Junk science

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Junk science is a term used in U.S. political and legal disputes that brands an advocate's claims about scientific data, research, analyses as spurious. The term conveys a pejorative connotation that the advocate is driven by political, ideological, financial, or other unscientific motives.

The term was first used in relation to expert testimony in civil litigation. More recently, it has been used to criticize research on the harmful environmental or public health effects of corporate activities, and occasionally in response to such criticism. "Junk science" is often counterposed to "sound science", a term used to describe studies that favor the accuser's point of view. It is the role of political interests which distinguishes debate over junk science from discussions of pseudoscience and controversial science.

The terms 'junk science' and 'sound science' do not have an agreed-upon definition or significant currency within the scientific community; they are primarily terms of political debate.

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History

The phrase "junk science" appears to have been in use prior to 1985. A 1985 United States Department of Justice report by the Tort Policy Working Group noted: 'The use of such invalid scientific evidence (commonly referred to as "junk science") has resulted in findings of causation which simply cannot be justified or understood from the standpoint of the current state of credible scientific or medical knowledge.'[1] In 1989, Jerry Mahlman (a proponent of anthropogenic global warming theory) used the phrase 'noisy junk science' in reference to the alternative theory of global warming due to solar variation presented in *Scientific Perspectives on the Greenhouse Problem* by Frederick Seitz et al.[2]

Peter W. Huber presented an exposition of the phrase with respect to litigation in his 1991 book *Galileo's Revenge: Junk Science in the Courtroom.* The book has been cited in over 100 legal textbooks and references; as a consequence some sources cite Huber as the first to coin the phrase. By 1997, the phrase had entered the legal lexicon as seen in an opinion by Supreme Court of the United States Justice John Paul Stevens, 'An example of "junk science" that should be excluded under the Daubert standard as too unreliable would be the testimony of a phrenologist who would purport to prove a defendant's future dangerousness based on the contours of the defendant's skull.' [3] Lower courts then set guidelines for identifying 'junk science,' such as the 2005 opinion of United States Court of Appeals for the Seventh Circuit Judge Easterbrook, 'Positive reports about magnetic water treatment are not replicable; this plus

the lack of a physical explanation for any effects are hallmarks of junk science.' [4]

As the subtitle of Huber's book, "Junk Science in the Courtroom," suggests, his emphasis was on the use or misuse of expert testimony in civil litigation. One prominent example cited in the book was litigation over casual contact in the spread of AIDS. A California school district sought to prevent a young boy with AIDS, Ryan Thomas, from attending kindergarten. The school district produced an expert witness, Dr. Steven Armentrout, who testified that a possibility existed that AIDS could be transmitted to schoolmates through yet undiscovered "vectors." However, five experts testified on behalf of Thomas that AIDS is not transmitted through casual contact, and the court affirmed the "solid science" (as Mr. Huber called it) and rejected Dr. Armentrout's argument.[5]

In 1999, Paul Ehrlich and others advocated public policies to improve the dissemination of valid environmental scientific knowledge and discourage junk science: 'The Intergovernmental Panel on Climate Change reports offer an antidote to junk science by articulating the current consensus on the prospects for climate change, by outlining the extent of the uncertainties, and by describing the potential benefits and costs of policies to address climate change.'[6] In a 2003 study about changes in environmental activism in the Crown of the Continent (Flathead) Ecosystem, Pedynowski noted that junk science can undermine the credibility of science over a much broader scale because misrepresentation by special interests casts doubt on more defensible claims and undermines the credibility of all research.[7]

In his 2006 book[8], Dan Agin emphasized two main causes of junk science: fraud, and ignorance. In the first case, Agin discussed falsified results in the development of organic transistors: 'As far as understanding junk science is concerned, the important aspect is that both Bell Laboratories and the international physics community were fooled until someone noticed that noise records published by Jan Hendrik Schön in several papers were identical - which means physically impossible.' In the second case, he cites an example that demonstrates ignorance of statistical principles in the lay press: 'Since no such proof is possible [that genetically modified food is harmless], the article in The New York Times was what is called a "bad rap" against the U.S. Department of Agriculture - a bad rap based on a junk-science belief that it's possible to prove a null hypothesis.' Agin asks the reader to step back from the rhetoric, 'But how things are labeled does not make a science junk science.' In its place, he offers, 'So where is the junk science? The answer is that it's in the hiding of what you need to know.'

Controversy surrounding use of the phrase "junk science"

John Stauber and Sheldon Rampton of *PR Watch* argue that the term "junk science" has come to be used to deride scientific findings which stand in the way of short-term corporate profits. In their book *Trust Us, We're Experts* (2001), they write that industries have launched multi-million-dollar campaigns to position certain theories as "junk science" in the popular mind, often failing to employ the scientific method themselves. For example, the tobacco industry has used the term "junk science" to describe research demonstrating the harmful effects of smoking and second-hand smoke, through the vehicle of various "astroturf groups". Theories more favorable to corporate activities may be praised using the term "sound science".

Edward Herman reported that from 1996 to 1998, there were 8 articles in the mainstream media labeling criticism of corporations or tort claims 'junk science' for every 1 article labeling research sponsored by corporations as such.[9]

The term was further popularized by Fox News columnist Steven Milloy, who used it to attack the results of scientific research on global warming, ozone depletion, passive smoking and many other topics. The credibility of Milloy's website junkscience.com, was questioned by Paul D. Thacker, a writer for The New Republic in the wake of evidence that Milloy had received funding from Phillip Morris, RJR Tobacco, and Exxon Mobil. [10][11][12] Thacker also noted that Milloy was receiving almost $100,000 a year in consulting fees from Philip Morris while he criticized the evidence regarding the hazards of second-hand smoke as "junk science". Following the publication of this article the Cato Institute, which had hosted the junkscience.com site, ceased its association with the site and removed Milloy from its list of adjunct scholars.

Tobacco industry documents reveal that Phillip Morris executives conceived of the "Whitecoat Project" in the 1980s as a response to emerging scientific data on the harmfulness of second-hand smoke.[13] The goal of the Whitecoat Project, as conceived by Philip Morris and other tobacco companies, was to use ostensibly independent "scientific consultants" to spread doubt in the public mind about scientific data through the use of terms such as "junk science".[13]

Use by scientists

In 1995, the Union of Concerned Scientists launched the Sound Science Initiative, a national network of scientists committed to debunking junk science through media outreach, lobbying, and developing joint strategies to participate in town meetings or public hearings.[14] The American Association for the Advancement of Science also recognized the need increased understanding between scientists and lawmakers in its newsletter on Science and Technology in Congress, "Although most individuals would agree that sound science is preferable to junk science, fewer recognize what makes a scientific study 'good' or 'bad'."[15] The American Dietetic Association, criticizing marketing claims made for food products, has created a list of "Ten Red Flags of Junk Science": [16]

Individual scientists have also used the term [17] [18][19] [20]

See also

- Agnotology
- Controversial science
- Daubert standard for science that can be used in United States federal courts
- Federal Rules of Evidence
- Fringe theory
- Frye Standard
- Pseudoscience
- Scientific method

Notes

1. ^ Report of the Tort Policy Working Group on the causes, extent and policy implications of the current crisis in insurance availability and affordability (Rep. No. 027-000-01251-5). (1986, February). Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office. (ERIC Document Reproduction Service No. ED274437)
2. ^ Roberts, L. (1989, November). Global warming: Blaming the sun. Science, 246(4933), 992-993.

3. ^ General Electric Company v. Robert K. Joiner, No. 96–188, slip op. at 4 (U.S. Dec. 15, 1997).
4. ^ Huber, P. W. (2001). Galileo's revenge: Junk science in the courtroom. New York: Basic Books. (Original work published 1991), 191.
5. ^ Charles H. Sanderson v. Culligan International Company, No. 04-3253, slip op. at 3 (7th Cir. July 11, 2005).
6. ^ Ehrlich, P. R., Wolff, G., Daily, G. C., Hughes, J. B., Daily, S., Dalton, M., et al. (1999). Knowledge and the environment. Ecological economics, 30, 267-284.
7. ^ Pedynowski, D. (2003). Toward a more 'Reflexive Environmentalism': Ecological knowledge and advocacy in the Crown of the Continent Ecosystem. Society and Natural Resources, 16, 807–825.
8. ^ Agin, D. P. (2006). Junk Science: How politicians, corporations, and other hucksters betray us. New York: Thomas Dunne Books.
9. ^ Hass, B., & Kleine, M. (2003, Summer). The rhetoric of junk science. Technical Communication Quarterly, 12(3), 267-284.
10. ^ "Smoked Out: Pundit For Hire", published in *The New Republic*, accessed 20 Sept 2006.
11. ^ PRWatch.com article describing the financial links between Milloy and the tobacco industry, accessed 20 Sept 2006.
12. ^ Activity Report, R.J. Reynolds Tobacco Co., December 1996, describing R.J.R. Tobacco's direct input into Milloy's junkscience website. From the Legacy Tobacco Documents Library at the University of California, San Francisco. Accessed 5 Oct 2006.
13. ^ ***a*** ***b*** Minutes of a meeting in which Philip Morris Tobacco discusses the inception of the "Whitecoat Project". Accessed 5 Oct 2006.
14. ^ Union of Concerned Scientists. (1998, Winter). Sound science initiative. ASLO bulletin, 7(1), 13.
15. ^ Sound Science for Endangered Species. (2002, September). In Science and Technology in Congress. American Association for the Advancement of Science. Retrieved November 12, 2006, from http://www.aaas.org/spp/cstc/pne/pubs/stc/stc02-09.pdf.
16. ^ Volume 106, Issue 4, Pages 601-607. (2006, April). Position of the American Dietetic Association: Food and Nutrition Misinformation (Journal of the American Dietetic Association). Retrieved October 25, 2006, from http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/advocacy_adar0202_ENU_HTML.htm (p. 605)
17. ^ Merrow, J. (2005, February 23). Unlearning Bad Science. Education Week. Retrieved November 3, 2006, from Public Broadcasting Service Web site: http://www.pbs.org/merrow/news/edweek4.html.
18. ^ Baron, L. A. F. (2001, February). The Influence of "Junk Science" and the Role of Science Education. Imprimis, 30(2). Retrieved November 12, 2006, from Hillsdale College Web site: http://www.hillsdale.edu/imprimis/2001/february/default.htm.
19. ^ Murray, B. (2006, November 12). The Methods of Science and Journalism. FACSNET, science and technology. Retrieved November 12, 2006, from Foundation for American Communications Web site: http://www.facsnet.org/tools/sci_tech/methods.php3.
20. ^ Hill, C. T. (2001). Fifty Years of Science and Technology Policy in Ten Minutes. AAAS Science and Technology Policy Yearbook, 107. Retrieved November 12, 2006, from American Association for the Advancement of Science Web site: http://www.aaas.org/spp/rd/ch7.pdf.

Further reading

- Dan Agin, *Junk Science: How Politicians, Corporations, and Other Hucksters Betray Us*, 2006. ISBN 0-312-35241-7.
- Peter W. Huber, *Galileo's Revenge: Junk Science in the Courtroom*, 1993. ISBN 0-465-02624-9.
- Steven J. Milloy, *Junk Science Judo: Self-Defense against Health Scares and Scams*, 2001. ISBN 1-930-86512-0.
- Chris Mooney, *The Republican War on Science*, 2005. ISBN 0-465-04675-4.
- Susan Kiss Sarnoff, *Sanctified Snake Oil: The Effect of Junk Science on Public Policy*, 2001. ISBN 0-275-96845-6.

External links

- Project on Scientific Knowledge and Public Policy (SKAPP) DefendingScience.org

- David Michaels (June 2005). "Doubt is Their Product". *Scientific American*: 96–101. Retrieved on on 2008-06-03.
- Annamaria Baba, Daniel M. Cook, Thomas O. McGarity & Lisa A. Bero. (July 2005 2005). "Legislating "Sound Science": The Role of the Tobacco Industry". *American Journal of Public Health* **95** (1): 20–27. doi:10.2105/AJPH.2004.050963. PMID 16030333. Retrieved on 2008-06-03.
- David Michaels and Celeste Monforton (July 2005). "Manufacturing Uncertainty: Contested Science and the Protection of the Public's Health & Environment". *American Journal of Public Health* **95** (1): 39–48. doi:10.2105/AJPH.2004.043059. PMID 16030337. Retrieved on 2008-06-03.
- Derek Yach and Stella Aguinaga Bialous (November 2001). "Junking Science to Promote Tobacco". *American Journal of Public Health* **91** (11). Retrieved on 2008-06-03.
- Sheldon Rampton and John Stauber (Third Quarter 2000). "How Big Tobacco Helped Create "the Junkman"". *PR Watch* **7** (3). Center for Media and Democracy. Retrieved on 2008-06-03.
- Paul D. Thacker (2005-05-11). "The Junkman Climbs to the Top". Environmental Science & Technology. Retrieved on 2008-06-03.