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EDITORIAL

Selling science

*'I can't believe that! said Alice.
'Can't you?' the Queen said in a pitying tone. 'Try again: draw a long breath and shut your eyes.' Alice laughed. 'There's no use trying' she said. 'One can't believe impossible things.'
'I daresay you haven't had much practice' said the Queen. 'When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast'.*

—Lewis Carroll
Through the Looking Glass
Chapter V

Scientists spend a great deal of their time trying to convince other scientists of the importance of their work. In the practice of contemporary science, peer acceptance and peer recognition are almost universally sought by scientists. Journals, bulletin boards on the internet, conferences, symposia and seminars form an extended marketplace; an extraordinarily rich and diverse exhibition ground, where scientists market their wares. Can science be sold? Is science a commodity, whose dissemination and acceptability are enhanced by the clever application of marketing strategies? In the fiercely competitive modern world, do the techniques of packaging and advertising decide the acceptability of the results of scholarly scientific research? In thinking about the techniques of marketing, that might be of value in today's science, my attention was drawn to a paper intriguingly titled, 'Is Science Marketing?' (Peter, J. P. and Olson, J. C., *Journal of Marketing*, 1983, pp. 111–125; <http://pages.stern.nyu.edu>). The authors begin with the problem that analysts of marketing have always wrestled with: 'Is marketing a science?' Their comments on the studies aimed at addressing this question are sharp: 'Although well intentioned, we believe the debate regarding whether or not marketing is a science has been largely unproductive. For the most part, we attribute the current confusion to the somewhat naive conceptions of science that have informed the controversy. In particular, we consider the typical beliefs about how scientists do scientific work and how scientific progress is achieved to be inconsistent with current views about such issues in the

disciplines of philosophy, sociology, and history of science'. Peter and Olson then turn the tables on the debate on marketing as a science to ask instead, 'is science marketing?'.

In their long and at times, mildly provocative analysis, they touch upon the many techniques of marketing science, which scientists adopt almost instinctively. They note that: 'in addition to direct advertising via publication in journals, books, and proceedings, a theory can also be promoted through publicity and personal selling'. (The authors use 'theory' in a general sense to signify a scientific finding.) In discussing the key attributes of a 'theory' that impact on its marketing success, Peter and Olson raise many issues, which will touch a chord in most scientists. They note that the 'professional credentials and status of the inventor or borrower' has a direct bearing on marketability of scientific research. 'Scientists who are well known and respected, based on their previous contributions to a field, have better chances of successfully introducing new theories than do less well-known researchers. The credibility of the scientist/marketer may add a halo effect to the theory product. Inventors or borrowers who do not enjoy a strong reputation in their fields (e.g. doctoral students) may need to attract established researchers ("celebrity scholars") to help market their theories'. In a telling comment the authors note: 'Strong empirical support is a highly desirable attribute that will enhance the marketability of a theory. However, strong empirical evidence is neither necessary nor sufficient for the successful dissemination of a theory'. Twenty years after the Peter and Olson analysis, it is clear that scientists in their diverse roles as researchers, authors, journal editors, referees, speakers, listeners, readers, committee members and administrators of science will, almost without exception, endorse the view that marketing is as important for scientific success as inventiveness, commitment, originality, scholarship or even plain good luck.

Publication in journals remains the most reliable way of 'marketing' scientific research, but the process of choosing journals and shepherding a paper past the peer review hurdles and overburdened editors is becoming an increasingly arduous task for authors. Even as the language of business and commerce has begun to dominate

science, arcane scientific journals have transformed themselves to compete in the marketplace. Journals try to claw their way up the 'impact factor' ladder and when they position themselves a rung above their competitors, they are quick to trumpet their success in 'hard to miss' advertisements. And, it is the impact factor that draws authors to exhibit their wares on the pages of a journal. In a recent commentary, Peter Lawrence notes in rather foreboding tones: 'The decision about publication of a paper is the result of interaction between authors, editors and reviewers. Scientists are increasingly desperate to publish in a few top journals and are wasting their time and energy manipulating their manuscripts and courting editors. As a result, the objective presentation of the work, the accessibility of articles and the quality of research itself are being compromised'. As Lawrence notes, with a tinge of regret that we all must share, 'even our language reflects this obsession – we say that Jim Jargon did well as a graduate student because he published a "Cell paper", illustrating that we now consider the journal more important than the message' (*Nature*, 2003, 422, 259). The reference here is to the journal *Cell*, which raised the art of marketing biomedical science (and journals) to new heights, touching off an intense competition with journals like *Nature* and *Science* to lure the most glamorous authors to hawk their sensational findings on the journal's pages. Editors (and their assistants) attend international conferences to recruit authors, with incentives to relax review processes and old-fashioned flattery as weapons of choice (Journals Tussle Over Talent, Sam Jaffe, *The Scientist*, 2002, Oct. 14, pp. 59–60). In an editorial comment, Richard Gallagher of *The Scientist* notes that the 'big three' journals '*Nature*, *Science* and *Cell* undoubtedly have some say in the perception and development of science'. But he goes on to ask: 'Is it now time to dismantle the hegemony?' Gallagher raises the interesting thought 'that too much power is concentrated in the hands of a few individuals; that these individuals do not know what they are doing; or that they do know what they are doing, but operate on standards more akin to Hollywood casting than to standard peer review, giving preference to "star" names'. (*The Scientist*, 2002, Oct. 14, p. 10). As both Lawrence and Gallagher emphasize, scientists flock to high profile journals with an intensity that sometimes borders on desperation. Why do scientists do it? Lawrence provides a view from his vantage point as a researcher and author: 'Evaluations of scientists depend on numbers of papers, positions in lists of authors and journal's impact factors. In Japan, Spain and elsewhere such assessments have reached formulaic precision. But bureaucrats are not wholly responsible for these changes – we scientists have enthusiastically colluded. What began as someone else's measure has become our (own) goal. Although there are good reasons for publishing papers where they are more likely to be read, when we give the journal priority over the science we turn ourselves into philistines in our own world'.

In India the compulsive obsession with journals and impact factors has reached new heights. Like in everything else, the trends are set by administrators, who have uncritically embraced 'quantitative indicators', resulting in what Lawrence refers to as an 'audit society', in which each indicator is invested with a specious accuracy and becomes an end in itself.

The game of marketing science and scientists extends well beyond journals and the world of publishing. The conference and symposia circuit permits constant advertising. In India enormous sums of money, by local standards, are spent in hosting international superstars and meetings of dubious scientific value; undoubtedly an effort to market organizers and the hosting institutions. Indian scientists spend considerable sums of money on travel to international meetings, in the hope that personal selling of results might score over anonymous peer review. Symposia are most often used for 'generating contacts', a term that will appeal to marketing executives, rather than to learn of new and useful science. Our evaluation system for scientific scholarship is becoming increasingly skewed in favour of those who would make even aggressive marketing executives blush.

As the marketing of science becomes a commonly accepted practice, new problems have begun to emerge. In industry, false and specious claims are commonly used to push new products. We view with tolerance advertisements for creams that will safely lighten dark skins and for lotions that will allow the bald to sprout hair. Many claims for marketed products are simply untrue. But, in science false claims, marketed aggressively, can be extraordinarily detrimental, as researchers across the world attempt to replicate remarkable results, investing large amounts of time and money. The case of Jan Hendrik Schön, who took the world of nanotechnology by storm, publishing several papers in *Nature* and *Science* in the years 2000–2001, has been a shocking revelation of the infirmities of the peer review and editorial processes. Even more importantly, it raises doubts on the manner in which high stakes research is carried out, and internally assessed by collaborators, in the best laboratories of the world. The spate of retractions published in the 3 October 2002 issue of *Nature* is testimony to a fraudulent marketing plan that went astray.

There are many worrying issues to confront. In countries like India where laboratories, institutions and individuals struggle for success, on a playing field that does not often seem to be level, the danger that marketing may take precedence over science is ever present. In committees which decide large grants on mega projects, it is hard to sift fact from fiction; vigorous marketing can blur the distinction. So much is claimed, on occasion, that listeners must suspend disbelief. Like the White Queen in *Alice*, we may need to believe in the impossible.

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