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STATISTICS, LIES AND DAMNED LIES

It was Edwin H. Land (1909-1991), American inventor of the Polaroid camera, who observed that:

“Science is a method to keep yourself from kidding yourself.”

But it was Richard P. Feynman (1918-1988), American physicist and Nobel-Prize-winner, who took this notion further, saying:

“The first principle [of science] is that you must not fool yourself. And you are the easiest person to fool. So you have to be very careful about that. After you've not fooled yourself, it's easy not to fool other scientists. [6/14/1974 at Caltech]

In a speech to the National Science Teachers Association in 1966, Feynman elaborated on the role of science in separating fact from fiction:

“The race has ideas, but they are not necessarily profitable. So there came a time in which the ideas ... were all accumulations not only of practical and useful things, but great accumulations of all types of prejudices, and strange and odd beliefs. Then a way of avoiding the disease was discovered. This is to doubt that what is being passed from the past is in fact true, and to try to find out ab initio again from experience what the situation is, ... And that is what science is: the result of the discovery that it is worthwhile rechecking by new direct experience, and not necessarily trusting the experience from the past. ... That is my best definition [of science].”

Feynman, a mathematical genius, may have added that one of the most important tools of science is statistical analysis or, more simply, statistics. These mathematical methods also developed slowly and incrementally, and then much more rapidly in

the last hundred years. Statistics make it possible, for the first time, not only to expose the mistakes and errors of the past but to distinguish observations and experimental results that are real from those due to chance. Not only that, it gives guidance on the sort of measurements and how many of them are necessary and how to limit or deal with confounding variables and “noise” in what is measured. Importantly, statistics deals in numerical data, even if only “binary,” an either/or measurement. This is the source of its great power, unlocked by the scientific practice of “measure what is measurable, and make measurable what is not so.”[1]

Despite all of this, statistics has come to be associated with deception. Mark Twain – citing British Prime Minister Benjamin Disraeli – classed it as a step beyond “lies” and “damned lies.”[2] How can this be? It seems likely that it is the result, on the one hand, of a widespread popular trust in science, particularly when it relies on mathematical analysis – and computers! – and, on the other hand, of a widespread popular ignorance, misunderstanding and even fear of statistics as a difficult subject best left to experts. Even people doing science may not understand statistics very well and journalists understand it even less. Moreover, both are motivated to announce and publicize the unexpected and extraordinary in order to draw attention. And, of course, the public prefers exaggerated claims and sensational stories.

Are actual lies involved? Sometimes they are, especially when it comes to marketing products and services. Money and personal gain have always been strong motivators. But as the saying goes:

“Never attribute to malice what can be easily explained by ignorance and incompetence.”[3]

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Sadly – disturbingly! – ignorance and incompetence are often excused, if not justified, by the “everyone is doing it” trope. This is dangerous, especially when it comes to scientific work that may influence if not determine public policies both national and international. One analysis suggests that most research reports published in the peer-reviewed scientific literature are unreliable because of poor methods, inappropriate data manipulation and serious misconceptions.[4] There is not enough appreciation and concern for the pitfalls of interpreting research findings and too much reluctance to admit a failure to discover something significant. In this connection, “publication bias” is another problem that plagues science: positive findings are published and publicized while negative or inconclusive results are buried. Yet it is arguably at least as important to know of lines of research that are fruitless because science – and all of life, in fact – is a process of trial and error. As Thomas Edison put it:

“Negative results are ... just as valuable to me as positive results. I can never find the thing that does the job best until I find the ones that don't.”

So what can be done? Statistics can be compared with the introduction of innovations such as electricity. To extend the analogy, what most people need is not to know Ohm's Law but to know how to avoid electrocution. Likewise, researchers and others, while relying on statisticians, need to know the problems that can arise with statistical information.

As there is great public interest in disasters, mishaps and corruption it would be rewarding for journalists and their audience if attention were drawn to abuses of statistics. The broad categories of it are not hard to understand and do not require skills in higher math. The classic resource is Darrell Huff's How To Lie With Statistics. A more recent work is Alex Reinhart's Statistics Done Wrong and its associated website www.statisticsdonewrong.com

[1] Often misattributed to Galileo but was said of Galileo by two 19th Century French scholars.

[2] Twain himself is often cited as the source but others had expressed the same or similar ideas; whether Disraeli ever said it is unknown.

[3] Often referred to as “Hanlon's Razor” but many others had previously expressed the same idea.

[4] “Why Most Published Research Findings Are False” by John P. A. Ioannidis online at <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0020124>

All NTCOF events can be found through our website calendar, or our meetup page, from which you can RSVP, at: - www.meetup.com/church-of-freethought - JOIN THE NTCOF MEETUP GROUP !!!

Social Luncheon: Today, immediately after our Service, join us for lunch and discussion at the Jason's Deli on MacArthur Blvd just south of I-635, at 7707 N MacArthur Blvd, phone (972) 432-0555.

Freethought Salon: Discuss today's service topic or other conundrums on most non-first Sundays of the month, over breakfast/coffee (or not), in the atrium of the Embassy Suites DFW Airport North – on Bass Pro Drive in Grapevine beginning at 10:00 AM.

Game Night: Most Friday nights at the IHOP on 2310 Stemmons Trail (I-35), near Northwest Highway (Loop 12). Plan to arrive at about 7:30 PM, and stay late playing Imperial 2030, Dominion, Terraforming Mars, Le Havre, Ticket To Ride, and other fun games!

Have Another Idea? Email or call! Read bulletins & presentations and post on the FORUM at www.churchoffreethought.org LIKE US at www.facebook.com/northtexaschurchoffreethought/ and sign up for our Twitter feed at www.twitter.com/ntcof !

**GUEST SPEAKER NEXT MONTH
FFRF'S Randy Hoenig
"SCOUTING: God,
Gays, Girls & Gender"
> Sunday, October 6, 2019 <
HERE at the Hawthorn Suites DFW
Airport North 10:30 AM**

**THANK YOU !!
FOR YOUR TIME and
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of the NTCOF !!
It is needed, appreciated and
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**The North Texas Church of Freethought
The Fellowship of Unbelievers**

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