



The Policy Studies Organization

Dupont Summit 2014

..... Science, Technology, and Environmental Policy Issues

December 5, 2014 ♦ Historic Whittemore House, Washington, DC

Panel

"The Possibilities and Perils of Life Beyond Earth: Ethical and Policy Issues in Astrobiology"

The purpose of the panel would be two-fold: first, to outline and explore some of the profound policy questions raised by the relatively new, rapidly advancing, and highly interdisciplinary field of astrobiology; and second, to inform those in attendance about the emerging networks of scholars and policymakers that are now being built in order to begin to formulate answers to these questions, as well as the specific work that our group is doing to create platforms for educational public debate about the policy issues involved.

Astrobiology -- as defined in the context of NASA's 21st century "Astrobiology Roadmap" (<https://astrobiology.nasa.gov/roadmap/>) -- encompasses three broad and interrelated areas of study: 1. the study of the origins and evolution of life on earth, 2. the search for (and potential study of) life beyond the earth, and 3. the predictive and strategic consideration of the future of life both on and beyond the earth.

The study of the origins and evolution of life on earth is a crucial component of astrobiology because we must first understand the conditions of life's emergence and development here in order to construct informed hypotheses about the potential characteristics and possible locations of life elsewhere in the cosmos and how to detect its presence across the tremendous distances involved. In addition, as we search for extraterrestrial life, we must continually examine the technical and procedural protocols that are in place for dealing with its discovery -- for example, the quarantine and handling procedures set by NASA's office of Planetary Protection. And, at least for now, the only concrete basis we have for thinking about how to develop and refine such protocols is our knowledge and experience regarding terrestrial life -- including, for example, our hard-won (and still relatively rudimentary) understanding of how terrestrial contaminants and pathogens travel and spread.

Of course, the social and cultural -- and, therefore, policy -- implications of astrobiology extend far beyond technological and procedural issues. The discovery of even primitive microbial life (much less intelligent life) outside of our solar system would represent a seminal moment in human history, one which could redefine foundational philosophical, religious, and ethical perspectives on human life and civilization.

Moreover, as our understanding of terrestrial biology continues to advance, at the same time that our technical capacities for space travel and habitation continue to expand, we are beginning to see the development of bioengineering as a central ethical dimension of conversations in and about
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Panel (continued)

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astrobiology. As the NASA Administrator has recently highlighted -- <http://time.com/76178/nasa-chief-humanitys-future-depends-on-mission-to-mars/> -- humanity is on its way to becoming a multi-planetary species. Accordingly, ongoing discussions in environmental ethics and policy need to be expanded beyond the terrestrial context, and serious consideration needs to be given to where (and by whom) the moral and legal lines will be drawn regarding, for example, the manipulation and/or manufacture of living organisms for deployment in space.

Should we, for example, attempt to design new, bioengineered forms of vegetation capable of flourishing in the Martian environment to provide nourishment and/or fuel for prolonged human habitation there? Does the expansion of the human environment into space represent more of a boon or a threat to efforts to slow and reverse the degradation of the terrestrial environment? Should humans reengineer *ourselves* to be better adapted for extended travel and/or habitation in non-terrestrial environments?

The science and technology of astrobiology is advancing more quickly with every passing year. The possibility that this science and technology will, in the not-too-distant future, profoundly transform human society is very real. And the general public has consistently displayed a fascination with this possibility, through its enthusiastic embrace of imaginative considerations thereof in the literature and filmography of science fiction. Yet, serious public discussion of the ethical and social issues related to such a transformation, informed by genuine scholarly analysis, has been lacking. We believe the time is ripe to change this.

One concrete sign of the timeliness of this effort is the very active engagement with our program by the US House of Representatives Committee on Science, Space, and Technology, which has, over the last two years, regularly called for testimony on the policy dimensions of astrobiology by the current and previous Blumberg Chairs and others associated with the program. (For some examples of this testimony, see: <http://science.house.gov/hearing/full-committee-hearing-astrobiology-search-biosignatures-our-solar-system-and-beyond>).

In short, we hope to engage those in attendance at the DuPont Summit in a wide-ranging exploration of a set of profoundly important organizational and policy considerations related to the potential social and cultural consequences -- both good and ill -- of our ongoing effort to determine whether or not we are alone in the universe.



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Panel Biographies

"The Possibilities and Perils of Life Beyond Earth: Ethical and Policy Issues in Astrobiology"

John Baross, *Professor of Astrobiology and Oceanography, University of Washington*

Steven Dick, *Baruch S. Blumberg NASA/Library of Congress Chair in Astrobiology*

Paul Hayes, *Director of Policy Debate and Professorial Lecturer, School of Media and Public Affairs, George Washington University*

Derek Malone-France, *Associate Professor of Philosophy and Religion and Executive Director, University Writing Program, George Washington University*

