

# Carl Sagan's "Baloney Detection Kit"

In his 1995 book *The Demon-Haunted World: Science as a Candle in the Dark*, Carl Sagan provides a list of 20 common fallacies to watch out for (especially in religion and politics). He covers them in detail; this is just the short list:

- 1 *ad hominem* (Latin "to the man", attacking the arguer, not the argument)
- 2 argument from authority
- 3 argument from adverse consequences
- 4 appeal to ignorance (the claim that if it's not proved false it must be true; used a lot by creationists)
- 5 special pleading (often to rescue a proposition in deep rhetorical trouble)
- 6 begging the question (AKA assuming the answer)
- 7 observational selection (AKA enumeration of favorable circumstances)
- 8 statistics of small numbers (related to #7)
- 9 misunderstanding of the nature of statistics
- 10 inconsistency
- 11 *non sequitur* (Latin "it does not follow")
- 12 *post hoc, ergo propter hoc* (Latin "after that, therefore because of that")
- 13 meaningless question
- 14 excluded middle (AKA false dichotomy; used a lot in politics)
- 15 short-term vs. long-term (subset of #14 but Sagan said it's important enough to warrant special attention)
- 16 slippery slope (related to #14 as well)
- 17 confusion of correlation and causation
- 18 straw man
- 19 suppressed evidence (AKA half-truths)
- 20 weasel words

Michael Shermer, editor and publisher of *Skeptic* magazine and author of *The Borderlands of Science*, supplemented Sagan's list with a set of 10 questions (<http://homepages.wmich.edu/%7Ekorista/baloney.html>) to ask about truth claims:

- 1 How reliable is the source of the claim?
- 2 Does this source often make similar claims?
- 3 Have the claims been verified by another source?
- 4 How does the claim fit with what we know about how the world works?
- 5 Has anyone gone out of the way to disprove the claim, or has only supportive evidence been sought?
- 6 Does the preponderance of evidence point to the claimant's conclusion or to a different one?
- 7 Is the claimant employing the accepted rules of reason and tools of research, or have these been abandoned in favor of others that lead to the desired conclusion?
- 8 Is the claimant providing an explanation for the observed phenomena or merely denying the existing explanation?
- 9 If the claimant proffers a new explanation, does it account for as many phenomena as the old explanation did?
- 10 Do the claimant's personal beliefs and biases drive the conclusions, or vice versa?