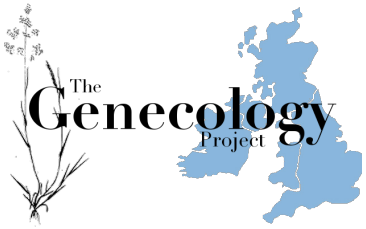
Developmental Evolution } Computational HPS
The Laubichler Lab @ASU

The Genecology Project

Digital Innovation Group

Center for Biology & Society
Arizona State University



Synopsis.
The Genecology Project is a collaborative, interdisciplinary, student-run investigation of the agro-ecological field of *genecology*, also known as *experimental taxonomy*, in post-WWII Britain. We use computational methods in conjunction with archival materials, oral histories, and social network analysis to reconstruct and contextualize the shifting patterns of collaboration and discourse among plant ecologists who engaged in genecological research.

Objectives.
- Promote and support historical and philosophical inquiry into plant sciences.
- Create and make available digital knowledge-base of collaborations and institutional affiliations extracted from the scientific literature, secondary historical literature, oral histories, and archives.
- Collect and share oral histories that shed light on the history of genecological research.
- Model genecological research literature using network analysis and topic modeling, and scrutinize the impact of social and institutional network structure on patterns of language and discourse.
- Illuminate the history of ecology through an interactive website that allows users to explore the GP knowledge-base temporally, spatially, and thematically.
- Solicit and integrate contributions to the knowledge-base from other science-studies scholars.

Intellectual Merits.
The decades following WWII were a period of expansion and transformation in ecological research. In Britain, arguments about the nature and study of intraspecific variation and adaptation in plants led to new models of evolutionary change in heterogeneous environments, setting the stage for fields like ecological genetics and evolutionary population ecology in the 1960s and '70s. The GP scrutinizes these transformations and their linkages to shifting agricultural, economic, and institutional factors. In contrast to the standard case-study model, the GP takes a bottom-up approach that starts with a broad view of investigative activity in this field, and uses computational methods to uncover and scrutinize patterns of scientific activity and discourse.

Broader Impacts.
The GP breaks new ground in HPS research by implementing and integrating new digital and computational methods, and by pioneering a new collaborative research model for historical scholarship. As part of the ASU Digital Innovation Group, the GP creates new educational resources, opportunities, and experiences for students in biology, computer science, and the humanities. The GP engages scientists, policy-makers, and lay audiences with the history of ecology through interactive online exhibits, and presentations and exhibits at scientific conferences.

Tools & Infrastructure.
- Digital HPS Community Repository (http://digitalhps.org/node/3)
- Vogon - Digital text-annotation and network-building tool (http://gobtan.sourceforge.net/)
- Quadriga - Web-based platform for collaborative digital research (http://sf.net/projects/quadriga/)
- InPhO Vector Space Model - Topic-modeling algorithms (http://github.com/inpho/vsm)
- Tethne - Tools for citation-based network analysis in Python (http://github.com/diging/tethne)

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