

Letter to Editor

On The Fragility of Empires and Paradigms

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In the perspective of deep time we can see that empires do not last indefinitely; nor indeed do scientific paradigms. The rise and fall of empires have punctuated human history throughout the ages. The collapse of an empire often comes suddenly and follows on the heels of major catastrophes such as wars and pestilences. Scientific paradigms are similarly fragile and can be overturned by a few transformative discoveries, as for instance happened in the case of the geocentric world view with the observations of Galileo Galilei. The two historical processes can be seen to be related in a fundamental way.

The way in which scientific paradigms are successively overturned has been meticulously described in the famous book by Thomas S. Kuhn [1]. All historians of science today are familiar with this seminal work by Kuhn, which provided insights which have guided our thoughts on this subject since the sixties. As for the decay and collapse of empires, ever since Edward Gibbon (*The History of the Decline and Fall of the Roman Empire*, London, 1832), those processes, apparently all following the same series of steps, have haunted the minds of all serious historians and are ever present in the anxieties of forecasters. Fortunately, these processes, although often ignored or put out of mind, have been absolutely clear to all thinking people for some time. Most of us alive today witnessed the sudden fall of the Soviet Empire, which we all thought, were so strong, and we saw it collapse like a house of cards in a short time. The most impressive empires and the most passionately held scientific theories (remember that until the 1950s 'outer space' was firmly believed by all to be 'empty'?) can vanish in moments when reality meets them head on.

We believe that a horrific global catastrophe in relation to the COVID-19 pandemic looms large if urgent action is not taken so as to honestly understand its true cause. Pronouncements given from the highest pulpits are worth nothing if they are not based on facts. Based on unpublished work by EJS it has recently been argued that the premise that the virus came from animals rests on the shakiest imaginable ground, a questionable premise and circular logic based on that premise [2]. If that assumption is threatened all that rests upon it is open to question.

If we remain content to adhere to obsolete paradigms and thereby arrive at wrong conclusions we face the risk of replacing one human tragedy with another on a more horrific scale – an economic disaster that could threaten to destroy the cohesion of modern society and wreak untold misery on hundreds of millions of people worldwide. We have discussed some of these issues in a series of recent articles [2-4]. It is of the utmost importance and urgency to lay aside false ideologies and to look at the body of emerging evidence dispassionately and without prejudice. It is only then that we would gain even a glimmer of hope to understand the facts and thus forge a way that may eventually lead to a lasting solution.

The societal reluctance to come to grips with the present disaster is, in our view, due to a deep-rooted reluctance to accept a body of evidence that points inexorably to a connection between terrestrial life and a wider cosmic biosphere. If we look at all the evidence dispassionately, the proposition that COVID-19 could have a cosmic connection is no longer seen as bizarre. This would be the first step towards constructively coping with COVID-19 whilst also helping to plan for the avoidance of similar disasters in the future. Such plans could take the form of regularly monitoring the stratosphere for incoming microorganisms that we have suggested earlier [5]. We noted that collections of stratospheric material have consistently revealed the presence of bacteria, including new bacterial species, at

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the height of 41km [5-7]; and the presence of bacteria on the exterior of the International Space Station at 400km has also been reported [8]. Because the descent through the atmosphere of viral and bacterial-sized particles from heights above 40km could take several months, the desirability of monitoring the stratosphere is amply clear. Aircraft, balloons and rockets could be deployed for this purpose along with next generation gene sampling technologies to give us advanced warning of future pandemic-causing pathogens before they fall to Earth.

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