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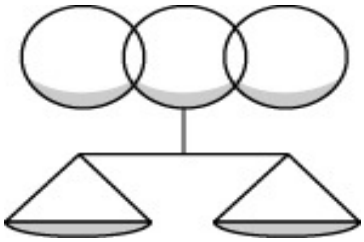
FOR

LAW AND BEHAVIORAL RESEARCH



The Evolution of Parasites and Infectious Disease: Perspectives in Biology, Human Behavior, and Institutions

The Royal Society
Carlton House Terrace
London, England

March 26-28, 2022

Convened by the Gruter Institute for Law & Behavioral Research
With Support from Gordon Getty

Co-Organizers:

Monika Gruter Cheney, J.D.

Oliver Goodenough, J.D.

Andrew Torrance, J.D., Ph.D.

Isabel Behncke, Ph.D.

Organizing Goals

The COVID-19 pandemic underscores the paramount importance of understanding the evolution of pathogens and disease. We live in the age of space travel, driverless vehicles, heart transplants, and the world wide web. And yet, a microscopic viral pathogen - SARS-CoV-2 - brought our global society to a virtual close during its initial months and more than two years later we still see significant disruptions in all aspects of society. From the insights of Charles Darwin to W.D. Hamilton and Marlene Zuk, to Paul Ewald and Holly Swain Ewald, evolutionary biology provides critical insight on how a pathogen such as SARS-CoV-2 could wreak such havoc. What do we know about the continuing evolution of SARS-CoV-2? And, given ongoing research on and technological capability for creating novel pathogens, including gain of function research, as illustrated in Matt Ridley's *Viral*, what are the key insights from evolutionary biology, virology, immunology and infectious disease to be highlighted for human society going forward? Finally, compounding the above complexity, with Paul Ewald and Holly Swain Ewald's critical work showing "persistent" infections giving rise to scores of chronic diseases, what are the additional implications for novel pathogens, whether arising through "natural" evolution or in a lab?

Just as important to human society in the face of future novel pathogens: what lessons from behavioral biology, scientific innovation, law and public policy, and economics, inform our responses to a pandemic? Nearly every domain of society and individual life was uprooted by this pandemic: individuals, families, and institutions all experienced "environmental change" of the largest scale imaginable. But humans also exerted their own "environmental change" back on the SARS-CoV-2 virus in the form of rich innovation, including innovation in the development of vaccines and therapeutics, and innovation in institutions. What can we learn about these human responses to such pathogens so that we may be better prepared for future pandemics?

We are fortunate to have a preeminent, interdisciplinary group of scientists, legal scholars, historians, economists, and other thinkers gathering together to participate in this discussion. In order to provide a useful arc to the symposium sessions and allow ample time for discussion, we have organized the two and one half-day symposium into sessions focused on the topics outlined below; these topics are meant to serve as a useful starting point, not a comprehensive pool of topics.

Symposium Format

We have organized the two and one half symposium days into three broad session topics, as outlined below. We anticipate that individual talks will last approximately 20 minutes followed by five minutes of questions. In addition, we have slated additional time for general discussion at the end of each session. We have done our best to match participants with session topics, however, if you should prefer to speak in a different session, simply email Monika Cheney (mgc@gruter.org) to indicate your preference.

Opening Dinner: March 25, 6:30 Stafford Hotel, The Wine Cellar

Day 1 March 26:

7:30 – 9:00 Breakfast available for Stafford Guests in the Game Bird restaurant

9:00 Introductions

Session I: Evolution of Parasites and Infectious Disease

Chair: Andrew Torrance

Parasites in Evolutionary Context
Eörs Szathmáry
Ulf Dieckmann

Infection and Persistent Infection and Human Disease
Holly Swain Ewald
Paul Ewald

Novel Pathogens in the 21st Century: From Zoonoses to Gain of Function/Lab Generated Pathogens
Matt Ridley

12:30 - 2:30 Lunch (note we will have an extended time for lunch due to afternoon session continuing straight to dinner)

Andrew Torrance
Penny Riggs
Mati Patel
General Discussion Chair: Andrew Torrance

Session II: Evolution Across Different Networks and Time Scales

Chair: Isabel Behncke

Layered Complex Systems: Genetics, Immunology, Institutions and Innovation
Carlos Bustamonte
Erol Akçay

6:00 Drinks Reception and Dinner: The Royal Society

Day 2 March 27:

7:30 – 9:00 Breakfast available for Stafford Guests in the Game Bird restaurant

9:00 Session II: Evolution Across Different Networks and Time Scales Cont'd

Chair: Isabel Behncke

Layered Complex Systems: Genetics, Immunology, Institutions and Innovation Cont'd

Pete Richerson
Bill Casebeer
Julian Morris

Panel Discussion Monika Cheney and Bill Gurley

12:30 - 1:30 Lunch

Chair: Oliver Goodenough

Layered Complex Systems: Behavioral Responses

Lydia Hopper
Isabel Behncke
Sarah Brosnan
Debra Lieberman
Rosalind Arden

General Discussion Chair: Oliver Goodenough

Dinner: 7:00 Celebrating W. D. Hamilton's Book at the Natural History Museum

Day 3 March 28 (half day):

7:30 – 9:00 Breakfast available for Stafford Guests in the Game Bird restaurant

9:00 Session III: Evolution of Legal, Economic and Scientific Institutions in Response to Pathogenic Disease

Chair: Monika Cheney

Oliver Goodenough
Gordon Getty
Susan Dudley
Andy Morriss
Terence Kealey
John Constable
Brian Mannix
Michael ‘t Sas-Rolfes

General Discussion Chair: Monika Cheney

12:00 Symposium Concludes