

## **Science Under Attack: Vaccines and Autism**

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## Science under Attack: Vaccines and Autism

**Autism's False Prophets: Bad Science, Risky Medicine, and the Search for a Cure.** Paul A. Offit. Columbia University Press, 2008. 328 pp., illus. \$24.95 (ISBN 9780231146364 cloth).

Paul Offit is one of the most respected scientists and clinicians in a field of vital importance to public health: infectious diseases and the vaccines that prevent them. He has received numerous awards for his work. He serves as the chief of infectious diseases and director of the Vaccine Education Center at the Children's Hospital of Pennsylvania, and also is the Maurice R. Hilleman Professor of Vaccinology and a professor of pediatrics at the University of Pennsylvania School of Medicine. With colleagues, he invented a rotavirus vaccine that saves the lives of thousands of children each year. So why is a nice guy like Paul Offit getting death threats against himself and his family that have required armed guards on campus, FBI plainclothesmen at national meetings, and special attention to his mail? *Autism's False Prophets* will give you the answer and introduce you to that strange part of our culture in which scientists are confronted by people who reject facts, and in which evidence is at war with belief.

Offit begins by reminding the reader of several fantastic false claims from the medical world that have captured the imagination of the public in recent years: laetrile as a cure for cancer, silicone breast implants as a cause of disease, facilitated communication and secretin as treatments for autism. He has nothing but sympathy for the families who are quick to believe reports that offer hope. However, he has little sympathy for the fringe scientists and trial lawyers who profit from these scams or for the ignorant politicians and credulous journalists who trumpet false claims to the public.

Every scientist should know the dramatic story of how public confidence in vaccines has been shaken by claims that the measles, mumps, and rubella (MMR) vaccine and the preservative thimerosal in other vaccines lead to autism. The MMR scare began in the United Kingdom in 1998. Warning: Because much of this story is presented in chronological order, the reader sometimes has to read through a few chapters to learn that all the claims are bogus. This device may increase the drama, but I would hate to think that someone went to bed thinking that children with autism have measles virus in their intestines and cerebrospinal fluid, rather than knowing that the lab that reported these polymerase chain reaction results was contaminated and that the investigators neglected to run negative controls. In another case, the research

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assistant who ran the samples told the investigator that all the samples that appeared to be positive for measles virus were false positives. The investigator nonetheless reported the samples as positive. It gets worse. These odious "studies" were funded by a law firm hoping to sue vaccine manufacturers, but this was never mentioned as a conflict of interest when the paper was published in *The Lancet*. The paper's first author, Andrew Wakefield, held a press conference to make sure that the media would not overlook the implications of his findings. At the same time he was applying for a patent on a new, "safer" vaccine.

Offit does a wonderful job of comparing the media hype with what really happened. A series of large studies showed no relationship between the MMR vaccine and autism. Unfortunately, the number of MMR vaccinations in the United Kingdom fell quickly, and measles cases rose, as did deaths from the virus. Public health officials in the United Kingdom are still struggling to restore vaccination rates to pre-scare levels.

The case for ethylmercury in thimerosal causing autism was always without merit. This claim was based not on falsified data, but on no data at all. In 2001, several nonscientists who were parents of children with autism announced a hypothesis that mercury in vaccines caused autism. They believed, and tried to demonstrate, that the symptoms of mercury poisoning were similar to those of autism. Not one expert in autism or mercury toxicity was convinced—the symptoms are not similar at all—but parent advocacy groups, journalists, and politicians were off and running in no time. To date, no evidence favoring this hypothesis has been produced. Large epidemiological studies show no difference in autism rates between children exposed to thimerosal and those not exposed. There is no difference between blood levels of mercury (much less ethylmercury) in children with and without autism. Indeed, the rate of autism diagnoses has continued to rise even though thimerosal was removed from most US childhood vaccines by 2002. Undeterred, advocacy groups and those who offer to treat "mercury poisoning" continue to press their beliefs on the public, with the collusion of journalists, politicians, and celebrities.

Offit is not an expert on ethylmercury toxicity or on autism, but he is a quick study. He does a fine job of summarizing the history of this claim, although he doesn't go into detail about how completely the hypothesis is refuted by toxicology studies that were already available when the hypothesis was gen-

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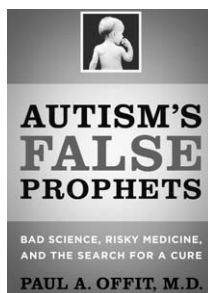
erated. This scare, too, has resulted in outbreaks of infectious diseases in the United States.

Offit has had lots of time to think about how the richest countries in the world can find themselves facing disruptions of public health systems that threaten to return us to a plague of infectious diseases usually associated with the third world. His chapters on "Science and Society" and "Science and the Media" will make you think.

Juries are notoriously prone to fall for emotional arguments and ignore science. But recently, judges have been taking their own role in civil cases with expert witnesses very seriously. That is, they are considering whether the so-called experts before them actually have relevant expertise. If their credibility is questionable, their testimony should not be heard by a jury. Thus far, although cases claiming that vaccines cause autism have been brought against vaccine manufacturers in the United Kingdom, Canada, and the United States, all have been dismissed by judges who found the plaintiffs' experts to be less than credible.

Offit focuses on the "Omnibus Autism Proceeding" before three Special Masters of the US Court of Federal Claims, in which almost 5000 families are suing the federal government for compensation for their children's autism. In this special "vaccine" court, the plaintiffs have every opportunity to make their case. The taxpayers cover their legal expenses and the standard of proof is lower than in the civil courts. The Special Masters decided before the hearings to consider the testimony of any witnesses the plaintiffs chose to present. The first of two hearings focused on the MMR vaccine and was complete when *Autism's False Prophets* was published. Offit presents some of the actual testimony. The reader will see quickly why all the civil suits have failed. The plaintiffs' experts were not experts, whereas the witnesses for the government were all well-known and active scientists in their fields. Since the book's publication, the Special Masters have released their decisions. Each rejects the plaintiffs' case as being speculative and

not supported by the facts. Their conclusion is the same as that reached by the World Health Organization, the Centers for Disease Control and Prevention, the American Academy of Pediatrics, and the Institute of Medicine (twice).



One of the things that impressed me most about this book was that Offit chose to dedicate it to five remarkable parents of children on the autism spectrum. They have braved the same slings and arrows as Offit, and they deserve the accolades of a public that should be grateful for their strength in the face of attack. These are the "real heroes—and true prophets—of this story." Peter Hotez and Michael Fitzpatrick are physicians who have tried to convince the public to stop chasing imaginary cures and to back funding for science and services. Roy Richard Grinker is an anthropologist interested in how different cultures respond to people with autism. Camille Clark and Kathleen Seidel are bloggers with quick wits and clear vision; both have fought tirelessly for the right of all children to be treated with respect and dignity. If you go to Seidel's blog, "Neurodiversity," you will be astonished by what a person with a master's degree in library science can find out from public records. She is astute on many aspects of this story, from bad science to legal chicanery to the profitability of snake oil.

My thanks to Paul Offit for making this very sad story so compelling.

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## THE DEMISE OF PUBLIC PLANT BREEDING

**Plant Breeding and Biotechnology: Societal Context and the Future of Agriculture.** Denis Murphy. Cambridge University Press, 2007. 440 pp., illus. \$60.00 (ISBN 9780521530880 paper).

Agriculture is subject to evolutionary processes that have transformed it from simple food production into a globally interconnected, industrial activity that feeds and clothes billions and supplies critical inputs to a vast array of manufactures. Steps toward the spatial integration and intensification that characterize contemporary agriculture have been evident since early post-Neolithic times, although they became especially obvious in the agricultural revolutions of the early 20th century, during which mechanization, industrially produced fertilizer, and plant breeding arrived on the scene. The last of these revolutions is the subject of Denis Murphy's book *Plant Breeding and Biotechnology: Societal Context and the Future of Agriculture*.

Laid out in six parts, the book describes the development of plant breeding, the public and private social contexts that have organized it, the ascendancy of the private sector, the emergence of the current "agbiotech paradigm," plant breeding's relation to contemporary patterns and problems of agriculture, and the future of plant breeding. Murphy's primary goal is to demystify plant breeding so as to advance public knowledge and reinvigorate public plant breeding. Frustration with the collapse of public support for plant breeding, polemical disputes over transgenic seeds, and academic retreat from plant breeding are recurrent themes. The social context alluded to in the subtitle is the policy and institutional environment surrounding plant breeding. Murphy's secondary goal is to examine public attitudes about the activities and outputs of plant breed-

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