

This Week's Citation Classic®

Connell J H. Effects of competition, predation by *Thais lapillus* and other factors on natural populations of the barnacle *Balanus balanoides*. *Ecol. Monogr.* 31:61-104. 1961.
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Using controlled experimental manipulations under natural conditions, I found that densities of recruitment of barnacles at a study site in Scotland were usually determined by space available and mortality soon after settlement rather than by a limited supply of larvae arriving from the plankton. Thereafter, in the lower intertidal zone, intraspecific competition for space and predation eliminated most of the population before the members could breed so that most of the offspring probably were produced by the portion of the population at the upper part of the shore. [The SC® indicates that this paper has been cited in more than 345 publications.]

The Profound Effect of a Pioneer French Ecologist

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This paper contains almost all of my PhD thesis, and so represents my first serious scientific research. I was led to it by a series of chance events that often seem to determine the direction of one's life. As a beginning graduate student in zoology at the University of California, Berkeley, in 1947, I was enrolled in the graduate seminar, as was expected of all students. When it came my turn to give a seminar, I chose to report on a paper by E.S. Deevey.¹ I don't remember why I chose it, but it proved to be a turning point in my career. The paper described methods of getting data on mortality in natural populations, and cited a paper by H. Hatton² on barnacles as the very best example.

At the time I was doing an MA degree, studying a population of reclusive rabbits, a system not conducive to applying any of the methods described by Deevey. Later, as I was starting research for a PhD at

Glasgow University, I remembered Deevey's paper and belatedly decided I had better read Hatton's original paper. I plowed through it (107 pages in French) and discovered something not mentioned by Deevey: Hatton had done controlled experiments in the field, under natural conditions.

Then and there, I decided to expand on Hatton's work on invertebrates on rocky marine shores, doing field experiments on earlier stages (larvae newly settled from the plankton) and on the effects of predation and competition for space (since Hatton had already studied the effects of the physical environment). It turned out to be an excellent system to measure recruitment, growth, and mortality in natural populations, as well as being amenable to controlled field experiments. I'm sure I would not have realized the power of field experimentation without reading Hatton's paper, and I would never have found it in its relatively obscure French journal if I had not needed to prepare a detailed seminar report on Deevey's paper when I was a beginning graduate student.

The reason my 1961 paper has been frequently cited is probably because it addressed two topics whose importance ecologists have recently begun to recognize: (a) the role of recruitment from outside a population on its dynamics, and (b) the relative importance of various forces, such as predation, competition, and the physical environment, as well as the interactions among these forces, on populations. References to recent work on these topics are cited below.³⁻⁶

This account may serve as an illustration of how one's writings can profoundly affect the lives of students; my career was shifted into a new direction by Hatton and Deevey, unbeknownst to them.

1. Deevey E S. Life tables for natural populations of animals. *Quart. Rev. Biol.* 22:283-314. 1947. (Cited 450 times.) [See also: Deevey E S. Citation Classic. *Current Contents/Agriculture, Biology & Environmental Sciences* 16(30):16. 29 July 1985.]
2. Hatton H. Essais de biométrie explicative sur quelques espèces intercotidales d'algues et d'animaux. *Ann. Inst. Oceanogr.* 17:241-348. 1938.
3. Connell J H. Some mechanisms producing structure in natural communities: a model and evidence from field experiments. (Cody M L & Diamond J M. eds.) *Ecology and evolution of communities*. Cambridge, MA: Belknap Press. 1975. p. 460-90. (Cited 490 times.) [See also: Connell J H. Citation Classic. *Current Contents/Agriculture, Biology & Environmental Sciences* 19(30): 16. 25 July 1988.]
4. Lewin R. Supply-side ecology. *Science* 234:25-7. 1986.
5. Connell J H. The consequences of variation in initial settlement vs. post-settlement mortality in rocky intertidal communities. *J. Exp. Mar. Biol. Ecol.* 93:11-45. 1985. (Cited 105 times.)
6. Apparent versus "real" competition in plants. (Grace J B & Tilman D. eds.) *Perspectives on plant competition*. New York: Academic Press. 1990. p. 9-26.
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