The Impact of Coronavirus on the Ecosystem of Rationality

Alireza Mansouri*

Abstract

The recent pandemic is a reminder of several important lessons from Popper's philosophy. My aim in this paper is to address some of these lessons. By making use of Popper's *theory of three worlds*, I explain how coronavirus has a far-reaching impact on the ecosystem of rationality, and how the viruses that threaten humans could also be a threat to the whole life on Earth. Applying the epistemological *distinction between science and technology,* I go on to explain the pivotal role of science in preventing further crises. This, I argue, is done by putting technology in the sphere of rationality; through both *criticizing* technologies and inspiring the invention of clean technologies, and also technologies that serve us as alerting systems. I shall argue that critical rationalism helps us to understand the 'pandemic problem situation' in a more informed manner and thus helps us to find out about the vulnerable points of our ecosystem of rationality in a more efficient way. In the latter part of the paper, I shall develop the thesis that while during the recent pandemic, *science* did it best to warn us about its dangers, the policy-makers, who are technologists of a sort, in many countries did not take those warnings seriously. Even when the crisis turned into a global catastrophe, the three types of technologies (health-care, lock-down, and diagnosis and treatment) were not fully efficient in controlling the pandemic. Drawing on Popper's ideas I shall argue that in the face of the current emergency, our best chance to improve our situation is to apply the method of *piecemeal social engineering* to alleviate people's suffering.

Keywords: COVID-19, Coronavirus, pandemic, critical rationalism, Popper's theory of three worlds

Introduction

Although an epidemic or pandemic is not a new situation, its impact on the world's ecosystem is far greater than ever, because of the wider possibilities and choices that science and technology *now* offer. A complex modern world with intertwined socio-technical systems that sometimes transcend state boundaries may be more vulnerable than ever before, because instability and defect in one part of these systems can quickly transfer to the entire system and cause it to malfunction. Now, science helps us to discover the outbreak and the origin of disease much earlier than before. But this knowledge does not necessarily lead to appropriate *decisions*. Expecting an invisible danger that lurks at any moment, may lead to fear or panic attack. The resulting panic, in its turn, may cause hasty decisions that, due to powerful and accessible human technologies, may be the source of more destructive consequences for the entire world ecosystem. This increases our responsibility regarding our decisions, both before and after an epidemic.

* Philosophy of Science Dept. at the *Institute for Humanities and Cultural Studies*; Tehran, Iran
email: mansouri@ihcs.ac.ir
This paper delivered at the *1st international Zoom-based conference on the work of Karl Popper*, organised by Jeremy Shearmur, on 27th March, 2021.

In this paper, by making use of Popper's *theory of three worlds*, I try to explain the ontological status of the Covid-19, and then attend to the implications of the interaction of the coronavirus and the human world.

The Ontological Status of the Coronavirus

According to Popper's theory of three worlds, the realm of reality is not limited to physical entities and natural kinds (world 1; W1) or even mental states (World 2; W2). There are other realms in reality, in particular a world of thoughts, theories, problems, designs, works of art and literature (world 3; W3). Each world, directly or indirectly, has a causal effect on the other two worlds (Popper, 1979; 1985). W2 is the medium through which the impact of W1 and W3 are.

The Coronavirus family belongs to W1, which affects both Worlds 1, 2, and 3. They were discovered in the 1960s. Of 40 different species of the coronavirus family, seven are known to have been transmitted to humans so far. They cause adverse effects such as the common cold family in humans. There are some types of the virus that are associated with more severe symptoms: such as SARS, MERS, and COVID. The latest type, Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), broke out in December 2019. Although there have been speculations that this virus may not be a purely natural type, the genetic sequence of SARS-CoV-2 rules out a lab-engineered virus (Holden Thorp, May 2020).

The Impact of Coronavirus on the Ecosystem of Rationality

Before its transmission into humans, coronavirus had infected other animals In other words, this virus has already been active in W1. Moreover, through its synergetic impact on W3 and W2, it seems it is capable of causing more extensive and longer-lasting changes in W1. It can be argued that the main reason for this disproportional impact is due to the existence of W3 - a world to which other living things than humans do not have access.

Part of the impact of the coronavirus on W3 is the emergence of certain problems, theories, and scientific discoveries due to the presence of the virus. Technological changes, modifications, and interventions are among other significant effects brought about by the impact of the coronavirus on W3.

Our lives owe much to W3, since humans know about viruses only through W3. Through W3 we can identify potential dangers before they occur. So in this sense, science, besides its inspiring role in shaping the designs of some technological plans and policies, plays a critical role for technology. Before presenting theories that suggest the existence and the mechanism of replication of viruses, although they were real and existed in W1, we were not aware of them.

Technology in the Sphere of Rationality

The distinction between Science/technology is an important epistemological distinction, which despite the critical rationalists' warnings, is often ignored in some philosophical approaches and doctrines. There are many substantive differences between these two entities, which are both man-made. For example, science aims to approach the truth about reality, but in engineering and technological activities, the aim is effectiveness for practical purposes (Agassi, 1966; Miller, 2006; Miller, 2009; Paya & Mansouri, 2018).

Although science and technology are epistemologically different, they interact. One important aspect of this interaction is the role of science in critical assessment of technology. By this critical role, science partakes in the *rationality* of technology (Miller, 2006; Miller, 2009).

Because *rationality* is a matter of *method*; it is the way we deal with our beliefs or theories and this way is critically and negatively (ibid, 2006: 50). In this line of thought, critical attitude towards technologies is the starting point for controlling technologies, because new problems emerges by criticizing technologies, and the new *problems* lead to the invention of new (social) technologies.

In contrast, ignoring the critical role of science may lead to disasters. In many cases, technological disasters happen, when economic and political policies and institutions have created such a rigid and undemocratic network that scientific criticism fails to lead to a *will for reform*. Moreover, a doctrine that underestimates science, or reduces science to technology, provides an inadequate ground for the growth of science and deprives technology of a significant source of rationality. For example, the government in charge in South Africa in 2000, influenced by HIV/AIDS denialism, did nothing to prevent the spread of the disease. The result was the death of more than 330,000 people (Horgan, 2020: March 9).

Both in the outbreak of AIDS in South Africa and the Covid-19 pandemic, science has played its critical role. In the case of COVID-19, scientists had frequently warned about global warming, deforestation and its consequences for the outbreak of pandemics. Stopping deforestation will reduce our exposure to new disasters and damps down the spread of a long list of other vicious diseases that have come from rainforest habitats—Zika, Nipah, malaria, cholera and HIV among them. A 2019 study found that a 10 percent increase in deforestation would raise malaria cases by 3.3 percent; that would be 7.4 million people worldwide.[1] Yet despite years of global outcry, deforestation still runs rampant. In its 2007 report, WHO, based on scientific studies, warned about the dangers of epidemics in human societies. However, this was not taken seriously on a global scale until it emerged as a worldwide crisis. Despite scientific warnings, deforestation and wet market business continued.

Despite scientific warnings, safety measures also have shortcomings. In health-care technologies, if we categorize the health technologies involved in epidemics into three levels of health-care (prevention), diagnostic and therapeutic, none of them was adequately efficient to prevent the recent crisis, whereas we had enough time to be prepared because of our level of knowledge. At the individual level of *prevention*, primitive mask technology is still used. At the global level, internet infrastructures are not ideal and accessible for many people. There is also no sufficient efficiency in the field of *diagnostic technologies*. Research shows that without pandemic containment measures, pathogens can spread exponentially (Maier & Brockmann, 2020). Thus, efficient diagnostic and mitigation techniques can reduce the pressure on the hospital and medical sector, and reduce the risk of contagion in health-care workers on the first line of infection, and at the same time, patients will receive medical treatment and recover faster. Therefore, diagnostic technologies are vital in effective measures against pandemics, both in terms of accuracy, speed and availability, so that patients can be diagnosed and quarantined at the early stages and then receive treatment. Studies show that we have shortcomings in treatment technology (Quammen, 2020). *The World Health Report 2006 - Working together for health* contains an expert assessment of a shortage crisis in the global health workforce.[2] The shortage is most severe in the poorest countries.

Moreover, SARS-CoV-2 from W1 has had a significant impact on the technological structures of the world and has exposed the shortcomings of the economic and health-care

[1] See: 'Stopping Deforestation Can Prevent Pandemics' (2020, May 1). Retrieved May 1, 2020, from *Scientific American* (editorial): https://www.scientificamerican.com/article/stopping-deforestation-can-prevent-pandemics/

[2] About one-tenth of cases of Covid-19 in Italy and Spain are related to health-care workers, while the world is short of about 15 million health-care workers by 2030. See (Ahmed, Ahmed, Pissarides, & Stiglitz, 2020).

socio-technical systems, for example the inequality and rich-poor gap divide which exists in the world. Now many Economists are talking about the economic crisis caused by this pandemic, and the mismatch between the health and the economic systems. (see: Stiglitz, 2020; Horgan, 2020: 20 April; Chomsky 2020: April 25, 14).

All of these show that *criticisms* of technologies were ignored by many important institutions representing some of the most influential social technologies of our day, namely, decision-making institutions, organizations, and governments. This corroborates the doctrine that W3 cannot influence W1 unless through W2. Thus, although criticism (from W3) can be directed towards technological functions, it is not enough to control and improve technologies. Technologies, as human constructs have no essence in themselves; their invention, use, control and improvements depend on our *decisions,* and it is of most importance to make the right decision in the situations like this. Knowing the dangers of disease (from W3) may negatively affect mental health issues such as anxiety, fear, depression, stress, and concern about the practical implications of the pandemic response, including financial difficulties. These effects increase the risk of emotional decisions among people (especially vulnerable groups), leading to reactions and decisions that deepen the crisis (Burgess 2020, May 4). Notwithstanding, we should attempt to use this knowledge to take the right policies and decisions; among them may be establishing new institutions for controlling technologies or changing the way we use them.

Attempts to make a vaccine, albeit late, seem to have succeeded.[3] But that is not all. In general, this crisis, with its various dimensions, greatly impacted the collective intentionality, or W2 of human societies. People have realized the significant role of science and have become sensitive to deforestation and the dangers of technology. Intellectuals in democratic societies have a good opportunity to use this collective intentionality to create reforms in public policies, especially in environmental issues, health-care and economic systems.

Conclusion

The impact of crises on humans can profoundly affect the whole life on Earth, because humans have the accessibility to W3. Due to this ability, we are responsible. Individuals and communities with more facilities and authority are more responsible due to their wider choices. Technologies enter the sphere of rationality through persistent criticism. In this situation, the critical role of science, philosophy and ethics is irreplaceable, so we should take them seriously.

So, we need more than ever to elect the politicians and policy-makers who, through democratic process,[4] take steps towards establishing an effective global health care system; reducing military spending in favour of health care; introducing tax schemes to reduce poverty and injustice; and paying attention to science warnings about global warming and its role in environmental degradation and deforestation which cause disease outbreaks.[5] Moreover, to

[3] Although, producing effective vaccines in such a short period after the breakout, with the collaborations and cooperation of institutions around the world, is a great achievement, it shows if we had listened to the warnings of science, we might not have caught in the pandemic, or at least we could have reduced the deaths and sufferings.

[4] Laurie Macfarlane, for example, in a paper in *Open Democracy* suggested, since China has been more successful in managing this and similar crises than the United States and Europe, its centralized system may be an efficient model for Europe and America. However, although we need to reform some neoliberal policies, especially in the field of economics, as John Horgan emphasized in a review of McFarlane's view, they should be made through democratic process (Horgan, 2020, April 27).

[5] See Agassi (2005) for democratic control of technology.

prevent and overcome global crises like pandemics, we need a universal map and global participation that also considers the local considerations for each socio-technological system. This responsibility leads us to rely on collective reasoning in making decisions, to criticize them relentlessly, and to modify them step by step with *piecemeal engineering* (see: Popper, 1966), because the slightest mistake may cost us a greater disaster. Rather than generating permission to carry out low-quality investigations, the urgency and scarcity of pandemics heighten the responsibility of key actors in the research enterprise to coordinate their activities to uphold the standards necessary to advance this mission (London & Kimmelman, 2020). Therefore, the main challenge for the key actors in this situation is how to act quickly on large-scale with the social engineering approach that relies on gradual modifications at small-scale.

Acknowledgement

Although the responsibility of any errors is my own, I am immensely grateful to Professor Ali Paya for his comments on an earlier version of the manuscript.

References

The World Health Report 2006 - working together for health. (2006). Retrieved May 12, 2020, from The World Health Organization: https://www.who.int/whr/2006/en/

The world health report 2007 - A safer future: global public health security in the 21st century. (2007). Retrieved May 12, 2020, from World Health Organization: https://www.who.int/whr/2007/en/

Stopping Deforestation Can Prevent Pandemics (editorial). (2020, May 1). Retrieved May 1, 2020, from Scientific American: https://www.scientificamerican.com/article/stopping-deforestation-can-prevent-pandemics/

Agassi, J. (1966). "The Confusion between Science and Technology in the Standard Philosophies of Science," *Technology and Culture, 7*(3), 348-366.

Agassi, J. (2005). *Technology social and philosophical Aspect.* Dordrecht, Boston: Lancaster: D. Reidel.

Ahmed, F., Ahmed, N., Pissarides, C., & Stiglitz, J. (2020, April 2), "*Why inequality could spread COVID-19*," Retrieved May 14, 2020, from the Lancet: https://www.thelancet.com/

Burgess, R. (2020, May 4). "*COVID-19 mental-health responses neglect social realities*," Retrieved May 9, 2020, from nature: https://www.nature.com/articles/d41586-020-01313-9.

Chomsky, N. (2020, April 14). *Chomsky and Pollin: To Heal From COVID-19, We Must Imagine a Different World*. Retrieved from Global Policy: https://www.globalpolicyjournal.com/blog/14/04/2020/chomsky-and-pollin-heal-covid-19-we-must-imagine-different-world

Chomsky, N. (2020, April 25). *The latest massive failure of neoliberalism*. Retrieved from https://www.euractiv.com/section/economy-jobs/ interview/chomsky-on-covid-19-the-latest-massive-failure-of-neoliberalism/

Estola, T. (1970), "Coronaviruses, a New Group of Animal RNA Viruses". *Avian Diseases, 14*(2), 330–336.

Holden Thorp, H. (2020, May 8). "*Both/and problem in an either/or world*," Retrieved from http://science.sciencemag.org/

Horgan, J. (2020, March 9). "*The Coronavirus and Right-Wing Postmodernism*," Retrieved May 9, 2020, from Scientific American: https://blogs.scientificamerican.com/cross-check/the-coronavirus-and-right-wing-postmodernism/

Horgan, J. (2020, April 27). *Will COVID-19 Make Us Less Democratic and More like China?* Retrieved May 9, 2020, from Scientific American: https://blogs.scientificamerican.com/cross-check/will-covid-19-make-us-less-democratic-and-more-like-china/

Horgan, J. (2020, April 20). *"Will COVID-19 Make Us More Socialist?"* Retrieved May 9, 2020, from Scientific American: https://blogs.scientificamerican.com/cross-check/will-covid-19-make-us-more-socialist/

London, A. J., & Kimmelman, J. (2020, May 01). "Against pandemic research exceptionalism," *Science, 368*(6490), 476-477.

Maier, B. F., & Brockmann, D. (2020, May 15). "Effective containment explains subexponential growth in recent confirmed COVID-19 cases in China". Science, pp. 742-746

Miller, D. (2006). *Out of Error.* Burlington: Ashgate Publishing Company.

Miller, D. (2009, August 10). "Putting Science to Work," *Inaugural lecture in a Weekly Series Organized by the Faculty of Engineering of the National University of Columbia*. Retrieved Feb 5, 2021, from http://citeseerx.ist.psu.edu/viewdoc/

Paya, A., & Mansouri, A. (2018). "Science and Technology: Differences, Interactions, and Their Consequences". *Philosophy of Science, 8*(2), 134 - 105 {in Persian}.

Popper. (1985). *Self and Its Brain*. Springer International.

Popper, K. R. (1999). *All Life Is Problem Solving.* (P. Camiller, Trans.) London: Routledge.

Popper, K. R. (1966). *The Open Society and Its Enemies.* United Kingdom: Routledge.

Popper, K. R. (1979). *Objective Knowledge: An Evolutionary Approach* (Revised edition ed.). Oxford University Press.

Quammen, D. (2020, May 4). "Why Weren't We Ready for the Coronavirus?" Retrieved May 9, 2020, from *The New Yorker*: https://www.newyorker.com/

Stiglitz, J. (2020, April 6). *Internationalizing the Crisis*. Retrieved from Project Syndicate: https://www.project-syndicate.org/; and in https://www.weforum.org/agenda/2020/04/internationalizing-coronavirus-covid19-globalization-leadership/