

Chaucer's Descendants

Evolutionary biologists help trace the ancestry of a classic

By JEFFREY BRAINARD

Literary scholars revere Geoffrey Chaucer's *The Canterbury Tales* for providing one of the most colorful characters in English literature. The Wife of Bath is coarse, lusty, nagging, and indiscriminate in her taste for men. "Were he short or long or blak or whit / I took no kepe," she says.

Other versions of the medieval classic depict the Wife in a more chaste light, as a woman who expresses her sexual appetites within the confines of marriage.

The text changes arose because scribes copied *The Canterbury Tales* by hand before the printing press was invented. There are 58 separate variants now available of the chapter called "The Wife of Bath's Prologue," and differences abound, bedeviling literary scholars. Which Wife of Bath, they wonder, is most true to Chaucer's original?

Recently, literary scholars got help from an unlikely source—a pair of biologists who have used computers to track microbial evolution. Adrian C. Barbrook and Christopher J. Howe of the University of Cambridge in England had previously constructed family trees showing how sets of species were related to common ancestors. Howe, who has an interest in medieval manuscripts, hit upon the idea of using the same software for a new application, tracing the evolution of the varying Chaucer texts.

Results of their analysis, published in the Aug. 27 *NATURE*, support new interpretations of the texts, says Peter Robinson, a Chaucer scholar at De Montfort University in Leicester, England, and a coauthor of the *NATURE* paper. The analysis indicated that some lesser known versions of "The Wife of Bath's Prologue" may be closer to Chaucer's original than those in standard modern editions. The study also offered new hope for the Wife of Bath's reputation.

The new approach "makes a lot of sense," says Ronald Thisted, a statistician at the University of Chicago who has used statistics to study

poems attributed to Shakespeare. The study shows how scientific methods "can be employed unexpectedly and fruitfully in another area," he adds.

The early copyists, who were probably working from various drafts of Chaucer's never-finished manuscript, introduced errors, which Barbrook likens to genetic mutations. Other scribes made additional copies of those copies, and changes to the text persisted and multiplied. Gradually, distinct versions evolved—the literary equivalent of new species of life, he says.

Scholars had tried before to analyze the texts' variations without use of computers, Robinson says. The volume of the texts made the job daunting, and they gave up.

Barbrook and Howe's preparation for this literary exegesis consisted of studying evolution from a much earlier era—the development of chloroplasts in microorganisms more than 2 billion years ago.

A few years ago, Howe attended a scholarly meeting about tracing manuscript histories and there realized a new use for an evolutionary approach. He soon joined forces with Robinson. The raw material for their analysis already existed. Since 1989, Robinson and colleagues from two other universities had been loading the 58 texts of "The Wife of Bath's Prologue" into a database for easier reference.

Out of the many stories in *The Canterbury Tales*, the researchers chose this chapter for analysis because the differences among the versions are relatively large. The researchers chose 2,500 "char-

acters," or sections of text that varied. They regard each as the literary equivalent of a gene.

Every character has up to 10 versions, just as genes can have several alternate sequences of hereditary code, or alleles. For example, one group of manuscripts begins with the word "Experiment" while most start with "Experience."

Using software called SplitsTree, the researchers produced a map that shows how 44 texts of the prologue fit into six distinct, related groups. The analysis indicates that the remaining 14 were probably hybrid copies of two different manuscripts. The researchers excluded them from the map because their dual ancestry would have thrown off the program's statistical calculations, Barbrook says.

Robinson suggests that scholars could reap new literary insights by examining manuscripts dubbed the O group, which the analysis suggests are closest to the original. Experts have not closely scrutinized them in part because several of these texts are stored only in individual libraries, he says.

At least one of the O texts, called the Hengwrt, paints the Wife of Bath as more faithful than she is in most of the other texts that have been studied, Robinson notes. Although the new findings place the O texts closer to Chaucer's original, he says that scholars will have to continue making subjective judgments about which text in the group is the closest.

The approach described in the *NATURE* paper differs from that used by Thisted and a colleague a decade ago to examine whether other Elizabethan authors might have penned works attributed to Shakespeare. Their method counts the frequency of particular words and traces patterns among several different poems and plays.

That approach, too, grew out of biological studies. Thisted adapted the statistical approach by the late Sir Ronald Fisher in a study that estimated the number of butterfly species in Malaysia.

Shakespeare scholars had scoffed at the idea that any statistical analysis could offer relevant insights into their beloved Bard. But the examination of *The Canterbury Tales* may get a less chilly reception because it merely automates a process that scholars had attempted by hand, says Winthrop Wetherbee III, a Chaucer specialist at Cornell University. □

