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## Of Hot Papers and "Critical" Acclaim

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In our last issue, chemist James Collman of Stanford University took us to task for listing a controversial paper on a new theory of superconductivity in our Hot Papers section (see his letter in *The Scientist*, February 6, 1989, page 11).

The paper in question, by Yuejin Guo, Jean-Marc Langlois, and William A. Goddard of the California Institute of Technology ("Electronic structure and valence-bond band structure of cuprate superconducting materials," *Science*, volume 239, number 4842, pages 896-9, 19 February 1988), Collman noted, "has been roundly criticized, [which] perhaps accounts for the extensive citation." He asserted that "excessive citation of a scientific article may not be a commendation, but rather a condemnation."

Perhaps we have not made it clear enough what the Hot Papers section represents. We identify a paper as "hot" after we have determined that it has received many more citations than others of the same type (in this case, others in condensed-matter physics) and of the same age. By designating a paper as hot, we are making no qualitative judgment on it. Rather, we are merely noting that a particular paper has been frequently discussed in the recent literature.

The paper is, thus, noteworthy, and listing it simply alerts the scientific community to the measurable fact that, in recent months, it has been frequently discussed.

The content of that discussion may, of course, be favorable or critical. Citations can be made both positively and negatively. Collman is correct about that. But he is incorrect to attribute to us the view that each citation is positive and that, therefore, each paper we list is qualitatively better than others or, indeed, is "correct." Nevertheless, to the extent that members of the scientific community believe a particular paper is worth comment, we do claim that the papers we list as hot are important. After all, papers can be importantly right or importantly wrong. Just because a work is "roundly criticized" does not mean it is unimportant.

The subject of negative citations and, more broadly, the motivations of citers, is a fascinating and complex subject. No one has yet thoroughly studied exactly what circumstances call for overt negative citations. Indeed, as A.J. Meadows long ago observed, "The scientific community does not normally go out of its way to refute incorrect results. If incorrect results stand in the way

of further development of a subject, or if they contradict work in which someone has a vested interest, then it may become necessary to launch a frontal attack. Otherwise, it generally takes less time and energy to bypass erroneous material, and simply allow it to fade into obscurity." (*Communication in Science*, London: Butterworths, 1974, page 45.) That is a generalization, of course, but one that I have found to be correct in most cases.

Whether the citations to the theory of Guo, Langlois, and Goddard are positive or negative (in fact, we found over half of the 29 citations to the theory to be neutral in content—merely taking note of some aspect of the theory), the intent of listing it in Hot Papers was simply and only to flag the work as receiving lots of attention. After all, a

theory that explains high-temperature superconductors is one of the big questions in science right now, and even incorrect theories may help speed progress.

As with most undertakings in life, however, there is always room for improvement. And so it is with our Hot Papers section. With this issue we are adding to each hot paper listed comments by one or more of the paper's authors (or, in lieu of that, comments by a recognized authority working in the field that is the subject of the paper) on why they think the work has been receiving overt mention by so many of their colleagues.

We think this will add value and interest to an already valuable and interesting feature of *The Scientist*. Let us know what you think of this improvement. ■