

and such others as Bockris would be more authentically portrayed by an ancient Greek tragedist than by the simplistic morality tale of this book.

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Galileo's Revenge: Junk Science in the Courtroom by Peter Huber. Harper Collins, 1991. 274 pp. \$23, (c).

At a recent meeting of the American Statistical Association I bought a T-shirt for my wife that said, "Statistics means you never have to say you're certain." No matter that I hid it out of sight to the extent that I clean forgot about its existence and then overlooked her birthday; the statistical point of the pun is that the same data set can be viewed in many ways.

Yet, despite what my undergraduate students believe, not just anything goes. And not merely because the ruling elite of the academy has imperially decreed what is acceptable and what is otherwise. Nor is there a conspiracy to suppress deviant views. Simply stated, non-sensical procedures and non-sensical results are identifiable and thus can be eliminated from discussion.

Unfortunately, judges and juries, especially when influenced by lawyers and expert witnesses, don't see matters with the same statistical clarity as statisticians do. Peter Huber, author of *Galileo's Revenge: Junk Science in the Classroom*, would change "influenced" to "hoodwinked." His major contention is that malpractice on the witness stand and pseudo-science in the courtroom are rampant.

As a consequence, good products such as the Audi automobile or the drug Bendectin are ousted from the marketplace because unscrupulous lawyers and experts can make a lucrative living litigating endlessly. In twentieth-century America, one can strike it rich on anecdotal rare events just at the threshold of recognition.

Make that very rich. Weak electromagnetic fields, electronic fetal monitoring, cesarean deliveries, breast implants, and AIDS transmission are areas in which clever footwork can convince judges and juries that unlikely doesn't imply absolutely impossible. One of Huber's favorite examples is that of "a soothsayer who decided she had lost her psychic powers following a CAT scan" and "persuaded a Philadelphia jury to award her one million dollars in damages." His other favorite is "the cancer-by-streetcar cases" of trauma: a woman falls off a public vehicle and the injury causes breast cancer.

While not everyone may share Huber's disdain or contempt for soothsayers, astrologers and homeopaths, none would disagree with his scathing critique of entrepreneurial scientific experts who are "saxophones, because the lawyer calls the tune and the expert plays it." Huber juicily quotes a personal injury lawyer:

You get a professor who earns \$60,000 a year and give him the opportunity to make a couple hundred thousand dollars in his spare time and he will jump at the chance. They are like a bunch of hookers in June.

Huber's point of view is neatly summarized on page 182:

The casual follower of jury verdicts might easily conclude that most pelvic disease is caused by IUDs and tampons, most lung disease by workplace dust and building asbestos, most road injuries by defects in car design, and most miscarriages, birth defects, and cancers by medicinal drugs, pollution, or obstetrical incompetence. But they aren't. By far the most important keys to safety and good health involve tobacco, alcohol, seat belts, diet, and sexual habits — matters well within an individual's own reach and control. Pandering to junk science that asserts otherwise is dangerous.

And therein lies the rub. By claiming the individual is in control of his life, drug companies, automobile manufacturers, the government or obviously guilty parties such as the tobacco industry are absolved from any wrong doing.

Huber is too willing to caricature any litigant as a self-seeking, publicity nut-case armed with opportunistic contingency attorneys and sleazy expert witnesses willing to swear to scientific extremes. To put things bluntly, cost-cutting design of cars has caused many accidents, some IUDs have caused pelvic disease, asbestos does kill without smoking as an additional factor, some medical doctors are incompetent and the tobacco industry does everything in its power to hook consumers. The trick, as always, is to distinguish the quacks from the genuine.

A tough trick, as is evident from the choice of title, *Galileo's Revenge*:

One way to dishonor Galileo is to imprison him for heresy. Another, quite as effective, is to teach his views side by side with those of astrologers and mystics. It is not liberal, open-minded, tolerant, scientific, or progressive to give equal time to astrology and astronomy. The modern judge who defers to mainstream science will at the same time defer to science's own, methodical acceptance of the possibility of error. To insist that things are more uncertain still is to deny things we know to be true, and believe things we know to be false.

My prescription for honoring Galileo is self-serving but simple. Require that judges and juries be statistically literate, able to discern the virtually impossible from the merely unlikely. Whether or not this will deter shyster lawyers, I can't guarantee but at the very least, this should keep up the enrollment in statistics classes.

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