

Review of: *Dogmatism in Science and Medicine: How Dominant Theories Monopolize Research and Stifle the Search for Truth*, Henry H. Bauer, Jefferson, North Carolina: McFarland & Company, Inc., 2012, pp. 1-293.

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I begin this review of *Dogmatism in Science and Medicine* with a personal story. More than fifteen years ago I performed a natural experiment. I was shown a pre-print of a study demonstrating that the plastic sealant coating inside tin cans leached into the food in quantities found to be bioactive in mice. I asked my colleague, a friend of one of the authors, where it was going to be sent for publication. I learned that the investigator was planning to submit the article to a second-tier refereed science journal. Here's where the experiment begins.

I recommended that the author send it to a premier journal like *Nature*. My reasoning had more to do with the public health implications of the study than with pathbreaking science. The chemical sealant was identified as an endocrine disruptor, albeit the theory of endocrine disruption was not fully embraced by all segments of the scientific community. I hypothesized that if the article were published in *Nature* rather than the originally designated "safe" journal, the issue would get international media attention, while if published in the alternative, it would be lost in the background noise. I served as a matchmaker between the author and the editor of *Nature*. A London editor of *Nature* sent out the paper for review. The two pediatric endocrinologists who reviewed the paper did not even send back written reviews. Instead they phoned them in to the editor. The editor translated their views to the author; namely, that the chemical in question at the doses revealed could not possibly have a hormonal effect on children or adults. Therefore, they felt it should not be published. After a delay of roughly three months, the paper was eventually published in the lesser known journal and, as I expected, brought no media attention.

That was then. Today the theory of endocrine disrupting substances is mainstream. Even the skeptical Endocrine Society has published papers on the subject of endocrine disruptors.

What did this experience teach me? Science is an inherently conservative institution when it comes to adopting new hypotheses or new theories. The Columbia sociologist of science Robert Merton called it "organized skepticism". Hypotheses and theories are assumed false unless proven true. Science also tolerates a great deal of diversity. Even as the orthodoxy persists, theories critical of that orthodoxy find venues for publication, albeit not frequently in the prestigious journals.

Henry Bauer is professor emeritus of chemistry and science studies and dean emeritus of arts and sciences at Virginia Tech. His book focuses on what he terms "knowledge monopolies". According to the author, established scientific groups, journal editors, and individual scientists, in collaboration with the science media, set a limit of tolerance for what they will accept as credible knowledge or even credible hypotheses in publication. Bauer describes in great detail efforts to protect the orthodoxy from alternative theories, explanations and hypotheses of empirical evidence.

What is jarring about Bauer's book is that he is an equal opportunity "dogmatism smasher" and one can easily feel sympathy for some examples and feel intolerance for others. There are clearly cases in the history of science when the evidence in support of a theory reaches such consensus

among scientists that it is reasonable to discard the competitive accounts as in Copernican world-view, the germ theory of disease, or Einstein's alternative to the ether theory.

The three theories/explanations to which Bauer gives great attention are: The Big Bang Theory, Anthropogenic Global Warming and HIV as a cause of AIDS. He argues that the viewpoints that disagree with the orthodoxy are systematically suppressed. There is ample criticism to go around and most of the examples provided have a kernel of truth to them. Journals screen out against unorthodox points of view; funders stay afield from backwater hypotheses; the media exclude certain voices, underreport certain claims or perpetuate unvalidated numerical results; gatekeepers protect their journal's interest over sound intellectual exchange.

Readers may find, as I have, that Bauer overgeneralizes from his examples. He claims that anthropogenic climate change advocates have an unfalsifiable theory. Since the publication of Karl Popper's classic work *The Logic of Scientific Discovery* it is generally understood that unfalsifiable theories or hypotheses cannot claim the imprimatur of science. In Bauer's terms, climate science is an oxymoron. Theories or explanations that patch themselves up in the face of non-corroborating evidence can still be scientific if they respond to empirical tests and represent the best explanation available.

There are other statements in the book that are misleading such as the claim that GM soybeans pose a risk for people with allergies to peanuts. The truth is that some laboratory strains of genetically modified soybeans, which had a peanut protein embedded in the chromosome, proved allergenic in human trials. They were not commercialized and only used in an experimental setting for demonstrating proof of concept. No one doubts that allergens can be transferred across food products by the use of genetic technology.

The book also finds little value in several of the leading science journals. "So *Nature* and *Science* serve to indoctrinate the whole scientific community into whatever the mainstream consensus is on any and all topics" (69). Statements like this scattered throughout the book discredit the entire enterprise of science and thus diminish the many revealing stories the book brings to light.

The author expresses nostalgia for the science a half century ago when he asks: "Can 21st century science become trustworthy again?" Certainly, there have been changes in the culture of science since the mid-1950s, but not always in the ways described by the book. There have always been scientific gatekeepers in an enterprise that is fundamentally a meritocracy. There are more scientific journals today than ever before and more possibilities for publication even of unorthodox theories and hypotheses. Despite these shortcomings, I can fully support the author's vision of a "scientific free market in which peer review can in principle act as a self-correcting 'invisible hand' needs to be protected from knowledge monopolies and research cartels and the in-built conflicts of interest entailed by cartels and hegemonies" (243).

If you believe in independent peer review, whatever its limitations, then you must accept its outcome, even if it rejects your most treasured hypothesis. Time may prove you correct, but it will come from another peer review. I have reviewed for and have had my papers reviewed by many journals in the natural and social sciences. The picture painted by *Dogmatism in Science and Medicine* is not the general picture of journal publication that I see.

Among the three causes célèbre for the author the debate over HIV/AIDS stands out. Bauer comes to the defense of Peter Duesberg, with whom he collaborated, on the conclusion that AIDS is not an infectious disease caused by a retrovirus. And while the author denounces the

scientific AIDS establishment for its treatment of Duesberg it is not unnoticed by this reader that Duesberg's papers are published in the journals of *BioScience*, *PNAS*, *Medical Hypothesis*, *Italian Journal of Anatomy and Embryology* as well as *Scientific American*, not exactly a blackout.

I began this review with a story about endocrine disruptors and how they were first dismissed as unworthy of serious consideration in leading science journals. Some years have passed and a sea change has taken place in how the scientific establishment has embraced the explanation in which synthetic chemicals at low doses affect the endocrine system of animals. Science is not, as Bauer claims, an intellectual dictatorship. Rather, science is a conservative system that operates under the norm of organized skepticism. If anything, science demands our openness, humility and appreciation of fallibility and uncertainty.