this trend is fueled and even forced by leaders around the world.

According to Merzouk, the shadows that the inhabitants of Plato's cave see projected on the wall are the weakest form of knowledge: opinion. (Merzouk 2020) Social media abounds with "experts" who offer their opinions. And people end up grouping themselves according to the

opinions they consider true, often without any rational foundation, acting according to those opinions, sometimes against their own real interest. Moreover, such insulation is ideal for mass handling. And to induce emotions, and ultimately actions, for or against realities.

In his allegory, Plato describes what would happen if one of the prisoners escaped from the cave. After being blinded by the bright light of the Sun, he would discover that reality is not what they thought it was. Like the fire that casts light on the cave walls, the human condition is always linked to the impressions received through the senses. And in the absence of direct senses due to isolation, the impressions offered by the media remain, be it social media or mass- media. Basically, Plato suggests, we cannot break away from the bonds of our human condition, just as the prisoners of the cave could not free themselves from chains. When (if) we still manage to escape from our cave, we will find a transformed world, which many of us will no longer understand - another "realm", the source of a higher reality than the one we knew.

No one knows the actual number of people infected with coronavirus. In addition, there are asymptomatic, and even in symptomatic people the disease becomes visible only a few days after infection. So, any of us can be, at some point, a potential vector of the disease. And you can become a victim at any time without knowing it. From a philosophical point of view, you are in what theorists call decision-making in conditions of uncertainty. You can't estimate the odds of being sick or contagious - victim or vector.

Justice theorist John Rawls used this model of decisional uncertainty as a thought experiment called the "veil of ignorance", (Rawls 1999) a method of determining the morality of problems. It requires a decision-maker to choose on a social or moral issue and assumes that he has enough information to know the consequences of his possible decisions for everyone, but would not know or take into account that person. The theory holds that not knowing the final

position in society would lead to the creation of a fair system, as the decision maker would not want to make decisions that benefit one group to the detriment of another, because the decision maker could theoretically reach any group. (Francis 2020)

The thinking experiment proposed by John Rawls states that people who make political decisions imagine that they know nothing about the talents, abilities, tastes, social class and positions they will have in a social order. When such parties select the principles for the distribution of rights, positions and resources in the society in which they will live, this "veil of ignorance" prevents them from knowing who will receive a certain distribution of rights, positions and resources in that society. (Rawls 1999)

According to Leslie Francis, the COVID pandemic can be considered a natural version of John Rawls' thought experiment: it puts a veil of ignorance on the state of infection. You know nothing about yourself, whether you are infected or not, or whether you will be infected. And you wonder, what principles would you accept in terms of physical distancing, wearing masks, allowing businesses to reopen or allowing crowds to gather, if you don't know your own situation about COVID infection? (Sfetcu 2020c)

Of course, you know some features of your situation that allow you to answer these questions. You know, for example, if your job allows you to work from home, or if you have a safe garden, or if you work for a company that has become a hot spot for infection. You know if you are diabetic, obese or elderly.

In the current pandemic there are elements of both comparative uncertainty and comparative certainty, which shows that Rawls was half right and half wrong about how we should think about injustice in the world.

So, if you're unlucky enough to be close to someone who doesn't wear a mask, remind him of what is half right and half wrong about Rawls' thought experiment. At some point, we don't really know if we could be the victim or a vector for COVID. (Francis 2020) But we know our situations of relative privilege or disadvantage in terms of COVID. As we make social decisions at the political level and individual decisions about what needs to be done in light of government policies, we must constantly remember to correct our assumptions about privilege with the reality of the veil of ignorance behind which we stand regarding infectious disease.

Medical staff and scientists now look like the reluctant heroes of this pandemic. But science is facing increasing challenges. In the midst of the pandemic, scientific communities are struggling to distinguish between the good and the bad sciences. " Science has an ugly, complicated dark side," Jackie Flynn Mogensen wrote in a recent article for Mother Jones, " and the Coronavirus is bringing it out." Her argument here is: “What was once a marathon has been compressed to a 400-meter dash: Researchers race to deliver results, academic journals race to publish, and the media races to bring new information to a scared and eager public”. (Mogensen 2020)

Questions arise that the medical profession and science are not prepared or equipped to imagine and address.

Joe Humphreys in the *Irish Times*, states that " The coronavirus pandemic has been a shock not just to the health system. It has given a jump-start to moral consciences. Things we tolerated as a society - such as low pay for essential workers and income barriers to hospital treatment - suddenly seem abominable.” (Humphreys 2020)

Such problems have been studied by a generation of scientists in the field of sociology of science. (Dabashi 2020) The central element of this discipline is the idea that no scientific investigation or scientific methodology is completely independent of social and political factors or

even religious preferences, framing this way the nature of the raised questions and the speculated answers.

1 Viruses

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Viruses reproduce only inside the living cells of organisms, (Wu 2020) being known so far more than 6,000 species of viruses. (International Committee on Taxonomy of Viruses (ICTV) 2020) When it infects a cell, the viruses force it to rapidly produce thousands of identical copies of the original virus.

A relatively common misconception about what a biological virus actually is, is that a virus often refers only to protective capsules made up of proteins, which contain viral genomic information in the extracellular environment. (Jacob and Wollman 1961) This particle is a virion and is generally considered dead. Matti Jalasvuori (Jalasvuori 2012) highlights the difference between a virus and a virion, which allows us to appreciate viruses as evolutionary players or even as living organisms. (Forterre and Prangishvili 2009)

Virions are external, autonomous, consisting of genetic material (DNA or RNA molecules) that encode the structure of proteins, a protein layer (capsid), and sometimes an outer layer of lipids.

Viruses are far too small to be visualized with a regular microscope, with diameters between 20 and 300 nanometers. (Mahy 1998) The first images of them were obtained by electron microscopy in 1931 by German engineers Ernst Ruska and Max Knoll. (Fraengsmyr and Ekspong 1993) Rosalind Franklin discovered the complete structure of the virus in 1955. (Creager and Morgan 2008)

Viruses appear to have played a role in events such as the origin of cell life (Koonin, Senkevich, and Dolja 2006) and the evolution of mammals. (Gifford 2012)

The origin of viruses is unclear (they have existed since the first evolution of living cells. (Iyer et al. 2006) There are three main hypotheses that explain the origin of viruses: (Shors 2016)

1. The regressive hypothesis ('degeneration hypothesis', (Dimmock, Easton, and Leppard 2007) or 'reduction hypothesis': (Mahy and Regenmortel 2009) they come from small cells that previously parasitized larger cells.
2. The cell origin hypothesis ('wandering hypothesis') (Mahy 1998) or 'escape hypothesis': (B. W. J. Mahy and Regenmortel 2009) they come from bits of DNA or RNA that have 'escaped' from the genes of a larger organism. (Shors 2016)
3. The co-evolution hypothesis ('the first virus hypothesis'): (B. W. J. Mahy and Regenmortel 2009) they come from complex molecules of proteins and nucleic acid appearing simultaneously with the cells on which they would have been dependent.

One hypothesis claims that viruses have probably appeared several times in the past through one or more mechanisms. (B. W. J. Mahy and Regenmortel 2009)

Even the simplest bacteria is far too complex to have appeared spontaneously at the beginning of evolution. Subsequently, evolution has been able to produce increasingly complex systems. Matti Jalasvuori concludes that the first true cell must have already been a product of evolution, (Jalasvuori 2012) resulting from a primordial community. (Doolittle 2000) The community has evolved mainly horizontally by changing genetic information between protocells, rather than in a 'Darwinian' way, passing genes vertically to offspring. (Koonin and Martin 2005) It follows that the protocells themselves were not coherent genetic entities, but more or less random collections of independent genetic replicators, which evolved collectively thus maintaining the common genetic code. (Vetsigian, Woese, and Goldenfeld 2006) Since viruses or virus-like

replicators are thought to be able to come up with new genes, then they could have been one of the elements in that primordial community.

Matti Jalasvuori states that viruses provide a possible explanation for the horizontal evolution of early life, as virions are essentially genetically encoded structures that mediate the cell-to-cell transfer of genetic information. As the primary system advanced, some of the first viruses established a permanent residence in some of the protocols. (Jalasvuori 2012)

Scott Podolsky (Podolsky 1996) described the different roles of viruses in theorizing the origin of life, from the 1920s to the 1960s. (Kostyrka 2016) He noted that viruses were integrated into life-origin scenarios characterized by a "nucleocentric approach", unlike a "cytoplasmic approach". The nucleocentric approach defined life based on self-duplication. (Podolsky 1996, 80) The cytoplasmic approach focused on the cytoplasm as a model to define life and understand its origin, conceived as self-regulation.

Podolsky identified three major roles of viruses in early life origin scenarios. (1) as a "metaphor" of life (conceptualized as an image of primitive life), as an "operational model" (provides, by analogy, a conceptual representation of possible mechanisms), and their phylogenetic role, conferring virus-centered nucleocentric arguments with a real "sense of historicity". (Podolsky 1996, 84) Thus, viruses could be seen as the "relatively unmodified descendants of the primordial precursor to all later life forms."

According to Gladys Kostyrka in *What roles for viruses in the origin of life scenarios?* (Kostyrka 2016) the conceptualization of viruses as inert products of living cells or extracellular agents had strong implications for the roles that viruses could play in life origin scenarios. The divergence between an "endogenous thought style" and an "exogenous thought style" has been particularly strong in the debates. Felix d'Herelle proposed a virocentric scenario of the origin of

life. (Félix d' Hérelle 1926) For d'Herelle, viruses are not primitive life forms, (F. d'Hérelle 1928, 540) because they are parasites of cells. But viruses could represent relatively unchanged descendants of primitive life forms (phylogenetic role), and could also serve as a metaphor for life (metaphorical role). (F. d'Hérelle 1928, 538) Based on a viral metaphor of life, d'Herelle hypothesized that the simplest forms of life are not cellular, but micellar.

The scenario proposed by Alexander and Brigdes in 1928 differs in many respects from d'Herelle's scenario. (Alexander and Bridges 1928) Their approach is nucleocentric, because they conceive of the virus as an example of life. They consider viruses as simple life forms ("ultrabionts"), but more complex than fundamental ones ("moleculobionts").

J. B. S. Haldane provided another example of the conception of life which, like d'Herelle, is not strictly nucleocentric, but nevertheless gives viruses important roles in the origins of life. But Haldane refused to call viruses "living" and rather described them as models for understanding the first "half-living molecules" (Haldane 1929) that might have existed before the formation of the first cell.

The phylogenetic roles of viruses have been particularly contested. Viruses would rather be the result of the reductive evolution of cells. (Laidlaw 2014) The Green-Laidlaw hypothesis or the retrograde hypothesis for the origin of viruses has convinced many biologists. (Podolsky 1996, 101–3)

The hypotheses of the origin of life due to viruses increased during the years 2000-2010. (Koonin and Dolja 2013) According to Gladys Kostyrka, the following syllogism would probably be accepted by many biologists: (Kostyrka 2016)

1. Viruses depend on cells (no virus could have existed before cells),
2. The search for the origin of life is to trace the appearance of the first cell,

3. Viruses are therefore excluded from discussions about the origins of life.

This syllogism seems to hinder the phylogenetic or historical role of viruses in the origins of life. However, Patrick Forterre hypothesized that viruses appeared before DNA cells and before LUCA (Last Universal Cellular Ancestor), (Forterre 2006) resulting in a phylogenetic role for viruses. According to Forterre, ancestral viruses did not contribute to the emergence of cell life; Cell life must have existed before, because viruses need cells to replicate. But viruses are said to have contributed to the origin of DNA cells. A simplified version of the scenario for the appearance of DNA is that RNA viruses appeared inside the second era of the RNA world, because RNA cells already existed and could be parasitized. (Kostyrka 2016) (Forterre 2005)

Confirmation of the phylogenetic role of viruses could therefore explain the problematic coexistence of two distinct ways of replicating DNA in the living world. This scenario also gives viruses an operational role. Viruses, for Forterre, have phylogenetic and operational roles, but they are not metaphors of primitive life. (Forterre 2016)

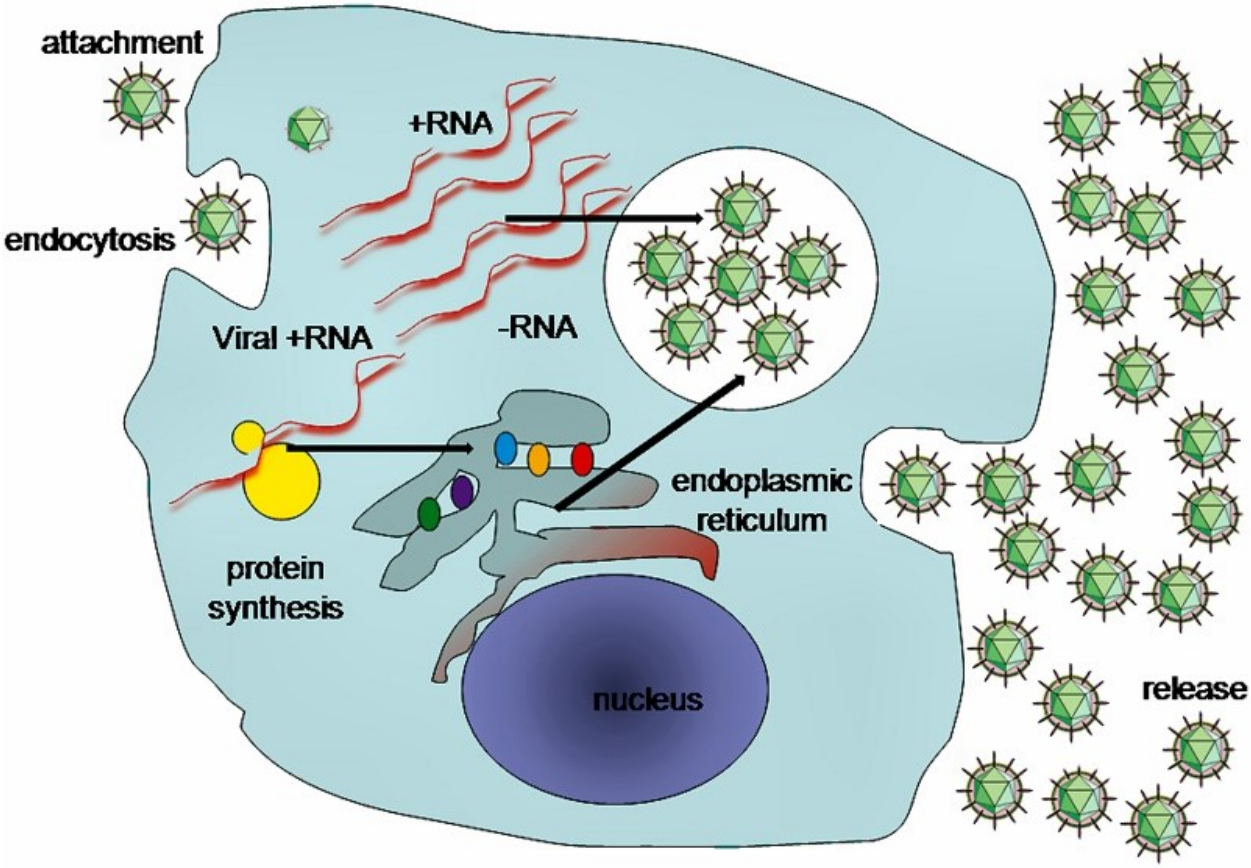
Eugene Koonin develops a virocentric scenario for the origin of life ("primordial virus world scenario" (Koonin 2009)). Koonin also assumes that viruses appeared during the second world of RNA, but rejects the alleged existence of RNA cells, mainly due to RNA instability. (Koonin, Senkevich, and Dolja 2006, 10) He argued that the first cells must have been DNA cells, so viruses must have appeared in a world without cells. Thus, Koonin rejects the common assumption that viruses cannot exist without cells. (Koonin and Dolja 2013, 550) In 2006, Koonin formulated the "ancient viral world hypothesis" that no gene is shared by all virus species - there is no common ancestor of all viruses, viruses have multiple origins. To explain the presence of these genes in existing viruses, Koonin assumes that they came from a primordial viral world and were conserved. (Koonin 2009, 60)

Koonin argues that the phylogenetic role of making it possible to switch from RNA to DNA is not just attributed to viruses. (Koonin and Dolja 2014, 289) He attributes a phylogenetic role to all components of viruses. To some extent, this hypothesis also provides a metaphor for life. (Koonin and Martin 2005)

The originality of Koonin's virocentric scenario is based on the underlying conception of viruses. Unlike Forterre, Koonin argues that viruses can exist and replicate without cells. Thus, Koonin also challenges the premise 1 of the syllogism. Moreover, the viral world "is by no means limited to the typical viruses that encode capsid". (Koonin and Dolja 2013)

Gladys Kostyrka concludes that Forterre and Koonin both argue for possible analogies between the real pathways of viral replication and those that may have existed in the early stages of life, and that viruses played an important phylogenetic role in the appearance of DNA and, more generally, in the evolution of replication mechanisms. But Forterre claims that viruses could only exist if there were cells, because viruses are intracellular parasites. Thus, the phylogenetic role of viruses would have taken place after the appearance of cell life. On the contrary, Koonin's conception of viruses contradicts the definition of viruses as intracellular parasites. For Koonin, viruses are fundamentally selfish genetic elements surrounded by a capsid. (Kostyrka 2016)

How could the virus play a role in the appearance of life if the existence of cells is a precondition for the existence of viruses? Gladys Kostyrka proposes several strategies. A first important strategy for introducing viruses into life-giving scenarios is to define life as acellular. A very different strategy for introducing viruses into life-origin scenarios is based on redefining cell life. (Kostyrka 2016)



A typical cycle of virus replication

There are six basic steps in virus replication: (Mahy 1998)

1. Attachment: binding between viral capsid proteins and specific receptors on the host cell surface. (Más and Melero 2013)
2. Penetration: virions enter the host cell through receptor-mediated endocytosis or membrane fusion. (Dimmock, Easton, and Leppard 2007)
3. Uncoating: removing the viral capsid. (Blaas 2016)
4. Replication: genome multiplication. (Isomura and Stinski 2013)
5. Assembly: a change in proteins (maturation) occurs after the virus has been released from the host cell. (Barman et al. 2001)

6. Release - by lysis, a process that usually kills the cell by breaking the membrane and the cell wall. (Dimmock, Easton, and Leppard 2007)

Viruses facilitate horizontal gene transfer, increasing genetic diversity. (Canchaya et al. 2003) There is an ongoing debate as to the extent to which viruses are a life form, or are "living organisms" (Rybicki 1990) and self-replicators. (Koonin and Starokadomskyy 2016)

Viruses undergo genetic changes through several mechanisms. In antigenic shift (when there is a major change in the virus genome) individual bases in DNA or RNA move to other bases - these changes can confer evolutionary benefits, such as resistance to antiviral drugs. (Sandbulte et al. 2011) When it may be the result of recombination or reassortment, influenza viruses can cause pandemics. (Hampson and Mackenzie 2006) RNA viruses often exist as quasispecies or swarms of viruses of the same species, but with slightly different nucleoside sequences of the genome. Such quasispecies are a major target for natural selection. (Metzner 2006) In genetic recombination a DNA is broken and then joined to the end of a different DNA molecule. Recombination usually occurs when viruses infect cells simultaneously. (Worobey and Holmes 1999)

Many organisms harbor a variety of genes unknown to science. (Mocali and Benedetti 2010) Many of these new genes are found in viral genomes. (Yin and Fischer 2008)

Viruses could be considered genetic modifiers. Viruses themselves do not evolve, but are evolved by cells. (Moreira and Lopez-Garcia 2009) But many viral genes do not appear to have cellular counterparts. (Yin and Fischer 2008) Viruses appear to have genes that produce structurally and functionally conserved proteins that have no apparent cellular ancestors. (Keller et al. 2009)

Viral infections usually cause an immune response that kills the virus. These immune responses can be triggered by specific vaccines. There are viruses, such as those that cause AIDS, and viral hepatitis, which manage to prevent these immune responses by causing chronic infections.

Some viruses do not cause apparent changes in the infected, asymptomatic cell (latency), (Sinclair 2008) a feature of herpes viruses. (Whitley and Roizman 2001) These latent viruses can sometimes be beneficial, increasing immunity against bacterial pathogens. (Barton et al. 2007) Other infections persist throughout life, (Bertoletti and Gehring 2007) so infected people are known as carriers because they serve as reservoirs of infectious viruses. (Rodrigues et al. 2001)

Virus transmission can be vertical (e.g., mother-to-child), or horizontal (person-to-person). Horizontal transmission is the most common mechanism of virus spread. (Antonovics et al. 2017) Epidemiology is used to break the chain of infection in populations during outbreaks of viral diseases, (Shors 2016) knowing the source of the outbreak and identifying the virus. Interruption can be done through vaccines, or isolation (quarantine), sanitation and disinfection. Vaccines can consist of attenuated viruses or viral proteins (antigens). (Palese 2006)

Matti Jalasvuori points out that, although viral infections can make the host resistant to subsequent infections by similar types of viruses, it is not a hereditary symbiosis. We are immune to chickenpox after an infection, but our children still have to infect themselves to become resistant. (Jalasvuori 2012)

During the spread of a virus epidemic, this integration of a virus into germ cells could provide an advantage to a person. (Jern and Coffin 2008) It is possible for the virus to establish a mutually beneficial relationship with its host. This symbiotic partnership would exist mainly at the level of genetic information, (Ryan 2009) but can still occur through a fusion of two distinct

entities of genetic reproduction. Although viruses could be considered to form symbiotic relationships through any mechanism, Matti Jalasvuori highlights some interesting aspects: How does this integrated virus affect the subsequent evolution of their hosts? The endogenous virus alters the genetic composition of chromosomes and can, for example, regulate the expression of host genes. (Jern and Coffin 2008) Some derived genes appear to have remained active for tens of millions of years. (Katzourakis and Gifford 2010) But even then, it is difficult to say with certainty how important these viruses were in the evolution of their hosts. (Jalasvuori 2012)

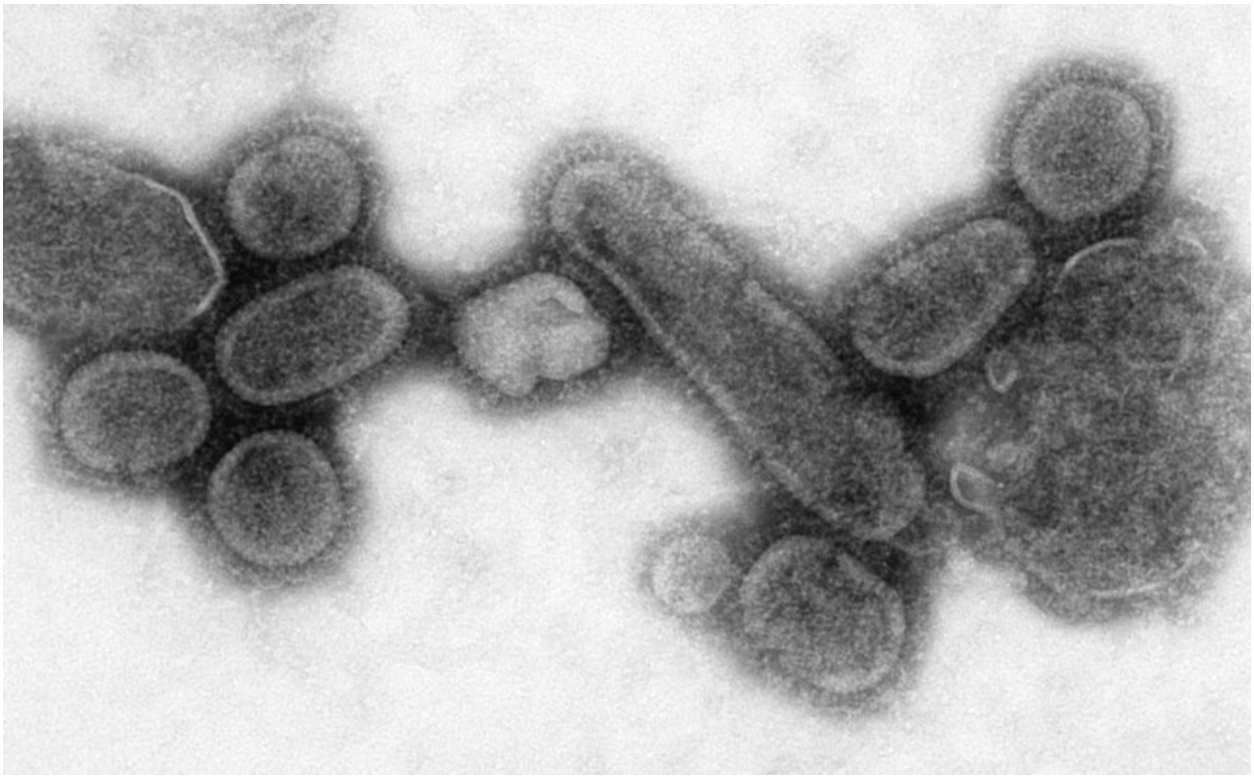


Image with electron microscope transmitting a recreated influenza virus from 1918

Viruses are an important natural means of gene transfer between different species, increasing genetic diversity and helping evolution, (Canchaya et al. 2003) being considered one of the largest reservoirs of unexplored genetic diversity on Earth. (Suttle 2007) They can also be used to manipulate and investigate cell functions, (Mahy 1998) being used as vectors to introduce genes

into the cells being studied. Virotherapy uses viruses as vectors to treat various diseases, including cancer treatment and gene therapy. (Jefferson, Cadet, and Hielscher 2015)

Many viruses can be synthesized "from scratch". The first synthetic virus was created in 2002. (Cello, Paul, and Wimmer 2002) This technology is used to investigate new vaccination strategies. (Coleman et al. 2008) It follows that viruses can no longer be considered extinct, as long as their genome sequence information is known and permissive cells are available.

The ability of viruses to cause epidemics has raised concerns about the possibility of their use in a biological warfare. The 1918 influenza virus was recently successfully recreated in a laboratory. (Zilinskas 2017) There are only two centers in the world authorized by the WHO to store smallpox virus stocks, which can be used as a weapon because the smallpox vaccine has sometimes had severe side effects, and is no longer commonly used in any country. (Artenstein and Grabenstein 2008)

1.1 Ontology

Sfetcu, Nicolae, "*Virus Ontology: Thing, Being, Process, or Information?*", SetThings (October 24, 2020), DOI: 10.13140/RG.2.2.35874.66241, URL = https://www.setthings.com/en/virus-ontology-thing-being-process-or-information/

The study of viruses raises pressing conceptual and philosophical questions about their nature, their classification, (O'Malley 2014, 45–94) (Mayr 1953) and their place within the biological world.

A major set of problems concerns the individuality and diachronic identity of a virus: what is the virus, the viral particle (virion) or the entire viral cycle? The correct identification of the virus has significant ontological consequences, also related to the place and time when biological entities begin and end. (Bouchard and Huneman 2013)

The main metaphysical thesis considers that the world is composed of things or substances, with things identified by their properties. But Dupre and Guttinger believe that widespread symbiosis threatens the clarity of the boundaries between organisms and even the uniqueness of these boundaries. (Dupré and Guttinger 2016) The integrated nature and blurred boundaries between organisms have led to claims that "traditional (substance-based) metaphysical accounts of individuality should be replaced with a process ontology, as the only 'philosophy of organism' that can make sense of the biological phenomena as we now know them." (J. Dupré and Guttinger 2016) (Henning and Scarfe 2013))

Dupre and Guttinger make an ontological statement that biological systems are processes. In this context, they challenge the view that viruses are distinct entities that follow their own intrinsic (and pathogenic) agenda, based on two arguments: symbiotic systems can include viruses, and viruses must be seen as processes. They argue that viruses are vital and ubiquitous elements of the larger flow of interconnected processes that make up biological systems. (Dupré and Guttinger 2016)

Microbial symbionts involved in the modulation of development and playing a central role in the development and homeostasis of the immune system, (Spasova and Surh 2014) with connection to the central nervous system, (Bravo et al. 2012) have contributed to a major philosophical reconsideration of the concept of biological individual. The human microbiome would consist not of passengers, but of parts of an integrated individual, the organism itself in its stable state proving to be a product of countless interactions between the host and microbes. Thus, viruses provide services to biological systems, some even vital. Viruses are an integral part of the system, rather than parasites, kept under control enough to allow the system to function. (Wylie,

Weinstock, and Storch 2012) Basically, the virus responds gradually and systematically to dietary changes. (Minot et al. 2011) suggesting a positive functional response to environmental changes.

Viruses kill the cells in which they reproduce and maintain their own life cycles, but it is considered possible that this killing of cells is functional for the larger system of which the virus is also a part. The result is a stable ecological relationship between viruses and their hosts, beneficial for the system as a whole, including in regulating the morphology and function of the intestine and in shaping the immune system.

Retroviruses have a single-stranded RNA genome that is reverse transcribed after infection in double-stranded DNA and inserted into the host genome. After insertion, the viral DNA is treated by the host as its own DNA, which means that it is transcribed and reproduced together with the rest of the host genome. (J. Dupré and Guttinger 2016) In some cases, retroviruses reach the host genome and can transform into what is known as endogenous retroviruses. It is estimated that up to 8% of the human genome actually consists of endogenous retroviruses, (Griffiths 2001) resulting in significant proportions of DNA from eukaryotic organisms initially entering the cell line via a virus.

The virus may function as a vast repository of genetic resources. (Minot et al. 2011) Thus, the human genome itself can be thought of as a database or library of resources that can be used in many ways by the cell. (Noble 2006) It can be speculated here that "the ability of microbes, specifically our symbiotic microbiome, to recruit genetic resources from the biotic environment may be a much more efficient way of responding to environmental contingencies than evolution by random genetic variation and selection." (Dupré and Guttinger 2016)

Given this close interconnection between viruses and their hosts, it seems plausible that viruses in complex multi-organic systems are vital functional parts of the whole, and can play

essential roles in eliminating harmful cells, mediating the transfer of genetic resources, developing their hosts, and their survival in difficult conditions. (Dupré and Guttinger 2016)

The question of whether viruses are alive has been asked repeatedly throughout the history of virological research. The answer is difficult, and it has changed over time. (Smith and Szathmáry 2000) A related issue is the extent to which viruses could be considered as organisms (in the idea that all organisms are living beings, but not all living beings are organisms). Many biologists believe that viruses are not organisms, which involve a very high degree of functional organization and cooperation, with strong interactions between the parties. (Huneman 2006)

Other biologists believe that discrimination between living things and things does not suit the specific case of viruses: the answer would depend on pre-existing conceptions of "life". In addition, the question of what viruses do is at least as important as the question of what they are (i.e., their living or non-living state). (Pradeu, Kostyrka, and Dupré 2016)

Koonin and Starokadomsky define the status of viruses among biological entities in the replicator paradigm. All biological replicators form a continuum along the selfishness-cooperativity axis, from completely selfish forms to fully cooperative ones. In this context, all organisms are communities of replicators that interact, co-evolving, from different classes. (Koonin and Starokadomskyy 2016)

According to Lewis et al., there is a third state, characteristic of latent cells (with reduced metabolic activity and able to resume growth and division according to external conditions), which is neither truly living nor non-living. (K. Lewis 2010)

In general, a dead organism still falls into the category of life. However, when it comes to viruses, these different aspects of life are tangled and are usually discussed together. Indeed,

viruses can be seen as not belonging to the category of living beings, because they are incapable of autonomous reproduction, and extracellular virions are in a latent (inert) state.

Koonin and Starokadomsky argue that it is always possible to say whether a particular entity belongs to the realm of biology, within the fundamental concept called of the "replicator paradigm." (Koonin and Starokadomskyy 2016) Replicators form a continuum along the axis of autonomy. The only universal feature shared by all replicators is the presence of a signal that allows replicative autonomy. (Kristensen et al. 2013) An orthogonal dimension of the replicating universe involves reproductive strategies (or lifestyles), from complete selfishness (associated with parasitism) to full cooperation. (Joh and Weitz 2011)

Transitions from one type of replicator to another have occurred on numerous occasions during evolution, but there is no evidence of evolutionary transitions between cells and viruses. (Koonin and Starokadomskyy 2016) Nor about the origin of the selfish elements in the “escaped genes” (which become autonomous, selfish replicators) of cellular life forms. Most essential viral genes (viral marker genes) do not have close counterparts between the genes of cellular life forms, being probably originated in a primordial, pre-cellular gene pool. (Koonin and Dolja 2013)

Virion stability and inactivity provide intuitive support for the common claim that viruses are not living things. The only thing that is constant throughout the viral cycle is the viral genome. Dupre and Guttinger believe that, therefore, the virus should simply be identified with its genetic material. But identifying the virus with something less than a cycle will lead to failure. The episode or virion is just part of what the virus does. " What matters is not the DNA molecule itself but what it does (or can do) in a particular context," (J. Dupré and Guttinger 2016) such as cell invasion and replication, rather than having a certain intrinsic property. Thus, an endogenous retrovirus is a

virus only as long as it maintains the ability to contribute to a viral process. If it lives in a host genome it is immaterial. And in the case of viral latency as episome, it should be considered viral.

Lopez-Garcia and others believe that viruses cannot be considered alive because of their inability to reproduce without a cellular host. (Lopez-Garcia 2012)

The common perception is that disinfectants kill most types of viruses. The logic here is simple: you can't kill something that isn't alive. Likewise, if something can get sick and eventually die, it is certainly alive. (Pearson 2008) Raoult and Forterre classify viruses as one of two fundamental categories. of organisms (encoding capsids, as opposed to organisms encoding ribosomes, i.e. cellular life forms), with the obvious implication that viruses are living things. (Raoult and Forterre 2008)

Living systems consist of complex interactions between elements that form lines of several different types. These elements include viruses. Dupré and O'Malley argued that the standard reasons for denying that viruses are alive are wrong: most of the criteria involved, such as the criterion of autonomy (that viruses require essential resources from the host cell for reproduction) would exclude them from the category of living entities. (J. O. Dupré 2009) But, going by these considerations, we ourselves depend vitally on a multitude of symbiotic organisms, so that on this criterion we would not be alive either. (J. Dupré and Guttinger 2016)

Rather than considering a set of features that qualify something as a virus, we should consider the activities that make up the viral life cycle. So, we should see viruses as processes rather than things. J. Dupré and Guttinger 2016) But the perspective of the process involves conceptual difficulties.

If we adopt the perspective of a process ontology, we can understand the constant fusion and separation, because the processes can unite in a single process and even maintain their identity.

Collaboration between virus and host is not a simple interaction, but a collaborative interaction between processes. The virus itself can only be understood if it is described as a cycle.

This process-centered perspective provides a very different understanding of activity and function in biological systems than just the interaction of discrete, evolutionary individual things. According to Guttinger, at least the virions are certainly not living, but are stages of living processes. (J. Dupré and Guttinger 2016)

Nicholas Rescher introduces a vision of processes as defined by a functional unit; there is a "programmatic structure" that characterizes and unifies a process. (Rescher 1996) The interconnected activities that form a functional unit are the key to understanding processes: "A process is made into the item it is not through its continuing ("essential") properties, as with a classically conceived substance, but by its history, by the temporal structure of its descriptive unfolding across time. The identity of a process is constituted through a sequential pattern of action.". (Rescher 1996, 41)

Who is a fundamental feature of the world, becoming or being? In a substantial perspective, the being is usually seen as fundamental, the activity deriving from the being. For a process ontologist, becoming is seen as the fundamental feature of the world, according to which a stable "thing" is actually a (slow) process. (Guttinger 2020c, 3) According to Dan Nicholson and John Dupré in the introduction to the Everything Flows essay collection:

> "As processes, and unlike things or substances, organisms have to undergo constant change to continue to be the entities that they are." (Nicholson and Dupré 2018)

What would contradict a vision of the process is that stability is a fundamental feature of the world. Thus, a process ontology should explain how these stable patterns occur. (Guttinger 2020, 3)

Stephan Guttinger considers the viral population in an organism to be an extremely diverse and, importantly, dynamic system, forming what researchers call a "mutant cloud" or "swarm". Through the interactions between cloud members and between the cloud and its wider context, the virus acquires new behavioral characteristics, responding quickly to environmental changes, including the avoidance of antiviral drugs or cellular defense mechanisms. Thus, the diversity of the virus is, at least in part, defined by the larger systems in which the cloud develops and moves. (Guttinger 2020a, 1)

This concept leads researchers to new approaches in antiviral treatments, looking for ways to interfere with the dynamics of the mutant cloud. The result is the need to move from a vision of things to a process-based understanding of viruses, with a more relational and dynamic vision.

During a viral cycle, the original virus is completely destroyed and only the associated information is passed on to the next generation. This is different for cellular organisms, which have to pass on a physical part of them from generation to generation. The viral information hypothesis states that genetic information is reproduced to the detriment of the system's energy efficiency. According to this hypothesis, viruses are the only biological entities that simply reproduce as information. When a virus enters its host, the virion completely disassembles and the nucleic acid is copied into new genomes, which are then packaged and released as new virions. Physically, there is nothing left of the original form of the virion. "Not one single molecule, atom, or quark must be transferred between the old and new. The only thing that must be moved between viral generations is the information to build the next set of viruses." (Rohwer and Barott 2013)

According to Forest Rohwer and Katie Barott, in *Viral information*, the viral information hypothesis states that:

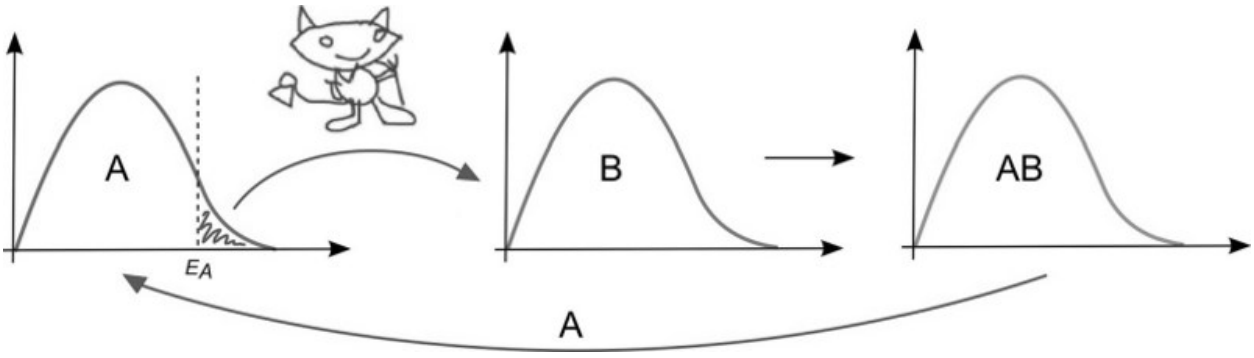
1. Physical information refers to the position in the Universe.

2. Biology creates physical information by changing the position of matter, effectively functioning as Maxwell's Demon.

3. Viral information converts different types of physical information in itself to the detriment of overall energy efficiency.

4. The destruction of physical information has a thermodynamic cost, which is quantified by Landauer's principle. Extremely large populations, such as viruses, experience selection at the Landauer limit and this is observable. (Rohwer and Barott 2013)

The dynamics of viruses are incredible. (Weinbauer 2004) Every week 10^{31} viruses disintegrate and 10^{31} new viruses appear. Practically 1.7×10^{25} new viruses are produced every second, and for each new virus approximately 50,000 base pairs of DNA must be synthesized. (Steward, Montiel, and Azam 2000) It turns out that every second more than 10^{30} pairs of viral DNA bases are performed, involving the death of approximately 10^{24} microbial cells every second.



Maxwell's Demon Illustration and Landauer's Principle. The demon / enzyme selectively selects "A" molecules with enough energy to react with "B" reactant, leading to the "AB" product. This process slightly cools the "A" population. This heat loss is brought back into the system by the surrounding universe. During degradation / erasure of "AB", "A" returns to its population and this heat can be measured using methods such as isothermal calorimetry. Source: (Rohwer and Barott 2013

In the sense of communication, information is a measure of "surprisal". (Tribus 1961) (Rohwer and Barott 2013) The bigger the surprise, the more information we find out. The thermodynamic consequence of physical information was defined mathematically by Rolf

Landauer. (Landauer 1996) The heat released by erasing physical information can best be imagined by invoking Maxwell's Demon. The demon is a hypothetical creature that can collect "hot" molecules from one container and move them to another. This creates a temperature difference that could be turned into mechanical work. The daemon actually gains information about the relative position of the molecules. (Szilard 1929)

Rohwer and Barott propose that biology behave like Maxwell's Demon. Genetic information is the set of instructions for building Maxwell's Demon. This new information has a thermodynamic cost when it is erased, and the amount of heat released by destroying the information is also described by the Landauer Principle. (Toyabe et al. 2010) It should thus be possible to observe the link between physical information and thermodynamics and use it to better understand biology and, in particular, the success of viruses. (Rohwer and Barott 2013)

To prove that the viral information is real, Djamali and colleagues used isothermal calorimetry to study the heat released by marine microbial and viral communities. (Djamali et al. 2012) The decrease in the number of cells, together with the increase in diversity, is very similar to viral information. (Rohwer and Barott 2013)

The additional energy costs of the physical information associated with a mutation could explain why identical viral sequences are observed on a global scale. Rohwer and Barott conclude that imagining the biosphere as a massive system that ultimately feeds viruses, thus explaining why biological diversity is dominated by viruses. The viral information hypothesis has the potential to synthesize ecology and the theory of evolution by incorporating viruses with the rest of biology in a thermodynamic framework.

The boundaries between viruses and related entities are not easy to define. A very important class of related entity, plasmids, are generally considered to be differentiated from viruses by their

lack of a capsid, consisting of empty DNA. But viruses do not have capsid at all stages of their life cycles, and can attach to a host eukaryotic genome in the form of an episome, the difference between a viral and a plasmid episome being quite unclear. Dupre and Guttinger conclude from this that they are parts of processes that differ at different stages of their life cycles. (J. Dupré and Guttinger 2016)

To find out what a virus really is, an ontology of the substance has little to offer. The point of view of substance assumes its essentialism and / or individualism, but none of them fits well with the interconnected image of the biological world that the natural sciences paint. (J. Dupré and Guttinger 2016)

Koonin and Starokadomsky state that the status of viruses in the field of biology is naturally defined within the replicator paradigm. (Koonin and Starokadomskyy 2016) The whole history of life is a story of parasite-host coevolution that includes the struggle between them and various forms of cooperation. Thus, the replicator paradigm provides the conceptual framework for the theoretical and experimental study of interactions in the replicator community. The complementarity of replication and metabolism (broadly defined to include energy production) is the biological manifestation of the dualism of information (entropy) and energy, as Schroedinger explains. (Schrodinger, Schrödinger, and Dinger 1992) But here, too, a dilemma arises: replication or metabolism first? Different approaches are possible. In conclusion, the replicator paradigm is considered central in biology, helping to establish the status of viruses in the biological world.

2 Pandemics

Sfetcu, Nicolae, "*Philosophical aspects of pandemics*", SetThings (October 19, 2020), DOI: DOI: 10.13140/RG.2.2.34967.80801, URL = https://www.setthings.com/en/philosophical-aspects-of-pandemics/

Throughout human history, there have been a number of pandemics. The most devastating pandemic was the plague known as the Black Death, which killed about 200 million people in the 14th century, (Philipkoski 2015) and the 1918 flu pandemic (Spanish flu). (Centers for Disease Control and Prevention and Hajmirbaba 2020) Current pandemics include COVID-19 and HIV / AIDS.

The World Health Organization (WHO) has outlined the steps for the evolution of an influenza virus into a pandemic: (National Center for Biotechnology, Information, National Library of Medicine, and National Institutes of Healt 2020)

1. Uncertain probability of pandemic
    a. Phase 1: Animal-to-animal infection only
    b. Phase 2: Animal-to-human infection (considered a human pandemic threat)
    c. Phase 3: Sporadic or grouped human cases (no sustained outbreaks at the community level)
2. Medium to high probability - Phase 4 (sustained community outbreaks)
3. High to certain probability - Phase 5 (sustained in two countries in a WHO region)
4. Ongoing pandemic - Phase 6 (sustained in another WHO regions)
5. Post-peak
    a. Peak (levels drop below peak in most countries)
    b. Possible new wave (activity increases again in most countries)
    c. Post-pandemic (levels return to normal seasonal levels)

Notes:

• Phases 3-6 are "sustained", involving human-to-human transmission.

• After phase 6: the involved “countries” are the ones with “adequate surveillance”.

• The WHO no longer officially uses the "pandemic" category. (Nebehay 2020)

Michel Foucault, in *Discipline and Punish: The Birth of the Prison* (*Surveillance and Punishment, the Birth of Prison*), (Michel Foucault 1975) describes the measures taken in the seventeenth century in a city, on the basis of an order, against the plague pandemic (Chapter 3. Panopticism):

“First, a strict spatial partitioning: the closing of the town and its outlying districts, a prohibition to leave the town on pain of death, the killing of all stray animals; the division of the town into distinct quarters, each governed by an intendant. Each street is placed under the authority of a syndic, who keeps it under surveillance; if he leaves the street, he will be condemned to death. On the appointed day, everyone is ordered to stay indoors: it is forbidden to leave on pain of death. The syndic himself comes to lock the door of each house from the outside; he takes the key with him and hands it over to the intendant of the quarter; the intendant keeps it until the end of the quarantine. Each family will have made its own provisions; but, for bread and wine, small wooden canals are set up between the street and the interior of the houses, thus allowing each person to receive his ration without communicating with the suppliers and other residents; meat, fish and herbs will be hoisted up into the houses with pulleys and baskets. If it is absolutely necessary to leave the house, it will be done in turn, avoiding any meeting. Only the intendants, syndics and guards will move about the streets and also, between the infected houses, from one corpse to another, the “crows”, who can be left to die: these are “people of little substance who carry the sick, bury the dead, clean and do many vile and abject offices”. It is a segmented, immobile, frozen space. Each individual is fixed in his place. And, if he moves, he does so at the risk of his life, contagion or punishment.

“Inspection functions ceaselessly. The gaze is alert everywhere: “A considerable body of militia, commanded by good officers and men of substance”, guards at the gates, at the town hall and in every quarter to ensure the prompt obedience of the people and the most absolute authority of the magistrates, “as also to observe all disorder, theft and extortion”. At each of the town gates there will be an observation post; at the end of each street sentinels. Every day, the intendant visits the quarter in his charge, inquires whether the syndics have carried out their tasks, whether the inhabitants have anything to complain of; they “observe their actions”. Every day, too, the syndic goes into the street for which he is responsible; stops before each house: gets all the inhabitants to appear at the windows (those who live overlooking the courtyard will be allocated a window looking onto the street at which no one but they may show themselves); he calls each of them by name; informs himself as to the state of each and every one of them “in which respect the inhabitants will be compelled

> to speak the truth under pain of death"; if someone does not appear at the window, the syndic must ask why: "In this way he will find out easily enough whether dead or sick are being concealed." Everyone locked up in his cage, everyone at his window, answering to his name and showing himself when asked — it is the great review of the living and the dead.

> "This surveillance is based on a system of permanent registration: reports from the syndics to the intendants, from the intendants to the magistrates or mayor At the beginning of the "lock up", the role of each of the inhabitants present in the town is laid down, one by one; this document bears "the name, age, sex of everyone, notwithstanding his condition": a copy is sent to the intendant of the quarter, another to the office of the town hall, another to enable the syndic to make his daily roll call. Everything that may be observed during the course of the visits — deaths, illnesses, complaints, irregularities is noted down and transmitted to the intendants and magistrates. The magistrates have complete control over medical treatment; they have appointed a physician in charge; no other practitioner may treat, no apothecary prepare medicine, no confessor visit a sick person without having received from him a written note "to prevent anyone from concealing and dealing with those sick of the contagion, unknown to the magistrates". The registration of the pathological must be constantly centralized. The relation of each individual to his disease and to his death passes through the representatives of power, the registration they make of it, the decisions they take on it.

> "Five or six days after the beginning of the quarantine, the process of purifying the houses one by one is begun. All the inhabitants are made to leave; in each room "the furniture and goods" are raised from the ground or suspended from the air; perfume is poured around the room; after carefully sealing the windows, doors and even the keyholes with wax, the perfume is set alight. Finally, the entire house is closed while the perfume is consumed; those who have carried out the work are searched, as they were on entry, "in the presence of the residents of the house, to see that they did not have something on their persons as they left that they did not have on entering". Four hours later, the residents are allowed to re-enter their homes." (Michel Foucault 1975) (M. Foucault, Agamben, and Benvenuto 2020)

Michel Foucault highlights the strict monitoring of the city's inhabitants, with a power of the authorities exercised without discrimination. A well-developed model of the disciplinary mechanism. It is established by order for each individual his place, his illness and death, his well-being. A spectacle of the absurd that changes people's identities, allowing a completely different truth to appear. The plague, as a form, both real and imaginary, of disorder and disorder, is opposed by the correlative medical and political discipline. A discipline considered by the authorities as ideal for the control of rebellions, crimes, vagrancy, desertions, and in general of people who appear and disappear, live and die in disorder. (M. Foucault, Agamben, and Benvenuto 2020)

Unlike leprosy, which gave rise to exclusionary rituals, the plague gave rise to disciplinary projects. Instead of dividing people as in the case of leprosy, the disciplinary mechanism in the case of the plague called for surveillance and control, an intensification and refinement of power. Tactical compartments were used instead of exile. Separation (marked) against segmentation (analyzed and distributed). Exile against arrest, with different political ideals. The first is that of a pure community, the second that of a disciplined society, the utopia of the perfectly governed city. (M. Foucault, Agamben, and Benvenuto 2020)

Major epidemics and pandemics have always been significant social and cultural events. In *Madness and Civilization: A History of Insanity in the Age of Reason* (*Folie et Déraison: Histoire de la folie à l'âge classique*), (Michel Foucault 2001) Michael Foucault describes the Great Confinement, which was based on the leprosy colony model, a " game of exclusion " that for centuries dominated exclusion structures where the role of the leper was replaced by the poor, vagrants, prisoners and those considered "crazy". (Peters, Jandrić, and McLaren 2020) Foucault writes:

> "In the Middle ages, exclusion hit the leper, the heretic. Classical culture excluded by means of the General Hospital, the Zuchthaus, the Workhouse, all institutions which were derived from the leper colony. I wanted to describe the modification of a structure of exclusion. (Foucault, 1996, p. 8) Once leprosy had gone, and the figure of the leper was no more than a distant memory, these structures still remained. The game of exclusion would be played again, often in these same places, in an oddly similar fashion two or three centuries later. The role of the leper was to be played by the poor by the vagrant, by prisoners and by the 'alienated', and the sort of salvation at stake for both parties in this game of exclusion is the matter of this study. The forms this exclusion took would continue, in a radically different culture and with a new meaning, but remaining essentially the major form of a rigorous division, at the same time social exclusion and spiritual reintegration. " (Michel Foucault 2001, 6) (Peters, Jandrić, and McLaren 2020)

In *Abnormal: Lectures at the Collège de France, 1974-1975* (*Les Anormaux. Cours au Collège de France, 1974-1975*), (Michel Foucault 2004) Foucault shows that the solution adopted

for the plague was quarantine, which divided the cities into controlled sections: a pyramidal form of administrative control, where surveillance functioned. keep going. As Foucault explains

" It is not exclusion but quarantine. It is not a question of driving out individuals but rather of establishing and fixing them, of giving them their own place, of assigning places and of defining presences and subdivided presences. Not rejection but inclusion. You can see that there is no longer a kind of global division between two types or groups of population…one that has leprosy and one that does not…There is a close and meticulous observation…[a] constant examination of a field of regularity within which each individual is constantly assessed in order to determine whether he conforms to the rule, to the defined norm of health." (Michel Foucault 2004, 45–47) (Peters, Jandrić, and McLaren 2020)

As Elden observes, in treating plague cities

"the 'emergency plan' [*plan d'urgence*] for epidemic disease comprised the following measures:

1. All people must remain at home in order to be isolated in a particular place, even in a single room;
2. The town is divided into distinct sectors or regions, inspectors patrol the streets, and a system of generalised surveillance is used to compartmentalise and control;
3. To accompany the detailed reports that come from these sectors, there will be a centralised information system;
4. People who do not show themselves for the inspectors at their windows will undoubtedly have contracted the plague, and therefore must be transported to a special infirmary, outside the town. Statistics can be derived from the reports that follow;
5. Houses need to be disinfected and sterilised … " (Elden 2003, 243) (Peters, Jandrić, and McLaren 2020)

The WHO published, in 1999, with revisions in 2005 and 2009, a guide to pandemic situations. (World Health Organization 2010) (World Health Organization 2011) All versions of this document refer to influenza. Pandemic severity measures were based on the mortality rate, (Centers for Disease Control and Prevention 2007) although this is not considered by some specialists as an appropriate measure of the severity of the pandemic. (Reed et al. 2013)

The basic steps in controlling an outbreak are limitation (through monitoring, isolation and therapy, including vaccination) (Threats 2007) and mitigation (after controlling the spread of the disease), but these steps can also be addressed simultaneously. (Baird 2020) Reducing the epidemic peak ("flattening the epidemic curve") reduces the risk of overcrowding in health

services and provides time for the development of vaccines and treatments. (Anderson et al. 2020) (Stawicki et al. 2020) Non-pharmaceutical measures (Stawicki et al. 2020) such as hand hygiene, wearing masks, self-quarantine, and social distancing are also used. (Qualls et al. 2017)

Foucault's analysis is found today in public health management strategies for the treatment of coronavirus.

During a pandemic, certain forms of philosophical investigations are always emphasized. The most common approach in these situations is existentialism, which explores the nature of existence by emphasizing the experience of the human subject, (MacQuarrie 1973) starting from "existential anxiety" or a feeling of disorientation, confusion or anxiety in the face of a meaningless reality, or a seemingly absurd world. (Solomon 1776) Søren Kierkegaard is considered the first existentialist philosopher, (Crowell 2020) although he did not use the term existentialism. (Kierkegaard 1992) According to Kierkegaard, every individual - not society or religion - is solely responsible for giving meaning to life and living it with passion and sincerity, or "authentic." (Watts 2003) The predominant value of existentialist thinking is freedom, its main virtue being authenticity.

The notion of the absurd contains the idea that there is no meaning in the world beyond the one we give it. This also includes the amorality or "injustice" of the world. Existentialism is generally understood in two fundamental ways. According to Albert Camus, the world or the human being is not in itself absurd. The absurdity appears by juxtaposing the two due to the incompatibility between them. (Wartenberg 2008) The other interpretation, by Søren Kierkegaard, states that the absurd is limited to the actions and choices of human beings. These are considered absurd because they come from human freedom, undermining their foundation outside of them. According to Camus, the supreme hero of the absurd lives meaninglessly and faces suicide without giving in. (Michelman 2010)

"Existential anxiety" is considered a negative feeling that results from the experience of human freedom and responsibility. Despair is also a feeling specific to existentialism, (The Free Dictionary 2020a) being defined as a loss of hope.

Sisyphus, the symbol of the absurdity of existence, painting by Franz Stuck (1920)

The Plague (*La Peste*) by Albert Camus, a novel published in 1947, tells the story of a plague epidemic that allegedly appeared in the French Algerian city of Oran. (Camus 1972) The

Plague is considered a classic existentialist novel, (Hughes 2010) emphasizing the inability of individual characters to affect their destinies, even the power of the absurd.

Michael A. Peters, Petar Jandrić and Peter McLaren discuss, in *Viral modernity? epidemics, infodemics, and the 'bioinformational' paradigm*, the concept of viral modernity, based on the nature of viruses and their role in evolution and culture, and the concept of bioinformationalism. In this paradigm, COVID-19 can be considered a "bioinformationalist" response that " represents historically unprecedented level of sharing information from the sequencing of the genome to testing for a vaccination." (Peters, Jandrić, and McLaren 2020)

They state that understanding these complex forces from historical and political perspectives is essential in examining the current COVID-19 epidemic. They show how bioinformation, modernity, the concepts of virus and quarantine and post-truth politics "blend into a poisonous public stew in this case." The authors emphasize the importance of informal education in relation to biopolitics, public health management and bioinformationalism in this case. (Peters, Jandrić, and McLaren 2020)

Petar Jandrić notes that computer viruses bring a viral modernity that "causes and disrupts the opening of a free distribution model, as well as distributed knowledge, media and learning systems". Alterability of information allows the virus to modify and change information, providing conditions for self-replicability. " (Peters 2012, 62)

The Gaia hypothesis, also called the Earth reaction hypothesis, (J. Lovelock 2001) formulated by James Lovelock (J. E. Lovelock 1972) and later developed by Lynn Margulis, (J. E. Lovelock and Margulis 1974) proposes the idea that living organisms interact with their inorganic environment on Earth. to form a synergistic and self-adjusting, complex system that helps maintain and perpetuate the conditions for life on the planet. The Gaia hypothesis states that

this system determines the stability of the global temperature, the salinity of seawater, atmospheric oxygen levels, the maintenance of a liquid water hydrosphere, and in general the environmental variables that affect life on Earth.

According to the hypothesis, organisms co-evolve with their environment, "influence their abiotic environment, and that environment, in turn, influences the biota through the Darwinian process." (J. Lovelock 1995)

In the twentieth century, Russian scientists introduced concepts that overlap with the Gaia hypothesis. (Lapenis 2002) The less accepted versions of the hypothesis argue that changes in the biosphere occur through the coordination of living organisms and maintain these conditions through homeostasis. In some philosophical versions, all life forms are considered part of a single living planetary being called Gaia.

The famous French philosopher Bruno Latour stated during the COVID-19 pandemic, in "The first lesson that the coronavirus taught us" (Latour 2020) that we must take care of what we have, because it is over.

> "This seems to add a political limit to James Lovelock's Gaia hypothesis, which explains how "Life" acts to protect itself. Compared to the infinity of worlds taught by science, Lovelock, together with Margulis, proved that the Earth is unique because it has life." (Latour 2020)

Bruno Latour considers that the confirmation of the idea of the two is his greatest discovery of this period, although still not accepted by the main science. In this sense, the paradigm shift from Aristotelian cosmology to Galileo is just as important as the one from Galileo to Gaia.

2.1 Social dimensions

Sfetcu, Nicolae, "*Social Dimensions of Pandemics*", SetThings (October 26, 2020), DOI: 10.13140/RG.2.2.26974.87364, URL = https://www.setthings.com/en/social-dimensions-of-pandemics/

Viruses coexist for approx. 300 million years with humans. Sometimes viruses can infect people on a large scale. But how was the current pandemic possible?

Isolations and quarantines caused by the pandemic, by reducing daily and industrial activities, including tourism, (Team 2020) have had a strong effect on the environment and climate by reducing pollution. In China, there has been a 25% reduction in carbon emissions (Myllyvirta 2020) and a 50% reduction in nitrogen oxide emissions. (Zhang et al. 2020) But the pandemic has also provided new opportunities for illegal activities with negative social effects, such as deforestation of the Amazon rainforest (Roberton and Bodo 2020) and in Africa. (Deliso 2020)

Global warming is causing extreme weather events that have led to an increase in infectious diseases. The new climate can support epidemiological vectors for longer periods of time, creating more favorable conditions for replication and the emergence of new vectors. (Epstein 2011)

Diseases caused by coronaviruses have occurred more frequently in recent decades. Zoonotic diseases (in which the virus passes from animals to humans) have now accounted for 75% of all emerging diseases, facilitated by climate change through rapid changes in temperature and humidity. The most fundamental way to protect ourselves from zoonotic diseases is to prevent destruction of nature. Where ecosystems are healthy and biodiverse, they are resilient, adaptable and help to regulate diseases." (United Nations 2020d) The United Nations Environment Program explicitly states the link between nature destruction (including due to climate change) and the COVID-19 pandemic. (United Nations 2020c)

The World Bank also says climate change increases the risk of epidemics, including through excessive deforestation that is believed to be responsible for 31% of zoonotic diseases. (Boukerche and Mohammed-Roberts 2020) Climate change and deforestation increase animal migration and the link between them and humans, facilitating the transmission of viruses. Increasing humidity also facilitates transmission. (Environmental Health News 2020) Climate change also leads to a decrease in the number of animals in the population, and therefore less genetic diversity, along with increasing conflicts between nations, human migration, and less efficient medical and sanitation systems, increasing the risk epidemics. (Ferrell 2020)

It should be noted that if the global temperature increases the human body's ability to fight the virus decreases, while bats will be less affected. (Worland 2020)

Depletion of food resources due to climate change can lead people to hunt wild animals, including bats, which are possibly carriers of coronavirus. (AlHusseini 2020)

In July 2020, the United Nations Environment Program and the International Institute for Animal Research published a report entitled "*Prevention of the next pandemic - zoonotic diseases and how to break the chain of transmission*", which states that the frequency of zoonotic diseases is increasing due to the destruction of nature that led to "high demand for animal protein, unsustainable agricultural practices and climate change". (United Nations 2020c)

In the case of emerging infectious diseases, it is considered that there is a border that has already been skipped. (Guttinger 2020b) Viruses normally have a native area (their "reservoir") from which they should not be pushed out. This creates a dangerous intimacy, with "hotspots" that include locations such as markets, which become real hotbeds of epidemics. David Quammen, author of *Spillover*, states that:

"We are invading tropical forests and other wild landscapes, which are home to so many species of animals and plants - and inside those creatures, so many unknown viruses. We cut down

> the trees; we kill the animals or put them in cages and send them to the markets. We disrupt ecosystems and shake viruses from their natural hosts. When this happens, the viruses need a new host. Often we are." (Quammen 2012)

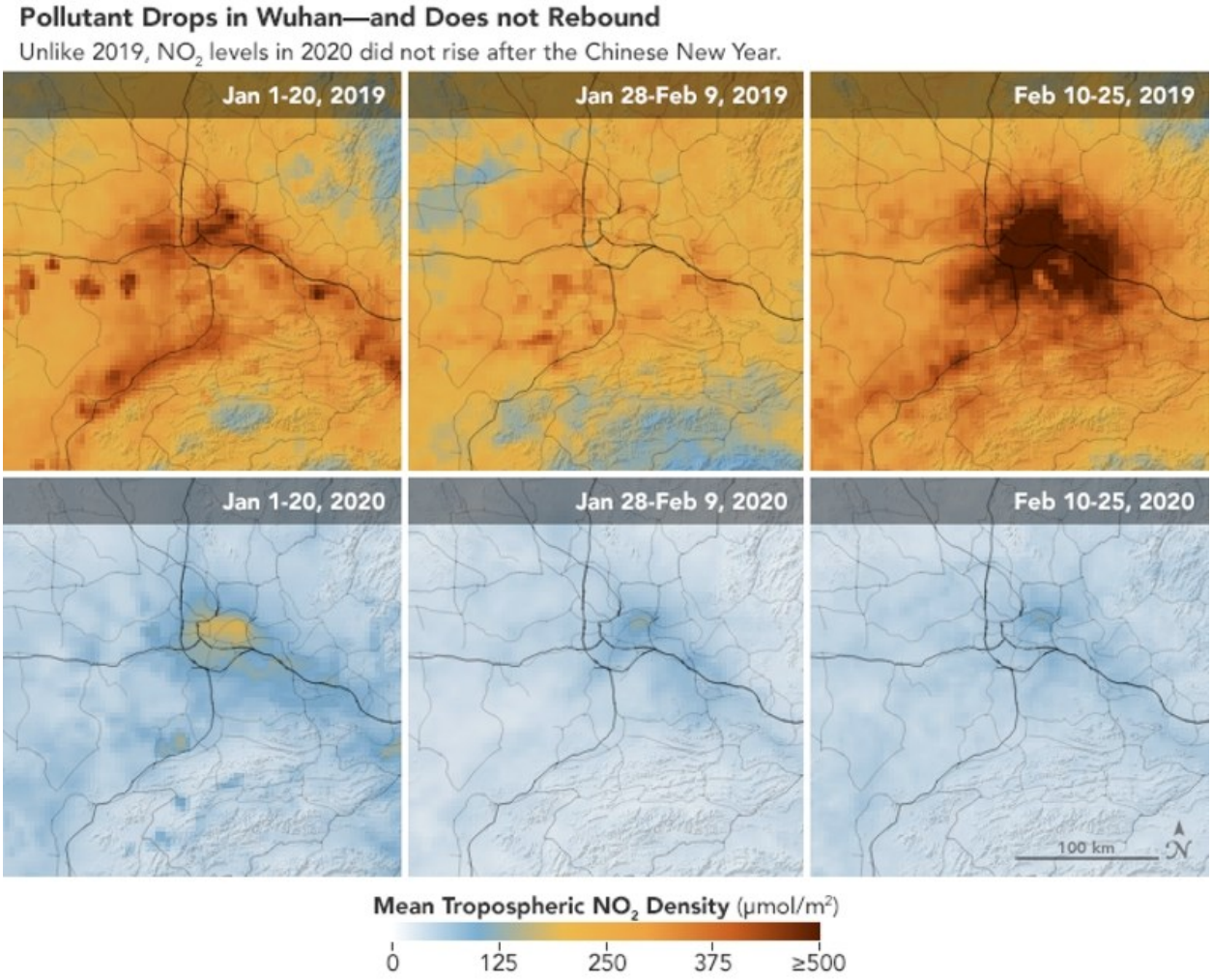
This view of viruses has implications for how risk management is managed. If our emphasis is on the idea of distinct realms to be kept at a distance, the emphasis is on identifying locations where the boundary between them is violated. This creates a dangerous intimacy. These "hotspots", which include locations such as wetlands, are now becoming key areas of intervention that need to be closed or monitored.

Climate is an influential driving force of vector-borne diseases. Infections caused by vectors have distinctive characteristics that determine pathogenicity. These include the rate of survival and reproduction of the vector, the level of activity of the vector (i.e. the rate of feeding) and the rate of development and reproduction of the pathogen in the vector or host. Climate change substantially affects the reproduction, development, distribution and seasonal transmission of diseases.

Five of the warmest years on record have occurred since 2010, when the rate of melting glaciers in Antarctica was highest, and global sea levels rose by eight centimeters in the last century. Many primordial viruses to which modern humans have reduced immunity have survived in the Arctic ice. Climate change is affecting ecosystems and allowing diseases to cross their invisible borders. As the tropical climate expands, diseases such as malaria and the Zika virus will become a threat in new locations. The WHO estimates that a 2-3 ° C increase can increase the risk of malaria by 5%. (Sfetcu 2020d)

Through direct action over the last hundred years, and especially in recent years, humans have destabilized the ecosystem by forcing many living things, including viruses, to find new hosts. According to Dr. Dawn Wright quoted by *Forbes*, the COVID-19 pandemic is an undesirable side effect of human destabilization of animal habitats: "The novel coronavirus was

very likely to have originated in bats," Wright said. "Through our activities, through our urbanization, through the ways that we treat wildlife, we are disrupting or destroying their habitats. Species such bats have to shift their distribution accordingly. As they move to get away from what is disrupting them or killing them, sometimes it brings them and their diseases closer to where people are." (Kantor 2020)



Images from NASA's Earth Observatory show a sharp drop in pollution in Wuhan when comparing NO2 levels in early 2019 (top) and early 2020 (bottom). Source: (Earth Observatory 2020)

Globalization allows infectious diseases to spread rapidly around the world. (Daulaire 2011) The world is more interdependent than at any other time in history. People move much faster than before, spreading disease faster and to more places. Before globalization, a virus was naturally

isolated. But at the same time, global transport and trade in agricultural products have made it possible to overcome species barriers.

When a population is infected with a new disease for which they have not developed antibodies through generations of previous exposures, the new disease tends to spread.

We are part of the biodiversity of this planet. And it is an integrated system, says Sean O'Brien President and CEO of NatureServe. According to the UN, we could lose one million species in the next two decades. And we don't really know the impact we have on the extinction of the species. (O' Brien 2020)

The German philosopher Markus Gabriel considers that the crisis triggered by SARS-CoV-2 is only the first of many, the most serious of which will be ecological. (Carbajosa 2020) But he hopes that we will emerge from the pandemic a more moral society and act more constructively in the climate crisis, to the detriment of globalization and neoliberalism.

Rob Wallace believes that the main causes of the pandemic are, in particular, the dynamics and pressures of a global economy. (Wallace 2013) He highlights agricultural practices and commercial interests as drivers of the spread of disease. Changes in animal husbandry, the way they are kept, circulated and processed, can lead to the emergence of potentially dangerous new strains. For example, Porcine Reproductive and Respiratory Syndrome (PRRS) emerged in the United States in the late 1980s and spread rapidly in the pig population around the globe, but became dangerous only when intensive farming became a common practice in closed shelters, while increasing the size of the herds, removing piglets from their mothers and introducing the widespread use of artificial insemination. (Más and Melero 2013)

Richard Sennett, a sociologist and professor at the London School of Economics, is concerned about the declining welfare state, which he says is due to current liberalism that has

limited the response to the crisis. (Sennett 2004) He believes that we need to return to the concept of individual housing in cities and we will need to rethink our growth.

Esther Duflo, Nobel Prize winner, believes that the challenge is to try to maintain jobs and wages once we have overcome the current situation, (Mars 2020) fearing that large companies will opt for automation.

Everything on our planet is connected. The disappearance of caterpillars, for example, may have a major impact on the ecosystem, including humans.

Economic globalization implies the interconnectedness of world economies and the interdependence of internal and external supply chains. (Conley 2000) As economies increase levels of integration, any global financial and economic turmoil can cause a global recession. (Peckham 2013)

Today, Europe is importing a viral epidemic. The epidemic creates more confusion here than in the place of origin. Europe is currently in a state of relative turmoil, between nations and between aspirations. The coronavirus pandemic is considered by Nancy and Esposito a product of globalization. (Nancy and Esposito 2020)

Now, eradicating the virus is no longer enough. The contagious brutality of the virus is spreading as administrative brutality. There is a need to select those eligible for treatment (plus existing economic and social injustices.)

The viral magnifying glass magnifies the contradictions of our society and our limitations.

2.2 Ethics

Sfetcu, Nicolae, "*Ethics in the pandemic*", SetThings (October 29, 2020), DOI: 10.13140/RG.2.2.36811.82728, URL = https://www.setthings.com/en/ethics-in-the-pandemic/

Skepticism calls into question the validity of some or all of human knowledge. (The Free Dictionary 2020b) It is a thread that goes through many philosophical discussions of epistemology. Moral skepticism holds that there is no knowledge of what is right and wrong, of good and evil. And the skepticism of the outside world is the thesis that there could be no knowledge of matters outside one's mind. (Sfetcu 2020a)

In fact, we are all skeptical of at least some of the senses, or knowledge. But skepticism is considered an evil among many philosophers, who have devised entire intellectual programs specifically to defeat the skeptics.

But there is a virtue of skepticism that is crucial to a healthy democracy. Ancient skeptical tradition says that intellectual humiliation is a virtue. It is not a weakness to admit that you do not know, that you have no answers.

Today, we live in a world that causes an almost instantaneous judgment. We are inundated with calls for outrage, support, indignation and sympathy. The explicit norm is that silence is a kind of complicity, and not expressing an opinion is itself an approval. (Messerly 2020)

We live in a world where information has become increasingly difficult to process. A world with sophisticated fake news and deep capabilities, combined with old manipulation techniques, as in George Orwell, a world where virtual life like the Matrix influences our decisions in the real world.

We suffer from confirmation prejudices. Moreover, our beliefs prevent us from detecting bad reasoning. According to a famous study, we are less likely to discover formal errors in arguments when we have conclusions that we consider agreeable. Our beliefs are not just things

we consent to, but things that determine us. The stakes of beliefs are high, and once we have them, we tend to keep them. (Messerly 2020)

Content providers compete for our attention, delivering more or less manipulative images and messages. We are encouraged to focus on instantaneous judgment, on the basis of which a purposeful narrative can be constructed, with a diet of information that protects us from unforeseen turns.

All these aspects are terrible for democracy. They can make us feel involved in the politics of the day, but it's just an increasingly elaborate issue or marketing. The real policy is of great commercial interests that are based only on our perceptions. When our judgmental capacities are outsourced in this way, we lose our real meaning.

The ancient skeptical tradition teaches us the importance of suspending judgment, even in the face of persistent appeals to the apparent reality. Aikin and Talisse, in *The Democratic Virtues Of Skepticism*, (Messerly 2020) urge us to step back immediately, not as a way to separate ourselves from the world, but as a strategy to appreciate it correctly. Suspension of judgment is a necessary precursor to the correct assessment of the appropriate degree of trust we should attach to a faith. In a democracy, the project of self-government between equal politicians urges us to intellectual humility. Judgments must depend on the evidence taken into account. We need to be open to new evidence, able to hear those we disagree with, to hear their reasons. This is true democracy; equality with those with whom we disagree. Skeptics believe that very few opinions deserve to be agreed, but they also believe that almost every point of view deserves to be taken seriously enough to be investigated. We must take the views of our fellow citizens seriously, because they are our equals. For this, we need to find a way to slow down our tendency to hastily form beliefs.

"Who decides what is best for an individual?" The principle of well-being may conflict with the individual interest of patients. Distributive justice considers fair access to care and resources. Remunerative justice is concerned with the sanctioning of crimes. (Riggs 2020)

In 2011, the U.S. Centers for Disease Control and Prevention (CDC) published a paper on the ethics of ventilator allocation during a pandemic, stating that

"The utilitarian rule of maximizing the number of lives saved is widely accepted during a public health emergency". (Centers for Disease Control and Prevention 2011)

Utilitarianism can generate significant personal, ethical, and practical moral barriers for health care providers:

"Covid-19 critical interventions - testing, PPE [personal protective equipment], ATI beds, ventilators, therapists and vaccines - go first to front-line health care workers and others who care for ill patients and who keep critical infrastructure operating, particularly workers who face a high risk of infection and whose training makes them difficult to replace". (Emanuel et al. 2020)

"[In a public health emergency], healthcare institutions and public health officials also have a duty to keep resources low, reflecting the humanitarian goal of saving as many lives as possible." (Institute of Medicine (US) 2009)

Immanuel Kant argued that individual, conscious choices and respect for other people are the foundations of moral life. But in the case of pandemics, doctors are being asked to give up these values and focus on the wider interests of society. (Kant 2017) (Riggs 2020)

Much of the applied ethics relates to three theories:

1. *Utilitarianism*, where the right policy is the one that leads to the greatest happiness, (Bentham 1988) (Mill 1863) with the initial difference between an act and a utilitarian morality, later the idea of motive or intention into morality, (Sidgwick 1874) and Peter Singer with the preference into moral decision-making. (Singer 2011)
2. *Deontological ethics*, based on "rules", with an obligation to perform the "correct" action, regardless of the real consequences (represented by the notion of categorical imperative of

Immanuel Kant), (Kant 2008and the natural law, developed by Thomas Aquinas. (Aquinas and Regan 2000)

3. *Ethics of virtue*, derived from the notions of Aristotle (Aristotle 1566) and Confucius, (Confucius 2013) which states that the right action will be that chosen by a suitable virtuous agent. (Sfetcu 2020a)

Consequentialism argues that the consequences of one's behavior are the fundamental basis of any judgment on the correctness of such behavior. Thus, from a consistent point of view, an act of moral right (or omission to act) is one that will produce a good result or consequence. The moral value of an action is determined by its potential consequence, not by a set of rules. Consequentialism is usually in contrast to deontological ethics (where rules and moral duty are central), the ethics of virtue (which focuses on the character of the agent), and the pragmatic ethics (which treats morality as science). (Scheffler 1988) (Sfetcu 2020a)

Utilitarianism states that the best action is the one that maximizes utility. Jeremy Bentham, the founder of utilitarianism, described utility as the sum of all the pleasures that result from an action, minus the suffering of anyone involved in the action. (Bentham 1988) There is currently disagreement about maximizing total utility (total utilitarianism) or average (average utilitarianism).

The largest medical institutions and various ethicists advocate a utilitarian approach in times of public health crises to maximize benefits for society, in direct conflict with our common (Kantian) view of respect for individuals. (Riggs 2020) A central problem with utilitarianism is that there is no clear way to evaluate moral choices, including in medical decisions. In general, Kantian medical ethics is respected in medicine. But in a pandemic, when resources are poor, deep choices of life and death must be made. In these situations, the principles of utilitarianism offer

the best answer, with the transition from a patient-centered thinking model to a society-centered thinking model.

Savulescu et al. addresses the issue of pandemic priority in *Utilitarianism and the pandemic*, with a focus on two issues: patient triage, and quarantine. They believe that utilitarianism is the only relevant ethical theory to maximize what is good for all (the principle of beneficence). Individual freedoms may conflict with the general good, so the question of the impartiality of the principle of beneficence is raised. (Savulescu, Persson, and Wilkinson 2020)

To differentiate between what is good and bad for the individual, Savulescu highlights hedonism (which supports the pursuit of pleasure and the avoidance of suffering as the only components of well-being, and that what we should do depends exclusively on what affects the well-being of individuals), (Shaver 2019) but it would be too narrow to differentiate between good and evil.

Although some moral theories argue that it is more important not to do harm than to do good, Savulescu believes that there is no significant moral difference between doing evil and omitting good.

The main versions of utilitarianism are act utilitarianism (which argues that an action is correct if it maximizes utility), and rules utilitarianism (which argues that an action is correct if it conforms to a rule that maximizes utility). (Sfetcu 2020a)

Richard Hare argued that moral thinking takes place on two levels, intuitive and critical, and that we should move between them depending on the circumstances. (Hare 1981) Triage rules can be justified by a form of rule utilitarianism that allows for quick intuitive decisions. "Critical level" utilitarianism involves choosing the action that maximizes the good when we think lucidly,

with all the facts at hand. In complex and urgent situations, Hare argues that we should use act utilitarianism.

Savulescu explores the implications of utilitarianism at a critical level for the current COVID-19 pandemic, and describes " plausible rules of thumb that would tend to maximize utility and would be useful in emergency and urgent situations." (Savulescu, Persson, and Wilkinson 2020) As rules of thumb, consider the number, probability, duration of treatment, and resources.

An interesting approach to utilitarianism is the idea that, while preventing COVID-19 may be cost-effective, it is not the most effective action from a utilitarian point of view. The Gates Foundation estimated that global eradication of malaria would cost much less (Gates and Chambers 2015) and save many more lives.

Quality of life may also be relevant: if the years of life saved by a pandemic lockdown were of low quality, it would negatively affect the overall benefits.

Triage generally focuses on whether or not treatment should be applied. According to utilitarianism, physicians should be prepared to refuse treatment to patients with a poor prognosis to allow treatment of patients with a better prognosis if they arrive later in the emergency department. Thus, for utilitarians the responsibility is not only of actions, but also of inactions.

Savuleascu emphasizes that the elaboration of rules for assessing the social value of people (who has priority) is complex from an ethically and epistemically point of view, susceptible to abuse and difficult to apply fairly. Utilitarianism at the critical level does not support such priority rules, being sensitive to potential abuse (social value can be easily abused by privileges and priorities).

Intentions are irrelevant to utilitarians; even if the consequences are unintended, we are still responsible for our actions, if the negative results are predictable and avoidable. Thus, the

authorities have a moral responsibility for choosing the wrong policy. But those who do not take care of their own health are also responsible, as there is a tendency to take this into account when allocating resources. (Friesen 2018) " Responsibility (or the disposition to behaviour that led to ill health) is only relevant for utilitarians insofar as it affects probability, length or quality of survival." (Savulescu, Persson, and Wilkinson 2020)

Psychological bias, intuition and heuristics sometimes matter in triage. Utilitarianism seeks to maximize the good, designed impartially.

Savulescu states that all these rules can be assembled into an algorithm for allocating ventilators and other resources. The algorithm divides the decision-making process into stages and gives priority based on different criteria depending on the availability of resources. Utilitarianism depends very much on accurate information and requires good evidence, being complementary to science.

According to utilitarianism, the right policy is the one that maximizes the well-being in general, at the level of all people in all countries, through a radical impartial equality - it is a theory without national borders.

For utilitarianism, freedom and rights are important only insofar as they ensure well-being. Utilitarianism favors a more coercive approach if it is more effective. But it is important that "the extent of the liberty restriction or rights violation should be commensurate with the effect on well-being." (Savulescu, Persson, and Wilkinson 2020)

Savulescu concludes that utilitarianism is a demanding and counterintuitive theory. Health policy is often misguided by politics or popular opinion, not ethics. Utilitarianism provides a clear framework for setting goals and priorities, and provides criteria for measuring success.

Wim Vandekerckhove proposes an approach to the COVID-19 pandemic through the prism of disaster management, or existentialist philosophy. (Vandekerckhove 2020) Thus, Tanguay-Renaud talks about public emergencies by wondering what kind of emergency can justify the state of emergency in which the duties and promises made create new responsibilities and roles. (Tanguay-Renaud 2009)

Bernard Williams defines "the first question of politics" as "securing of order, protection, safety, trust, and the conditions of cooperation." (B. A. O. Williams 2005)

M. Walzer discusses why, in a pandemic, the political community is put before family, friends, the religious or professional community. (Walzer 2006)

John argues that there are two ways in which actions are prohibited in emergencies: by adopting "threshold deontology" or rethinking the self-defense. (John 2009)

Melnick and Bernheim demonstrate how public health officials can use a code of ethics when making decisions about the allocation of ventilators, based on the principles of the code of ethics of public health, by building relationships to build biopreparedness. (Melnick and Bernheim 2009) This can create a consensus on resource allocation decisions. In this regard, in a paper on disaster management, Zack writes that

> "… preparation and response require plans and both kinds of plans have ethical aspects. Is there an ethics of disaster preparation planning distinct from an ethics of disaster response planning?", (Zack 2009, 55)

claiming that in previous pandemics there was inadequate disaster preparedness, only a disaster response. Zack discusses two models: Save the Greatest Number (SGN) and Save ALL that can be saved (SALL). While SALL has moral consensus, SGN is relative. SALL is the model we need to use in the preparation phase, and SGN will be used effectively in the pandemic, through medical triage. This can only be justified if there is a broad public debate, i.e. a political community. (Vandekerckhove 2020)

According to Wim Vandekerckhove, existentialism is another way of approaching the pandemic. In this regard, MacMillan et al. provides three key pieces of information: existentialism places a priority on the individual and the existential self, allows for a coherent examination of decision and ethics at the individual and organizational level, and is inherently "applied" and focused on the "process" by allowing an understanding of the meaning of work. (MacMillan, Yue, and Mills 2012, 27)

For Albert Camus, the absurd is caused by the conflict between our expectation of a rational and just world and the disappointment caused by the real world. This conflict can be overcome by a "leap of faith", accepting the irrationality of our choices. (Camus 1971) (Camus 1985)

It should be noted that such an approach, in which the protagonists accept what comes by playing their role, is also found in the most famous Romanian folk ballad, Miorița. (Baladă populară 2020)

Albert Camus emphasizes the importance of role-playing, and Vandekerckhove states that this acceptance of the role is not an excuse, but rather the basis for making exceptions and becoming authentic. This is what pandemic doctors do, they only fulfill their role by adopting the utilitarian approach. Despite the applause, says Vandekerckhove, they are not heroes. It just "plays their role." They cannot do more than that. (Vandekerckhove 2020)

Anthony B. Pinn, in *Humanism's Vulnerable Human*, (Pinn 2020) refers to Albert Camus's *La Peste* (Camus 1972) to compare the existential circumstances of particular times of anxiety and trauma, similar from there to the current pandemic period COVID-19. Pinn believes that we need to look for ways to absorb and process this reality of our lives, trying to understand the circumstances. Humanists try to understand this phenomenon in relation to a great unity of life:

"Camus reminds readers of the interconnected nature of all life—the manner in which human existence is tied to other modes of life, seen and unseen." (Pinn 2020)

The end of Camus's book emphasizes the idea that life is subject to the movement and activity of material forces that humans cannot control. According to Camus, the end of the plague is not a victory over death, but rather a pause in action. There are threats we cannot conquer. In this sense, the "plague" thus generates a feeling of perpetual rebellion; an understanding of the fact that we struggle to improve circumstances all our lives, "because we can, not because we will be successful," a clear reference to the myth of Sisyphus. If the fight is permanent, why fight again, if we don't win once and for all? *Le Mythe De Sisyphe Essai Sur L'absurde*, of Camus, ends with these words:

> "I leave Sisyphus at the foot of the mountain. One always finds one's burden again. But Sisyphus teaches the higher fidelity that negates the gods and raises rocks. He too concludes that all is well. This universe henceforth without a master seems to him neither sterile nor futile. Each atom of that stone, each mineral flake of that night-filled mountain, in itself, forms a world. The struggle itself toward the heights is enough to fill a man's heart. One must imagine Sisyphus happy."(Camus 1985)

Personally, I have always considered this idea to be perhaps the most important in life: the result is much less important than the way to get it.

Like Sisyphus, we will have to fight this virus all the time, just because we can. COVID-19 will be defeated at some point, but will not disappear. The threat will remain.

> "Things impact us, inform us, shape us—in a sense determine the nature and meaning of human life… we're not only part of the world, we're dependent upon a world that doesn't bend to our will and doesn't prioritize the criteria for our well-being." (Pinn 2020)

For individuals in a pandemic, Hiram Crespo proposes the Epicurean philosophy as a tool to manage their own lifestyle. (Crespo 2020) Like Aristippus of Cyrene, (Internet Encyclopedia of Philosophy 2020) who invented the ethics of pleasure, we should be adaptable and flexible, seeing opportunities for pleasure in any situation.

Epicurus advises us not to postpone our happiness. The moments of isolation spent in the pandemic are moments to make the most of intimate pleasures. We must take into account what is in our power to control.

In Epicurus' short *Letter to Menoeceus* about the fear of death and the fear of disease and pain, he says that nature sets the limits of all our pain and that since death is ignorance, the only way it makes us suffer it is waiting for something that we will not actually be there to experience. (Epicurus 2016)

The ancient Greek philosophers used the word *ataraxia* for the moral ideal of a quiet, pleasant, unperturbed feeling. Epicurus taught us that death is nothing to us. As long as we live, we should be concerned about the quality of our lives and the lives of those we love. (Crespo 2020)

3 COVID-19

Sfetcu, Nicolae, "*Life and death in a pandemic*", SetThings (October 20, 2020), DOI: 10.13140/RG.2.2.14848.25608, URL = https://www.setthings.com/en/life-and-death-in-a-pandemic/

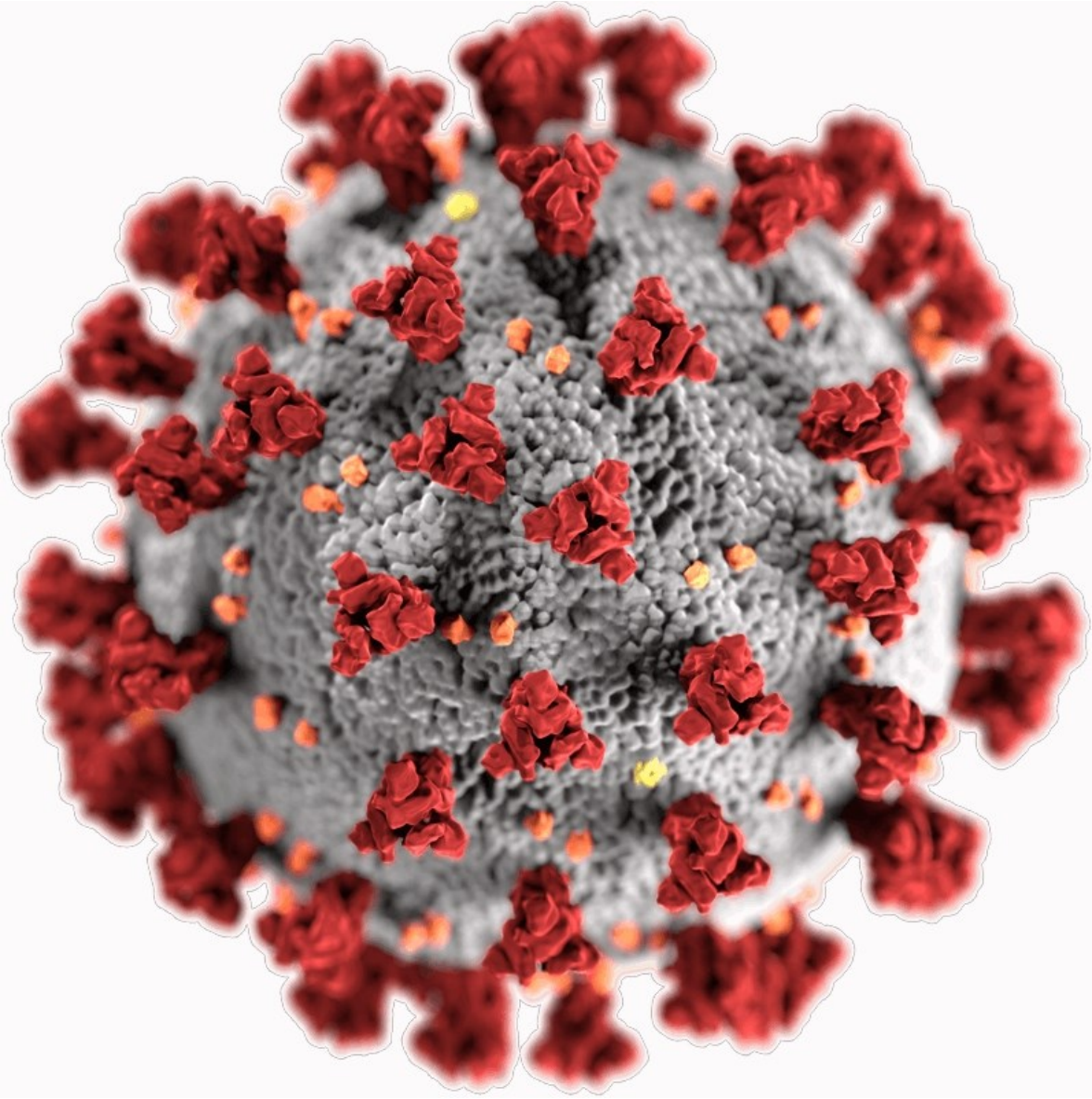
At the beginning of the crisis, the international media called China's strategy to combat coronavirus "tough", "extreme", "severe" and "controversial", stressing that it offered "no guarantee of success". (Qin, Myers, and Yu 2020) After the difficult experiences that other countries have gone through, " a crude and extreme version of the Chinese lockdown became the international norm." (Caduff 2020) Testing strategies differed from country to country and have changed in countries over time, and there was no agreement between experts and officials on what counts as death from the virus, this confusion influencing the data published by each country and making all comparisons in fact incomparable, creating "the sense of a major threat obscuring the differential nature of risk."

The lack of family doctors in rural areas and the low level of the public health system (Chrisafis 2019) have increased the pressure on hospitals in urban centers exceeding their capacity.

Caduff concludes that it is difficult to make predictions without the correct scientific methodologies, but “it is important to understand that the strategic combination of confusion, contradiction and the play of extreme opposites is foundational for authoritarian rule. Everything that instills a sense of disorder and that intensifies the crisis magnifies the desire for decisive action." (Caduff 2020)

Coronavirus is a RNA virus that causes infections of the respiratory tract of varying severity, from the common cold to lethal versions (SARS, MERS and COVID-19). The symptoms differ depending on the animal. For human coronavirus, there are still no vaccines or drugs to prevent or treat infections.

Coronavirus was discovered in the 1930s in domestic chickens. (Estola 1970) In the 1940s, two other animal coronaviruses were isolated. (McIntosh 1974) Human coronaviruses were discovered in the 1960s. (Kahn and McIntosh 2005) June Almeida, at St. Thomas Hospital in London, visualized the coronavirus by electron microscopy in 1967, later highlighting the morphological links between them. (Almeida 2008)



(Illustration of the SARS-CoV-2 virion (Giaimo 2020)
Red protrusions: spike proteins
Grey coating lipids, mainly
Yellow: envelope proteins
Orange: membrane proteins)

In 2003, following the outbreak of severe acute respiratory syndrome (SARS) in Asia, the World Health Organization (WHO) officially named the respective SARS-CoV coronavirus. More than 8,000 people were infected, about ten percent of whom died. (Li et al. 2005) A large number of human coronaviruses were subsequently identified, including HCoV NL63 in 2004, HCoV HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 in 2019. (Zhu et al. 2020)

A life cycle of a coronavirsul includes

1. Cell entry (Simmons et al. 2013)

2. Genome translation: the RNA genome of the virus enters the cell cytoplasm acting as an RNA messenger. (Fehr and Perlman 2015)

3. Replication - transcription: nonstructural proteins coagulate to form a complex that replicates and transcribes RNA from an RNA strand. (Fehr and Perlman 2015) By replication the viral genome is reproduced, (Fehr and Perlman 2015) and by transcription the complex is capable of genetic recombination when at least two viral genomes are present in the same infected cell. (Payne 2017, 17) RNA recombination determines the genetic variability of coronavirus. (Su et al. 2016)

4. Assembly and release: Replicated positive genomic RNA becomes the genome of descending viruses. RNA transcription takes place inside the endoplasmic reticulum. Interactions between proteins lead to the assembly of viruses, which are then released from the host cell by exocytosis and can infect other host cells. (Fehr and Perlman 2015)

5. Transmission: Carriers of viruses can transmit them in the environment (Cui, Li, and Shi 2019) depending on the coronavirus species, by aerosol, fomite or fecal-oral route. (Decaro 2011a) SARS coronavirus is transmitted through aerosols. (Decaro 2011b)

It is estimated that the first coronavirus appeared relatively recently, approx. 8000 BC, although some models place it 55 million years ago, involving a long-term coevolution with bats and avian species. (Wertheim et al. 2013) Bats and birds, as warm-blooded flying vertebrae, are an ideal natural reservoir for the coronavirus gene pool, allowing the evolution and extensive dissemination of coronaviruses. (Woo et al. 2012)

In December 2019, an outbreak of pneumonia was reported in Wuhan, China (Board 2020) with a new strain of coronavirus (World Health Organization 2020d) named 2019-nCoV by the World Health Organization (WHO), (World Health Organization 2020b) then renamed SARS-CoV-2 by the International Committee on Virus Taxonomy. The virus has a 96% similarity to the bat's coronavirus. (Cohen 2020)

The World Health Organization has declared the outbreak of COVID-19 an urgent public health concern on 30 January 2020, and a pandemic on 11 March. (World Health Organization 2020c) The pandemic has caused global social and economic disruption, the largest since the global recession triggered by the Great Depression, (IMFBlog 2020) and global famine that has affected 265 million people. (United Nations 2020a)

Among the first reactions from the beginning of the pandemic was the search for culprits for its beginning and spread. This has exacerbated prejudice, xenophobia and racism towards people of Chinese descent (Burton 2020) and conspiracy theories. People in Italy (the first country in Europe to experience a severe outbreak of COVID-19) also suffered from suspicion and xenophobia. (Nadeau 2020) Discrimination against Muslims in India has also escalated after Indian authorities identified a gathering of an Islamic mission group as a source of pandemic. (Kolachalam 2020) In Paris, ethnic minorities complained of discriminatory police actions during quarantine. (Dodman 2020) In South Korea, the LGBTQ community has been blamed by some for

the spread of the virus. (Thoreson 2020) Even in China, xenophobia and racism against non-residents, especially people of color, have increased during this period. (Asiedu 2020)

One of the most contested measures taken globally in the COVID-10 pandemic is social distancing (later called physical distancing to prevent the development of negative social associations). Methods of social distancing include quarantine; travel restrictions, closure of schools, workplaces, stadiums, theaters or shopping malls. (World Health Organization 2020a) Non-cooperation with distance measures in some areas has contributed to the further spread of the pandemic. Opposition to social distancing also came from some heterodox epidemiologists. (Farr 2020)

The pandemic has also affected political systems in several countries, leading to the suspension of legislative activities (Tumilty 2020) and the rescheduling of elections. (Corasaniti and Saul 2020)

The measures taken to combat the pandemic have allowed an unusually large expansion of government power, many sociologists are concerned that the state will hardly give up, after the mitigation of the pandemic, this power, there are many historical precedents in this regard.

In the opinion of Rocco Ronchi, (M. Foucault, Agamben, and Benvenuto 2020) the measures taken in the current pandemic confirm Foucault's thesis that the current power is biopolitical. He sees the virus as presenting the characteristic of an event, also possessing its "virtue" ("unlike simple facts, events possess a "virtue", a force, a property, a *vis*, that is, they do something"). The events are traumatic, producing transformations before taking place or even being possible. Thus, events generate the "real" possibility. It follows that the "virtue" of an event thus consists in making possible operational methods which "before" were simply impossible, unimaginable.

The philosopher Slavoj Zizek, in *Coronavirus is 'Kill Bill'-esque blow to capitalism and could lead to reinvention of communism (Op-Ed)*, states that "the coronavirus will also compel us to re-invent communism based on trust in the people and in science", against racism and the spread of new nationalisms. The virus would thus have dealt a severe blow to capitalism. (Zizek 2020)

Byung-Chul Han, in *La emergencia viral y el mundo de mañana. Byung-Chul Han, el filósofo surcoreano que piensa desde Berlín*, sees the individual as a possible active player who does not consider transformation to be safe. Human reason will have to defeat the virus. (Han 2020)

Giorgio Agamben, in *L'invenzione di un'epidemia*, argued that quarantine measures strengthen government mechanisms against individual freedoms. (Agamben 2020c)

Jorge González Arocha, in *Philosophy, Social Death and the Necessary Ethical Turn After Covid-19,* discusses the social death and ethical transformation involved in the COVID-19 pandemic. A crisis of the way we live, but also of the way we die. (Gonzalez Arocha 2020) In the philosophy of death, against the current COVID-19 pandemic, Arocha distinguishes several chronological stages: the first stage was ignorance, almost denial, when the virus was seen only as something unlikely. Later, images of the dead began to appear, the death becoming real, with involved medically, sociologically and politically problems. An intermediate stage (especially in the USA) was the one that denies the true nature of the virus. Demonstrations and protests against quarantine followed, and the denial of the virus's effectiveness as a denial of the possibility of death. The situation we are in today reveals the weakness of the mechanisms built to hide real death. In the end, the economic crisis comes to be considered more important than any other existential crisis.

For the analysis of the COVID-19 pandemic, Dodds and Settemsdal use their own concept, ecopsychoanalysis, a dialogue between psychoanalysis, science, philosophy, complexity theory, aesthetics and ecology, with a special emphasis on our relationship with the inhuman and climate change. (Dodds 2020) Ecopsychoanalysis considers the earth and the mind as intertwined, interconnected in a multitude of ensembles and developments. COVID-19 asks us to explore the strange ecology of nature that revolves around us and threatens to destroy us.

The virus gave us a chance to take a break and "rethink the runaway train of our civilization before it smashes into the ecological wall toward which it has been hurtling with accelerating speed, and shows how quickly society can actually change." Coronavirus, says Dodds, makes us all too aware of the problem of death, an obsession we try to get rid of as we follow the daily balance sheets of the dead and the exponential growth curves. (Dodds 2020) According to Freud in *Thoughts for the Times on War and Death*: (Freud 1964) ”We showed an unmistakable tendency to put death on one side, to eliminate it from life. We tried to hush it up,” an attitude towards death which “has a powerful effect on our lives. Life is impoverished, it loses in interest.” Like war, pandemics sweep away the “conventional treatment of death. Death will no longer be denied; we are forced to believe in it… Life has, indeed, become interesting again.” War and pandemics, Dodds says, while inevitable, must be resisted. (Dodds 2020) But being forced to face death makes us feel alive even as we die. War, Freud continues, “strips us of the later accretions of civilization, and lays bare the primal man in each of us. It compels us once more to be heroes who cannot believe in their own death; it stamps strangers as enemies, whose death is to be brought about or desired; it tells us to disregard the death of those we love.” For Camus too there can be no final victory against death: “the plague bacillus never dies or disappears for good . . . the day would

come when, for the bane and the enlightening of men, it would rouse up its rats again and send them forth to die in a happy city." (Freud 1964) (Dodds 2020)

Albert Camus also states that there can be no final victory against death: "the plague bacillus never dies or disappears for good . . . the day would come when, for the bane and the enlightening of men, it would rouse up its rats again and send them forth to die in a happy city."

"Each of us has the plague within him . . . we must keep endless watch on ourselves lest in a careless moment we breathe in somebody's face and fasten the infection on him. What's natural is the microbe. All the rest, health, integrity, purity . . . is a product of the human will, of a vigilance that must never falter." (Camus 1972) (Dodds 2020)

The ecological strangeness of the coronavirus, says Dodds, gives us a chance to rethink what is really important, and the chance of a global culture. COVID-19 has led to the dramatic destabilization of the world's economic and social systems, with unpredictable and complex results. (Dodds 2020)

Freud acknowledged that solidarity in the face of a natural catastrophe is "one of the few gratifying and exalting impressions which mankind can offer." It is being tested today, when humanity is facing one of the greatest crises in its modern history. (Freud 1964) (Dodds 2020

3.1 Biopolitics

Sfetcu, Nicolae, "*Biopolitics in the COVID-19 pandemic*", SetThings (October 28, 2020), DOI: 10.13140/RG.2.2.29380.04488, URL = https://www.setthings.com/en/biopolitics-in-the-covid-19-pandemic/

Biopower is a term coined by Michel Foucault, referring to the practice of modern nation-states by "an explosion of numerous and diverse techniques for achieving the subjugations of bodies and the control of populations". (Michel Foucault 1990, 140) Foucault used the term to refer specifically to public health practices, among other regulatory mechanisms. Biopower control people in large groups, through an *anatomo-politics of the human body*, and *biopolitics of the population* through social institutions of discipline. Power is codified in both social practices and human behavior, as the human subject gradually accepts subtle regulations and expectations of the social order. (Policante 2010)

> " By this I mean a number of phenomena that seem to me to be quite significant, namely, the set of mechanisms through which the basic biological features of the human species became the object of a political strategy, of a general strategy of power, or, in other words, how, starting from the 18th century, modern Western societies took on board the fundamental biological fact that human beings are a species. This is what I have called biopower." (Michel Foucault et al. 2009, 1)

A specific way of applying biopower is what Foucault calls "*massifying*", (Michel Foucault et al. 2009, 55–86) which uses scientific apparatus and equipment. This anatomo-politics of the human body correlates with the new knowledge of science and technology under the guise of a liberal democracy, where life itself becomes a deliberate political strategy and an economic, political and scientific problem, to which the nation state is coupled.

Foucault argues that while the stated purpose of biopower is to maximize life, it also has a dark side: when the stakes are life itself, anything can be justified by the state, thus being able to easily eliminate groups identified as threatening the life of the nation, or of humanity. (Michel Foucault 1990, 137)

Foucault draws attention to what he calls the major political and social project, namely the "*milieu intérieur*" (inner environment), as a support for the truths uttered by the authorities. In the modern version, the government is thus presented to the population in the media as a means of efficiency, fiscal optimization, political responsibility and rigor, forming a public discourse of government solidarity and social consensus. (Michel Foucault et al. 2009, 283)

Biopolitics is a concept that takes into account the management of the life and populations of a governed region. According to Foucault, biopolitics is "to ensure, sustain, and multiply life, to put this life in order." (Michel Foucault 1990) So, the poststructuralist meaning given by Foucault to the term denotes social and political power over life.

Foucault speaks of a style of government that regulates populations through "biopower" in all aspects of human life. (Michel Foucault et al. 2009, 1) Agni Vlavianos Arvanitis (Pellam 2015, 43) considers biopolitics as a conceptual and operational framework for the development of society, promoting bios as a central theme in all forms of life. (Tolba 2001, 1027)

Biopolitics produces a generalized disciplinary society (Michel Foucault et al. 2009, 377–78) and regulatory controls through biopolitics of the population. (Michel Foucault et al. 2009, 378,397) Foucault states that the humanities, especially the medical sciences, have led at the emergence of the anatomo-politics of the human body, a biopolitics and bio-history of man.

Foucault's biopolitics refers to the intersection between power (political, economic, judicial, etc.) and the bodily autonomy of the individual. (Schirato, Danaher, and Webb 2012, 90) In the study of colonialism, biopolitics is the means by which a colonizing force uses political power to regulate and control the colonized population. (Said 1979, 113) Mercantilism has often allowed for a biopolitical approach to hunger, with multiple historical examples.

Foucault's concept of *biopolitics* is derived from his own concept of *biopower* and the extension of state power over the physical and political bodies of a population. (Lemke, Casper, and Moore 2011) Biopolitics acts as a control apparatus exercised over an entire population. (Michel Foucault 2003, 242)

Giorgio Agamben is a well-known Italian philosopher who investigates the concepts of the state of emergency, the way of life (borrowed from Ludwig Wittgenstein) and the *homo sacer*. The concept of biopolitics (starting from the work of Michel Foucault) is found in many of his writings.

Agamben says that what is manifesting in this pandemic is the growing tendency to use the state of emergency as a normal paradigm of government, through a militarization of those areas where there are people proven to be infected. Such a formula will allow the government to quickly extend the state of emergency to all regions. He lists a number of serious restrictions on freedom imposed by pandemic restrictions. These restrictions would be disproportionate to the real threat. Once terrorism is exhausted as a justification for exceptional measures, "epidemics could provide the ideal pretext for expanding these measures, beyond any limitation." (Agamben 2020c) Thus, "in a vicious circle, the restriction of freedom imposed by governments is accepted in the name of a desire for security, which was created by the same governments that now intervene to satisfy it." (Agamben 2020)

Agamben notes that

> "Faced with the frantic, irrational and completely unfounded emergency measures adopted against an alleged epidemic ... why the media and the authorities are doing everything possible to spread a state of panic, thus causing a genuine state of emergency, with serious limitations to move and suspend daily life in entire regions?" (Agamben 2020c)

Later, Agamben returns with some clarifications (Kotsko 2020a) introducing the concept of "*naked life*": "The first thing that the panic wave, which paralyzed the country, clearly showed, is that our society believes in nothing but naked life." People

> "… are prepared to sacrifice practically everything – normal living conditions, social relations, work, even friendships and religious or political beliefs – to avoid the danger of falling ill. The naked life, and the fear of losing it, is not something that brings men and women together, but something that blinds and separates them. Other human beings, like those in the plague described by Manzoni, are now seen only as potential contaminators to be avoided at all costs or at least to keep at a distance of at least one metre. The dead – our dead – have no right to a funeral and it's not clear what happens to the corpses of our loved ones. Our fellow humans have been erased and it's odd that the Churches remain silent on this point. What will human relations become in a country that will be accustomed to living in this way for who knows how long? And what is a society with no other value other than survival?"

> "Men have become so used to living in conditions of permanent crisis and emergency that they don't seem to notice that their lives have been reduced to a purely biological condition, one that has lost not only any social and political dimension, but even any compassionate and emotional one. A society that lives in a permanent state of emergency cannot be a free one. We effectively live in a society that has sacrificed freedom to so-called "security reasons" and as a consequence has condemned itself to living in a permanent state of fear and insecurity." (Kotsko 2020)

According to Agamben, we've come to talk about the virus in terms of war. A war against an invisible enemy. "The enemy isn't somewhere outside, it's inside us." (Kotsko 2020)

In *A Question*, Giorgio Agamben returns with an approach to "social distancing" as the new principle of organizing society, decreeing that "a norm that affirms that we must renounce the good to save the good is just as false and contradictory as that which, to protect freedom, orders us to renounce freedom." (Kotsko 2020b)

In *New Reflections*, Agamben, states that, with this forced isolation, we live a new totalitarianism. It is always dangerous to entrust doctors and scientists with decisions that are ultimately ethical and political. (Dean 2020)

In *Medicine as Religion*, Giorgio Agamben: states (Agamben 2020b) that in the modern West coexist three major belief systems: Christianity, capitalism and science, which sometimes intersect. The novelty consists in the fact that between science and the other two faiths, without noticing, an underground and relentless conflict was triggered, with successful results for science. In science, medicine occupies a special place, being characterized by

- does not need a special dogma, but is limited to borrowing its fundamental concepts from biology - there is a god or evil principle, namely disease, whose specific agents are bacteria and viruses, and a beneficent god or principle that is not health, but recovery, whose cultic agents are drugs and therapies
- the phenomenon has become permanent and ubiquitous - it is no longer about taking medication, doctor visits or surgery: all our lives we must worship this cult moment by moment, because the enemy, the virus, is always present and must be fought constantly
- the practice of worship is no longer free and voluntary - it becomes mandatory from a normative point of view
- the medical religion has unreservedly taken over the eschatological urgency from Christianity - the medical religion combines the perpetual crisis of capitalism with the Christian idea of an end time
- like capitalism and unlike Christianity, the medical religion does not offer the prospect of salvation and redemption - recovery is only temporary, as the evil God, the virus, cannot be eliminated once and for all.

"Philosophers must again come into conflict with religion, which is no longer Christianity, but science, or that part of it which has taken the form of a religion." (Agamben 2020b)

Patrick Zylberman described, in 2013, the process by which health security becomes an essential part of state and international policy strategies, (Flahault et al. 2016) (M. Lewis 2020) by creating a kind of "health terror" as a tool for governance. Zylberman points out that the apparatus used by the WHO was articulated in three points: 1) the construction, on the basis of a possible risk, of a fictitious scenario allowing the government of an extreme situation; 2) adopting the logic of the worst case scenario as a regime of political rationality; 3) the organization of all citizens in a way that strengthens government institutions, through which the imposed obligations are

presented as evidence of altruism and the citizen no longer has the right to health but is legally obliged to be healthy (*biosecurity*).

Agamben considers, in *Biosicurezza*, (Agamben 2020a) that the emergency situation can allow the design of a governance paradigm whose effectiveness will go beyond any normal form of governance. Thus, biosecurity has already proved capable of causing the absolute cessation of all political activities and all social relations as the maximum form of civic participation.

> "In question is a whole conception of the destinies of human society from a perspective that, in many respects, seems to have adopted the apocalyptic idea of the end of the world from the religions that are now at their west. After replacing politics with the economy, now, in order to ensure governance, even this must be integrated with the new paradigm of biosecurity, in front of which we will have to sacrifice all other requirements. It is legitimate to ask whether such a society can still be defined as human or whether the loss of sensitive relationships, face, friendship, love, can really be compensated by an abstract and supposedly completely fictitious health security." (Agamben 2020a)

Jean-Luc Nancy, in *Excepción viral*, (Nancy 2020b) states that Agamben fails to observe that exception really becomes the rule in a world where technical interconnections reach a hitherto unknown intensity.

Many critics of Agamben consider his statements to be paranoid and exaggerated. (Peters 2020) Thus, J. L. Nancy responds by emphasizing:

> "We must be careful not to reach the wrong target: an entire civilization is in question, there is no doubt about it. There is a kind of viral exception - biological, computer, cultural - that is pandemic. Governments are nothing more than gloomy executors, and questioning them seems like a diversionary ploy rather than a political reflection." (Nancy 2020)

Regarding Agamben's statements, Slavoj ŽiŽek wonders (Žižek 2020b) why would the state power be interested in promoting such a panic, which generates distrust of state power and disrupts the economy? Measures in the event of an epidemic should not be automatically reduced to the usual paradigm of surveillance and control propagated by thinkers such as Foucault. The problem is that these measures may not be effective, and the inefficiency may be hidden by the authorities that will manipulate and hide the real data.

Roberto Esposito, in *Curati a oltranza*, discusses Nancy's strong opposition to the paradigm of biopolitics, but there is no denying the constant development of biopolitics. (Esposito 2020) The state of emergency pushes the policy towards "exceptional procedures that may, in the long run, undermine the balance of power in favor of the executive branch". But he believes the risks to democracy are an exaggeration. Politics and medicine have been interconnected for at least three centuries, which has led to a process of medicalization of politics and a politicization of medicine.

John Cassidy (Cassidy 2020) states that it is too early to reject Agamben's theory because it may prove correct especially as the time of the US elections approaches: it is possible that Trump will use the "state of emergency" to take exceptional governmental powers to declare a postponement for a year or two." (Peters 2020)

Shaj Mohan, in *What Carries Us On*, (Mohan 2020) talks about Gandhi's principles of hypophysics, according to which nature is good, following Kant's taxonomy of moral thinking. (Mohan, Dwivedi, and Nancy 2018) Following an analogy-based reasoning, he concludes that the theory of "biopolitics" is itself a kind of hypophysics, the other part of hypophysics being the technological determinism. In contrast, biopolitics and other theories make us immobile and resigned like animals caught in headlights.

Panagiotis Sotiris considers that notions such as "biopolitics", "naked life," or "state of emergency", developed by Giorgio Agamben and debated by many philosophers, are a clear example of failure to respond to the challenges of the pandemic. (Sotiris 2020) It proposes a rethinking of biopolitics, as formulated by Michel Foucault, (Michel Foucault 1990, 139–40) proposing a democratic biopolitics, "also be based on the democratization of knowledge. The increased access to knowledge, along with the need for popularization campaigns makes possible

collective decision processes that are based on knowledge and understanding and not just the authority of experts." (Sotiris 2020)

Daniele Lorenzini, in *Biopolitics in the Time of Coronavirus*, proposes a completely different understanding of biopolitics from Michel Foucault's notion. (Lorenzini 2020) Inventing the notion of biopolitics, Foucault wanted first of all to make us aware of the historical passage of a threshold, of what he calls the "threshold of biological modernity" of a society. (Michel Foucault 1990, 143) Thus, " Our society crossed such a threshold when the biological processes characterizing the life of human beings as a species became a crucial issue for political decisionmaking," at the same time remaining faithful to Foucault's idea that power is not good or bad in itself, but that it is always dangerous.

According to Lorenzini, biopolitics is always a policy of differential vulnerability, which "structurally relies on the establishment of hierarchies in the value of lives, producing and multiplying vulnerability as a means of governing people." (Lorenzini 2020) In this regard, Lorenzini states that the "medical heroes" and "care workers" who "fight the coronavirus" certainly deserve our appreciation, but are they really the only ones who "taking care" of us? After all, don't all workers deserve - and not exclusively in these "exceptional" circumstances - to be considered "heroes"? The virus blatantly reveals that "our society structurally relies on the incessant production of differential vulnerability and social inequalities."

3.2 Neocommunism

Sfetcu, Nicolae, "*Through the pandemic, towards a new communism?*", SetThings (November 1, 2020), DOI: 10.13140/RG.2.2.12914.12484, URL = https://www.setthings.com/en/through-the-pandemic-towards-a-new-communism/

Following the declaration of the COVID-19 pandemic, Slavoj Žižek published a book called *Pandemic !: COVID-19 Shakes the World* (Žižek 2020a) which triggered a wave of reactions. In the book, he presents how the media ruthlessly exploited this subject, accentuating the panic. Many major studies have predicted the emergence of such a pandemic, but have been ignored by all governments, declaring them to be exaggerated.

Žižek believes that the current pandemic has led to the bankruptcy of the current "barbaric" capitalism, wondering if the path that humanity will take is a neo-communism (he describes himself as a "radical leftist" and a "communist in a qualified sense").

"The threat of virus contagion provided us with new forms of solidarity and clarified the need for control over power. On account of our efforts to save humanity from self-destruction, we are creating a new kind of humanity." (Hadar 2020)

Žižek argues these ideas with the pandemic socio-political measures of German Chancellor Angela Merkel and the President of France, and the temporary nationalization of the railways by Boris Johnson. "Even [US President Donald] Trump transferred billions of dollars to the public. He issued calls to take over the private sector insofar as medical supplies are concerned." (Hadar 2020)

But it can still be a form of sophisticated capitalism that tries to save itself through unique, seemingly socialist temporary actions. Like Bruno Latour, (Latour 2020) Žižek considers that the current crisis is part of a continuous and irreversible process of ecological change.

Žižek believes that we needed catastrophes to be able to meditate again on the society in which we live. The epidemic is a variation of the "five point palm exploding heart technique," a term specific to Žižek that appears in the films *Shaw Brothers*, *Clan of the White Lotus*, and *Executers of Shaolin*. The term is used by the protagonist in the movie *Kill Bill: Volume 2*: (Tarantino 2004) five quick sword blows, one after the other, to the heart region, which will explode.

The moral task during this pandemic is to alleviate suffering, not to "save." The daily routine of daily freedom is almost impossible in our pandemic days. In time, it will turn into nostalgia. We will have to invent a new way of life, new rituals. Life so far will not return.

In these times, it is important to turn to humanism. Ordinary people are preoccupied with their daily problems, with no connection to any ideology.

Žižek states that he fears a "human-faced barbarism" - a survival by forced inhuman means, albeit sympathetically, based on expert advice, along with messages that undermine the cornerstone of our social ethics.

Žižek's book highlights three post-pandemic development trends: the Trump model of ruthless capitalism, the optimistic European model, and the Chinese model. (Hadar 2020) Žižek's fear is a permanent, Matrix-type isolation.

China will probably emerge as the most effective superpower in fighting the pandemic, compared to the poorly organized systems centered in Washington and Brussels. After a crisis of legitimacy, between an incompetent Western barbarism and an effective Eastern totalitarianism, Žižek predicts the emergence of a latent "communism". By "communism", Žižek means the need for a "global organisation that can control and regulate the economy as well as limit the sovereignty of nation states when needed." when nation states are needed and a "shift away from the market."

Coronavirus epidemics can give a new impetus to the life of communism." (Žižek 2020a) This trend is already seen in the massive mobilization of state resources for the payment of wages, in the nationalization of services and direct industrial production. "When Donald Trump is issuing cheques to millions of Americans, and a Conservative British government is effectively nationalising the railways, old orthodoxies melt into air." (Koshy 2020)

This new kind of solidarity is not based on idealistic slogans of the left, but on a necessity. "Communism is the translation of this epidemiological reality into a durable politics." (Koshy 2020)

The rolls of toilet paper are a prime example of Western bourgeois culture, a heyday of consumer capitalism. (Peters 2020) The Western panic purchase of these products, based on a viral rumor, is an example of creating the problem of lack. Strahle and Bonfield note that " [p]anic, as historically conceived, has been represented as a polar case of collective disorganization …. clearly resting beyond the explanatory power of economic theories which depend on the rationality assumption." (Strahle and Bonfield 1989) The argument of "cumulative collective irrationality" contradicts the theory of efficient markets.

In *Monitor and Punish? Yes, Please!*, Slavoj Žižek wonders who will still be able to shake hands and hug? Privileged, he replies. The financial elite will retreat to isolated areas and have fun there with stories in the style of Bocacio's *Decameron*. (Boccaccio 2003)

> " We, ordinary people, who will have to live with viruses, are bombarded by the endlessly repeated formula “No panic!”… and then we get all the data that cannot but trigger a panic. The situation resembles the one I remember from my youth in a Communist country: when government officials assured the public that there was no reason to panic, we all took these assurances as clear signs that they were themselves in a panic.” (Žižek 2020a)

In this paper, Žižek clarifies that when he spoke of the fact that the coronavirus epidemic could give a new impetus to the life of communism, he did not think of China, "this is not the Communism I have in mind," arguing with public statements. of WHO:

> "WHO chief Dr. Tedros Adhanom Ghebreyesus said Thursday that although public health authorities across the globe have the ability to successfully combat the spread of the virus, the organization is concerned that in some countries the level of political commitment does not match the threat level. 'This is not a drill. This is not the time to give up. This is not a time for excuses. This is a time for pulling out all the stops. Countries have been planning for scenarios like this for decades. Now is the time to act on those plans,' Tedros said. 'This epidemic can be pushed back, but only with a collective, coordinated and comprehensive approach that engages the entire machinery of government." (Berlinger 2020)

Or, as Will Hutton said: "Now, one form of unregulated, free-market globalization with its propensity for crises and pandemics is certainly dying. But another form that recognizes interdependence and the primacy of evidence-based collective action is being born." (Hutton 2020)

The coronavirus epidemic not only signals the limit of market globalization, but also the limit of nationalism, of state sovereignty. Humanity can only be saved through global coordination and collaboration. (Žižek 2020a) And this would be true for all deeper crises.

Some cynics would be tempted to see the coronavirus as a beneficial infection that allows humanity to get rid of the old, the weak and the sick, and there are signs of reduced unconditional solidarity, ŽiŽek arguing that the final choice is either a brutal logic of survival, or a kind of reinvented communism. Even when life returns to normal, it will not be the same normal as before; we will have to learn to live a much more fragile life, with constant threats hiding right around the corner. (M. Lewis 2020)

Žižek explains here a term he developed starting from a specific technique of sword blows in the heart area, the "five point palm exploding heart technique". He argue this concept from *On Death and Dying*, (Kübler-Ross and Ira Byock 2014) in which Elisabeth Kübler-Ross proposed five stages of how we react to the knowledge that we have a terminal illness: denial, anger, negotiation, depression and acceptance, steps considered by Elisabeth Kübler-Ross to be valid for any form of catastrophic personal loss. These five steps can also be applied to society in the event of traumatic crises. In the case of the coronavirus epidemic, there was first a denial (there is no

such thing), then anger (sometimes racist), followed by negotiation (we can limit the damage), depression (we are all doomed), and finally acceptance, which it can take two directions: accepting the disease, or acting in collective solidarity.

As Agamben speaks of "naked life", (Kotsko 2020a) Žižek says that we should reconcile with "the undead", a threat to our very survival, exploding when we least expect it. Viruses are considered to be “non-living chemical units or sometimes as living organisms.” This oscillation between life and death is crucial: viruses are neither alive nor dead in the usual sense of these terms. They are the living dead: a virus is alive due to its drive to replicate, but it is a kind of zero-level life, a biological caricature not so much of death-drive as of life at its most stupid level of repetition and multiplication.” (M. Lewis 2020)

Jean-Luc Nancy speaks of "communovirus": a virus that comes from communism, a virus that communizes us. (Nancy 2020a) It is still too early to know how to designate the society produced by this combination, if it will be communist and how the virus has affected individual competition, but so far COVID-19 has allowed China to demonstrate the effectiveness of the collective and state aspect of its system.

The virus communicates to us. It puts us on an equal footing, paradoxically isolating each of us. This need for unity, interdependence and solidarity, together with the decrease in air pollution due to the reduction of transport and industry, have led some sociologists to speak of the collapse of techno-capitalism.

The COVID-19 pandemic provides an ideal philosophical and political experiment, to which Western governments have responded very differently. Panagiotis Sotiris (Sotiris 2020) argues that the transition from the power of the sovereign as a right to life and death to the state guarantee of the health and productivity of the population

”Faced with the frenetic, irrational and entirely unfounded emergency measures adopted against an alleged epidemic of Faced with the frenetic coronavirus…. why do the media and the authorities do their utmost to spread a state of panic, thus provoking an authentic state of exception with serious limitations on movement and a suspension of daily life in entire regions?." (Agamben 2020c)

The paradigm of biopolitics, Foucault's concept for the administration of life and a territory, should be complemented by that of bioinformation, in which the forces of biology and information coagulate in bioinformational capitalism. (Peters 2020)

In *Is Barbarism with a Human Face Our Fate?*, Slavoj Žižek states that radical changes are already taking place in the current pandemic, against which a mega-economic crisis will follow. "The impossible happened, our world has stopped." (Žižek 2020c)

Žižek says he fears barbarism with a human face - ruthless surveillance measures but legitimized by expert opinions. The authorities urge us to be calm and confident, but at the same time come up with terrible forecasts for long periods of time, suggesting that we will have to reduce the basic premise of our social ethics: caring for the elderly and the weak. This pandemic utilitarianism violates even the basic principles of Kantian ethics with which we are accustomed. Hospitals are already doing the same with patients suffering from other diseases.

The fight against coronavirus can only be waged together with the fight against ideological mystifications, plus as part of a general ecological fight, which includes nature. In these efforts, we must keep in mind that we are in a triple crisis: medical (epidemic), economic, and mental health.

Žižek reaffirms that he spoke of a communism imposed by the need for survival, a version of what, in the Soviet Union of 1918, was called "war communism." We are all socialists in a crisis but, he wonders, will this forced socialism be socialism for the rich (like saving the banks in 2008 while millions of ordinary people lost their small savings)? "Will the epidemics be reduced to

another chapter in the long sad story of what Naomi Klein called “disaster capitalism,” or will a new (more modest, maybe, but also more balanced) world order emerge out of it?" (Žižek 2020c)

Srecko Horvat also states in an interview that the virus opens an eschatological threat almost forgotten by the West, which, together with the climate crisis, creates a dystopian vision of the future. Fear has become the main currency; no one really believes the authorities anymore. " Coughing today has become almost a terrorist act." (Pogačar 2020)

> "Today's reality is already much worse than Orwell's 1984, it seems closer to Aldous Huxley’s, a sort of narco-capitalism in which technology anaesthetises the social body to a degree that many are not even aware anymore that they are enslaved. Ironically, coronavirus stopped the global machine, at least for a moment, and even showed that it is, in fact, possible to radically stop carbon emissions. ... The only alternative, if we don't organise and mobilise, is barbarism." (Pogačar 2020)

3.3 Desocialising

Sfetcu, Nicolae, "*Desocialization in and after the pandemic*", SetThings (November 5, 2020), DOI: 10.13140/RG.2.2.35832.06405, URL = https://www.setthings.com/en/desocialization-in-and-after-the-pandemic/

Social isolation (*desocialization*) implies a complete or almost complete lack of contact between an individual and society. This can be a problem for people of any age, although the symptoms may differ depending on the age group. (Khullar 2016) Social isolation can include staying home for long periods of time, and lack of face-to-face communication with family, acquaintances, friends, or co-workers. Social isolation can lead to feelings of loneliness, fear of others or negative self-esteem.

> "The magnitude of risk associated with social isolation is comparable with that of cigarette smoking and other major biomedical and psychosocial risk factors. However, our understanding of how and why social isolation is risky for health – or conversely – how and why social ties and relationships are protective of health, still remains quite limited." (House 2001)

Social isolation can contribute to " poorer overall cognitive performance and poorer executive functioning, faster cognitive decline, more negative and depressive cognition, heightened sensitivity to social threats, and a self-protective confirmatory bias in social cognition." (Cacioppo and Hawkley 2009) Wilson et al. reported that social isolation increases cognitive decline and the risk of Alzheimer's disease, (Wilson et al. 2007) contributing to a vicious cycle in which the person becomes increasingly isolated.

Kanai et al. reported that loneliness was negatively correlated with the density of gray matter in an area involved in the perception of biological movement, mentalization, and social perception. (Kanai et al. 2012)

Juan Arnau Navarro says that one of the concepts discussed today is cosmopolitanism, a term invented by Diogenes, supported by Leibniz and Hume and criticized by Kant. (Navarro

2020) Psychologists in Spain call the symptoms developed by quarantine *cabaña*, a type of anxiety. Isolation has forced us to better assess our real needs and re-evaluate priorities. (Redacción MAPFRE 2020)

The word "*ubuntu*" in the Bantu language of South Africa literally means "I am because we are". It highlights the fact that we cannot exist independently of our relationships with others. (Bastian, Jetten, and Chen 2013) Our own humanity is reduced when others are treated us without dignity and respect. At the same time, according to Desmond Tutu, provoking harm to another person can also affect perceptions of oneself. (Tutu and Tutu 1999) It follows that a person's humanity depends on the humanity of those around him. And when people behave violently and aggressively, they tend to continue to behave more violently and aggressively in the future. (Martens et al. 2007)

Self-dehumanization arises from the recognition that one's actions have caused harm to others that cannot be justified. Bastian et al. argue that when people act in ways they perceive as immoral, it will affect the way they view their own humanity. (Bastian, Jetten, and Chen 2013) Concepts about morality and humanity are closely linked (Bastian et al. 2011) and dehumanization processes are usually rooted in moral judgments.

Social ostracism (social exclusion of an individual) can occur in the absence of challenge. (K. D. Williams 2007) Ostracization has negative consequences on the self: depletion of resources for self-regulation (Ciarocco, Sommer, and Baumeister 2001) and increased dissonance related to interpersonal relationships, (Zhou et al. 2009) leading to a convenient interpersonal transgression to explore the process of self-dehumanization.

Feeling human is a desirable and valuable resource; people thus tend to strengthen their humanity in order to protect themselves against existential threats. (Vaes, Heflick, and Goldenberg 2010)

In their study, Bastian et al. focused on three working hypotheses, of which, in the case of the pandemic, we are primarily interested in the perceived immorality of one's actions mediating the relationship between ostracism and self-dehumanization, and the needs of social belonging. (Maner et al. 2007) Their prediction is that dehumanization will motivate prosocial behavior and self-sacrifice. Linking self-dehumanization with moral commitment suggests important relationships between dehumanization and self-centered emotions, such as guilt, shame, and embarrassment. (Tangney, Stuewig, and Mashek 2007) These emotional responses may coincide, and even lead to self-dehumanization.

Jen Rushforth, in *Solitary Confinement - Social Death and Its Afterlives*, a review of Lisa Guenther's book, quote Guenther statement that

> "To be socially dead is to be deprived of the network of social relations, particularly kinship relations, that would otherwise support, protect, and give meaning to one's precarious life as an individual. It is to be violently and permanently separated from one's kin, blocked from forming any meaningful relationship, not only to others in the present but also to the heritage of the past and the legacy of the future beyond one's own finite, individuated being." (Rushforth 2017) (Guenther 2013)

Regarding the isolation of detainees, Guenther notes that "deprived of meaningful human interaction, otherwise healthy prisoners become unhinged. They see things that do not exist. They do not see things that do." (Guenther 2013)

In a CIA textbook on sensory deprivation and isolation, the effects of isolation were listed as hallucinations, illusions, and, as mentioned directly in the CIA textbook, " an intense love of any other living thing." (Guenther 2013, 82) According to Maslow, people have a deep need for love and social belonging, and only then for safety and physiological needs. (Maslow 1943)

"The social death of prisoners in solitary confinement does not affect just the individual or the family or the local community; it affects all of us." (Guenther 2013, 253)

Massimo De Carolis, in *The threat of contagion*, (De Carolis 2020) states that the measures taken so far are disturbing, dissolve the social bond and impose a regime of loneliness and police control over the entire population, a strong reminder of the darkest experiences of our recent political past.

This leads to the destruction of the social bond and an obsessive control in the name of "public health", which certainly did not come from the coronavirus. " For at least a century, modern social mechanisms have tended to generate a society based on isolation, in which the spontaneity of social life is perceived as an obstacle or even as a threat to the stability of the system." (De Carolis 2020)

Against the background of the COVID-19 pandemic, there has been an increase in violence in society in general, and in the family in particular. (Deutsche Welle 2020) Violence is rampant against women as well as doctors, nurses and street vendors. (United Nations 2020b) Emergency calls increased by 25% during this period after social distancing measures were adopted. The European Parliament issued a press release calling on Member States to increase support for victims of domestic violence during the pandemic. (European Parliament 2020b)

Quarantine and traffic restrictions continue to expose women to domestic violence, exacerbated by job losses and economic insecurity. Increased violence is also manifested in refugee camps, as is gender-based violence in public spaces. (United Nations 2020b)

At the same time, there has been a significant reduction in the spread of sexually transmitted infections in several countries, attributed to COVID-19 quarantines and social distancing measures. (NSW Government 2020) Common flu transmission rates also declined significantly during the pandemic. (Cowling et al. 2020)

De Carolis states that there is no social life that does not involve the risk of contagion, just as there is no organic life that does not involve the risk of illness and death. Thus, we will have to ask ourselves to what extent we are willing to put ourselves in danger, and risk our biological security ” to have dinner with a friend, to embrace a child or simply to chat with the people hanging around in the square? Where do we place the bar when deciding that our social happiness has precedence over safeguarding our health? Is political existence more important than biological survival?” (De Carolis 2020)

Thomas Hobbes introduced the concept of the *state of nature* (without government) in his 1651 book, *Leviathan*. (Hobbes 1651) Hobbes calls this situation the condition of simple nature," without a recognized authority: ”no account of Time; no Arts; no Letters; no Society”. (Hobbes 1651) (Bufacchi 2020) Everyone's right to everything invites a serious conflict, a competition for resources. The conflict will continue to be fueled by multiple disagreements, including moral ones. In such a case, the natural state will become a state of war, possibly a "war of all against all". (Lloyd and Sreedhar 2020) Whenever political stability falls apart, it can be replaced by anarchy.

> “In such condition, there is no place for Industry; because the fruit thereof is uncertain; and consequently no Culture of the Earth; no Navigation, nor use of the commodities that may be imported by Sea; no commodious Building; no Instruments of moving." (Hobbes 1651)

We are not in a natural Hobbesian state, although at present there is no theater, no concerts, no trips and no sporting events. (Bufacchi 2020) But we are beginning to see initial manifestations of what Hobbes called the "war of all against all": countries competing aggressively on the world market for coronavirus protection equipment, for areas previously disputed but in which peace has recently spread, or strong rallies. “And which is worst of all, continual fear, and danger of violent death; And the life of man, solitary, poor, nasty, brutish, and short.” (Hobbes 1651)

COVID-19 instilled fear in all of us - the fear continues. But not everything is lost. The only way to survive is through social cooperation. But the state of nature is also a state of equality,

in which we are all equally vulnerable. Thus, only through unity, teamwork and solidarity will we defeat this invisible enemy. (Bufacchi 2020)

For this, Vittorio Bufacchi proposes a new social contract, which will be the cornerstone of a new civil society, in *Coronavirus: it feels like we are sliding into a period of unrest, but political philosophy offers hope*. (Bufacchi 2020) Unprecedented sacrifice, trust and social cooperation will be needed. Bufacchi believes that the biggest threat to social cooperation is the selfish actions of so-called "free-rider" passengers who benefit from cooperation without contributing anything to the common good.

4 Forecasting

Sfetcu, Nicolae, "*The world after the COVID-19 pandemic*", SetThings (November 7, 2020), DOI: 10.13140/RG.2.2.20745.67681, URL = https://www.setthings.com/en/the-world-after-the-covid-19-pandemic/

In the case of the COVID-19 pandemic, there are some signs of a shift of paradigm, including the sudden disappearance of the "wall" ideology: "a cough was enough to make it suddenly impossible to evade the responsibility that each individual has towards all living beings for the simple fact of (still…) being part of this world, and of wanting to be part of it". (M. Foucault, Agamben, and Benvenuto 2020) The whole is always involved in part, that "everything is, in certain sense, in everything" and that in nature there are no autonomous regions that are an exception. In nature there is no " dominion within another", according to Spinoza. (Spinoza 2019) The epidemic leads to the creation of red zones, internal isolation and the militarization of territories, but here "the wall has a completely different meaning compared to the walls the rich build to keep out the poor. A wall is being erected for the other, whoever she or he may be". (M. Foucault, Agamben, and Benvenuto 2020) Ronchi believes that these walls are erected to replace handshakes, they are a means of communication, not a sign of exclusion.

The COVID-19 pandemic necessitates the application of pragmatic intelligence to govern, as far as possible, the spontaneity of a process that takes place against our intentions. The political command will have to assume specific responsibility. it will have to take precedence over the economy.

In addition, the virus invites us to meditate on our fragility. He has the ability to generate a more sober idea of freedom: to be free means to do what needs to be done in a specific situation.

The famous French philosopher Bruno Latour wrote an essay for the *AOC* newspaper, *Imaginer les gestes-barrières contre le retour à la production d'avant-crise*, stating that this lesson

is “the most amazing: we have actually shown that it is possible, in a few weeks, to stop all economic systems in the world…” (Latour 2020)

Bruno Latour considers this epidemic to be a huge opportunity for us to learn; a huge experiment. Viruses are in us, and we will have to learn to live with them.

Epidemic isolation has forced us all to retreat into ourselves through introspection. The questions we asked ourselves developed a different way of thinking about how they would create a different future than the one we had foreseen.

The pandemic has shown us how quickly we can become infected globally. An incredible demonstration of network theory and the power of virality. This implies a fusion, in a sense, between the individual and the collective.

The pandemic has reopened the debate about what is necessary and what is possible, what is useful and what is not. We will not have to change the production system, but to replace it completely. Bruno Latour states that if he had enough power, he would first and foremost change the production system on an ecological basis.

At the ZKM Center for Art and Media in Karlsruhe, Germany, (Arènes 2020) the sphere of human existence was defined as the "critical zone", a narrow band of Earth that can support life, including only a few kilometers thick - above and below the Earth's surface. In light of this concept, you can be an escapee trying to escape from this area, like Elon Musk, or a captive. but for us captives, resources are limited. We have to take care of what we have, because it's finished.

This seems to add a political limit to James Lovelock's Gaia hypothesis (J. Lovelock 2001) which explains how "Life" acts to protect itself. Compared to the infinity of worlds preached by science, Lovelock, together with Margulis, (J. E. Lovelock and Margulis 1974) proved that the Earth is unique because it has life. Bruno Latour considers the confirmation of the idea of the two

as his greatest discovery of this period, although not yet accepted by mainstream science. In this sense, the shift of paradigm from Aristotelian cosmology to Galileo is just as important as from Galileo to Gaia. (Sfetcu 2020b)

Buheji and Ahmed highlight the opportunities and possible positive effects generated by the COVID-19 pandemic (Buheji, Ahmed, and Ahmed 2020) and the relationship between the crisis and the global societies of extreme capitalism. They summarized the respective ideas in two tables:

Visible and hidden socio-economic opportunities of the crisis (COVID-19) - Opportunities: (Buheji, Ahmed, and Ahmed 2020)

Visible Opportunities	Hidden Opportunities
Beyond Technology Advancement	Controlling & Balancing the Growth Model
Rise of Safety-Entrepreneurship	Controlling Diverting Socio-economic Development
Understanding the Fragility of Capital Economy	Controlling Resilience Attentions
Understanding the Importance of World Harmony	Getting to Work Out of Comfort-Zone
Communication Model	Enhancing Sharing Economy
Importance of Self-Sufficiency	New Insights of livelihood and Welfare Promotion
Synergy and Community Solidarity	Eliminating the Threats of AI Domination
Intrinsic Power	Enhancing Community Capacity
Importance of Credibility and Transparency	Living with Minimalist Mindset
Value of Physical Contact	Enhancing Curiosity Economy
The Rise of Epidemiology	Re-establishing Our Spiritual & Social-Being

Visible and hidden socio-economic opportunities of the crisis (COVID-19) - Risks: (Buheji, Ahmed, and Ahmed 2020)

Visible Risks	Hidden Risks
Rise of Cross-infections	Limitation of Human Development Capacity
Risk Inside & Outside Health Center	Being busy with AI while Pathogens are getting sophisticated
Limitation of Isolation facilities	Stagnant Business Models
Increase of Interconnectivity that Spread the Viruses	High-rise Building in Global Cities with Minimal Preparedness
Uncontrolled Human Apatite & Desire	Non-availability of Global Agreed Risk Management Framework

Free Market Hostility	Low Competence in Solving Socio-economic Complex Problems
Foodborne-Diseases	Chaos Due to Global Panic

The authors conclude that the next 20-30 years would be the age of change towards greater dependence on intrinsic powers. In addition, due to the challenge of cross-infections, a new trend could be triggered that affects all types of lifestyle industry. Humanity needs most today not extrinsic powers, but rather intrinsic powers that come from within, but the current mentality driven by the capital economy is not yet ready to accept this choice, being dominated by the lack of need to own and control. (Buheji, Ahmed, and Ahmed 2020)

To address climate change and economic inequality, a set of social and economic reforms (Green New Deal - GND) (Whyte 2019) has been proposed in the United States that combines Roosevelt's economic approach with modern ideas such as renewable energy. and resource efficiency. (Lovell 2008) There are proposals to include the Green New Deal or parts of it in the US COVID-19 pandemic recovery program (Gilliland 2020) and in the European Union, in April 2020, the European Parliament called for the inclusion of the European Green Agreement in the COVID-19 pandemic recovery program. (European Parliament 2020a)

The COVID-19 pandemic represents a global paradigm shift, with a strong impact on the global economy and sustainable development scenarios. According to Contipelli, the pandemic highlighted the weakness of current governments, poverty, fragile health and education systems and the lack of international cooperation. (Contipelli and Picciau 2020) Possible future crises cannot be solved with the same economic and social models. Deforestation, biodiversity loss and climate change maximize the likelihood of other pandemics occurring in the future. Contipelli believes that more needs to be invested in renewable energy and sustainable infrastructure and funding new research and development, reforestation, coral reef restoration, regenerative

agriculture, sustainable fishing, etc. A sustainable post-pandemic future will exist only through international agreements to reduce emissions and increase finance for sustainable development. (Bastian, Jetten, and Chen 2013)

Manoj Kr. Bhusal, in *The World After COVID-19: An Opportunity For a New Beginning*, argues that the world after COVID-19 will be "different and difficult one, with unprecedented economic hardships and rampant social anxieties" (Bhusal 2020) We now have a chance to reflect and review our system, and to come up with a fairer alternative. COVID-19 will shape our economic and political future and leave a profound cultural and psychological impact. COVID-19 will shake global power structures in a disordered and multipolar post-pandemic world.

China has proven its effectiveness (Waterson and Kuo 2020) given that, according to Ikenberry, the liberal hegemonic order led by the Americans has already been threatened during the George W. Bush administration. (Ikenberry 2012) Bhusal predicts that the two countries will isolate themselves to serve their own interests, and trade wars and the race for supremacy will intensify. As China is not yet fit and ready to lead the world, with a divided European Union, and more emerging but powerless powers, we will witness a new international order that is not very orderly.

The idea of a multipolar world is an older one, being considered by some to be more stable. (Amin 2006) Haass proposes the idea of non-polarity, without a center (nation states, corporations and non-governmental organizations) controlling or dominating any other center. (Haass 2020, 44–56)

It is possible to develop an increase in repressive regimes and powerful people in some countries, with dictators taking advantage of this pandemic to concentrate power, with Bhusal citing Viktor Orban in Hungary as the first EU dictator. (Kelly 2020)

Modern technologies already allow almost total pandemic-motivated surveillance, such as smartphones in China, (Xu Elegant and Chandler 2020) facial recognition in Russia, (Ball 2020) police robots in Tunisia, (Jawad 2020) drones in India (Poovanna 2020) or smart bracelets in South Korea. (Cole 2020) These practices will continue after the pandemic, extending abusively to spying on political opponents or suppressing dissent. Thus, the pandemic will fundamentally change the way information services operate. In this regard, Yuval Noah Harari recently wrote:

> "As a thought experiment, consider a hypothetical government that demands that every citizen wears a biometric bracelet that monitors body temperature and heart-rate 24 hours a day. The resulting data is hoarded and analyzed by government algorithms. The algorithms will know that you are sick even before you know it, and they will also know where you have been, and who you have met." (Harari 2020)

Bhusal notes that, although instability, global conflicts (United Nations 2020b) and poverty will increase, (Picheta 2020) we will not witness the end of globalization. Capitalism and globalization will survive, but multilateralism and global cooperation will fail miserably, reducing international development cooperation activities.

The practices adopted during the "quarantine" period (telework, online school and telemedicine) will be normal activities. The digital world and automation in the production and services sector will develop exponentially, redefining consumer behavior.

Bhusal concludes that

> "Most of the problems that we have witnessed during this pandemic, however, are not caused by COVID-19 itself, but by dysfunctional political and social systems built on the foundation of neoliberal corporate capitalism. In that sense, COVID-19 is a wake-up call for a historical retrospection. Hence, the ultimate task of humankind, in the aftermath of this crisis, is to reject patchwork on neoliberal corporate capitalism and construct an alternative system that will be just, inclusive and fair for the many." (Bhusal 2020)

Noam Chomsky emphasizes social issues and questions the contradictions of the Western political system and the varying degrees of importance given to each crisis, depending on who suffers from it. (Chomsky, Pollin, and Polychroniou 2020) (Redacción MAPFRE 2020) He

emphasizes the socio-economic problems that, in his opinion, are products of neoliberalism, and our lack of foresight when it comes to protecting us against a pandemic. But he believes that we have a chance for society to reorganize into a better society. Chomsky insists on the implementation of the Green New Deal, a pact to reduce social inequalities and combat climate change. Chomsky says that "there is no profit in prevention", and that is why we did not invest in it. The concept of "black swan" developed in 2007 by Nassim Nicholas Taleb, (Taleb 2007) which refers to totally unpredictable events, should have been taken into account.

According to Rocco Ronchi, in *Le virtù del virus*, if the virus has the characteristic of an event, it must also possess its "virtue" (a force, a property, a vision, that is, they do something). An event is always traumatic, producing transformations and generating "real" possibilities. The "virtue" of an event thus consists in making possible operational methods, methods that "before" were simply impossible, unimaginable. (Ronchi 2020) In this sense, the "COVID-19 event" shows signs of paradigm shift, the most obvious being the sudden disappearance of the ideology related to "walls". It teaches us that in nature there are no autonomous regions that are an exception. The epidemic leads to zonal isolations, but here the wall has a different meaning than the one that separates the rich from the poor. Here, "your neighbor" is radically reduced to the size of "anyone."

The virus seems to restore the supremacy that once belonged to politics. According to a metaphor by Ronchi, the very hypothesis of domination is ridiculed by a cough in Wuhan. In this sense, "COVID-19 also possesses this virtue: it commands politics to assume its specific responsibility, it restores the primacy that politics has illusively left to other sovereign spheres, becoming subordinate to them, declaring its own impotence and limiting to play an exclusively technical role". (Ronchi 2020)

Among the virtues of the virus, we can mention its ability to generate a more sober idea of freedom: to be free means to do what needs to be done in a specific situation.

Bibliography

Agamben, Giorgio. 2020a. "Biosicurezza." Quodlibet. 2020. https://www.quodlibet.it/giorgio-agamben-biosicurezza.

———. 2020b. "La medicina come religione." Quodlibet. 2020. https://www.quodlibet.it/giorgio-agamben-la-medicina-come-religione.

———. 2020c. "L'invenzione di un'epidemia." Quodlibet. 2020. https://www.quodlibet.it/giorgio-agamben-l-invenzione-di-un-epidemia.

Alexander, J., and C. B. Bridges. 1928. "Some Physico-Chemical Aspects of Life, Mutation, and Evolution." *Biology and Medicine* II: 9–58.

AlHusseini, Ibrahim. 2020. "Climate Change Is Only Going to Make Health Crises like Coronavirus More Frequent and Worse." Business Insider. 2020. https://www.businessinsider.com/climate-change-making-health-crises-like-coronavirus-frequent-worse-2020-4.

Almeida, Joyce. 2008. "June Almeida (Née Hart)." *BMJ* 336 (7659): 1511–1511. https://doi.org/10.1136/bmj.a434.

Amin, S. 2006. "Beyond US Hegemony?: Assessing the Prospects for a Multipolar World." Undefined. 2006. /paper/Beyond-US-Hegemony%3A-Assessing-the-Prospects-for-a-Amin/13c6d4ac1b765b70c05b12b7fedf573666b677da.

Anderson, Roy M., Hans Heesterbeek, Don Klinkenberg, and T. Déirdre Hollingsworth. 2020. "How Will Country-Based Mitigation Measures Influence the Course of the COVID-19 Epidemic?" *The Lancet* 395 (10228): 931–34. https://doi.org/10.1016/S0140-6736(20)30567-5.

Antonovics, Janis, Anthony J. Wilson, Mark R. Forbes, Heidi C. Hauffe, Eva R. Kallio, Helen C. Leggett, Ben Longdon, Beth Okamura, Steven M. Sait, and Joanne P. Webster. 2017. "The Evolution of Transmission Mode." *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences* 372 (1719). https://doi.org/10.1098/rstb.2016.0083.

Aquinas, St Thomas, and Richard J. Regan. 2000. *Treatise on Law*. Hackett Publishing.

Arènes, Alexandra. 2020. "Critical Zones - Reimagines Humanity's Relationship with the Earth." 2020. https://www.stirworld.com/inspire-people-critical-zones-reimagines-humanitys-relationship-with-the-earth.

Aristotle. 1566. "The Nicomachean Ethics." 1566. https://www.goodreads.com/work/best_book/2919427.

Artenstein, Andrew W., and John D. Grabenstein. 2008. "Smallpox Vaccines for Biodefense: Need and Feasibility." *Expert Review of Vaccines* 7 (8): 1225–37. https://doi.org/10.1586/14760584.7.8.1225.

Asiedu, Kwasi Gyamfi. 2020. "After Enduring Months of Lockdown, Africans in China Are Being Targeted and Evicted from Apartments." Quartz Africa. 2020. https://qz.com/africa/1836510/africans-in-china-being-evicted-from-homes-after-lockdown-ends/.

Baird, Robert P. 2020. "What It Means to Contain and Mitigate the Coronavirus." The New Yorker. 2020. https://www.newyorker.com/news/news-desk/what-it-means-to-contain-and-mitigate-the-coronavirus.

Baladă populară. 2020. "Miorița - Wikisource." 2020. https://ro.wikisource.org/wiki/Miori%C8%9Ba.

Ball, S. 2020. "100,000 Cameras: Moscow Uses Facial Recognition to Enforce Quarantine." France 24. March 24, 2020. https://www.france24.com/en/20200324-100-000-cameras-moscow-uses-facial-recognition-to-enforce-quarantine.

Barman, Subrata, Ayub Ali, Eric K. -W. Hui, Lopa Adhikary, and Debi P. Nayak. 2001. "Transport of Viral Proteins to the Apical Membranes and Interaction of Matrix Protein with Glycoproteins in the Assembly of Influenza Viruses." *Virus Research* 77 (1): 61–69. https://doi.org/10.1016/S0168-1702(01)00266-0.

Barton, Erik S., Douglas W. White, Jason S. Cathelyn, Kelly A. Brett-McClellan, Michael Engle, Michael S. Diamond, Virginia L. Miller, and Herbert W. Virgin. 2007. "Herpesvirus Latency Confers Symbiotic Protection from Bacterial Infection." *Nature* 447 (7142): 326–29. https://doi.org/10.1038/nature05762.

Bastian, Brock, Jolanda Jetten, and Hannah Chen. 2013. "Losing Our Humanity: The Self-Dehumanizing Consequences of Social Ostracism." 2013. https://journals.sagepub.com/doi/abs/10.1177/0146167212471205.

Bastian, Brock, Simon M. Laham, Samuel Wilson, Nick Haslam, and Peter Koval. 2011. "Blaming, Praising, and Protecting Our Humanity: The Implications of Everyday Dehumanization for Judgments of Moral Status." *British Journal of Social Psychology* 50 (3): 469–83. https://doi.org/10.1348/014466610X521383.

Bentham, Jeremy. 1988. *The Principles of Morals and Legislation*. Prometheus Books.

Berlinger, Joshua. 2020. "WHO Says 'this Is Not a Drill' as Coronavirus Infections near 100,000." CNN. 2020. https://www.cnn.com/2020/03/06/asia/coronavirus-covid-19-update-who-intl-hnk/index.html.

Bertoletti, Antonio, and Adam Gehring. 2007. "Immune Response and Tolerance during Chronic Hepatitis B Virus Infection." *Hepatology Research* 37 (s3): S331–38. https://doi.org/10.1111/j.1872-034X.2007.00221.x.

Bhusal, Manoj Kr. 2020. "The World After COVID-19: An Opportunity For a New Beginning." *International Journal of Scientific and Research Publications (IJSRP)* 10 (05): 735–41. https://doi.org/10.29322/IJSRP.10.05.2020.p10185.

Blaas, Dieter. 2016. "Viral Entry Pathways: The Example of Common Cold Viruses." *Wiener Medizinische Wochenschrift* 166 (7): 211–26. https://doi.org/10.1007/s10354-016-0461-2.

Board, The Editorial. 2020. "Opinion | Is the World Ready for the Coronavirus?" *The New York Times*, January 29, 2020, sec. Opinion. https://www.nytimes.com/2020/01/29/opinion/coronavirus-outbreak.html.

Boccaccio, Giovanni. 2003. *The Decameron*. Edited by G. H. McWilliam. 2nd Edition. London: Penguin Books.

Bouchard, F, and P Huneman. 2013. "From Groups to Individuals | The MIT Press." The MIT Press. 2013. https://mitpress.mit.edu/books/groups-individuals.

Boukerche, Sandrine, and Rianna Mohammed-Roberts. 2020. "Fighting Infectious Diseases: The Connection to Climate Change." 2020. https://blogs.worldbank.org/climatechange/fighting-infectious-diseases-connection-climate-change.

Bravo, Javier A., Marcela Julio-Pieper, Paul Forsythe, Wolfgang Kunze, Timothy G. Dinan, John Bienenstock, and John F. Cryan. 2012. "Communication between Gastrointestinal Bacteria and the Nervous System." *Current Opinion in Pharmacology* 12 (6): 667–72. https://doi.org/10.1016/j.coph.2012.09.010.

Bufacchi, Vittorio. 2020. "Coronavirus: It Feels like We Are Sliding into a Period of Unrest, but Political Philosophy Offers Hope." The Conversation. 2020. http://theconversation.com/coronavirus-it-feels-like-we-are-sliding-into-a-period-of-unrest-but-political-philosophy-offers-hope-137006.

Buheji, Mohamed, Dunya Ahmed, and Abdullah Ahmed. 2020. "Foresight of Coronavirus (COVID-19) Opportunities for a Better World." ResearchGate. 2020. https://www.researchgate.net/publication/339973652_Foresight_of_Coronavirus_COVID-19_Opportunities_for_a_Better_World.

Burton, Nylah. 2020. "The Coronavirus Exposes the History of Racism and 'Cleanliness.'" Vox. February 7, 2020. https://www.vox.com/2020/2/7/21126758/coronavirus-xenophobia-racism-china-asians.

Cacioppo, John T., and Louise C. Hawkley. 2009. "Perceived Social Isolation and Cognition." *Trends in Cognitive Sciences* 13 (10): 447–54. https://doi.org/10.1016/j.tics.2009.06.005.

Caduff, Carlo. 2020. "What Went Wrong: Corona and the World after the Full Stop." 2020. https://www.academia.edu/42829792/What_Went_Wrong_Corona_and_the_World_after_the_Full_Stop?auto=download&fbclid=IwAR2MaZetE1nMVqHDqvhfSJvX-6fQKAwDQdhRegTaHRm3Jx_8xMeRY2YZemo.

Camus, Albert. 1971. *L'étranger*. Revised ed. Edition. Paris: Gallimard.

———. 1972. *La Peste*. French & European Pubns.

———. 1985. *Le Mythe De Sisyphe Essai Sur Labsurde*. GALLIMARD Edition. Paris: Folio.

Canchaya, Carlos, Ghislain Fournous, Sandra Chibani-Chennoufi, Marie-Lise Dillmann, and Harald Brüssow. 2003. "Phage as Agents of Lateral Gene Transfer." *Current Opinion in Microbiology* 6 (4): 417–24. https://doi.org/10.1016/S1369-5274(03)00086-9.

Carbajosa, Ana. 2020. "El virus se quedará allí hasta que encontremos una manera sostenible de hacer negocios." EL PAÍS. May 1, 2020. https://elpais.com/cultura/2020-05-01/el-virus-se-quedara-alli-hasta-que-encontremos-una-manera-sostenible-de-hacer-negocios.html.

Cassidy, John. 2020. "The Good, The Bad, and the Ugly in the Two-Trillion-Dollar Stimulus." The New Yorker. 2020. https://www.newyorker.com/news/our-columnists/the-good-the-bad-and-the-ugly-in-the-two-trillion-dollar-stimulus.

Cello, Jeronimo, Aniko V. Paul, and Eckard Wimmer. 2002. "Chemical Synthesis of Poliovirus CDNA: Generation of Infectious Virus in the Absence of Natural Template." *Science (New York, N.Y.)* 297 (5583): 1016–18. https://doi.org/10.1126/science.1072266.

Centers for Disease Control and Prevention. 2007. "Interim Pre-Pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States." https://www.cdc.gov/flu/pandemic-resources/pdf/community_mitigation-sm.pdf.

———. 2011. "Ethical Considerations for Decision Making Regarding Allocation of Mechanical Ventilators during a Severe Influenza Pandemic or Other Public Health Emergency." https://www.cdc.gov/about/advisory/pdf/VentDocument_Release.pdf.

Centers for Disease Control and Prevention, and Soheil Hajmirbaba. 2020. "1918 Pandemic (H1N1 Virus) | Pandemic Influenza (Flu)." June 16, 2020. https://www.cdc.gov/flu/pandemic-resources/1918-pandemic-h1n1.html.

Chomsky, Noam, Robert Pollin, and C. J. Polychroniou. 2020. *Climate Crisis and the Global Green New Deal: The Political Economy of Saving the Planet*. London ; New York: Verso.

Chrisafis, Angelique. 2019. "French Medics Warn Health Service Is on Brink of Collapse." The Guardian. June 11, 2019. http://www.theguardian.com/world/2019/jun/11/french-medics-health-service-collapse-doctors-nurses-protest-outside-french-health-ministry-strikes.

Ciarocco, Natalie J., Kristin L. Sommer, and Roy F. Baumeister. 2001. "Ostracism and Ego Depletion: The Strains of Silence." *Personality and Social Psychology Bulletin* 27 (9): 1156–63. https://doi.org/10.1177/0146167201279008.

Cohen, Jan. 2020. "Wuhan Seafood Market May Not Be Source of Novel Virus Spreading Globally." Science | AAAS. January 26, 2020. https://www.sciencemag.org/news/2020/01/wuhan-seafood-market-may-not-be-source-novel-virus-spreading-globally.

Cole, William. 2020. "South Korea Vows to Strap GPS Tracker Wristbands on Lockdown Flouters." Mail Online. April 12, 2020. https://www.dailymail.co.uk/news/article-8212355/South-Korea-vows-strap-GPS-tracker-wristbands-lockdown-flouters-stem-coronavirus-spread.html.

Coleman, J. Robert, Dimitris Papamichail, Steven Skiena, Bruce Futcher, Eckard Wimmer, and Steffen Mueller. 2008. "Virus Attenuation by Genome-Scale Changes in Codon Pair Bias." *Science (New York, N.Y.)* 320 (5884): 1784–87. https://doi.org/10.1126/science.1155761.

Confucius. 2013. *Confucian Analects, The Great Learning & The Doctrine of the Mean*. Courier Corporation.

Conley, Tom. 2000. "Defining and Understanding Economic Globalisation." *Policy, Organisation and Society* 19 (1): 87–115. https://doi.org/10.1080/10349952.2000.11876720.

Contipelli, Ernani, and Simona Picciau. 2020. "Post-COVID-19 Rebuilding Our Paradigms Through Sustainable Development Goals and the Sufficiency Economy Philosophy." ResearchGate. 2020. https://www.researchgate.net/publication/343079841_Post-COVID-19_Rebuilding_Our_Paradigms_Through_Sustainable_Development_Goals_and_the_Sufficiency_Economy_Philosophy.

Corasaniti, Nick, and Stephanie Saul. 2020. "16 States Have Postponed Primaries During the Pandemic. Here's a List." *The New York Times*, August 10, 2020, sec. U.S. https://www.nytimes.com/article/2020-campaign-primary-calendar-coronavirus.html.

Cowling, Benjamin J., Sheikh Taslim Ali, Tiffany W. Y. Ng, Tim K. Tsang, Julian C. M. Li, Min Whui Fong, Qiuyan Liao, et al. 2020. "Impact Assessment of Non-Pharmaceutical Interventions against Coronavirus Disease 2019 and Influenza in Hong Kong: An Observational Study." *The Lancet Public Health* 5 (5): e279–88. https://doi.org/10.1016/S2468-2667(20)30090-6.

Creager, Angela N. H., and Gregory J. Morgan. 2008. "After the Double Helix." *Isis* 99 (2): 239–72. https://doi.org/10.1086/588626.

Crespo, Hiram. 2020. "An Epicurean Guide to Living More Pleasantly in Times of Coronavirus." TheHumanist.Com. April 28, 2020. https://thehumanist.com/features/articles/an-epicurean-guide-to-living-more-pleasantly-in-times-of-coronavirus.

Crowell, Steven. 2020. "Existentialism." In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Summer 2020. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/sum2020/entries/existentialism/.

Cui, Jie, Fang Li, and Zheng-Li Shi. 2019. "Origin and Evolution of Pathogenic Coronaviruses." *Nature Reviews Microbiology* 17 (3): 181–92. https://doi.org/10.1038/s41579-018-0118-9.

Dabashi, Hamid. 2020. "What Can Avicenna Teach Us in Time of Coronavirus?" 2020. https://www.aljazeera.com/opinions/2020/6/15/what-can-avicenna-teach-us-in-time-of-coronavirus/.

Daulaire, Nils. 2011. "Globalization and Health." June 22, 2011. https://web.archive.org/web/20110622194117/http://www.globalhealth.org/assets/html/drmed3.html.

De Carolis, Massimo. 2020. "The Threat of Contagion." The Anarchist Library. 2020. https://theanarchistlibrary.org/library/massimo-de-carolis-the-threat-of-contagion.

Dean, D. Alan. 2020. "New Reflections (Giorgio Agamben)." Medium. May 13, 2020. https://medium.com/@ddean3000/new-reflections-giorgio-agamben-c5534e192a5e.

Decaro, Nicola. 2011a. "Alphacoronavirus‡." In *The Springer Index of Viruses*, edited by Christian Tidona and Gholamreza Darai, 371–83. New York, NY: Springer. https://doi.org/10.1007/978-0-387-95919-1_56.

———. 2011b. "Betacoronavirus‡." In *The Springer Index of Viruses*, edited by Christian Tidona and Gholamreza Darai, 385–401. New York, NY: Springer. https://doi.org/10.1007/978-0-387-95919-1_57.

Deliso, Meredith. 2020. "Conservationists Fear African Animal Poaching Will Increase during COVID-19 Pandemic." ABC News. 2020. https://abcnews.go.com/International/conservationists-fear-african-animal-poaching-increase-covid-19/story?id=70118142.

Deutsche Welle. 2020. "Domestic Violence Rises amid Coronavirus Lockdowns in Asia | DW | 09.04.2020." DW.COM. 2020. https://www.dw.com/en/domestic-violence-rises-amid-coronavirus-lockdowns-in-asia/a-53077378.

Dimmock, Nigel J., Andrew J. Easton, and Keith N. Leppard. 2007. *Introduction to Modern Virology*. 6th Edition. Malden, MA: Wiley-Blackwell.

Djamali, Essmaiil, James Nulton, Peter Turner, Forest Rohwer, and Peter Salamon. 2012. "Heat Output by Marine Microbial and Viral Communities." *Journal of Non Equilibrium Thermodynamics* 37 (September): 291–313. https://doi.org/10.1515/jnetdy-2011-0235.

Dodds, Joseph. 2020. "Elemental Catastrophe: Ecopsychoanalysis and the Viral Uncanny of COVID-19." *Stillpoint Magazine* (blog). April 8, 2020. https://stillpointmag.org/articles/elemental-catastrophe-ecopsychoanalysis-and-the-viral-uncanny-of-covid-19/.

Dodman, Benjamin. 2020. "Violence Flares in Tense Paris Suburbs as Heavy-Handed Lockdown Stirs 'Explosive Cocktail.'" France 24. April 21, 2020. https://www.france24.com/en/20200421-violence-flares-in-tense-paris-suburbs-as-heavy-handed-lockdown-stirs-explosive-cocktail.

Doolittle, W. F. 2000. "The Nature of the Universal Ancestor and the Evolution of the Proteome." Current Opinion in Structural Biology. Curr Opin Struct Biol. June 2000. https://doi.org/10.1016/s0959-440x(00)00096-8.

Dupré, John, and S. Guttinger. 2016. "Viruses as Living Processes," March. https://doi.org/10.1016/j.shpsc.2016.02.010.

Dupré, John; O'Malley. 2009. "Varieties of Living Things: Life at the Intersection of Lineage and Metabolism." *Philosophy & Theory in Biology* 1 (December). http://dx.doi.org/10.3998/ptb.6959004.0001.003.

Earth Observatory. 2020. "Airborne Nitrogen Dioxide Plummets Over China." Text.Article. NASA Earth Observatory. February 28, 2020. https://earthobservatory.nasa.gov/images/146362/airborne-nitrogen-dioxide-plummets-over-china.

Elden, Stuart. 2003. "Plague, Panopticon, Police." *Surveillance & Society* 1 (3): 240–53. https://doi.org/10.24908/ss.v1i3.3339.

Emanuel, Ezekiel J., Govind Persad, Ross Upshur, Beatriz Thome, Michael Parker, Aaron Glickman, Cathy Zhang, Connor Boyle, Maxwell Smith, and James P. Phillips. 2020. "Fair Allocation of Scarce Medical Resources in the Time of Covid-19." *New England Journal of Medicine* 382 (21): 2049–55. https://doi.org/10.1056/NEJMsb2005114.

Environmental Health News. 2020. "Coronavirus, Climate Change, and the Environment." EHN. March 20, 2020. https://www.ehn.org/coronavirus-environment-2645553060.html.

Epicurus. 2016. *Letter to Menoeceus: Epicurus*. CreateSpace Independent Publishing Platform.

Epstein, Paul R. 2011. *Changing Planet, Changing Health : How the Climate Crisis Threatens Our Health and What We Can Do about It*. Berkeley : University of California Press. http://archive.org/details/unset0000unse_c1j4.

Esposito, Roberto. 2020. "Curati a oltranza." *Antinomie* (blog). February 28, 2020. https://antinomie.it/index.php/2020/02/28/curati-a-oltranza/.

Estola, T. 1970. "Coronaviruses, a New Group of Animal RNA Viruses." *Avian Diseases* 14 (2): 330–36. https://doi.org/10.2307/1588476.

European Parliament. 2020a. "COVID-19: MEPs Call for Massive Recovery Package and Coronavirus Solidarity Fund." April 17, 2020. https://www.europarl.europa.eu/news/en/press-room/20200415IPR77109/covid-19-meps-call-for-massive-recovery-package-and-coronavirus-solidarity-fund.

———. 2020b. "COVID-19: Stopping the Rise in Domestic Violence during Lockdown." July 4, 2020. https://www.europarl.europa.eu/news/en/press-room/20200406IPR76610/covid-19-stopping-the-rise-in-domestic-violence-during-lockdown.

Farr, Christina. 2020. "Sweden Kept Its Country Relatively Open during the Coronavirus Pandemic, but Its Elderly Paid a Price." CNBC. July 17, 2020. https://www.cnbc.com/2020/07/17/how-sweden-fought-coronavirus-and-what-went-wrong.html.

Fehr, Anthony R., and Stanley Perlman. 2015. "Coronaviruses: An Overview of Their Replication and Pathogenesis." In *Coronaviruses: Methods and Protocols*, edited by Helena Jane Maier, Erica Bickerton, and Paul Britton, 1–23. Methods in Molecular Biology. New York, NY: Springer. https://doi.org/10.1007/978-1-4939-2438-7_1.

Ferrell, Jesse. 2020. "Analysis of New Research Paper Tying Coronavirus to Weather." 2020. https://www.accuweather.com/en/weather-blogs/weathermatrix/analysis-of-new-research-paper-tying-coronavirus-to-weather/703270.

Flahault, Antoine, Didier Wernli, Patrick Zylberman, and Marcel Tanner. 2016. "From Global Health Security to Global Health Solidarity, Security and Sustainability." *Bulletin of the World Health Organization* 94 (December): 863–863. https://doi.org/10.2471/BLT.16.171488.

Forterre, Patrick. 2005. "The Two Ages of the RNA World, and the Transition to the DNA World: A Story of Viruses and Cells." Biochimie. Biochimie. October 2005. https://doi.org/10.1016/j.biochi.2005.03.015.

———. 2006. "The Origin of Viruses and Their Possible Roles in Major Evolutionary Transitions." Virus Research. Virus Res. April 2006. https://doi.org/10.1016/j.virusres.2006.01.010.

———. 2016. "To Be or Not to Be Alive: How Recent Discoveries Challenge the Traditional Definitions of Viruses and Life." Studies in History and Philosophy of Biological and

Biomedical Sciences. Stud Hist Philos Biol Biomed Sci. October 2016. https://doi.org/10.1016/j.shpsc.2016.02.013.

Forterre, Patrick, and David Prangishvili. 2009. "The Origin of Viruses." *Research in Microbiology* 160 (7): 466–72. https://doi.org/10.1016/j.resmic.2009.07.008.

Foucault, M., G. Agamben, and S. Benvenuto. 2020. "Coronavirus and Philosophers | European Journal of Psychoanalysis." 2020. https://www.journal-psychoanalysis.eu/coronavirus-and-philosophers/.

Foucault, Michel. 1975. *Surveiller et punir: Naissance de la prison*. French Language Edition. Paris: GALLIMARD.

———. 1990. *The History of Sexuality, Vol. 1: An Introduction*. Reissue Edition. New York: Vintage.

———. 2001. *Madness and Civilization: A History of Insanity in the Age of Reason*. Psychology Press.

———. 2003. *"Society Must Be Defended": Lectures at the Collège de France, 1975-1976*. Translated by David Macey. First Edition. New York: Picador.

———. 2004. *Abnormal: Lectures at the Collège de France, 1974-1975*. Translated by Graham Burchell. First Edition. New York, NY: Picador.

Foucault, Michel, François Ewald, Alessandro Fontana, and Arnold I. Davidson. 2009. *Security, Territory, Population: Lectures at the Collège de France 1977--1978*. Edited by Michel Senellart. Translated by Graham Burchell. First Edition. New York, NY: Picador.

Fraengsmyr, Tore, and Goesta Ekspong. 1993. "Nobel Lectures in Physics 1981-1990." *Singapore: World Scientific, |c1993, Edited by Fraengsmyr, Tore; Ekspong, Goesta*. http://adsabs.harvard.edu/abs/1993nlp..book.....F.

Francis, Leslie. 2020. "Covid and the Veil of Ignorance." Philosophy Talk. 2020. https://www.philosophytalk.org/blog/covid-and-veil-ignorance.

Freud, Sigmund. 1964. *Thoughts for the Times on War and Death (1915)*. Hogarth Press.

Friesen, Phoebe. 2018. "Personal Responsibility within Health Policy: Unethical and Ineffective." *Journal of Medical Ethics* 44 (1): 53–58. https://doi.org/10.1136/medethics-2016-103478.

Gates, B, and R Chambers. 2015. "From Aspiration to Action: What Will It Take to End Malaria? | Medicines for Malaria Venture." 2015. https://www.mmv.org/newsroom/publications/aspiration-action-what-will-it-take-end-malaria.

Giaimo, Cara. 2020. "The Spiky Blob Seen Around the World." *The New York Times*, April 1, 2020, sec. Health. https://www.nytimes.com/2020/04/01/health/coronavirus-illustration-cdc.html.

Gifford, Robert J. 2012. "Viral Evolution in Deep Time: Lentiviruses and Mammals." *Trends in Genetics: TIG* 28 (2): 89–100. https://doi.org/10.1016/j.tig.2011.11.003.

Gilliland, Donald. 2020. "Coronavirus Calls for an Aggressive Green New Deal." Text. TheHill. March 19, 2020. https://thehill.com/opinion/energy-environment/488356-coronavirus-calls-for-an-aggressive-green-new-deal.

Gonzalez Arocha, Jorge. 2020. "Philosophy, Social Death and the Necessary Ethical Turn after COVID-19." SSRN Scholarly Paper ID 3599774. Rochester, NY: Social Science Research Network. https://doi.org/10.2139/ssrn.3599774.

Griffiths, David J. 2001. "Endogenous Retroviruses in the Human Genome Sequence." *Genome Biology* 2 (6): reviews1017.1. https://doi.org/10.1186/gb-2001-2-6-reviews1017.

Guenther, Lisa. 2013. "Solitary Confinement." Book. University of Minnesota Press. 2013. https://www.upress.umn.edu/book-division/books/solitary-confinement.

Guttinger, Stephan. 2020a. "A Virus Is Not a Thing, Part 1: The Case for a Process View of Viruses." *Philosophy, Logic and Scientific Method* (blog). July 6, 2020. https://www.lse.ac.uk/philosophy/blog/2020/07/06/a-virus-is-not-a-thing-1/.

———. 2020b. "A Virus Is Not a Thing, Part 2: Do Viruses Jump? Process-Thinking and the Question of Pandemics." *Philosophy, Logic and Scientific Method* (blog). July 22, 2020. https://www.lse.ac.uk/philosophy/blog/2020/07/22/a-virus-is-not-a-thing-2/.

———. 2020c. "A Virus Is Not a Thing, Part 3: What Virology Can Tell Us about Philosophy." *Philosophy, Logic and Scientific Method* (blog). August 25, 2020. https://www.lse.ac.uk/philosophy/blog/2020/08/25/a-virus-is-not-a-thing-3/.

Haass, Richard. 2020. "The Age of Nonpolarity," September 2, 2020. https://www.foreignaffairs.com/articles/united-states/2008-05-03/age-nonpolarity.

Hadar, Alon. 2020. "Celeb Philosopher: After Pandemic, 'World as We Know It Will Be Just Nostalgia.'" The Times of Israel. 2020. https://www.timesofisrael.com/celeb-philosopher-after-pandemic-world-as-we-know-it-will-be-just-nostalgia/.

Haldane, J. B. S. 1929. "The Origin of Life." *The Rationalist Annual*, no. 148: 3–10.

Hampson, Alan W., and John S. Mackenzie. 2006. "The Influenza Viruses." *Medical Journal of Australia* 185 (S10): S39–43. https://doi.org/10.5694/j.1326-5377.2006.tb00705.x.

Han, Byung-Chul. 2020. "La emergencia viral y el mundo de mañana. Byung-Chul Han, el filósofo surcoreano que piensa desde Berlín." EL PAÍS. March 21, 2020. https://elpais.com/ideas/2020-03-21/la-emergencia-viral-y-el-mundo-de-manana-byung-chul-han-el-filosofo-surcoreano-que-piensa-desde-berlin.html.

Harari, Yuval Noah. 2020. "Yuval Noah Harari: The World after Coronavirus | Free to Read." March 20, 2020. https://www.ft.com/content/19d90308-6858-11ea-a3c9-1fe6fedcca75.

Hare, R. M. 1981. *Moral Thinking: Its Levels, Method, and Point*. *Moral Thinking*. Oxford University Press. https://oxford.universitypressscholarship.com/view/10.1093/0198246609.001.0001/acprof-9780198246602.

Henning, Brian G., and Adam Scarfe. 2013. *Beyond Mechanism: Putting Life Back Into Biology*. Lexington Books.

Hérelle, F. d'. 1928. "Bacteriophage, a Living Colloidal Micell." *Colloid Chemistry, Theoretical and Applied* II: 535–41.

Hérelle, Félix d' . 1926. "Le Bactériophage et Son Comportement. (Book, 1926) [WorldCat.Org]." 1926. https://www.worldcat.org/title/bacteriophage-et-son-comportement/oclc/11981307.

Hobbes, Thomas. 1651. "Leviathan: Book I, Chapters 6-9." 1651. https://www.sparknotes.com/philosophy/leviathan/section3/.

House, James S. 2001. "Social Isolation Kills, But How and Why?" *Psychosomatic Medicine* 63 (2): 273–274.

Hughes, Edward. 2010. *The Cambridge Companion to Camus*. Cambridge ; New York: Cambridge University Press.

Humphreys, Joe. 2020. "Are We All Kantians Now? The Covid-19 Effect on Moral Philosophy." The Irish Times. 2020. https://www.irishtimes.com/culture/are-we-all-kantians-now-the-covid-19-effect-on-moral-philosophy-1.4229595.

Huneman, Philippe. 2006. "Naturalising Purpose: From Comparative Anatomy to the 'Adventure of Reason.'" *Studies in History and Philosophy of Science Part C: Studies in History and*

Philosophy of Biological and Biomedical Sciences 37 (4): 649–674. https://doi.org/10.1016/j.shpsc.2006.09.004.

Hutton, Will. 2020. "Coronavirus Won't End Globalisation, but Change It Hugely for the Better." The Guardian. March 8, 2020. http://www.theguardian.com/commentisfree/2020/mar/08/the-coronavirus-outbreak-shows-us-that-no-one-can-take-on-this-enemy-alone.

Ikenberry, G. John. 2012. *Liberal Leviathan: The Origins, Crisis, and Transformation of the American World Order*. Reprint Edition. Princeton, NJ Oxford: Princeton University Press.

IMFBlog. 2020. "The Great Lockdown: Worst Economic Downturn Since the Great Depression." *IMF Blog* (blog). 2020. https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/.

Institute of Medicine (US), Committee on Guidance for Establishing Standards of Care for Use in Disaster Situations. 2009. *Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations: A Letter Report*. Edited by Bruce M. Altevogt, Clare Stroud, Sarah L. Hanson, Dan Hanfling, and Lawrence O. Gostin. Washington (DC): National Academies Press (US). http://www.ncbi.nlm.nih.gov/books/NBK219958/.

International Committee on Taxonomy of Viruses (ICTV). 2020. "Virus Taxonomy: 2019 Release." 2020. https://talk.ictvonline.org/taxonomy/.

Internet Encyclopedia of Philosophy. 2020. "Aristippus." 2020. https://iep.utm.edu/aristip/.

Isomura, H., and M Stinski. 2013. "Coordination of Late Gene Transcription of Human Cytomegalovirus with Viral DNA Synthesis: Recombinant Viruses as Potential Therapeutic Vaccine Candidates." Expert Opinion on Therapeutic Targets. Expert Opin Ther Targets. February 2013. https://doi.org/10.1517/14728222.2013.740460.

Iyer, Lakshminarayan M., S. Balaji, Eugene V. Koonin, and L. Aravind. 2006. "Evolutionary Genomics of Nucleo-Cytoplasmic Large DNA Viruses." *Virus Research*, Comparative Genomics and Evolution of Complex Viruses, 117 (1): 156–84. https://doi.org/10.1016/j.virusres.2006.01.009.

Jacob, F., and E. L. Wollman. 1961. "Viruses and Genes." *Scientific American* 204 (June): 93–107.

Jalasvuori, Matti. 2012. "Viruses: Essential Agents of Life." ResearchGate. 2012. https://www.researchgate.net/publication/278720857_Viruses_Essential_Agents_of_Life.

Jawad, Rana. 2020. "Coronavirus: Tunisia Deploys Police Robot on Lockdown Patrol." *BBC News*, April 3, 2020, sec. Africa. https://www.bbc.com/news/world-africa-52148639.

Jefferson, Artrish, Valerie E. Cadet, and Abigail Hielscher. 2015. "The Mechanisms of Genetically Modified Vaccinia Viruses for the Treatment of Cancer." *Critical Reviews in Oncology/Hematology* 95 (3): 407–16. https://doi.org/10.1016/j.critrevonc.2015.04.001.

Jern, Patric, and John M. Coffin. 2008. "Effects of Retroviruses on Host Genome Function." *Annual Review of Genetics* 42: 709–32. https://doi.org/10.1146/annurev.genet.42.110807.091501.

Joh, Richard I., and Joshua S. Weitz. 2011. "To Lyse or Not to Lyse: Transient-Mediated Stochastic Fate Determination in Cells Infected by Bacteriophages." *PLOS Computational Biology* 7 (3): e1002006. https://doi.org/10.1371/journal.pcbi.1002006.

John, Stephen David. 2009. "Supreme Emergencies, Epistemic Murkiness and Epistemic Transparency." Philosophy of Management. April 1, 2009. https://doi.org/10.5840/pom20098212.

Kahn, Jeffrey S., and Kenneth McIntosh. 2005. "History and Recent Advances in Coronavirus Discovery." *The Pediatric Infectious Disease Journal* 24 (11): S223. https://doi.org/10.1097/01.inf.0000188166.17324.60.

Kanai, Ryota, Bahador Bahrami, Brad Duchaine, Agnieszka Janik, Michael J. Banissy, and Geraint Rees. 2012. "Brain Structure Links Loneliness to Social Perception." *Current Biology* 22 (20): 1975–79. https://doi.org/10.1016/j.cub.2012.08.045.

Kant, Immanuel. 2008. *Groundwork for the Metaphysics of Morals*. Yale University Press.

———. 2017. *Kant: The Metaphysics of Morals*. Edited by Lara Denis. Translated by Mary Gregor. 2nd ed. Cambridge Texts in the History of Philosophy. Cambridge: Cambridge University Press. https://doi.org/10.1017/9781316091388.

Kantor, Marianna. 2020. "On Coronavirus And Climate Change." Forbes. 2020. https://www.forbes.com/sites/esri/2020/07/17/on-coronavirus-and-climate-change/.

Katzourakis, Aris, and Robert J. Gifford. 2010. "Endogenous Viral Elements in Animal Genomes." *PLoS Genetics* 6 (11): e1001191. https://doi.org/10.1371/journal.pgen.1001191.

Keller, J., N. Leulliot, N. Soler, B. Collinet, R. Vincentelli, P. Forterre, and H. van Tilbeurgh. 2009. "A Protein Encoded by a New Family of Mobile Elements from Euryarchaea Exhibits Three Domains with Novel Folds." *Protein Science: A Publication of the Protein Society* 18 (4): 850–55. https://doi.org/10.1002/pro.73.

Kelly, Ben. 2020. "If the EU Cannot Rein in Hungary's Dictator Viktor Orban, It Will Rot from the Inside." *The Telegraph*, March 31, 2020. https://www.telegraph.co.uk/politics/2020/03/31/eu-cannot-rein-hungarys-dictator-viktor-orban-will-rot-inside/.

Khullar, Dhruv. 2016. "How Social Isolation Is Killing Us (Published 2016)." *The New York Times*, December 22, 2016, sec. The Upshot. https://www.nytimes.com/2016/12/22/upshot/how-social-isolation-is-killing-us.html.

Kierkegaard, Søren. 1992. *Concluding Unscientific Postscript to Philosophical Fragments, Volume 1*. Translated by Howard V. Hong and Edna H. Hong. Revised ed. Edition. Princeton, N.J: Princeton University Press.

Kolachalam, Namrata. 2020. "Indian Muslims Are Being Scapegoated for the Coronavirus." Slate Magazine. April 9, 2020. https://slate.com/news-and-politics/2020/04/tablighi-jamaat-india-muslims-coronavirus.html.

Koonin, Eugene V. 2009. "On the Origin of Cells and Viruses: Primordial Virus World Scenario." *Annals of the New York Academy of Sciences* 1178 (1): 47. https://doi.org/10.1111/j.1749-6632.2009.04992.x.

Koonin, Eugene V., and Valerian V. Dolja. 2013. "A Virocentric Perspective on the Evolution of Life." *Current Opinion in Virology* 3 (5): 546. https://doi.org/10.1016/j.coviro.2013.06.008.

———. 2014. "Virus World as an Evolutionary Network of Viruses and Capsidless Selfish Elements." *Microbiology and Molecular Biology Reviews : MMBR* 78 (2): 278–303. https://doi.org/10.1128/MMBR.00049-13.

Koonin, Eugene V., and William Martin. 2005. "On the Origin of Genomes and Cells within Inorganic Compartments." *Trends in Genetics: TIG* 21 (12): 647–54. https://doi.org/10.1016/j.tig.2005.09.006.

Koonin, Eugene V., Tatiana G. Senkevich, and Valerian V. Dolja. 2006. "The Ancient Virus World and Evolution of Cells." *Biology Direct* 1 (1): 29. https://doi.org/10.1186/1745-6150-1-29.

Koonin, Eugene V., and Petro Starokadomskyy. 2016. "Are Viruses Alive? The Replicator Paradigm Sheds Decisive Light on an Old but Misguided Question." *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 59 (October): 125–34. https://doi.org/10.1016/j.shpsc.2016.02.016.

Koshy, Yohann. 2020. "Pandemic! By Slavoj Žižek Review – the Philosopher Provides His Solution." The Guardian. April 23, 2020. http://www.theguardian.com/books/2020/apr/23/pandemic-by-slavoj-zizek-review-the-philosopher-provides-his-solution.

Kostyrka, Gladys. 2016. "What Roles for Viruses in Origin of Life Scenarios?" *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 59 (October): 135–44. https://doi.org/10.1016/j.shpsc.2016.02.014.

Kotsko, ~ Adam. 2020a. "Giorgio Agamben: 'Clarifications.'" *An Und Für Sich* (blog). March 17, 2020. https://itself.blog/2020/03/17/giorgio-agamben-clarifications/.

———. 2020b. "Giorgio Agamben: A Question." *An Und Für Sich* (blog). April 15, 2020. https://itself.blog/2020/04/15/giorgio-agamben-a-question/.

Kristensen, David M., Alison S. Waller, Takuji Yamada, Peer Bork, Arcady R. Mushegian, and Eugene V. Koonin. 2013. "Orthologous Gene Clusters and Taxon Signature Genes for Viruses of Prokaryotes." *Journal of Bacteriology* 195 (5): 941–50. https://doi.org/10.1128/JB.01801-12.

Kübler-Ross, Elisabeth, and M. D. Ira Byock. 2014. *On Death and Dying: What the Dying Have to Teach Doctors, Nurses, Clergy and Their Own Families*. Reissue Edition. New York: Scribner.

Laidlaw, Patrick P. 2014. "Virus Diseases and Viruses." Cambridge University Press. 2014. https://www.cambridge.org/us/academic/subjects/history/history-medicine/virus-diseases-and-viruses, https://www.cambridge.org/us/academic/subjects/history/history-medicine.

Landauer, Rolf. 1996. "The Physical Nature of Information." *Physics Letters A* 217 (4): 188–93. https://doi.org/10.1016/0375-9601(96)00453-7.

Lapenis, Andrei G. 2002. "Directed Evolution of the Biosphere: Biogeochemical Selection or Gaia?" *The Professional Geographer* 54 (3): 379–91. https://doi.org/10.1111/0033-0124.00337.

Latour, Bruno. 2020. "Imaginer les gestes-barrières contre le retour à la production d'avant-crise." *AOC media - Analyse Opinion Critique* (blog). March 29, 2020. https://aoc.media/opinion/2020/03/29/imaginer-les-gestes-barrieres-contre-le-retour-a-la-production-davant-crise/.

Lemke, Thomas, Monica Casper, and Lisa Jean Moore. 2011. *Biopolitics: An Advanced Introduction*. 1st Edition. New York: NYU Press.

Lewis, Kim. 2010. "Persister Cells." *Annual Review of Microbiology* 64 (1): 357–72. https://doi.org/10.1146/annurev.micro.112408.134306.

Lewis, Michael. 2020. "The Virus and Philosophy | Philosophy@Newcastle." 2020. https://blogs.ncl.ac.uk/philosophy/2020/03/18/the-virus-and-philosophy/.

Li, Fang, Wenhui Li, Michael Farzan, and Stephen C. Harrison. 2005. "Structure of SARS Coronavirus Spike Receptor-Binding Domain Complexed with Receptor." *Science* 309 (5742): 1864–68. https://doi.org/10.1126/science.1116480.

Lloyd, Sharon A., and Susanne Sreedhar. 2020. "Hobbes's Moral and Political Philosophy." In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Fall 2020. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/fall2020/entries/hobbes-moral/.

Lopez-Garcia, Purificacion. 2012. "The Place of Viruses in Biology in Light of the Metabolism-versus-Replication-First Debate." *History and Philosophy of the Life Sciences* 34 (January): 391–406.

Lorenzini, Daniele. 2020. "Biopolitics in the Time of Coronavirus." *In the Moment* (blog). April 2, 2020. https://critinq.wordpress.com/2020/04/02/biopolitics-in-the-time-of-coronavirus/.

Lovell, Jeremy. 2008. "Climate Report Calls for Green 'New Deal.'" *Reuters*, July 21, 2008. https://www.reuters.com/article/us-climate-deal-idUSL204610020080721.

Lovelock, J. E. 1972. "Gaia as Seen through the Atmosphere." *Atmospheric Environment (1967)* 6 (8): 579–80. https://doi.org/10.1016/0004-6981(72)90076-5.

Lovelock, J. E., and L. Margulis. 1974. "Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis." *Tellus* 26 (August): 2.

Lovelock, James. 1995. *The Ages of Gaia: A Biography of Our Living Earth*. REV AND EXPANDED ed. Edition. New York: W. W. Norton & Company.

———. 2001. *Homage to Gaia: The Life of an Independent Scientist*. Oxford University Press.

MacMillan, Scott, Anthony R. Yue, and Albert J. Mills. 2012. "Both How and Why: Considering Existentialism as a Philosophy of Work and Management." Philosophy of Management. November 1, 2012. https://doi.org/10.5840/pom201211318.

MacQuarrie, John. 1973. *Existentialism: An Introduction, Guide, and Assessment*. London: Penguin Books.

Mahy, Brian W. J. 1998. *Topley and Wilson's Microbiology and Microbial Infections: Volume 1: Virology*. Edited by Leslie Collier, Albert Balows, and Max Sussman. 9th Edition. London : New York: Hodder Education Publishers.

Mahy, Brian W. J., and Marc H. V. van Regenmortel, eds. 2009. *Desk Encyclopedia of Human and Medical Virology*. 1st Edition. Amsterdam: Academic Press.

Maner, Jon K., C. Nathan DeWall, Roy F. Baumeister, and Mark Schaller. 2007. "Does Social Exclusion Motivate Interpersonal Reconnection? Resolving the 'Porcupine Problem.'" *Journal of Personality and Social Psychology* 92 (1): 42–55. https://doi.org/10.1037/0022-3514.92.1.42.

Mars, Amanda. 2020. "Esther Duflo: 'Las máquinas no enferman. Temo que esta crisis lleve a una mayor automatización.'" EL PAÍS. May 23, 2020. https://elpais.com/ideas/2020-05-23/esther-duflo-las-maquinas-no-enferman-temo-que-esta-crisis-lleve-a-una-mayor-automatizacion.html.

Martens, Andy, Spee Kosloff, Jeff Greenberg, Mark J. Landau, and Toni Schmader. 2007. "Killing Begets Killing: Evidence From a Bug-Killing Paradigm That Initial Killing Fuels Subsequent Killing:" *Personality and Social Psychology Bulletin*, June. https://doi.org/10.1177/0146167207303020.

Más, Vicente, and José A. Melero. 2013. "Entry of Enveloped Viruses into Host Cells: Membrane Fusion." In *Structure and Physics of Viruses: An Integrated Textbook*, edited by Mauricio

G. Mateu, 467–87. Subcellular Biochemistry. Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-007-6552-8_16.

Maslow, A. H. 1943. "A Theory of Human Motivation." *Psychological Review* 50 (4): 370–96. https://doi.org/10.1037/h0054346.

Mayr, E. 1953. "Concepts of Classification and Nomenclature in Higher Organisms and Microorganisms." *Annals of the New York Academy of Sciences* 56 (3): 391–97. https://doi.org/10.1111/j.1749-6632.1953.tb30229.x.

McIntosh, Kenneth. 1974. "Coronaviruses: A Comparative Review." In *Current Topics in Microbiology and Immunology / Ergebnisse Der Mikrobiologie Und Immunitätsforschung*, edited by W. Arber, R. Haas, W. Henle, P. H. Hofschneider, N. K. Jerne, P. Koldovský, H. Koprowski, et al., 85–129. Current Topics in Microbiology and Immunology / Ergebnisse Der Mikrobiologie Und Immunitätsforschung. Berlin, Heidelberg: Springer. https://doi.org/10.1007/978-3-642-65775-7_3.

Melnick, A. L., and R. G. Bernheim. 2009. "Using the Code of Ethics in Crisis Management Involving Complex Political Environments: Determining Ventilator Allocation During an Influenza Pandemic." Philosophy of Management. April 1, 2009. https://doi.org/10.5840/pom20098213.

Merzouk, Sayf. 2020. "Plato's Allegorical Cave, COVID-19, and the Infodemic." Medium. April 12, 2020. https://medium.com/@sayf.merzouk/platos-allegorical-cave-covid-19-and-the-infodemic-634fafecf40.

Messerly, John. 2020. "The Democratic Virtues Of Skepticism." *Reason and Meaning* (blog). July 15, 2020. https://reasonandmeaning.com/2020/07/15/the-democratic-virtues-of-skepticism/.

Metzner, Karin J. 2006. "Detection and Significance of Minority Quasispecies of Drug-Resistant HIV-1." *Journal of HIV Therapy* 11 (4): 74–81.

Michelman, Stephen. 2010. *The A to Z of Existentialism*. Scarecrow Press.

Mill, John Stuart. 1863. *Utilitarianism*. Parker, Son and Bourn.

Minot, Samuel, Rohini Sinha, Jun Chen, Hongzhe Li, Sue A. Keilbaugh, Gary D. Wu, James D. Lewis, and Frederic D. Bushman. 2011. "The Human Gut Virome: Inter-Individual Variation and Dynamic Response to Diet." *Genome Research* 21 (10): 1616–25. https://doi.org/10.1101/gr.122705.111.

Mocali, Stefano, and Anna Benedetti. 2010. "Exploring Research Frontiers in Microbiology: The Challenge of Metagenomics in Soil Microbiology." *Research in Microbiology* 161 (6): 497–505. https://doi.org/10.1016/j.resmic.2010.04.010.

Mogensen, Jackie Flynn. 2020. "Science Has an Ugly, Complicated Dark Side. And the Coronavirus Is Bringing It Out." *Mother Jones* (blog). 2020. https://www.motherjones.com/politics/2020/04/coronavirus-science-rush-to-publish-retractions/.

Mohan, Shaj. 2020. "What Carries Us On." Positions Politics. March 22, 2020. http://positionspolitics.org/shaj-mohan-what-carries-us-on/.

Mohan, Shaj, Divya Dwivedi, and Jean-Luc Nancy. 2018. *Gandhi and Philosophy: On Theological Anti-Politics*. London, UK: Bloomsbury Academic.

Moreira, D., and P. Lopez-Garcia. 2009. "Ten Reasons to Exclude Viruses from the Tree of Life. Nat Rev Microbiol 7: 306-311." ResearchGate. 2009. https://www.researchgate.net/publication/24186117_Moreira_D_Lopez-

Garcia_P_Ten_reasons_to_exclude_viruses_from_the_tree_of_life_Nat_Rev_Microbiol_7_306-311.

Myllyvirta, Lauri. 2020. "Analysis: Coronavirus Temporarily Reduced China's CO2 Emissions by a Quarter." Carbon Brief. February 19, 2020. https://www.carbonbrief.org/analysis-coronavirus-has-temporarily-reduced-chinas-co2-emissions-by-a-quarter.

Nadeau, Barbie Latza. 2020. "Italy Shows Just How Crazy Coronavirus Panic Can Get." *The Daily Beast*, February 29, 2020, sec. travel. https://www.thedailybeast.com/italy-shows-just-how-crazy-coronavirus-panic-can-get.

Nancy, Jean-Luc. 2020a. "Communovirus (English and French Text) | European Journal of Psychoanalysis." 2020. http://www.journal-psychoanalysis.eu/communovirus-english-and-french-text/.

———. 2020b. "Excepción viral." Ficción de la razón. February 28, 2020. https://ficciondelarazon.org/2020/02/28/jean-luc-nancy-excepcion-viral/.

Nancy, Jean-Luc, and Roberto Esposito. 2020. "A Much Too Human Virus." European Journal of Psychoanalysis. 2020. https://www.journal-psychoanalysis.eu/a-much-human-virus/.

National Center for Biotechnology, Information, National Library of Medicine, and National Institutes of Healt. 2020. "The WHO Pandemic Phases - Pandemic Influenza Preparedness and Response - NCBI Bookshelf." 2020. https://web.archive.org/web/20200421161230/https://www.ncbi.nlm.nih.gov/books/NBK143061/.

Navarro, Juan Arnau. 2020. "Cosmopolitas sin salir de casa." *El País*, July 10, 2020, sec. Babelia. https://elpais.com/cultura/2020/07/10/babelia/1594389054_561632.html.

Nebehay, Stephanie. 2020. "WHO Says It No Longer Uses 'pandemic' Category, but Virus Still Emergency." *Reuters*, February 24, 2020. https://www.reuters.com/article/uk-china-health-who-idUKKCN20I0PD.

Nicholson, Daniel J., and John Dupré, eds. 2018. *Everything Flows: Towards a Processual Philosophy of Biology*. OUP Oxford.

Noble, Denis. 2006. *The Music of Life: Biology beyond the Genome*. Illustrated Edition. Oxford ; New York: OUP Oxford.

NSW Government. 2020. "Sexually Transmitted Infections Surveillance Reports - Reports." 2020. https://www.health.nsw.gov.au/Infectious/reports/Pages/STI-reports.aspx.

O' Brien, Sean. 2020. "Conservation in the Era of Data and Analytics." *Esri* (blog). February 5, 2020. https://www.esri.com/about/newsroom/podcast/conservation-in-the-era-of-data-and-analytics/.

O'Malley, Maureen. 2014. *Philosophy of Microbiology*. Cambridge University Press.

Palese, Peter. 2006. "Making Better Influenza Virus Vaccines? - Volume 12, Number 1—January 2006 - Emerging Infectious Diseases Journal - CDC." https://doi.org/10.3201/eid1201.051043.

Payne, Susan. 2017. "Chapter 17 - Family Coronaviridae." In *Viruses*, edited by Susan Payne, 149–58. Academic Press. https://doi.org/10.1016/B978-0-12-803109-4.00017-9.

Pearson, Helen. 2008. "'Virophage' Suggests Viruses Are Alive." *Nature* 454 (7205): 677–677. https://doi.org/10.1038/454677a.

Peckham, Robert. 2013. "Economies of Contagion: Financial Crisis and Pandemic." *Economy and Society* 42 (2): 226–48. https://doi.org/10.1080/03085147.2012.718626.

Pellam, John L. 2015. *The Encyclopedia Intelligentsia: A Compendium of Great Thinkers and Bright Minds of the 21st Century*. Bibliotheque: World Wide International Publishers.

Peters, Michael A. 2012. "Open Works, Open Cultures, and Open Learning Systems." *Putting Knowledge to Work & Letting Information Play*, January, 55–71.

———. 2020. "Philosophy and Pandemic in the Postdigital Era: Foucault, Agamben, Žižek." *Postdigital Science and Education*, April, 1–6. https://doi.org/10.1007/s42438-020-00117-4.

Peters, Michael A., Petar Jandrić, and Peter McLaren. 2020. "Viral Modernity? Epidemics, Infodemics, and the 'Bioinformational' Paradigm." 2020. https://www.tandfonline.com/doi/full/10.1080/00131857.2020.1744226.

Philipkoski, Kristen. 2015. "Black Death's Gene Code Cracked." April 26, 2015. https://web.archive.org/web/20150426160438/http://archive.wired.com/medtech/health/news/2001/10/47288.

Picheta, Rob. 2020. "Coronavirus Pandemic Will Cause Global Famines of 'biblical Proportions,' UN Warns." CNN. 2020. https://www.cnn.com/2020/04/22/africa/coronavirus-famine-un-warning-intl/index.html.

Pinn, Anthony B. 2020. "Humanism's Vulnerable Human." TheHumanist.Com. April 28, 2020. https://thehumanist.com/features/articles/humanisms-vulnerable-human.

Plato. 2008. *The Republic*. Cosimo, Inc.

Podolsky, S. 1996. "The Role of the Virus in Origin-of-Life Theorizing." Journal of the History of Biology. J Hist Biol. Spring 1996. https://doi.org/10.1007/BF00129697.

Pogačar, Marko. 2020. "Coughing Has Become Almost a Terrorist Act: A Conversation with Srečko Horvat." 2020. https://www.versopolis.com/people/conversation/835/coughing-has-become-almost-a-terrorist-act-a-conversation-with-srecko-horvat.

Policante, Amedeo. 2010. "War against Biopower - Timely Reflections on an Historicist Foucault." *Theory & Event* 13 (1). https://doi.org/10.1353/tae.0.0123.

Poovanna, Sharan. 2020. "Drones Used to Monitor Body Temperature, People Movement in South Bengaluru." Mint. April 8, 2020. https://www.livemint.com/news/india/drones-used-to-monitor-body-temperature-people-movement-in-south-bengaluru-11586361317500.html.

Pradeu, Thomas, Gladys Kostyrka, and John Dupré. 2016. "Understanding Viruses: Philosophical Investigations." *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 59 (October): 57–63. https://doi.org/10.1016/j.shpsc.2016.02.008.

Qin, Amy, Steven Lee Myers, and Elaine Yu. 2020. "China Tightens Wuhan Lockdown in 'Wartime' Battle With Coronavirus." 2020. https://www.nytimes.com/2020/02/06/world/asia/coronavirus-china-wuhan-quarantine.html.

Qualls, Noreen, Alexandra Levitt, Neha Kanade, Narue Wright-Jegede, Stephanie Dopson, Matthew Biggerstaff, Carrie Reed, et al. 2017. "Community Mitigation Guidelines to Prevent Pandemic Influenza — United States, 2017." *MMWR. Recommendations and Reports* 66 (1): 1–34. https://doi.org/10.15585/mmwr.rr6601a1.

Quammen, David. 2012. *Spillover: Animal Infections and the Next Human Pandemic*. W. W. Norton.

Raoult, Didier, and Patrick Forterre. 2008. "Redefining Viruses: Lessons from Mimivirus." *Nature Reviews. Microbiology* 6 (4): 315–19. https://doi.org/10.1038/nrmicro1858.

Rawls, John. 1999. *A Theory of Justice*. Oxford University Press.

Redacción MAPFRE. 2020. "Philosophy and Coronavirus, How the Pandemic Is Changing Us." Grupo MAPFRE Corporativo - Acerca de MAPFRE. August 5, 2020. https://www.mapfre.com/en/philosophy-coronavirus-pandemic/.

Reed, Carrie, Matthew Biggerstaff, Lyn Finelli, Lisa M. Koonin, Denise Beauvais, Amra Uzicanin, Andrew Plummer, Joe Bresee, Stephen C. Redd, and Daniel B. Jernigan. 2013. "Novel Framework for Assessing Epidemiologic Effects of Influenza Epidemics and Pandemics." https://doi.org/10.3201/eid1901.120124.

Rescher, Nicholas. 1996. *Process Metaphysics: An Introduction to Process Philosophy*. F Second Printing Used Edition. Albany: State University of New York Press.

Riggs, Garrett. 2020. "Philosophy in a Time of Pandemic," 6.

Roberton, Jamie, and Lorand Bodo. 2020. "Deforestation of the Amazon Has Soared under Cover of the Coronavirus." NBC News. 2020. https://www.nbcnews.com/science/environment/deforestation-amazon-has-soared-under-cover-coronavirus-n1204451.

Rodrigues, C., M. Deshmukh, T. Jacob, R. Nukala, S. Menon, and A. Mehta. 2001. "Significance of HBV DNA by PCR over Serological Markers of HBV in Acute and Chronic Patients." *Indian Journal of Medical Microbiology* 19 (3): 141–44.

Rohwer, Forest, and Katie Barott. 2013. "Viral Information." *Biology & Philosophy* 28 (2): 283–97. https://doi.org/10.1007/s10539-012-9344-0.

Ronchi, Rocco. 2020. "Le virtù del virus." Text. Doppiozero. Doppiozero. March 8, 2020. https://www.doppiozero.com/materiali/le-virtu-del-virus.

Rushforth, Jen. 2017. "Solitary Confinement: Social Death and Its Afterlives." *Themis: Research Journal of Justice Studies and Forensic Science* 5 (1). https://scholarworks.sjsu.edu/themis/vol5/iss1/4.

Ryan, Frank. 2009. *Virolution*. Collins.

Rybicki, E. P. 1990. "The Classification of Organisms at the Edge of Life, or Problems with Virus Systematics." *South African Journal of Science*, no. 86: 182–86.

Said, Edward W. 1979. *Orientalism*. New York: Vintage Books.

Sandbulte, Matthew R., Kim B. Westgeest, Jin Gao, Xiyan Xu, Alexander I. Klimov, Colin A. Russell, David F. Burke, Derek J. Smith, Ron A. M. Fouchier, and Maryna C. Eichelberger. 2011. "Discordant Antigenic Drift of Neuraminidase and Hemagglutinin in H1N1 and H3N2 Influenza Viruses." *Proceedings of the National Academy of Sciences* 108 (51): 20748–53. https://doi.org/10.1073/pnas.1113801108.

Savulescu, Julian, Ingmar Persson, and Dominic Wilkinson. 2020. "Utilitarianism and the Pandemic." *Bioethics* 34 (6): 620–32. https://doi.org/10.1111/bioe.12771.

Scheffler. 1988. *Consequentialism and Its Critics*. Oxford University Press.

Schirato, Tony, Geoff Danaher, and Jen Webb. 2012. *Understanding Foucault: A Critical Introduction*. Allen & Unwin. https://researchprofiles.canberra.edu.au/en/publications/understanding-foucault-a-critical-introduction.

Schrodinger, Roger, Erwin Schrödinger, and Erwin Schr Dinger. 1992. *What Is Life?: With Mind and Matter and Autobiographical Sketches*. Cambridge University Press.

Sennett, Richard. 2004. *Respect in a World of Inequality*. Reprint Edition. New York; London: W. W. Norton & Company.

Sfetcu, Nicolae. 2020a. "Filosofie - Noțiuni de bază, Volumul 2." SetThings. 2020. https://www.setthings.com/ro/e-books/filosofie-notiuni-de-baza-volumul-2/.

———. 2020b. "Bruno Latour despre epidemia COVID." SetThings. June 13, 2020. https://www.setthings.com/ro/bruno-latour-despre-epidemia-covid/.

———. 2020c. "Pandemia COVID, John Rawls și vălul ignoranței." SetThings. July 15, 2020. https://www.setthings.com/ro/pandemia-covid-john-rawls-si-valul-ignorantei/.

———. 2020d. "Pandemia COVID e probabil să fie rezultatul direct al încălzirii globale și globalizării." SetThings. July 31, 2020. https://www.setthings.com/ro/pandemia-covid-e-probabil-sa-fie-rezultatul-direct-al-incalzirii-globale-si-globalizarii/.

Shaver, Robert. 2019. "Egoism." In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Spring 2019. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/spr2019/entries/egoism/.

Shors, Teri. 2016. *Understanding Viruses*. 3rd Edition. Burlington, Massachusetts: Jones & Bartlett Learning.

Sidgwick, Henry. 1874. *The Methods of Ethics*. Macmillan.

Simmons, Graham, Pawel Zmora, Stefanie Gierer, Adeline Heurich, and Stefan Pöhlmann. 2013. "Proteolytic Activation of the SARS-Coronavirus Spike Protein: Cutting Enzymes at the Cutting Edge of Antiviral Research." *Antiviral Research* 100 (3): 605–14. https://doi.org/10.1016/j.antiviral.2013.09.028.

Sinclair, John. 2008. "Human Cytomegalovirus: Latency and Reactivation in the Myeloid Lineage." *Journal of Clinical Virology*, CMV Special Issue, 41 (3): 180–85. https://doi.org/10.1016/j.jcv.2007.11.014.

Singer, Peter. 2011. *Practical Ethics*. Cambridge University Press.

Smith, John Maynard, and Eörs Szathmáry. 2000. *The Origins of Life: From the Birth of Life to the Origin of Language*. Oxford: Oxford University Press.

Solomon, Robert C. 1776. *Existentialism by Robert C. Solomon*. McGraw-Hill Higher Education.

Sotiris, Panagiotis. 2020. "Against Agamben: Is a Democratic Biopolitics Possible?" Viewpoint Magazine. March 20, 2020. https://www.viewpointmag.com/2020/03/20/against-agamben-democratic-biopolitics/.

Spasova, Darina S., and Charles D. Surh. 2014. "Blowing on Embers: Commensal Microbiota and Our Immune System." *Frontiers in Immunology* 5 (July). https://doi.org/10.3389/fimmu.2014.00318.

Spinoza, Baruch. 2019. *Delphi Collected Works of Baruch Spinoza (Illustrated)*. Delphi Classics.

Stawicki, Stanislaw P., Rebecca Jeanmonod, Andrew C. Miller, Lorenzo Paladino, David F. Gaieski, Anna Q. Yaffee, Annelies De Wulf, et al. 2020. "The 2019–2020 Novel Coronavirus (Severe Acute Respiratory Syndrome Coronavirus 2) Pandemic: A Joint American College of Academic International Medicine-World Academic Council of Emergency Medicine Multidisciplinary COVID-19 Working Group Consensus Paper." *Journal of Global Infectious Diseases* 12 (2): 47. https://doi.org/10.4103/jgid.jgid_86_20.

Steward, Grieg F., Janine L. Montiel, and Farooq Azam. 2000. "Genome Size Distributions Indicate Variability and Similarities among Marine Viral Assemblages from Diverse Environments." *Limnology and Oceanography* 45 (8): 1697–1706. https://doi.org/10.4319/lo.2000.45.8.1697.

Strahle, William M., and E. H. Bonfield. 1989. "Understanding Consumer Panic: A Sociological Perspective." *ACR North American Advances* NA-16. https://www.acrwebsite.org/volumes/6964/volumes/v16/NA-16/full.

Su, Shuo, Gary Wong, Weifeng Shi, Jun Liu, Alexander C. K. Lai, Jiyong Zhou, Wenjun Liu, Yuhai Bi, and George F. Gao. 2016. "Epidemiology, Genetic Recombination, and

Pathogenesis of Coronaviruses." *Trends in Microbiology* 24 (6): 490–502. https://doi.org/10.1016/j.tim.2016.03.003.

Suttle, Curtis A. 2007. "Marine Viruses--Major Players in the Global Ecosystem." *Nature Reviews. Microbiology* 5 (10): 801–12. https://doi.org/10.1038/nrmicro1750.

Szilard, L. 1929. "über die Entropieverminderung in einem thermodynamischen System bei Eingriffen intelligenter Wesen." *Zeitschrift für Physik* 53 (11): 840–56. https://doi.org/10.1007/BF01341281.

Taleb, Nassim Nicholas. 2007. *The Black Swan: The Impact of the Highly Improbable*. Random House Publishing Group.

Tangney, June Price, Jeffrey Stuewig, and Debra J. Mashek. 2007. "What's Moral about the Self-Conscious Emotions?" In *The Self-Conscious Emotions: Theory and Research*, 21–37. New York, NY, US: Guilford Press.

Tanguay-Renaud, François. 2009. "Making Sense of 'Public' Emergencies." Philosophy of Management. April 1, 2009. https://doi.org/10.5840/pom20098215.

Tarantino, Quentin. 2004. *Kill Bill: Vol. 2*. Action, Crime, Thriller. Miramax, A Band Apart, Super Cool ManChu.

Team, The Visual and Data Journalism. 2020. "Tracking the Global Pandemic: Where Has Been Hit Hardest?" *BBC News*, October 6, 2020, sec. World. https://www.bbc.com/news/world-51235105.

The Free Dictionary. 2020a. "Despair." TheFreeDictionary.Com. 2020. https://www.thefreedictionary.com/despair.

———. 2020b. "Skepticism." In *The Free Dictionary*. https://encyclopedia2.thefreedictionary.com/skepticism.

Thoreson, Ryan. 2020. "Covid-19 Backlash Targets LGBT People in South Korea." Human Rights Watch. May 13, 2020. https://www.hrw.org/news/2020/05/13/covid-19-backlash-targets-lgbt-people-south-korea.

Threats, Institute of Medicine (US) Forum on Microbial. 2007. *Strategies for Disease Containment*. *Ethical and Legal Considerations in Mitigating Pandemic Disease: Workshop Summary*. National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK54163/.

Tolba, Mostafa Kamal. 2001. *Our Fragile World : Challenges and Opportunities for Sustainable Development Vol. 1*. Eolss Publishers Co.,. http://digitallibrary.un.org/record/460370.

Toyabe, Shoichi, Takahiro Sagawa, Masahito Ueda, Eiro Muneyuki, and Masaki Sano. 2010. "Experimental Demonstration of Information-to-Energy Conversion and Validation of the Generalized Jarzynski Equality." *Nature Physics* 6 (12): 988–92. https://doi.org/10.1038/nphys1821.

Tribus, Myron. 1961. *Thermostatics and Thermodynamics*. 1st Edition. Van Nostrand Reinhold.

Tumilty, Ryan. 2020. "Federal Government Announces Aggressive Measures to Battle COVID-19 as Parliament Suspended until April." National Post. 2020. https://nationalpost.com/news/canada/canadian-parliament-suspended-until-april-due-to-coronavirus-crisis.

Tutu, Desmond, and Desmond Mpilo Tutu. 1999. *No Future Without Forgiveness*. Doubleday.

United Nations. 2020a. "Senior Officials Sound Alarm over Food Insecurity, Warning of Potentially 'Biblical' Famine, in Briefings to Security Council | Meetings Coverage and Press Releases." 2020. https://www.un.org/press/en/2020/sc14164.doc.htm.

———. 2020b. "UN Launches COVID-19 Plan That Could 'Defeat the Virus and Build a Better World.'" UN News. March 31, 2020. https://news.un.org/en/story/2020/03/1060702.

United Nations, Environment. 2020c. "Preventing the next Pandemic - Zoonotic Diseases and How to Break the Chain of Transmission." UNEP - UN Environment Programme. May 15, 2020. http://www.unenvironment.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and.

———. 2020d. "Science Points to Causes of COVID-19." UN Environment. May 22, 2020. http://www.unenvironment.org/news-and-stories/story/science-points-causes-covid-19.

Vaes, Jeroen, Nathan A. Heflick, and Jamie L. Goldenberg. 2010. "'We Are People': Ingroup Humanization as an Existential Defense." *Journal of Personality and Social Psychology* 98 (5): 750–60. https://doi.org/10.1037/a0017658.

Vandekerckhove, Wim. 2020. "COVID, Existentialism and Crisis Philosophy." *Philosophy of Management* 19 (2): 127–32. https://doi.org/10.1007/s40926-020-00140-2.

Vetsigian, K., C. Woese, and N. Goldenfeld. 2006. "Collective Evolution and the Genetic Code." Proceedings of the National Academy of Sciences of the United States of America. Proc Natl Acad Sci U S A. July 11, 2006. https://doi.org/10.1073/pnas.0603780103.

Wachowski, Lana, and Lilly Wachowski. 1999. *The Matrix*. Action, Sci-Fi. Warner Bros., Village Roadshow Pictures, Groucho Film Partnership.

Wallace, Rob. 2013. "The Virus and the Virus." CounterPunch.Org. June 14, 2013. https://www.counterpunch.org/2013/06/14/the-virus-and-the-virus/.

Walzer, Michael. 2006. *Arguing About War*. New Ed Edition. New Haven London: Yale University Press.

Wartenberg, Thomas E. 2008. *Existentialism: A Beginner's Guide*. Beginner's Guides Edition. Oneworld Publications.

Waterson, J., and L. Kuo. 2020. "China Steps up Western Media Campaign over Coronavirus Crisis." The Guardian. April 3, 2020. http://www.theguardian.com/world/2020/apr/03/china-steps-up-western-media-campaign-over-coronavirus-crisis.

Watts, Michael. 2003. *Kierkegaard*. Oneworld.

Weinbauer, Markus G. 2004. "Ecology of Prokaryotic Viruses." *FEMS Microbiology Reviews* 28 (2): 127–81. https://doi.org/10.1016/j.femsre.2003.08.001.

Wertheim, Joel O., Daniel K. W. Chu, Joseph S. M. Peiris, Sergei L. Kosakovsky Pond, and Leo L. M. Poon. 2013. "A Case for the Ancient Origin of Coronaviruses." *Journal of Virology* 87 (12): 7039–45. https://doi.org/10.1128/JVI.03273-12.

Whitley, Richard J., and Bernard Roizman. 2001. "Herpes Simplex Virus Infections." *The Lancet* 357 (9267): 1513–18. https://doi.org/10.1016/S0140-6736(00)04638-9.

Whyte, Chelsea. 2019. "Green New Deal Proposal Includes Free Higher Education and Fair Pay." New Scientist. 2019. https://www.newscientist.com/article/2193592-green-new-deal-proposal-includes-free-higher-education-and-fair-pay/.

Williams, Bernard Arthur Owen. 2005. *In the Beginning Was the Deed: Realism and Moralism in Political Argument*. Princeton University Press.

Williams, Kipling D. 2007. "Ostracism." *Annual Review of Psychology* 58 (1): 425–52. https://doi.org/10.1146/annurev.psych.58.110405.085641.

Wilson, Robert S., Kristin R. Krueger, Steven E. Arnold, Julie A. Schneider, Jeremiah F. Kelly, Lisa L. Barnes, Yuxiao Tang, and David A. Bennett. 2007. "Loneliness and Risk of

Alzheimer Disease." *Archives of General Psychiatry* 64 (2): 234. https://doi.org/10.1001/archpsyc.64.2.234.

Woo, Patrick C. Y., Susanna K. P. Lau, Carol S. F. Lam, Candy C. Y. Lau, Alan K. L. Tsang, John H. N. Lau, Ru Bai, et al. 2012. "Discovery of Seven Novel Mammalian and Avian Coronaviruses in the Genus Deltacoronavirus Supports Bat Coronaviruses as the Gene Source of Alphacoronavirus and Betacoronavirus and Avian Coronaviruses as the Gene Source of Gammacoronavirus and Deltacoronavirus." *Journal of Virology* 86 (7): 3995–4008. https://doi.org/10.1128/JVI.06540-11.

Worland, Justin. 2020. "The Wuhan Coronavirus, Climate Change, and Future Epidemics." Time. 2020. https://time.com/5779156/wuhan-coronavirus-climate-change/.

World Health Organization. 2010. "WHO Press Conference on 2009 Pandemic Influenza." https://web.archive.org/web/20110513194204/http://www.who.int/csr/disease/influenza/PIPGuidance09.pdf.

———. 2011. "Pandemic Influenza Preparedness and Response." https://web.archive.org/web/20110910112007/http://www.who.int/csr/disease/influenza/GIPA3AideMemoire.pdf.

———. 2020a. "Advice for the Public." 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public.

———. 2020b. "Laboratory Testing of Human Suspected Cases of Novel Coronavirus (NCoV) Infection." https://apps.who.int/iris/bitstream/handle/10665/330374/WHO-2019-nCoV-laboratory-2020.1-eng.pdf.

———. 2020c. "WHO Director-General's Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020." 2020. https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

———. 2020d. "WHO Statement Regarding Cluster of Pneumonia Cases in Wuhan, China." 2020. https://www.who.int/china/news/detail/09-01-2020-who-statement-regarding-cluster-of-pneumonia-cases-in-wuhan-china.

Worobey, Michael, and Edward C. Holmes. 1999. "Evolutionary Aspects of Recombination in RNA Viruses." *The Journal of General Virology* 80 (Pt 10) (October): 2535–43. https://doi.org/10.1099/0022-1317-80-10-2535.

Wu, Katherine J. 2020. "There Are More Viruses than Stars in the Universe. Why Do Only Some Infect Us?" Science. April 15, 2020. https://www.nationalgeographic.com/science/2020/04/factors-allow-viruses-infect-humans-coronavirus/.

Wylie, Kristine M., George M. Weinstock, and Gregory A. Storch. 2012. "Emerging View of the Human Virome." *Translational Research: The Journal of Laboratory and Clinical Medicine* 160 (4): 283–90. https://doi.org/10.1016/j.trsl.2012.03.006.

Xu Elegant, N., and C. Chandler. 2020. "When Red Is Unlucky: What We Can Learn from China's Color-Coded Apps for Tracking the Coronavirus Outbreak." Fortune. 2020. https://fortune.com/2020/04/20/china-coronavirus-tracking-apps-color-codes-covid-19-alibaba-tencent-baidu/.

Yin, Yanbin, and Daniel Fischer. 2008. "Identification and Investigation of ORFans in the Viral World." *BMC Genomics* 9 (January): 24. https://doi.org/10.1186/1471-2164-9-24.

Zack, Naomi. 2009. "The Ethics of Disaster Planning: Preparation vs Response." Philosophy of Management. April 1, 2009. https://doi.org/10.5840/pom20098216.

Zhang, Ruixiong, Yuzhong Zhang, Haipeng Lin, Xu Feng, Tzung-May Fu, and Yuhang Wang. 2020. "NOx Emission Reduction and Recovery during COVID-19 in East China." *Atmosphere* 11 (4): 433. https://doi.org/10.3390/atmos11040433.

Zhou, Xinyue, Liwei Zheng, L. Zhou, and N. Guo. 2009. "The Act of Rejecting Reduces the Desire to Reconnect: Evidence for a Cognitive Dissonance Account." https://doi.org/10.1016/J.JESP.2008.08.011.

Zhu, Na, Dingyu Zhang, Wenling Wang, Xingwang Li, Bo Yang, Jingdong Song, Xiang Zhao, et al. 2020. "A Novel Coronavirus from Patients with Pneumonia in China, 2019." *New England Journal of Medicine*, January. https://doi.org/10.1056/NEJMoa2001017.

Zilinskas, R. A. 2017. "A Brief History of Biological Weapons Programmes and the Use of Animal Pathogens as Biological Warfare Agents." *Revue Scientifique Et Technique (International Office of Epizootics)* 36 (2): 415–22. https://doi.org/10.20506/rst.36.2.2662.

Zizek, Slavoj. 2020. "Coronavirus Is 'Kill Bill'-Esque Blow to Capitalism and Could Lead to Reinvention of Communism." RT International. 2020. https://www.rt.com/op-ed/481831-coronavirus-kill-bill-capitalism-communism/.

Žižek, Slavoj. 2020a. "Pandemic!: COVID-19 Shakes the World." Wiley.Com. 2020. https://www.wiley.com/en-us/Pandemic%21%3A+COVID+19+Shakes+the+World-p-9781509546107.

———. 2020b. "Monitor and Punish? Yes, Please!" *The Philosophical Salon* (blog). March 16, 2020. https://thephilosophicalsalon.com/monitor-and-punish-yes-please/.

———. 2020c. "Is Barbarism with a Human Face Our Fate?" *In the Moment* (blog). March 18, 2020. https://critinq.wordpress.com/2020/03/18/is-barbarism-with-a-human-face-our-fate/.