Final Report

ELECTRONIC SCHOLARLY PUBLISHING: FOUNDATIONS OF GENETICS

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BACKGROUND

As the Human Genome Project (HGP) moves toward its successful completion, more and more people have become interested in understanding this project and its results. Since the HGP has significant ethical, legal, and social implications for all citizens, the number of individuals who do, or should wish to become familiar with the project is high. In addition to its importance in the training of professional geneticists, the HGP is of special relevance for undergraduate training in basic biology, and even for high-school and other K-12 education.

Understanding the results of HGP research requires a familiarity with the notions of basic genetics. Unlike other disciplines that evolved over centuries, modern genetics began abruptly with the rediscovery of Gregor Mendel's work in 1900. Within a few years, fundamental concepts were elaborated and the foundations of genetics established.

Because genetics developed so rapidly in just a few decades after 1900, the literature of that period constitutes a valuable resource even now. It may be read profitably by students and scientists wishing to understand the foundations of their field, as well as by laymen or historians of science. Unfortunately, the early literature is rapidly becoming almost inaccessible. Newer libraries do not hold older journals and even established libraries are moving their materials from that era into hard-to-reach (and impossible to browse) long-term storage in remote warehouses.

To be sure, key studies from the early work are discussed in nearly all textbooks, but a comparison of these presentations with the actual literature shows that most textbook treatments have essentially mythologized the early work so that real understanding is lost. There have been several collections of classic works developed over the years (although none lately), but these suffer from the effects of the necessary, but nonetheless pernicious, highly selective sampling that accompanies these projects. Such selectivity, coupled with introductions that offer essentially modern interpretations of the work, obscure the intellectual rigor and excitement of the original efforts.

PROJECT

The purpose of this project was to establish an electronic scholarly publishing system to allow the republishing of classic literature in genetics in electronic form, so that these

essential works would be readily available for all those with access to simple web-browsing software. This we have done and the result is the Electronic Scholarly Publishing (ESP) site at

http://www.esp.org

The original goals of the project have been achieved and the site now serves as a major resource for scholars and students world-wide.

ESP documents are made available via a World-Wide Web server maintained at the Fred Hutchinson Cancer Research Center (FHCRC) and they are rendered either as typeset-quality electronic files, in Adobe Acrobat PDF format, or as image facsimile of the original material (also in PDF format), or as HTML. The selection of the format depends on the original material (complex material, with many graphics requiring extensive reworking, is a good candidate for facsimile reproduction, as can be original first editions of rare material). Some documents is published in multiple formats.

The interface is designed to assist users in locating files of interest. Browse lists are maintained for the entire collection, with each browse list maintained in multiple copies, each in a different sort order: by author name, by title, by subject, by date of original publication, and by date of electronic republication (this "what's new" listing helps frequent visitors locate material added since their last visit.).

Introductory and pedagogical comments are provided for many republished documents. Documents are chosen for inclusion based on their scientific merit, which does not necessarily coincide with their currently being considered a "classic" paper. We attempt to republish blocks of related papers, including those that argued against positions that ultimately proved correct.

In collaboration with the Cold Spring Harbor Laboratory Press, we simultaneously republished Alfred Sturtevant's *A History of Genetics* in paper and electronic format, with the full text of this important book being available to all ESP readers at

http://www.esp.org/books/sturt/history/

This joint project was well-received by ESP users and continues to be one of the most popular components of the site.

We also developed a section called "Genetics in Context"

http://www.esp.org/timeline/

that presents a dual timeline comparing the dates of significant events in the history of genetics against significant events in world history.

The ESP site is referenced by hundreds of other sites and has become a standard source of assigned material used in many academic course worldwide. Its papers have been cited in *Nature Reviews Genetics* and *Scientific American*. A recent article[1] in the *Annual Review of Genomics and Human Genetics* cited ESP as an example of a genetics education site of use to the general public. In addition, the site was reviewed favorably in the Jan, 2001, issue of the *Genetics Society Newsletter*. Several textbooks refer students to ESP for resource materials, and many university and secondary school instructors

[1] Guttmacher, A. E. 2001. Human Genetics on the Web, *Annual Review of Genomics and Human Genetics*, 2:213–33.

assign readings from the ESP site. Hundreds of other web sites around the world refer readers to us and every day the site receives 1000-1500 document requests[2] from users.

FUTURE

DOE award DE-FG03-97ER623 supported the initial design, development, and deployment of the ESP site. Now, both the PI (Robert Robbins) and the host institution (Fred Hutchinson Cancer Research Center) are committed to maintaining the site and to keeping it and its contents available to users worldwide. We will also add to the site, both in content and in functionality, as time and resources permit. We have had some spontaneous assistance from users of the site and we will continue to solicit that type of help. We will continue to look for possible collaborations like we had with Cold Spring Harbor Laboratory Press in the publishing of Sturtevant's *History of Genetics*. We expect that the ESP site will play a continuing important role as a component in the emerging national digital library.

[2] We define "document request" as an actual web-client request for one of our documents or for one of our main web pages.