

## SCIENCE &amp; TECHNOLOGY

## Competition And Evolution

"The Great God of Competition" by Daniel Simberloff, in *The Sciences* (July-Aug. 1984), The New York Academy of Sciences, 2 East 63rd St., New York, N.Y. 10021.

Competition among species is now commonly accepted as one of the chief forces in evolution. But according to Simberloff, a biologist at Florida State University, its impact has been exaggerated.

Simberloff does not challenge Charles Darwin's theory of evolution. But Darwin's notion of natural selection concerned competition *within* particular species. His scheme was given a new twist during the 1950s by Yale zoologist G. Evelyn Hutchinson, who argued that competition for food *between* different species leads to evolutionary changes that enable each to survive. For example, of two bird species with plant seed diets inhabiting the same area, one might evolve a larger beak that would allow it to grasp larger seeds that the rival species could not.

Hutchinson's theory won rave reviews in the scientific community. Important support for "Hutchinson's Law" came from a 1956 study by E. O. Wilson and William Brown, both of Harvard. The study suggested that related species developed sharper differences when they lived in overlapping habitats than when they lived apart. The reason: increased competition in the zone of overlap. During the 1960s, Princeton's Robert MacArthur developed a sophisticated mathematical model to predict the outcome of such interaction. "It is only a slight overstatement," Simberloff writes, "to say that this one man provided employment for two decades' worth of theoretical ecologists."

Not until the 1970s did scientists seriously question Hutchinson's Law. McGill University biologist Peter Grant re-examined the 1956 Harvard study and found that it overestimated the differences between species. Meanwhile, ecologists began to wonder whether they had made some unwise assumptions. Are changes in the size of a species's beak, body, or feet always due to competition with other species? Or do environmental variations also cause such changes?

Today, Simberloff concludes, ecologists are beginning to realize that they overstated the importance of competition between species. It is a "formidable force," but so are changes in climate, vegetation, and terrain, as well as the vagaries of parasitism and disease.

## The Skyscraper's Great Ancestor

"The Crystal Palace" by Folke T. Kihlstedt, in *Scientific American* (Oct. 1984), P.O. Box 5919, New York, N.Y. 10164.

Today's glass-and-steel skyscrapers are hailed as modern marvels. But the technological advances that made them possible date back to the century-old design of England's Crystal Palace, which Franklin and Marshall College's Kihlstedt calls "one of the most influential buildings ever erected."

The glass-and-iron structure was built in London in 1851 to house the