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Covid-19 and Darwin: A Response to Pervez Hoodbhoy

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Corona Literature Explosion

Ever since the novel coronavirus-generated disease called covid-19 became global news late last year, countless views and comments have appeared in the world's print and electronic media on various aspects of the pandemic and its impact on the contemporary social order both at national and global levels. There is an almost endless supply of news each day on the pandemic and related issues that would make it difficult for anyone to keep track of each one of them. My simple wish is that, during this historic period of home confinement imposed on us by the pandemic when free time is in relative abundance, I would come across enough interesting articles to read to enable me to be educated on the subject. Thankfully, from time to time, I have been receiving from several friends really thoughtful articles on coronavirus and the diseases it has generated, particularly covid-19, which I don't think I would have found on my own. Perusing them has benefited me intellectually. These friends have shared the articles with me without expecting something in return. In the past but on different subject matters, I used to receive articles from friends accompanied with requests for my

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written responses. But it was not until April 2020 that I received the first corona article whose sender was soliciting a written response from me. The article in question is now the subject of my present discussion.

Pervez Hoodbhoy's Corona Article

The article is written by Pervez Hoodbhoy with the title *Corona – Our Debt to Darwin*. It first appeared in the widely read Pakistani daily, *The Dawn* on April 4th, 2020 [1]. I received it on April 12th. I told the sender, who is a friend, that I agree to write a response to it, but due to several current personal commitments, not to mention the dictates of Ramadan, I would not be able to start writing at least in another week. His assurance that I would not be given a deadline to submit my response made it easier for me to accept his request. But I must say that both the content of the article and the biodata of its author have also considerably influenced my decision to write a response. The article's title appears interesting. It intrigues me even before I read it. I have not seen previously any article that tries to relate coronavirus with Charles Darwin, a British 19th century biologist best known for his evolutionary theory through natural selection. On that account alone, I thought the article would be worth reading.

But the fame of its author also attracts my attention. In the article Pervez Hoodbhoy is only introduced as a physics teacher in Lahore and Islamabad. This is probably because in Pakistan, his native country, he needs no introduction, since he is a rather well-known figure as a scientist and intellectual-activist, albeit a controversial one. But outside Pakistan, particularly in Malaysia, not many people may know him except among certain intellectual and academic circles. So, let me highlight a few things about him. He is someone whose ideas I happen to know quite a bit, although these ideas are largely based on his book *Islam and Science* published decades ago (1991)[2]. The book was prefaced by Abdus Salam, his fellow countryman, who shared the 1979 Nobel Prize winner for Physics. I suppose many people, like myself, were curious to read the book largely because of Abdus Salam's preface. Anyway, the book left a lasting impression on my mind of the author's thought pattern. The book displayed plenty of fiery rationalism. Among Muslim intellectuals worldwide, Hoodbhoy is largely known thanks to this book. A leading nuclear physicist with a PhD from the prestigious Massachusetts Institute of Technology (MIT), he has been associated in his past scientific research with Abdus Salam. He has lectured widely in and outside Pakistan, and also received several prestigious international awards. His intellectual activism is said to be mainly influenced by his philosophical understanding of secularism, rationalism, and liberalism. This is the man whose corona article we are now discussing. I admit I have not kept abreast with his more recent writings. So, I am keen to find out if his key ideas and intellectual perspectives that I first encountered in the book are still central to his epistemological thought or have undergone significant changes or revisions.

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Sadly, after reading the corona article, I could only come to this unwelcome and, in a sense, pitiful conclusion! I am still reading the same old script from the author on the theme of encounter between religion and science. His ideological and philosophical positions that came out clearly in *Islam and Science* find reaffirmation in the article. What these positions are I will discuss later in greater details. The only thing new in the article is the discussion on coronavirus and what its author perceives as obstacles to the fight against the pandemic. But even in this specific discussion on coronavirus the apparent objective is to bolster his ideological position rather than to provide, for example, new insights into the ecological roots of the pandemic and to initiate new discourses on the significance of medical pluralism[3] for the contemporary world and the future of humanity. Coronavirus is featured in the article as just another supporting evidence of Darwin's natural selection and its assumed indispensability to contemporary biology as well as another instance of the irrelevance of traditional medicine to modern diseases. Apart from harping on the issue of the confrontation between science and religion, Hoodbhoy has hardly changed in another respect, that is, his polemical style of discourse. The article is polemical from beginning to end, and he seems to have succeeded in antagonising almost everyone mentioned in it. It would be a tough challenge for me to write a response to what is essentially a polemic!

When I use the word 'pitiful' in describing what I think of the article, my mind was directed to two related things. One is Hoodbhoy's tradition bashing and the other, his seemingly mixed feelings of hope and despair about the outcome of the conflict between science and tradition that could be confusing to readers. His tradition bashing in the article tells me that his quarrels with religion that I saw in *Islam and Science* have not abated [4]. I am thus reminded of a pertinent comment on him by Imad A. Ahmed, an American scientist, in his review of the book [5]. While acknowledging Hoodbhoy's scientific credentials, Imad Ahmed has this to say about him: "Regrettably, he fails to appreciate the understanding of the relationship of science to religion that is emerging in the reconstructionist wing of the Islamic revival. This puts limits on this otherwise outstanding book. The tragedy is that these limits may cause the book to be quickly dismissed by the people who would benefit the most from it – Muslims in the Arab world and elsewhere feeling challenged by Western culture who need to understand the *universality* of science." Ahmed wrote this comment three decades ago. In the comment he raised the important issue of the relevance of religion to any attempt aimed at advancing the cause of science in Muslim societies. Thus, while lauding Hoodbhoy's "thought experiment" on the creation of a universal scientific culture in the contemporary Muslim world, particularly in Pakistan, the worthiness of which no Muslim would disagree, Ahmed also saw then its major shortcoming. This is Hoodbhoy's lack of a sound understanding of the relationship of science to religion in the Muslim context. The corona article is good evidence that Ahmed's

constructive criticism was not heeded. Hoodbhoy is not interested in coming to terms with religion or tradition. This to me is a pity, since Islam's treasury of

universal teachings on knowledge and civilisational experience in scientific pursuits is sufficiently rich to cater to the needs of contemporary Muslims, including scientists, who are searching for guidelines on how to reconstruct a veritable universal scientific culture that would really benefit the whole of humanity. Hoodbhoy's blanket denunciation of tradition as anti-scientific, in the article and in the book, is without any scientific basis whatsoever, and certainly it would not help the search for these guidelines.

Given his blanket denunciation of tradition, which unfortunately he believes is for the sake of science, it is understandable if from time to time he would try to provide an assessment update on where science stands in its conflict with tradition. Interestingly, he has the ingenuity to seize the current issue of coronavirus as an opportune occasion to present his assessment, since he sees the pandemic as a golden opportunity to highlight what science can do and tradition cannot do to overcome the challenge, even if the anticipated vaccines are not yet in sight. But, despite his faith in the eventual victory of science over tradition, he is also unsure about the latter's strength. His assessment update in the corona article seems to be conveying contradictory messages. Thus, he appears on the one hand to be in despair at seeing religious and political leaders joining forces in their opposition to science[6]. On the other hand, he appears optimistic that science will come out as the winner in this conflict. But after all these decades of waging a "battle for rationality," to borrow from the title of his book, the best positive update on the battle that he could give is this: "Now the good news: most educated people are *beginning to understand* (italics mine) why scientific approaches work and unscientific ones don't." [7]

But for him to say, as in the quote, that thanks to coronavirus even educated people are only beginning to understand the miracle of scientific power, it could only be interpreted to mean that in reality he has hollow optimism about science replacing tradition. The serious implication of his assessment update is that the opposition of tradition to science, particularly in Pakistan, may be viewed as being so strong that all this while, hardly any progress has been made by the latter. I am not sure if he is fully aware of the implication of his saying. Moreover, although he believes that only science could find real answers to coronavirus, both biological and medical, these answers still belong to the realm of the future, and are thus still matters of hope! There is a serious flaw in the line of his argument in the article when he tries to solely base his optimism in question on the future success of science in dealing with coronavirus. How could he argue for the eventual replacement of tradition by science when, as he puts it, the former is still strong and science itself is yet to demonstrate its miraculous power over coronavirus on which he is banking so much for the anticipated replacement?

But even if science were to succeed in overcoming the coronavirus challenge, it would be wishful thinking on his part to expect tradition founded on religion to disappear or decline overnight on account of this factor alone. He should be honest enough to admit that tradition is a civilisational force that has proved to be more resilient than even science. Tradition is founded on principles that are

different from those of modern science, and it is known to have its own inner strength. Moreover, it is not monolithic as some people think. There are many different traditional voices, some of which are not only pro-science and pro-dialogue but also with the intellectual ability to contribute meaningful ideas to the scientific renaissance in contemporary Islam. To many people, including this author, the choice open to humanity in this science-tradition conflict is not to go either just for one or the other in an exclusive manner, but rather to go for their complementary roles and functions. Humanity needs both of them as two fundamental interactive sectors of civilisation for its wellbeing. But this is not to say that both are without shortcomings and weaknesses. Each could be questioned and criticised and also stands to be corrected. Let the truth and the common good prevail! Muslims should be reminded about the wisdom of science-tradition complementarity, what more when this happens also to be a core teaching of the Quran.

Indeed, the best way to go about resolving the tradition-science conflict is through a sustained dialogue in which one would be enriched by the other! In this respect, it is an important point to be noted that during this whole period of lockdowns and mobility control that the whole humanity is going through, it is not true to say, as maintained by Hoodbhoy, that while science and modern medicine are tirelessly searching for the right vaccines to counter covid-19, tradition is either doing nothing or doing all the wrong things in the fight against the pandemic. On the contrary, the world's diverse traditional medical and health systems are contributing in their own ways to winning this historic pandemic war, of course not necessarily in the form of direct therapies or remedial cures but no less importantly in the form of "preventive medicine," [8] that is, hygienic practices and dietary measures that could strengthen a person's immune system. If only all these contributions worldwide have been documented to show tradition's share of the fight against covid-19! These contributions are good illustrations of how tradition complements science in the pursuit of good health both personal and public.

It is also heartening to see a number of articles and news stories that have appeared during this pandemic depicting not only complementarity between science and tradition but also commonalities in their approaches to the pandemic. Perhaps the most instructive is the *Newsweek* opinion piece [9] by Craig Considine, a Professor at Rice University, USA titled 'Can the power of prayer alone stop a pandemic like the coronavirus? Even the Prophet Muhammad thought otherwise.' In his opinion piece, Considine has a simple but significantly profound message to all. He says, "Good hygiene and quarantine, or the practice of isolating from others in the hope of preventing the spread of contagious diseases, [which] are the most effective tools to contain covid-19" are not just suggested by medical scientists and health care professionals but also by

"Muhammad, the prophet of Islam, over 1,300 years ago." Also significant to the present discussion is the view of Noor Hisham Abdullah, Malaysia's leading medical scientist who is also its Director General of Health, [10] on the possible

use of traditional medicines as treatments of Covid-19 pandemic. He does not discount “the possibility that they may help in the recovery,” but emphasises that they “can be used to complement the treatment instead of being the treatment itself.”[11] Abdullah’s positive view that traditional medicine could complement modern treatments of coronavirus is in sharp contrast to that of Hoodbhoy who has only scorns for traditional remedies. While insisting that the fight against coronavirus must be based on “science and facts,” [12] Abdullah, who is noted for his scientific spirit, does not see his tolerance of traditional medicine as something unscientific!

In the light of the foregoing discussion, one wonders what really motivated Hoodbhoy to use the coronavirus as his new argument to attack tradition in the name of science when others, including scientists, see complementarity instead of enmity between science and tradition in the fight against the pandemic. If science cannot be the real motive, since coronavirus is neutral in the science-tradition conflict, then what is it? May be there are deeper motives that we need to look into in the corona article that are non-scientific in nature. Although prior reading of his *Islam and Science* is not necessary for one to have some insights into what these non-scientific motives could possibly be, it would make it a lot easier to identify these motives, since he has staked out in that book an ideological position that apparently underlies the article’s messages.

The Gist of Hoodbhoy’s Contentions in the Corona Article

In the corona article, Hoodbhoy takes up the following contentious issues for the readers:

[1] Beginning his article with an attack on the voices of religion singling out Prime Minister Imran Khan for banning teaching Darwin’s theory of evolution in Pakistani schools and universities and ridiculing the theory wherever it is taught.

[2] Maintaining that no matter what religionists say about Darwin, “every hope for dealing with today’s rogue virus rests squarely upon Darwin’s 200-year old discovery of the principle of natural selection.”

[3] Tradition and Darwin’s natural selection are opposed to each other on the issue of the origin of life on Earth, since tradition believes in “pre-purposed and pre-formed” origin of life, while the latter believes that life forms “randomly appear.”

[4] Thanks to coronavirus, “most educated people begin to understand why scientific approaches work and unscientific ones don’t.” “Even ultra-conservatives and science-rejecting world leaders are now begging scientists to speed up the rescue work.”

[5] Thanks to biological science founded by Darwin, “the coronavirus will eventually turn out to be a deadly controllable affair,” as human lives will “be saved by some yet to be invented drug or vaccine.”

Hoodbhoy ends his article with this statement: “All beneficiaries of modern medicine should surely forgive Darwin for his supposed transgressions.”

In my view, the above five points are the gist of Hoodbhoy’s assertions and claims in the corona article. The rest of the article is detailed comments on each of these five points. It is clear from these points that the main focus of Hoodbhoy’s treatment is Darwinian theory of natural selection both in relation to its critics as well as in relation to its indispensability to the future of biological science. Four out of five points are in explicit reference to Darwin. This observation together with the fact that Darwin features in the title of the article, its opening paragraph, and its concluding statement only goes to underscore the central place of his evolutionary theory in the article.

In the following section, I will try to provide responses to the five points but bearing in mind that part of the responses has already been given in the previous section.

My Responses to the Corona Article

As I see it, the author is taking up the issue of the novel coronavirus with the main purpose of remembering and saluting Charles Darwin’s contributions to biological science and thereby, intentionally or otherwise, reviving the old debate between religion and science on evolution. It is quite clear that in this debate he is on the side of Darwinian evolution. He presents the whatever little scientific findings we currently have on coronavirus as if these are a big, new argument against religion on the issue of origin of life on Earth. More precisely, he contends that coronavirus proves Charles Darwin right in his theory of evolution through natural selection and in his idea of the survival of the fittest. As he puts it, “evolution maintains that new kinds of life and new molecules randomly appear,” and “only those forms of life best adapted to a specific environment survive while all others die away.” The random appearance and biological development and characteristics of coronavirus, he says, is subject to the same evolutionary process by natural selection. In other words, coronavirus is an excellent illustrative example of how Darwinian natural selection works.

But if coronavirus proves evolution right then, by the same token, it proves religion or tradition wrong, since the latter insists that life appeared on Earth “pre-purposed and pre-formed,” which is contrary to Darwinian natural selection as emphasised in Hoodbhoy’s third major point of contention. It is rather ingenious of Hoodbhoy to come up with his claim that coronavirus confirms the truth of Darwinian natural selection, and the latter in turn is indispensable to a better science of coronavirus and to the discovery of vaccines to treat Covid-19. If the claim about the two-way corona-Darwin link turns out to be true, then it would definitely help tilt the evolution-tradition contention in favour of evolution, which is most probably what Hoodbhoy is hoping for. But the claim itself rests on the big assumption that Darwinian natural selection has always been central to evolutionary biology ever since it was advanced as the most plausible mechanism of evolution, which is actually far from the case.

Understandably, he wants to make a capital out of the claim and pursue it to its logical conclusion. If we can accept the logic of his claim, then we can see why now would be a good time for him to call on humanity to remember its debt to Darwin, as it is right in the midst of trying to better understand coronavirus and the diseases associated with it and to come up with new vaccines for their treatments. In trying to impress the world on the great relevance of Darwinian natural selection to coronavirus, he has to emphasise the message that natural selection would be the key to success in both the attempt to acquire better scientific knowledge of coronavirus and the attempt to deliver the needed vaccines. “Without Darwinian selection,” he says, “one can’t even begin to understand microbial-host interaction, the evolution of pathogens, or start developing drug and vaccines.” But as is characteristic of him, scientific pronouncements would often go hand in hand with sarcastic remarks, especially against religious and political leaders whom he considers as subscribers of anti-science views. Thus, in the article he has harsh words for those who reject Darwinian evolution by natural selection, including Imran Khan with whom he is known not to be in good terms. Hoodbhoy is also severely critical of traditional medicines generally. Both traditional Hindu and Islamic medicines that are popular in the Indian subcontinent are not spared of his criticism. Especially under heavy fire from him is Narendra Modi for promoting “claims of ancient India’s vast medical expertise,” which he could only see as extravagant! It is quite plain in the article that while heaping praise on Darwin, Hoodbhoy has only scorn for the world’s traditional medicines and premodern medical and health practices.

It is highly doubtful that when coronavirus becomes better known to science it would only help corroborate the view of Darwinian natural selection as the main driver of evolution. It is possible instead that it would corroborate the minority voices that are critical of the current mainstream evolutionary theory that upholds such a view of natural selection. It is also equally doubtful that Darwinian natural selection would come to the rescue of the global community in its fight against Covid-19 by helping to deliver the awaited vaccines. Science may succeed in finding the right vaccines to coronavirus, but if it succeeds it would be no thanks to Darwinian natural selection. There are several reasons for the doubt. Perhaps the most important is the shaky ground on which the premises of Hoodbhoy’s corona-Darwin link are based. Coronavirus needs a more open and more inclusive science, and not the disputed Darwinian theory of natural selection, to help reveal its true identity and properties. Hoodbhoy’s basic premise is that Darwinian natural selection is a scientific fact beyond dispute, and not simply a working theory that could be overturned or modified by new revelations in biology. But his confidence in Darwinian natural selection as reflected in his second point of contention is misplaced. Coronavirus that is informed by an epistemological framework of evolutionary biology that is more

inclusive than ever before will be more likely to lead to a new understanding of natural selection than to affirm natural selection originally put forward by Darwin.

Darwinism has evolved and with it also the understanding of what natural selection means, especially when other motors of evolution have been added to evolutionary theory in the past one century. Since Darwin, evolutionary biological thought underwent two major epistemological transformations. First, the fusion of Darwinian natural selection and Mendelian genetics and to a lesser extent, palaeontology, cytology, and systematics in the 1930s and 1940s to create what is known as the Modern Synthesis [13]. Second, the enlargement of the framework of the Modern Synthesis through the incorporation of new theories and ideas, particularly ‘neutral theory,’ which emphasises random events in evolution as well as modifications of the framework. This new evolutionary biology, which emerged around the middle of the second half of the 20th century is known as standard evolutionary theory (SET). SET contends “biological diversity is mostly explained by natural selection,” but natural selection is now defined as “the confluence of *random* phenotypic variation, *genetic* inheritance, and differential reproductive success.” [14] But several years ago another evolutionary framework has emerged known as Extended Evolutionary Synthesis (EES) that is confidently challenging several of the basic tenets of SET [15]. In the words of Kevin Laland, one of its architects, EES “maintains that important drivers of evolution, ones that cannot be reduced to genes, must be woven into the very fabric of evolutionary theory.” [16] EES is challenging in particular the tenet that phenotypic variation is entirely *random* and that natural selection is entirely driven by *genetic* inheritance. Laland and colleagues argue that, on the basis of empirical evidence, “much variation is not random because developmental processes generate certain forms more readily than others.” [17] Further, they maintain that “there is more to inheritance than genes, and that there are multiple routes to the fit between organisms and environments.” The latter assertion means that the traditional understanding of natural selection upheld by Hoodbhoy is being seriously questioned.

In the context of our response to the corona article, it is important to pay attention to the various points just highlighted about the history of evolutionary biology since Darwin, and especially on the emergence of EES that presents itself as an alternative perspective on evolutionary biology to SET, the present mainstream position. But Hoodbhoy has ignored them. It seems he is only interested in highlighting an interpretation of natural selection and the idea of random variation that have anti-religious flavour, and worse in a dogmatic fashion! What is urgently needed is an objective narrative of evolutionary theory. It is certainly important to those of us who would like to see a more enlightened debate on religion and evolution, instead of a vulgar one, to be better informed about the development of evolutionary biology, the pace of which seems to be getting astonishingly more rapid than ever. The EES perspective is particularly important

culture, which is our common goal, and an enlightened evolution-religion debate which is our concern. One of the lessons is an awareness of the virtues of plurality of perspectives, be it in science such as on evolutionary theory or in tradition such as on the concept of divine creation. The proponents of EES deserve support when they maintain that “a plurality of perspectives in science encourages development of alternative hypotheses, and stimulates empirical work.” I don’t think the corona article is educating the public on these lessons with its sectarian approach to evolution and religion.

Another lesson that can be learned from the scientific debate between EES and SET is that evolution is found to be no less an emotive issue than religion. Proponents of EES have brought up the issue of how “the mere mention of the EES often evokes an emotional, even hostile, reaction among evolutionary biologists,”[18] particularly among the defenders of SET. I am not surprised at this revelation made by EES proponents. I have encountered such kind of reaction before. If I may recall, in 1987, more than a decade before Hoodbhoy published his *Islam and Science*, I edited a book on critiques of Darwin’s evolutionary theory [19]. Even then I was already able to identify a good number of scientists and scholars who were highly critical of the theory on scientific grounds. So, it is only to be expected that in the new century “the number of biologists calling for change in how evolution is conceptualised is growing rapidly” as asserted by Laland and his colleagues [20]. But I also highlighted in the book the issue of hostility of evolutionists not to religious but scientific criticisms. I made the observation then that this hostility to criticism of traditional evolutionary theory was to be found among all educated modern men who have embraced evolution not just as a scientific theory but more significantly as an ideological belief or as secular religion. Indeed, there are many people, especially in the West who have adhered to evolution almost as a religion. Traits of religiosity related to beliefs, thinking and hopes that we normally associate in the past with a formal religion like Christianity or Islam are now transposed in the lives of these people to evolutionism. We only hope that as we enter the third decade of the 21st century we would be seeing more enlightened intra-evolutionary and evolution-religion debates.

In choosing the path of confrontation between evolution and tradition Hoodbhoy has proved himself to be objective neither towards evolution nor towards tradition. He has not presented the true face of tradition nor the true position of evolutionary biology. He presents each in the way he wants to see it. No wonder several respondents to his corona article have severely criticised him for this lack of objectivity. Danial Haqiqatju, for example, in his response that appeared in *The Muslim Skeptic* [21] goes to the extent of criticising Hoodbhoy as “a failure in science and in Islam.” Hoodbhoy’s lack of objectivity may be explained as due to his ignorance of science and tradition. Haqiqatju’s argument is that he has failed to keep himself “abreast of the latest developments within biology, where even evolutionists are admitting that Darwinism plays no appreciable role in the origins

and development of life.” Haqiqatju supports this argument by citing the names of contemporary scientists whose works have either rejected or critically questioned Darwinian natural selection [22].

Being ignorant of the abundant critiques of Darwin’s natural selection, says Haqiqatju, Hoodbhoj continues to hold fast to “the long-debunked Darwinian delusion” and “to subject Pakistan to garish displays of devotion to a long-ago fallen idol of atheistic materialism.” So, we see here Haqiqatju in his few assertions refuting Hoodbhoj’s claim that Darwin’s natural selection is indispensable to the progress of biological science. Haqiqatju also briefly comments on Hoodbhoj’s claim that “without Darwinian selection one can’t even begin to understand microbial-host interaction, the evolution of pathogens, or start developing drug and vaccines.” Haqiqatju dismisses the claim as “laughably false” only to remark that “a basic review of history will prove that an understanding of inoculation against diseases was known as early as the 10th century in China. Vaccines in their modern conception were invented by physician Edward Jenner against small pox in 1796, thirteen years before the birth of Darwin.” Haqiqatju reminded Hoodbhoj that Jenner was successful in the creation of the vaccines “without knowing anything about Darwinian selection.”

Haqiqatju also criticised Hoodbhoj for absolutizing Newtonian gravity when saying that without it no physics is possible. Haqiqatju pointed out that Newton’s Law of Gravitation is a “useful but ultimately false model of the gravitational force.” It is general relativity that is “now believed to be the true account of the attractive celestial mechanism known as gravity.” This criticism of absolutization of Newtonian gravity is shared by C. K. Raju, a noted Indian scholar in transcultural history and philosophy of scientific thought, another critic of the corona article [23]. Raju, however, generalises the issue with the phrase “eternal laws of nature” to provide him with a broader historical and philosophical context for his critique of Hoodbhoj. According to Raju, the idea of “God ruling the world with eternal laws” was a “Christian superstition” that originated with Saint Thomas Aquinas in the 13th century. The “Newtonian eternal law of gravity” is just a particularisation of this Thomist theological doctrine. Raju emphasises that the idea of gravity was already known to several non-Western civilisations long before Newton, but it was discussed in philosophical contexts that were different from the Western ones. To the historical evidences Raju has mentioned I would like to add that in 11th century Islam, Al-Biruni (d. 1048) and Ibn Sina (d. 1038) exchanged letters discussing among others the issue of the gravity of objects connected to their natural place in the universe [24]. Marking the peak of “medieval physics” the idea of gravity discussed was far more sophisticated than Newton’s conception of gravity.

Raju’s critique of the corona article has an interesting approach. He judges Hoodbhoj, whose mind he seems to know well and whom he used to criticise on several other occasions such as on the issue of Islam and science, in the light of the distinction he makes between true science and false science. Unfortunately,

he says, most people, including scientists, don't understand real science, resulting in their exploitation by opportunists in the name of science. He sees science as false either when it is based on superstitious beliefs and not real knowledge or when it serves evil purposes. To him, the Newtonian eternal law of gravity and other Western conceptions of "laws of nature" are not real science because these are based on wrong cosmological beliefs; and neither is "scientific creationism" true science. And he dismisses as not true science the very science that is pursued for destructive goals or to make maximum profits while violating time-honoured ethical values as in the case of many pharmaceutical companies. On the basis of the distinction he has made, Raju is able to pass judgment that not only is Hoodbhoy ignorant of real science but he has also committed a scientific heresy. Due to this ignorance, says Raju, Hoodbhoy is found to have passed erroneous judgments such as claiming "Islam is unscientific just because it does not accept the superstitious belief in eternal laws of nature" and "laws are the basis of physics," and caricaturing traditional medicines.

Conclusion

Based on the foregoing discussion it is clear that the underlying motive of the corona article is the defence or empowerment of the classical Darwinian natural selection in the ongoing conflict between science and tradition. Hoodbhoy is not defending it purely viewed as a scientific theory, but rather as an ideology, meaning here evolutionism. Of course, his sympathisers would like to read the article as meaning that he really believes biological science and modern medicine alone could address the challenges of coronavirus, but then he sees opponents of Darwinian natural selection and proponents of traditional medicine as standing in the way of their progress. Thus, from his perspective, it is only logical that he has to wage a fight against rejectors of Darwinian evolution and modern medicine and more generally against religious tradition that inspired them. But such a sympathetic reading would be contradictory to messages in the larger part of the article. It has been shown in the previous discussion that he is ignorant of true science, especially contemporary evolutionary biology. He is also ignorant of tradition as a whole. So, how could he be considered as a veritable advocate of scientific progress? On the contrary, it looks like it is he himself that stands in the way of scientific progress!

The worthiness of the corona article needs to be judged in the light of three criteria: (1) contribution to the development of true science both from epistemological and ethical perspectives; (2) promotion of harmony between science and religion or tradition, especially in societies where tradition is a major aspect of life; (3) contribution to public education on the challenges of the pandemic and what our holistic responses should be. Looking back at our discussion, it is not difficult to see that the article has failed to fulfil all the three criteria.

The article may best be viewed as an apologia for evolutionism, albeit a poor one! But I also see elements of scientism in the article. By scientism is meant the philosophical belief that science is the final arbiter of truth and that there is only one way of doing science or arriving at knowledge of the natural world, including the human body, namely the modern scientific method. It is this scientism that explains Hoodbhoy's rejection of the traditional narrative on the origin of life in favour of Darwinian evolution, and of traditional medicines in favour of modern medicine. Now, the essence of scientism is adherence to rationalism or the pursuit of rationality, an issue that is dear to Hoodbhoy as made clear by his book *Islam and Science*. But rationality and rationalism in their positive traits are not the exclusive monopoly of either science or scientism. I, therefore, maintain that it is possible to have a genuine respect for science without subscribing to scientism. It is also possible for religion to be a source of rationality as demonstrated so well by Islam. Taking all the three together – evolutionism, scientism, rationalism – one may ask what is the conceptual relationship between them? In my view, evolutionism needs the support of scientism to stay influential or may be even to stay alive! And scientism may be described as the handmaiden of secular rationalism. No wonder Hoodbhoy calls his ideological fight against Religious Orthodoxy as the “Battle for Rationality!”

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[1] The article was reprinted four days later in the country's weekly, *Frontier* (April 8th, 2020)

[2] See Pervez Hoodbhoy, *Islam and Science: Religious Orthodoxy and the Battle for Rationality* (London: Zed Books, 1991). Hereafter cited as *Islam and Science*

[3] By medical pluralism I mean the philosophical belief in the idea of the plurality and diversity of medical and health systems that are based on different conceptions of the human body and different approaches to health and diseases. The world needs many medical and health systems, since no single system could claim to have remedial and therapeutic monopoly in the sense that it alone is sufficient to cater to the health needs of humanity. For a discussion of medical pluralism, see Osman Bakar, *Islam and Civilizational Dialogue: The Quest for a Truly Universal Civilization* (Kuala Lumpur: University of Malaya Press, 1997), Chapter 8 titled 'Civilizational Dialogue in Philosophy of Medicine), pp. 97 – 106

[4] It is to be noted that Hoodbhoy often uses the terms tradition and religion interchangeably

[5] See Imad A. Ahmed, 'Review of Pervez Hoodbhoy, *Islam and Science*,' *Arab Studies Quarterly*, vol. 15, Issue 3, (Summer 1993): 133

[6] Hoodbhoy gives examples of notable figures in both Pakistan and India. In Pakistan he mentions Prime Minister Imran Khan and Maulana Tariq Jameel, whom he considers as the country's most popular preacher; in India he mentions Prime Minister Narendra Modi. It is noteworthy that Hoodbhoy considers these famous figures as being on the side of opposition to science not because they have denounced science per se, which they have not, but because they believe in certain traditional views and practices that are to him could only be detrimental to the cause of science.

[7] Hoodbhoy, 'Corona: Debt to Darwin,' *The Dawn* and *Frontier*

[8] On the central role of preventive medicine in public health in the Islamic tradition, see Osman Bakar, *Islamic Civilisation and the Modern World* (Kuala Lumpur: Islamic Book Trust, 2014), Chapter 6 titled "Islamic Medical and Public Health System."

[9] See *Newsweek*, Sun, May 24, 2020

[10] Noor Hisham Abdullah was named by China Global Television Network (CGTN) together with Anthony Fauci in the United States and Ashley Bloomfield of New Zealand as the world's three most loved public health officials for their impressive response to Covid-19. See *CGTN*, 14 April, 2020: 'In the Spotlight – The doctors at the top: Truth-tellers and heartthrobs.'

- [11] *The Star*, 30 April, 2020: ‘Covid-19: Traditional medicine only serves to complement recovery, says Health DG.’
- [12] *CGTN*, 14 April, 2020.
- [13] The term ‘modern synthesis’ is said to have been first coined by Julian Huxley. See his book, *Evolution: The Modern Synthesis* (New York and London: Harper & Brothers Publishers, 1942). It has several editions, including the Definitive Edition with a new forward by Massimo Pigliucci and Gerd B. Muller (MIT Press, 2010).
- [14] Michael Burdett, ‘The changing face of evolutionary theory?’ *BioLogos*, March 3, 2015
- [15] The idea of EES was raised as early as 2010 in a book edited by Massimo Pigliucci and Gerd B. Muller and a few years later by Denise Noble. See M. Pigliucci and G. B. Muller, eds., *Evolution: The Extended Synthesis* (The MIT Press, 2010); in 2013 Denise Noble called for an extended evolutionary synthesis to replace SET. See Denise Noble, ‘Physiology is rocking the foundations of evolutionary biology,’ *National Centre for Biotechnology Information*
- [16] Kevin Laland *et al.* ‘Does evolutionary theory need a rethink?’ *Nature*, vol. 514, 9 October 2014, pp. 161 – 164.
- [17] Laland *et al.* p. 162
- [18] Laland *et al.* p. 162
- [19] See Osman Bakar, *Critiques of Evolutionary Theory: A Collection of Essays* (Kuala Lumpur: Islamic Academy of Science, 1987)
- [20] Laland *et al.* p. 162
- [21] See Daniel Haqiqatjou, ‘Pervez Hoodbhoy fails in science and in Islam,’ *The Muslim Skeptic*, 8 April, 2020.
- [22] Haqiqatju mentions the names of Oxford biologist Denise Noble, biologist Kevin Laland, atheist philosopher Jerry Fodor and biologist Massimo Piattelli-Palmarini who co-authored the book *What Darwin Got Wrong*, another atheist philosopher, Thomas Nagel, and computer scientist David Gelernter whose essay ‘Giving up Darwin’ made headlines.
- [23] For his full critique, see C. K. Raju, ‘Response to Hoodbhoy,’ *Frontier*, April 11, 2020
- [24] For this historic exchange of scientific letters between two of Islam’s greatest minds, see ‘Ibn Sina-Al-Biruni Correspondence,’ trans. Rafik Berjak and Muzaffar Iqbal, *Islam & Science* (Centre for Islam and Science, Canada, published in instalments since June 2003)

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