

# This Week's Citation Classic

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**Dayton P K.** Competition, disturbance, and community organization: the provision and subsequent utilization of space in a rocky intertidal community. *Ecol. Monogr.* **41**:351-89, 1971.

[Dept. Zoology, Univ. Washington, Seattle, WA]

The paper utilized field experimentation to demonstrate that different types of physical and biological disturbance as well as competitive relationships have predictable functional roles in the intertidal community. An important conclusion is that relatively few species have disproportionately important selective influences on most of the other species. [The *SCI*<sup>®</sup> indicates that this paper has been cited over 210 times since 1971.]

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"I went to the University of Washington strongly influenced by Platt's<sup>1</sup> challenges to test alternate hypotheses, but otherwise I was utterly naive. I stumbled onto the easily manipulated intertidal system and the influence of Bob Paine, my adviser, and Joe Connell; both were immersed in intertidal research. My respect for and appreciation of theory and general ecology were shaped by Cordon Orians, Alan Kohn, and W.T. Edmondson; Robert Fernald and Paul Illg helped persuade me that my naive exaltation of natural history was respectable. Finally, I overlapped a large group of excellent graduate students.

"The actual research involved vast amounts of field time, and my memories are dominated by recollections of frantic dashes in the wee hours of the mornings to catch ferries so that I could return to campus to teach. Stipends from an NSF training grant eventually allowed me to spend more

time in the field and add a couple of important study sites to my thesis.

"Ecology often seems dominated by theoretical bandwagons driven by charismatic mathematicians; lost to many is the realization that good ecology rests on a foundation of solid natural history and progresses by use of proper scientific methods. While my paper did address questions of general interest, I believe that its strength is in the efforts to wed natural history and experimentation rather than buttress mainline theory. At that time most ecological concepts were based on theories involving competition only. These preconceptions influenced ecological research. My paper extended Paine's<sup>2</sup> by demonstrating that various levels of disturbance are major factors structuring the intertidal community and that they exert subtle changes in the competitive interactions. It is interesting to note that it is often claimed that intertidal experimentation followed speculation by theoreticians,<sup>3</sup> and Paine<sup>2</sup> acknowledges this influence. But most of this work is patterned after the experimentation of Connell in the 1950s<sup>4</sup> and Hatton in the 1920s,<sup>5</sup> which long preceded the wave of popular theory. Embarrassingly, my own work was begun in ignorance of most theory; I acknowledge its value, but deny the debt.

"While I would like to believe that its citations result from intrinsic value, I think that there is an element of timing and luck involved. I believe that citations are strongly influenced by gossip, and at that time Connell and Paine were actively selling the intertidal system, and prepared an audience for my paper. I have mixed emotions about my decision to publish my thesis as two large papers<sup>6</sup> rather than several smaller papers. The larger integrated format is aesthetically pleasing to me and probably responsible for the 'Citation Classic' selection; but I feel that the length intimidates some readers, who cite it without reading. The heritage of science involves communication, but I am not sure that communication is accurately reflected by citations."

1. **Platt J R.** Strong inference. *Science* **146**:347-53, 1964.
2. **Paine R T.** Food web complexity and species diversity. *Amer. Naturalist* **100**:65-75, 1966.  
[Citation Classics. *Current Contents*<sup>®</sup>/AB&ES (40): 12, 3 December 1979.]
3. **Levandowsky M.** A white queen speculation. *Quart. Rev. Biol.* **52**:383-6, 1977.
4. **Connell J H.** Effect of competition, predation by *Thais lapillus*, and other factors on the distribution of the barnacle *Balanus balanoides*. *Ecol. Monogr.* **31**:61-104, 1961.
5. **Hatton H.** Essais de bionomie explicative sur queleues especes intercotidales d'algues et d'animaux. *Ann. Inst. Monaco* **17**:241-348, 1938.
6. **Dayton P K.** Experimental evaluation of ecological dominance in a rocky intertidal algal community. *Ecol. Monogr.* **45**:137-59, 1975.