

Current Comments®

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Journal Proliferation and the Popular Press: A Response

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Within the last year or so, the *Wall Street Journal* and the *New York Times*, each a highly visible and prestigious example of the American mainstream press, published articles on the growth of the scientific literature.^{1,2} In these pieces, the authors offered mocking or harshly critical assessments of the quantity and variety of new scientific journals. Dismayed by what I viewed as facile and uninformed judgments of a complex problem, I was moved to respond with an editorial in *THE SCIENTIST*.³ That editorial is reprinted here.

Discussion regarding the size of the scientific literature is hardly a recent phenomenon. The attached Bibliography, while not comprehensive, offers a sampling of articles on the growth of the journal literature and its implications. The articles cover a range of disciplines, findings, and opinions. For example, in a 1974 commentary in *Chemical & Engineering News*, Sir Harold W. Thompson, president, International Union of Pure and Applied Chemistry, Oxford, UK, bemoaned the "rapid and undesirable increase in number of commercial journals." On the other hand, physicist John M. Ziman, Imperial College of Science and Technology, London, UK, noted in 1980 that "proliferation of the literature is not, however, necessarily a sign of ill health in science: it may be a natural consequence of scientific progress."

Presumably there are pressures on some researchers to publish as many papers as possible. In some instances this has resulted in the publication of papers described as "least publishable units"—often of limited

scope. This tactic, as well as the practice of granting coauthorship for reasons that have little to do with actual contributions to a paper, is unquestionably a significant topic for serious examination.

However, it is far too easy to get off a sensational and superficial journalistic cheap shot by appealing to the public's insecurity in its own knowledge of much that is going on today in scientific research. Senator William Proxmire of Wisconsin has exploited this insecurity to get the public to laugh at research projects with strange-sounding titles. It is easier to laugh at the terminology and foibles of some scientists than it is to ask the question, "Is there really so much going on today that I don't understand?" It's like a Don Rickles joke—maybe you laugh because you're uncomfortable.

Ironically, Proxmire and others would deplore any attempt by publicly supported scientists to reduce their efforts at public disclosure. The press howls at the slightest infringement of their prerogatives by the likes of Arnold Relman, *New England Journal of Medicine*, or other editors who, in their own perhaps misguided fashion, try to protect the public from premature disclosure.

The scientific community is already attempting to place less emphasis on quantity of output as a measure of performance, thanks to the advocacy of DeWitt Stetten, Jr., National Institutes of Health, Bethesda, Maryland,⁴ and others. At Harvard Medical School, for example, in accordance with guidelines published earlier this year, officials now review only a limited number of a candidate's best papers in deciding hiring

and promotion.⁵ However, it would be futile to attempt to restrict the output of the small percentage of prolific authors who have always accounted for a major portion of significant papers. Nobel-class scientists usually publish 5 times as many papers and receive 50 times more citations than does the average scientist.⁶

Unfortunately, this trend of superficial and potentially misleading treatment in the popular press shows no signs of waning. A recent article in *US News & World Report* is one more example. Entitled "Drowning in a sea of knowledge,"⁷ the one-page item presented the story in what have become

familiar terms, describing an uncontrollable flood of specious new journals—a torrent directly attributable to the widespread efforts of selfish or duplicitous scientists. Such a picture, as I point out below, is hardly accurate or complete and, indeed, may bring serious consequences.

* * * * *

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Too Many Journals? Nonsense!

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Every few weeks I read another journalist's jab at the value and quantity of scientific journals. When discussing the ever-expanding literature, reporters of the popular press frequently indulge in superficial analyses that distort reality, whether through misunderstanding or exaggeration.

Nancy Jeffrey revealed profound misunderstanding in "Mollusks, Semiotics and Dermatology: Narrow Scholarly Journals Are Spreading" (*Wall Street Journal*, August 27, 1987, p. 25). She invites readers to check out college library shelves and tells them "some off-beat periodicals are bound to jump out at you." A litany of journal titles—one carefully drawn up to invite ridicule—follows. This serves only to reinforce a contempt for specialized knowledge and reflects an increasing anti-intellectualism I see in the press and among the public.

How does Jeffrey explain journal proliferation? She says nothing about twiggling, the natural fractionation of knowledge and its embodiment in new journals. Nor does she note that more scientists are alive today than ever before, and that the journal is their primary medium of communication. Rather, Jeffrey attributes the appearance of new journals to institutions' pursuit of "glory"

and "prestige" or individual researchers' attempts to beef up their vitae.

A misunderstanding of the social process of science and of knowledge accumulation has misled the editors of the *Wall Street Journal* into publishing a shallow and absurd commentary on the exponential growth of journals. To attribute the growth of the journal literature to the pursuit of personal or institutional gain ignores the substance of what is being published in those many new journals. It is instinctive for researchers exploring uncharted terrain to band together to form invisible colleges; it is also quite logical for them to create new journals in which to conduct their specialized discussions. Is Jeffrey suggesting that we abandon new areas like molecular biology for which no journal existed 30 years ago? Are we to expect that superconductivity will be discussed only in existing journals?

Last month William J. Broad took up this same theme (*New York Times*, February 16, 1988, pp. C1, C11). Under the headline "Science Can't Keep Up With Flood of New Journals," Broad claims: "the number of scientific articles and journals being published around the world has grown so large that it is starting to confuse researchers,

overwhelm the quality-control systems of science, encourage fraud and distort the dissemination of important findings.”

Surely Broad exaggerates. By repeating the unqualified assertion that there are “40,000 scientific journals now estimated to roll off the presses around the world,” he in no way supports the contention that the size of today’s scientific literature “is starting to confuse...overwhelm...[or] distort....” I first heard this sort of dire warning as long ago as 1953. And its equivalent can be found as early as the 17th century.

Modern Information Methods

Obviously, no one reads 40,000 or even 400 journals. As is well known among experts whom Broad has the arrogance to ignore, a mere handful of journals accounts for the great majority of significant publications in any field (Bradford’s Law). There are probably no more than 25 titles (and often fewer) that an individual researcher needs to follow regularly (Garfield’s Law). As a supplement, the organized researcher makes use of modern information retrieval tools to scan the rest of the literature. This is part of being a professional scientist. Moreover, as the literature grows, new methods evolve to lessen the load of keeping current.

As for the contention that quality-control systems are being “overwhelmed,” I would point out that the number of journals published elsewhere has nothing to do with the professionalism of a particular journal’s editorial staff.

Although Broad concedes that “much of the growth is seen as a healthy part of the success and expansion of the scientific enterprise in the 20th century,” he prefers more dramatic explanations. He emphasizes dark personal motivations and the impact of the publish-or-perish syndrome: “undertak-

ing trivial studies because they yield rapid results, and needlessly reporting the same study in installments, magnifying the apparent scientific output.” He mentions simultaneous submission of the same paper to two or more journals and the practice of unwarranted co-authorship.

Deviant behavior certainly exists in science. But does Broad seriously believe that this is the fuel driving the dynamic growth of scientific journals? Apparently so, for he states, after detailing such misdeeds: “The upshot of all this is a continuing surge in the number of new journals.” Consider that non sequitur! Certainly such behavior accounts for some articles, but I doubt that journals have been launched because of it.

Broad also claims that the bigger the literature is, the greater the likelihood of fraud. Fraud and other forms of deviant behavior occurred in the age of little science and they will also occur in the age of big science. Broad, however, cites not a shred of empirical evidence for an increase in such deviance, whether owing to the proliferation of journals or to any other factor. He fails to do so because the evidence just doesn’t exist.

The misdeeds of scientists, like those of any other profession, deserve careful investigation. I welcome the news that a number of forums are planned to examine publication and research practices and how they might be improved to guard against these problems (p. 4). But merely asserting that journal publishing is out of control does nothing to explain the growth phenomenon or to solve the problems that do exist.

I find it ironic that reporters so often use evidence of the success of science to limit more of that success by raising the cry of “too many journals.” Allegations of misconduct may sell newspapers, but they may also cause a backlash that even the science muckrakers may one day regret. ■