

Evolution for Everyone with a DVD Player

Daniel J. Glass

State University of New York at New Paltz

A review of Feldman, J., *EVO: Ten Questions Everyone Should Ask about Evolution* [Film]. Hummingbird Films: Spencertown, NY, 2010.

EVO: Ten Questions Everyone Should Ask About Evolution (EVO) is a new educational film by Hummingbird Films, a Spencertown, New York-based husband and wife team consisting of filmmaker John Feldman and composer/arranger Sheila Silver. As its name implies, the film, created with the lay viewer in mind, presents a summary of what biological evolution is and how it works by posing the eponymous inquiries to various luminaries in the field of evolutionary studies. In its first conception, *EVO* was a pedagogical tool intended for high school biology students, and that pedigree is still evident in the film's current, general-audience incarnation. The film is cerebral and informative, yet still fascinating; it presents a commonly misunderstood topic in a way that tyros will understand and veterans will appreciate.

The questions begin with the fundamental ("What is evolution? Who was Darwin? What is natural selection?"), tackle the particulars ("How do species come about? Where do variations come from? What is a brief history of life? Is evolution random?"), touch upon the necessary ("What is the controversy? Why should anyone care about evolution?"), and even get into the surprisingly sophisticated ("What role does cooperation play?"). Feldman has picked questions that he believes the average person should (but might not) know the answers to, answers which provide a fairly good overview of what evolution is all about. The featured evolutionists include, but are not limited to, Niles Eldredge, Lynn Margulis, Peter and Rosemary Grant, and Daniel Dennett. The bulk of the film's content consists of the experts' answers to the ten questions, with Feldman narrating and weaving these replies together. SUNY Stonybrook's Doug Futuyma handles most of the didactic explanations of evolutionary principles, with University of Arizona's Richard Michod in a close second, both providing easy-to-understand examples of how evolution works, which are often accompanied by appealing animations. This format is surprisingly engrossing, as stunning wildlife footage and the aforementioned attractive visuals provided by graphic designer Guido Alvarez offer the eye plenty to soak in while listening to the voiceovers. For example, Futuyma's explanation of genetic drift, in which yellow and brown snails in a pasture are randomly trod on by

AUTHOR NOTE: Please direct correspondence to Daniel Glass, Department of Psychology, State University of New York at New Paltz, 1 Hawk Drive, New Paltz, NY 12561. Email: djglass@alumni.upenn.edu

grazing cows, leading to arbitrarily large populations of one or the other in future generations, is illustrated by a colorful dramatization with chillingly realistic crunching sounds. To illustrate how modification over generations can result in speciation, a cartoon blackboard is shown which sketches out an imaginary evolutionary tree for the birdlike creature which serves as the film's logo and mascot. In the background, the insistent, meditative musical score offers a beautifully appropriate accompaniment to the marvelous world of evolutionary wonders, with plaintive muted trumpet and flugelhorn providing color and sonority along with more exotic woodwind instruments such as the Egyptian flute.

As they are introduced by the scientists, key terms and concepts are displayed textually in animated "memo notes," complete with pushpins. These were evidently designed for the convenience of classroom note-takers, yet work fairly well even for a lay audience, as they give the viewer a chance to catch his or her breath and absorb each critical point before the eager interviewees launch into another evolutionary concept. Addressing the basic facts of evolution and its intellectual history, the film does an admirable job of making the content both accessible and interesting for newcomers while delving deeply enough to satisfy the knowledgeable viewer. Those who already understand evolution will find plenty to enjoy, from the dazzling nature footage to the horse's-mouth wisdom from the evolutionary experts. Photos of Darwin are interspersed with shots of his famous journals during the film's biographical section, while the scientists offer humorous and humanizing anecdotes about the legendary biologist. Failing to appreciate the diversity of the local tortoises among the different islands of the Galapagos, for example, Darwin's crew ate over a dozen of them during the voyage! Each of the fundamentals of evolution, such as natural selection, mutation, differential survival, and speciation are covered, and even fairly advanced concepts such as symbiogenesis are well-explained and elegantly integrated into the film. The ubiquitous political evolution vs. religion conflict is handled gracefully and masterfully, in a way that neither the religious nor scientific materialists should find objectionable (although, of course, some will object).

Proponents of applied evolutionary approaches might find themselves wanting more from the "Why should we care?" section about how evolution applies to us, although this is scarcely Feldman's fault, as Applied Evolution is a surprisingly recent movement (Bull & Wichman, 2001). Most of the applications provided by scientists are along the lines of the biomedical, especially with reference to pathogens and microbial resistance. While this may be among the most salient current uses of natural selection in action, evolution has the potential to be used much more widely in the understanding, diagnosis, and treatment of countless medical conditions, from cholera to Alzheimer's disease (Cochran, Ewald, & Cochran, 2000; Finch & Sapolsky, 1999), an application alluded to but never made explicit.

Environmental and ecological implications are also explored, leading to a short discussion of cultural evolution. One might suspect a slight bit of stray political agenda near the end of the film, when biologist Joan Roughgarden's statement that "biotechnology and genetic engineering [have been] sold on the basis of health and curing diseases [by] medical authority" is illustrated by a slow pan over a tableful of books all decrying genetically modified food. Whether or not this is what

Roughgarden was referring to (see Roughgarden, 2004 for her views), the most compelling objections to genetic engineering are from the ethical and political spheres (Uzogara, 2000), and some viewers might feel a twinge of unease to see such an issue share turf, however briefly, with an educational film about empirical science.

Feldman, with a couple of notable exceptions such as cooperation, stops short of delving into behavior and the mind, human or otherwise, precluding a discussion of evolution's applications to the political, economic, educational, or social realms. Of late, there have been burgeoning and promising attempts to integrate evolution into social policy, such as David Sloan Wilson's Binghamton Neighborhood Project, an initiative which uses theories from evolutionary social psychology to improve the quality of life in the Binghamton community (the project is the subject of an upcoming book by Wilson)(<http://bnp.binghamton.edu>). The Evolutionary Studies (EvoS for short) program, which also began at Binghamton and has now spread to numerous other campuses, treats evolution as an organizing framework that cuts across disciplines and academic departments from Psychology to History to English (<http://evostudies.org/>). Of course, the topic of evolutionary psychology, both theoretical and applied, could take up an entire film (or two) in and of itself, a fertile concept should Feldman ever decide to create a sequel.

With respect to production, the picture quality is crisp and the music flawless. Some may be surprised to see the Gaia hypothesis (Lovelock & Margulis, 1974) presented as if it were somehow central to the field of evolution rather than a controversial concept usually relegated to environmentalism and climate science (Kirchner, 2003). Then again, Gaia supporter Lynn Margulis is prominently featured in the film, and this is the one inevitable consequence of the movie's format; Feldman must report what his interviewees cover, whether or not it maps unanimously onto current sentiment in the field of evolutionary biology as a whole. This may be a good or a bad thing, depending upon how any given viewer stands on certain issues. Advocates of punctuated equilibrium will be pleased to find that theory discussed in the film, courtesy of Niles Eldredge. *EVO* also features a brief discussion of the controversial theory of group selection, without explicit clarification that it is an extension of standard gene selection which requires special conditions in order to take place. Granted, the topic is one with a muddled history and confusing present (Wilson, n.d.), perhaps placing a cohesive discussion beyond the scope of this film, but I fear that some may construe the brief coverage of group selection as advocating the naive "good of the species" variety. This small point may discourage certain biology teachers from showing it to students, which would be everyone's loss.

The serious and intellectual milieu created by Silver's sophisticated score and Feldman's cogitative narration, not to mention the film's vaguely P-shaped bird logo, brings to mind one of the educational science documentaries that PBS created in the 1990's, back in the days when a good educational film was both common and widely-appreciated; *EVO* recalls many of the strengths of those classics without appearing dated. A couple of minor qualms aside, *EVO: Ten Questions Everyone Should Ask About Evolution* is a superbly compiled and produced overview of biological evolution, for students, professionals, and lay audiences alike, highly recommended for anyone who can get their hands on a copy or attend a screening.

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