

Editorial*

N Sathyamurthy, Chief Editor

These are difficult times. The novel coronavirus has shaken us all up. We all get the common cold, caused by many different viruses, including the human coronaviruses and rhinoviruses, and we survive through it fairly easily. However, there are deadlier coronaviruses that seemed to have jumped to humans from other animals, and the most recent of these is SARS-CoV-2, responsible for COVID-19 disease. It seems to have started in China. Viruses recognize no geopolitical borders. Sure enough, they have invaded the entire globe. India is no exception. Diagnosing the infection is not simple, and it takes time for the symptoms to appear. It is not clear what the definitive treatment is. It is expected that it will take a year at least for a vaccine to be widely available, which can build herd immunity to protect a large population. Currently, the most vulnerable appear to be the elderly and all those with compromised immunity due to various reasons. We are grateful to Dr. Shahid Jameel, a well-known virologist from India for writing an excellent introduction to COVID-19. The Government of India announced an unprecedented 21 days lockdown of the entire nation to prevent (slow down) community transmission. Partha Majumder, the President of the Academy has written on the importance of the lockdown. With his permission and that of the publisher, *The Telegraph*, we reproduce in this issue two parts of his article to educate our readers on the subject.

The novel coronavirus has also brought to the forefront, the need for understanding evolutionary biology and social science, both unfortunately underrepresented in India. Evolutionary biology is required for understanding the origins, host-virus relationships (including virulence and transmission), and diversification of the virus after the jump to humans. Social systems (including eco-



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*Vol.25, No.4, DOI: <https://doi.org/10.1007/s12045-020-0961-7>



conomic and political systems), stratification, and social behaviours of humans can all influence how the virus can spread in humans, and social science can teach us effective behavioural interventions that may allow for the amelioration or containment of the disease. Coincidentally, the scientist featured on the back cover, George Price, was haunted by evolution in general, and also the evolution of human social systems and “human goodness”. His masterpiece, the Price Equation, showed mathematically how the characteristics of a population could change due to natural selection. This equation also showed under what conditions altruism could evolve—when would individuals be expected to cooperate with each other rather than showing spite. He also wrote about the logic of conflict based on game theory. Amitabh Joshi, a well-known evolutionary biologist, details the tortuous path George Price took and delves into his difficult life, but outstanding contributions.

There was a face-to-face interaction of P Balaram with Venkatesh Ramakrishnan on behalf of *Resonance*. While the former received his degrees in chemistry but became well-known for his work on peptides and proteins, the latter was trained as a physicist, but worked on a biological problem and received the Nobel Prize in Chemistry for the year 2009. The interaction brings out the story of how the transformation took place in Ramakrishnan and how he was able to crack the structure of the ribosome. His book on *Gene Machine* (reviewed recently by Mahak Sharma, *Resonance*, December 2019) is, in some sense similar to Watson’s *Double Helix*. I remember reading the *Double Helix* in one go, years ago. I did the same thing with the *Gene Machine*. It tells us about the competing efforts by Ramakrishnan, Steitz, and Yonath and others, and how Ramakrishnan and his group were able to succeed in an effort that everybody else predicted would be futile. The story also brings out the message how salary and the funds available at one’s disposal are not as important as choosing the right problem to work on (at the right time) in science and pursue it with doggedness. An important story that the youngsters must-read, even if they are not interested in a scientific career.



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Professor N Mukunda, the Founder Editor of *Resonance* looks back at the beginning of *Resonance* in his “Reflections” in this issue.

The central force field problem is fundamental in physics. While most of us are familiar with it in three dimensions, V. Balakrishnan and coauthors describe the problem in n dimensions. Amal Nathan Joseph describes how to determine the refractive index of a transparent material by a single measurement. Nitu Kumari and Shubangi Dwivedi trace the history of synchronization in pendulums discovered by Huygens and delves into the meaning of the word in non-linear dynamics in recent times. There is an interesting article by Jyoti Mittal on vegetable dyes for which India was (and is) famous. It gives an account of what can go into our food (and what cannot).

We, at *Resonance*, are committed to bringing out each issue on time. While our colleagues have worked from home and tried hard to bring the April issue on time, the countrywide lockdown prevents us from bringing out the print version on schedule. We request the understanding of the readers for the delay, which is beyond our control.

