

CURRICULUM VITAE

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Department of History and Philosophy of Science
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Areas of Specialization

History and Philosophy of Biology
Philosophy of Science

Areas of Competence

Environmental Ethics
Philosophy of Language

Education

08/2003-- Ph.D. History and Philosophy of Science, Indiana University, Bloomington, IN

“Models and the World: A Novel Approach to Causal Interpretations of Population Genetics”

committee: Elisabeth Lloyd (C), Colin Allen, Sander Gliboff,
Leonie Moyle

08/2003 MS. Biology, Western Carolina University, Cullowhee, NC

“Experimental Evolution: *Saccharomyces cerevisiae* in a Two Resource Environment”

committee: Sean O'Connell (C), James Costa, Cliff Zeyl, Henry
Mainwaring, Greg Adkison

05/2001 BS. Ecology and Philosophy, Juniata College, Huntingdon, PA

“Regrowth of an Appalachian-Oak Ridge Top Forest in Central Pennsylvania Following Severe Defoliation by *Lymantria dispar* (Gypsy Moth)”

advisor: Todd Gustafson

Dissertation Abstract

“Models and the World: A Novel Approach to Causal Interpretations of Population Genetics”

Population genetics is an abstract theory composed of a set of mathematical models. Because the theory is abstract its application to real biological phenomena is not straightforward. The objects and their relations in the theory are mathematical whereas the phenomena they purport to explain involve biological entities engaged in various causal activities such as eating and reproducing.

I develop a systematic framework for understanding how the theory relates to the world. By employing this framework in a series of case studies I argue that a causal interpretation of population genetics is coherent and makes better sense of explanations in population genetics than does a non-causal interpretation. I also explore some of the consequences of using such a framework for some issues in philosophy of science and philosophy of language.

In chapter 1 I review the literature and argue that there is a systemic semantic problem with the currently available causal interpretations of population genetics. I develop a framework that is designed to solve the problem by employing notions of model-world relationships developed by proponents of the semantic view of theories.

In chapter 2 I address some of the difficult metaphysical questions any causal interpretation must address regarding the causal efficacy of population level phenomena and the nature of explanations in population genetics. I argue that my framework allows one to sidestep the most problematic causal issues and makes better sense of explanation in population genetics than any non-causal interpretation does.

In chapters 3 and 4 I apply the framework to three case studies of biological work on speciation that rely on the explanatory machinery of population genetics, two involving natural selection and one involving genetic drift. For each case study I develop treatments of the relevant mathematical models, the empirical data, and the relationship between the two. I argue that my framework provides a cogent causal interpretation of the biological work.

In chapter 5 I argue that my framework challenges accepted wisdom in the philosophy of science regarding how the reference of theoretical terms is fixed. In particular, I argue that “new experimentalism” is incompatible with my framework.

Teaching

FA/2008	P100: Introduction to Philosophy: Appearance and Reality (discussion, two sections), Indiana University
SP/2006-SU/2008	X100: The Art and Science of Beer: History, Technology and Culture (lecture), Indiana University
SP/2005-FA/2005	X200: Scientific Reasoning (lecture), Indiana University
FA/2005	E103: Quantum Mysteries for Everyone (discussion, two sections), Indiana University
SP/2002-SP/2003	General Equivalency Diploma and English as a Second Language, Southwestern Community College
FA/2001-SP/2002	B102: Human Genetics (lab); B141: Principles of Biology II (lab, two sections); B105: Biology in the 21st Century (lab, two sections); Western Carolina University
SP/2001	PL260: Introduction to Philosophy of Science (tutor), Juniata College
SP/2000	BI326: Plant Systematics and Ecology (lab and field assistant), Juniata College

Research Positions

05/2006-11/2007	Assistant to the Editor, <i>History of Psychology</i>
06/2006-07/2006	Visiting Researcher, lab of Dr. Sean O'Connell, Western Carolina University
05/2003-06/2003	Visiting Researcher, lab of Dr. Cliff Zeyl, Wake Forest University
08/2002-08/2003	Research Assistant, Biology Department, Western Carolina University
05/2000-08/2000	Researcher, Von Liebig summer research fellowship, Juniata College

Publications

Lloyd, E., Dunn, M., Cianciolo, J., Mannouris, C. (2005), "Pluralism without Genic Causes?" *Philosophy of Science* 72: 334-341

Dunn, M. (2007), "What's a Beer Style?" In Steven Hales (Ed.), *Beer and Philosophy* Oxford: Basil Blackwell

Dunn, M. (submitted), "Picking out Drift." *Biology and Philosophy*

Research Presentations

- Dunn, M. and T. Gustafson. 2001. "Regrowth of an Appalachian-Oak Ridge Top forest in Central Pennsylvania Following Severe Defoliation by *Lymantria dispar* (gypsy moth)." Juniata College Research Symposium, Huntingdon, PA.
- Dunn, M. and S. O'Connell. 2002. "Adaptive Divergence in Laboratory Populations of *Saccharomyces cerevisiae* (brewer's yeast)." North Carolina Branch of the American Society for Microbiology Annual Meeting, Raleigh, NC.
- Dunn, M. and S. O'Connell. 2003. "Adaptive Divergence in Laboratory Populations of *Saccharomyces cerevisiae* (brewer's yeast)." American Society for Microbiology Annual Meeting, Washington D.C.
- Dunn, M. 2003. "Experimental Evolution: *Saccharomyces cerevisiae* in a Two Resource Environment." Department of Biology, Western Carolina University. (thesis defense presentation)
- Dunn, M. 2005. "Darwin on the Evolution of the Human Races." International Society for the History, Philosophy, and Social Studies of Biology Bi-Annual Meeting, Guelph, Ontario, Canada.
- Dunn, M. 2005. "Darwin on the Evolution of the Human Races or Why We're Not Platypuses." Going Awry, English Department Interdisciplinary Conference, Indiana University, Bloomington, Indiana.
- Dunn, M. and Capshew, J*. 2007. "The Present Past: Publication Patterns in History of Psychology, 1998-2007." European Society for the History of the Human Sciences, Dublin, Ireland. (*presenter)
- Dunn, M. 2007. "Two Requirements for a Concept of Genetic Drift." International Society for the History, Philosophy, and Social Studies of Biology Bi-Annual Meeting, Exeter, UK.
- Dunn, M. 2008. "Dobzhansky's Other Research Program: Dissecting Mechanisms in the Lab." History of Science Society Annual Meeting, Pittsburgh, PA.
- Dunn, M. 2009. "Dobzhansky's Other Research Program: Dissecting the Mechanisms that Maintain Variation." Making Mutations: Objects, Practices, Contexts, Cultural History of Heredity Workshop, Max Planck Institute for the History of Science, Berlin, Germany.

Grants and Fellowships

- Dunn, M. 2006. Richard S. Westfall Fellowship for Graduate Student Research Travel. Department of History and Philosophy of Science, Indiana University.
- Dunn, M. 2003. Ruth N. Halls Graduate Student Fellowship. Department of History and Philosophy of Science, Indiana University.

Dunn, M. and S. O'Connell. 2002. Faculty Research Assistantship Grant, Office of Research and Graduate Studies, Western Carolina University. Adaptive Divergence in Laboratory Populations of *Saccharomyces cerevisiae* (brewer's yeast).

Dunn, M. and T. Gustafson. 2000. William Von Liebig Summer Research Fund, Juniata College. Regrowth of an Appalachian-Oak Ridge Top Forest in Central Pennsylvania Following Severe Defoliation by *Lymantria dispar* (Gypsy moth).

Service

Co-organizer, Future Directions in Biology Studies (FDIBS) Workshop, Indiana University
Bloomington, July 2006

Professional Associations

History of Science Society
International Society for the History, Philosophy and Social Studies of Biology
Sigma Xi

Graduate Coursework:

Western Carolina University:

Darwin's Origin of Species (James Costa)
Evolutionary Processes (Richard Bruce)
Biology of Fungi (with lab) (Henry Mainwaring)
Biology of Algae (with lab) (Henry Mainwaring)
Biostatistics (Thomas Martin)
Readings in Microbial Ecology (Sean O'Connell)
Readings in Philosophy of Biology (James Costa and Daryl Hale)

Indiana University:

History and Philosophy of Science:

History of Biology (Sander Gliboff)
The History of Science Since 1750 (James Capshew and Sander Gliboff)
History of the Philosophy of Science: Kant to Carnap (Jordi Cat)
Survey of the Philosophy of Science (Chris Martin)
History of Brewing Science (independent study with Jim Capshew)
Darwin (Sander Gliboff)
Adaptationism (Elisabeth Lloyd)
Naturalism and its Critics (Michael Dickson and Chris Martin)
American Pragmatism (Elisabeth Lloyd)
Levels of Selection (Elisabeth Lloyd)
Pragmatism and Naturalism (Elisabeth Lloyd and Chris Martin)
History and Philosophy of Biology (Sander Gliboff and Jutta Shickore)

Philosophy:

Logic I (soundness and completeness) (Joan Weiner)
Philosophy and Language: Analyticity (Gary Ebbs)

Biology:

Speciation (Loren Rieseberg)
Population Genetics (Michael Wade)

Victorian Studies:

Sexual Selection (Lee Sterrenburg)

Languages

French (reading)
Spanish (reading)

References

Elisabeth Lloyd, History and Philosophy of Science, Indiana University
Colin Allen, History and Philosophy of Science, Indiana University
Sander Gliboff, History and Philosophy of Science, Indiana University
Leonie Moyle, Biology, Indiana University
Roberta Millstein, Philosophy, University of California Davis