

Astrobiology News December 2015: The Human Search for the Origins of Life

The latest issue of the journal *Astrobiology* outlines outcomes of a workshop organized by the Earth-Life Science Institute (ELSI) Origins Network (EON). Funded by a grant from the John Templeton Foundation, EON was created to form a global interdisciplinary network for research into the origins of life (OoL). The workshop, which was held in August 2015 at the Tokyo Institute of Technology, brought together a diverse group of scholars researching OoL questions from various perspectives. The group produced a white paper identifying common ground among different approaches, key questions, and suggesting a roadmap of activities to advance this fascinating field of study.¹

A key aspect of doing science is identifying the right questions to ask. By “right” I mean questions that lead to productive lines of research with the potential for advancing the field in question. What is particularly challenging in this case is the fact that relevant OoL research areas span laboratory experimentation, Earth and planetary exploration, theory, and computation, including efforts to synthesize artificial life (sometimes referred to as A-life) through the use of computer software, hardware, or “wetware” (biochemical-based life). American computer scientist Christopher Langton characterized artificial life as “locating life-as-we-know-it within the larger picture of life-as-it-could-be.”²

The white paper discusses approaches in three broad, overlapping classes: historical, characterized by research to determine the path of events that led to biology on Earth; synthetic, characterized by research into how to create the process of life either in simulation or in the laboratory; and universal, concerned with questions about necessary and sufficient conditions for life in different environments. Since current trends in all three approaches suggest the possibility of life based on a different set of molecular compounds from modern biology, the paper proposes that OoL studies be additionally characterized in terms of seven “types of life”, which include life as we know it as well as possibilities for life based on different composition or structure.

One point that is made several times throughout the paper is the necessity for better cross-disciplinary collaboration and discussion, a demand that is becoming increasingly necessary in all fields given our contemporary specialized society. Language and jargon employed in one field have different connotations in other fields, and communities differ “not only in the types of questions they ask but also in what is taken to constitute an answer.”¹ What I find particularly fascinating about

¹ Scharf, C., Virgo, N., Cleaves, J. II, et al. 2015, *A Strategy for Origins of Life Research*, *Astrobiology*, Vol. 15, No. 12, 1031 (DOI: 10.1089/ast.2015.1113)

² <http://www.britannica.com/technology/artificial-life>

this is that in essence we are being called to reinvent the “Renaissance Scholar”, but in terms of community rather than individual. Such collaborative approaches are absolutely essential when one asks questions such as, is life inevitable? Which properties of life are universal? What is the role of death and extinction in the emergence of life? Were cognition and consciousness inevitable?

Given that the 2016 theme for Evolution Weekend is “Exploring Ways to Engage in Complex Discussions in a Civil Manner”, might I humbly suggest that a good starting place would be finding ways to bridge language divides that cause misunderstandings? Before any complex discussions can take place, individuals need to make sure they properly understand their conversation partners! This can be particularly challenging for those of us raised as academics, because, let’s face it, no one wants to be seen as ignorant; however, the alternative is even less savory. We are faced with tremendous challenges today and the only way to face these challenges is together – the stakes are very high, the highest in fact, since the survival of humanity may hang in the balance!

Not to end on too somber a note, I wish you all happy and safe holidays (and for you Star Wars fans, may the force be with you)!

Until next month,

Grace

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