

The Problem of Publication-Pollution Denialism

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The world is facing a huge threat from pollution. The scientific community seems unable or unwilling to do anything about the problem and appears to be in a state of denial. The pollution crisis I'm describing is not the warming of the Earth's atmosphere due to an accumulation of greenhouse gasses. It is not the tragedy of plastic materials accumulating in the oceans. It is not the air pollution that is overwhelming many major urban areas and contributing to respiratory and other diseases in the local populations. It is, instead, the pollution of science and medicine by plagiarism, fraud, and predatory publishing. If the medical and scientific communities continue to remain in publication pollution denial, the trustworthiness, utility, and value of science and medicine will be irreparably damaged.

Harvard researcher Mark Shrime recently wrote an article entitled "Cuckoo for Cocoa Puffs?: The Surgical and Neoplastic Role of Cacao Extract in Breakfast Cereals." The fake authors he chose for the piece were Pinkerton A. LeBrain and Orson Welles. Shrime submitted this fake article to 37 journals. At last count, 17 had accepted the obviously phony, nonsensical paper.¹ John Bohannon² did the same thing with a completely phony paper, with even more depressing results in terms of peer-reviewed acceptance to journals. The journals that took these gibberish-laden, concocted articles were scam, author-must-pay, profit-driven entities that nevertheless have every appearance of being legitimate journals.

Jeffrey Beall, a librarian at the University of Colorado at Denver, maintains a list of what he terms *predatory publishers*. These publishers produce fake journals that recruit authors whom they will publish for pay, primarily for the purpose of providing profit for the publishers. These publishers are different from legitimate, indexed, peer-reviewed journals that use author-pay financial models to underwrite journal peer review, processing, and publication costs (eg, the PLOS family of journals). Predatory publishers are the direct descendants of vanity presses—book

publishers whose authors pay for the privilege of publishing to give the false impression that they have written a book that has been vetted by a mainstream, reputable publisher. Beall estimates that 25% of all open-access journals are predatory.³

Why the recent proliferation of polluting journals? As Sarwar and Nicolaou observe, "Arguably, many researchers and departments may have equated the concept of 'quantity' rather than 'quality' with research success. The association between the number of publications and suitability for funding or career progression has been with us for a while. When applying for senior posts, surgical trainees are continuously questioned on the number of publications achieved, disregarding the quality of the publication or journal. ... this attitude has predisposed to a massive rise in journal titles, many of which are of low quality and are poorly maintained."⁴

The problems generated by phony, predatory journals that use substandard or no peer review are enormous. Not only do they provide opportunities for the unscrupulous in academia and industry to pad their curriculum vitae and bibliographies with bogus articles and editorial appointments, they also make it difficult for those involved in the assessment and promotion of scholars to discern value from junk.⁵ The impact of publication pollution does not end there. Predatory, pay-to-publish, non-peer-reviewed journals flood disciplines with bad or fake science, making it hard, much as light pollution does, to see the real stars. Worse, publication pollution lessens the impact of legitimate science in the formation of public policy, undermining public health, weakening the overall value of legitimate publications in influencing policy, and creating opportunities for the continued power of crackpot views that corrode many areas of public life, such as vaccination, fluoridation, and the prevention and treatment of diseases, such as autism, AIDS, and cancer.

The pay-for-publication practices and inadequate peer review of phony journals are major sources of publication pollution but not the only sources. Misconduct is

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polluting the fabric of science and medicine as well.

Studies are making it into print that have been condemned by the Food and Drug Administration, other regulators, and legitimate authors and review groups. My colleague Charles Seife found in a review of Food and Drug Administration inspection reports between 1998 and 2013 that of nearly 60 clinical trials in which regulators had uncovered violations serious enough to earn the agency's most severe classification ("official action indicated"), 78 articles using data from these trials were published. Seife⁶ believes that there could well be more.

A recent analysis of the prevalence of research misconduct by Daniele Fanelli looked at "scientific behaviors that distort scientific knowledge" and found that 2% of the scientists surveyed admitted to serious misconduct (falsification or fabrication of data) at least once and nearly 34% admitted other questionable research practices. When participants were asked about their colleagues' practices, the results were much worse: 14% for falsification of data and 72% for other questionable practices.⁷

Fraud, however, pales in comparison to plagiarism as a means of polluting science and medicine. An article in *Nature* about the use of plagiarism-searching software found, during a few months in 2010,⁸ "staggering levels of plagiarism, from self-plagiarism, to copying of a few paragraphs, or the wholesale copying of other articles." Editor friends of mine from many fields of medicine and science tell me that they must spend inordinate amounts of time checking for plagiarism in submissions they receive. Unfortunately, the plagiarism problem appears to be increasing even as various computer software programs emerge to detect it.

All these polluting factors detract from the ability of scientists and physicians to trust what they read, devalue legitimate science, undermine the ability to reproduce legitimate findings, impose huge costs on the publication process, and take a toll in terms of disability and death when tests, treatments, and interventions are founded on faulty claims. Once pollution enters the waters of legitimate publication, it is difficult to expunge it from reader's minds, even if the articles have been retracted as flawed or bogus.⁹ As is so often true of

pollution, publication pollution has a very long half-life.

Publication pollution is corroding the reliability of science and medicine and yet neither the leadership nor those who rely on the truth of science and medicine are sounding the alarm loudly or moving to fix the problem with appropriate energy.

The currency of science is fragile, and allowing counterfeiters, fraudsters, bunko artists, scammers, and cheats to continue to operate with abandon in the publishing realm is unacceptable. Talk of free speech and the power of the marketplace of ideas to sort out the wheat from the chaff is naive. When the marketplace is full of dangerous and defective goods, there is no free market because the trust requisite to support a market has evaporated.¹⁰ The time for a serious, sustained international effort to halt publication pollution is now. Otherwise scientists and physicians will not have to argue about any issue—no one will believe them anyway.

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