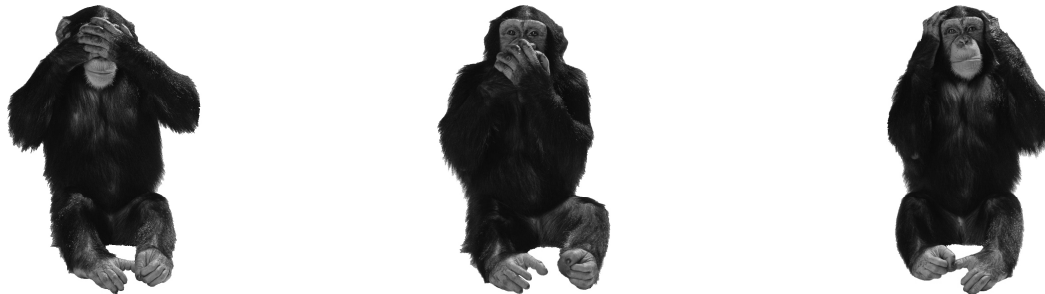


## Good Skepticism and Bad Skepticism

By Andrew Dart, author of Building your Skeptical Toolkit



I once worked with a guy who was skeptical about the existence of other planets. Now I'm not talking about planets in other solar systems here, I'm talking about planets like Mars, Saturn and Venus. He didn't accept that they were real and would scoff at the evidence in support of their existence, including the fact that with an average pair of binoculars it is possible to see, among other things, Jupiter and its four Galilean moons for yourself, something I even showed him once. In fact, he even had his doubts about the moon, though he was willing to admit that he was less sure about the non-existence of this celestial body than he was about the others.

I also worked with a lovely woman who was skeptical about the death of Princess Diana. Again I don't mean she believed in the conspiracy theory that states that the British Royal family had Diana assassinated to stop her from marrying Dodi Fayed and having his child, no she was skeptical about the idea of her being dead at all. She fully accepted that Diana was in the accident but believed that she had survived the crash and that she and Dodi had been rushed to hospital where they received plastic surgery and now live in hiding under new identities. She would admit that she had no evidence to support this and that it was just something she believed, but no amount of contradicting evidence would convince her that she was wrong.\*

Both of these people would call themselves skeptics when it comes to planets and Princess Diana's death respectively, but is that really what they are? Likewise, there are a lot of people who like to call themselves skeptics but who it can be strongly argued are

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\* I honestly know these people; I wish I was making it up.

anything but. There's HIV/AIDS skeptics, global warming skeptics, moon landing skeptics, evolution skeptics, holocaust skeptics, 9/11 skeptics and vaccination skeptics, to name but a few. But while there may be some people who would use these labels who could legitimately be described as skeptics the vast majority of them are not practicing skepticism at all, but rather skepticism's evil twin, denialism.

Skepticism is about looking at the evidence for a claim with an open mind, weighing up that evidence as well as the arguments both for and against your positions and being willing to change your mind if the evidence conflicts with your pre-existing beliefs. In fact, a good skeptic *wants* to be shown that they are wrong, they demand the evidence against what they believe and actively seek out the arguments against their position, and if a belief they have is shown conclusively to be wrong then they will happily abandon it. This is because a good skeptic wants to believe as many true things and disbelieve as many false things as possible, and you don't do this by adamantly sticking to your guns in the face of opposing evidence.

Denialism on the other hand is driven by ideology rather than evidence. Now denialists may claim they care about the evidence and will happily display any that supports their point of view, but in most cases they reject far more evidence than they accept. Furthermore, denialists will cling to evidence no matter how many times they have been shown that it is flawed, incorrect or that it does not support their conclusions; the same old arguments just come up again and again. Denialism also tends to focus on trying to generate a controversy surrounding the subject at hand, often in the public rather than scientific arena, and does so more often than not by denying that a scientific consensus on the matter even exists.

For example, vaccination "skeptics" cling tenaciously to Andrew Wakefield's fraudulent and thoroughly discredited 1998 paper on the alleged connection between vaccinations and autism, despite, and in fact in spite of, the overwhelming evidence of medical misconduct and shoddy science arrayed against it, which ultimately resulted in Wakefield having his licence to practice medicine in the UK revoked in 2011. They also claim their concerns about vaccinations are driven by the evidence rather than by ideological issues. And yet when thimerosal, an ethyl mercury-containing organic compound and the ingredient in vaccines that was claimed to cause autism, was removed from vaccines and autism rates did not change they simply refocused the target of their concern from

thimerosal to other chemicals used in vaccines. The numerous papers showing no link between thimerosal in particular and vaccines in general and autism and the growing consensus amongst scientists that autism is primarily a genetic condition continue to be simply dismissed or outright ignored by the anti-vaccination movement. This is not how skepticism works.

So how can you tell if you are dealing with actual skepticism rather than just denialism? Well medical scientists Pascal Diethelm and Martin McKee looked into various forms of denialism, publishing their findings in *The European Journal of Public Health*, and identified five key points that all forms of denialism seem to have in common. So here's what you need to keep an eye out for.

## Conspiracy Theories

So the vast majority of the scientific community and an overwhelming mountain of evidence is aligned against you, what are you going to do? Well you could always claim that there is a conspiracy to suppress the truth and that the scientists working in the field are engaged in a complex cover up for some bizarre and often undefined reason. In November 2009 the servers of the University of East Anglia in the UK were hacked into and a large number of emails were stolen. Some of these emails contained comments that appeared to confirm what some global warming skeptics had long believed, that the evidence for global warming was a lie and that those scientists working in the field were all part of a vast global conspiracy. Numerous independent investigations were launched, including those by the House of Commons Science and Technology Committee and the Independent Climate Change E-Mail Review, all of which found no evidence of any wrong doing on behalf of the scientists involved and yet claims of a conspiracy remain. And global warming skeptics are not the only ones taking this approach.

Holocaust skept...you know let's just call them what they are, holocaust deniers argue that the holocaust was a hoax perpetrated by Zionist conspirators in order to advance the interests of the Jewish people. The 9/11 Truthers movement believe that the United States planned the attacks on the World Trade Center as part of a conspiracy to get America involved in a war in the Middle East. Evolution deniers believe that the vast body of

evidence in support of evolution by natural selection doesn't actually exist and that the tens of thousands of biologists working in hundreds of separate academic institutions and laboratories around the world know this, but pretend otherwise in order to keep their jobs, or out of some fear of rocking the boat of scientific consensus.

Most scientists are viewed as simply towing the party line and it is assumed that none of them ever comes to their own conclusions based upon the evidence; they just believe what they are told to believe. As for the peer review process, well that is just a tool of the conspiracy to make sure that only those papers that agree with the conspirator's message get published. The reality, that the scientific world has a "fastest gun in the west" mentality where every new scientist is seeking to earn their spurs by taking down the theories of the big names in their field, is completely ignored in favour of an image of scientists huddling in their labs, terrified to admit that everything they are saying is a lie, and in fear of the powers that be, while only a few brave souls out of thousands have the courage to stand up and say "No, I know the truth and I just can't keep quiet anymore."

These conspiracy theories never attempt to actually address the evidence; rather they seek to dismiss it entirely as a fabrication of unseen forces. Furthermore no explanation as to how a conspiracy so vast that it encompasses every scientist in a given field, as well as every student studying to become a scientist in that field, can maintain itself without someone blowing the whistle is ever given, and reasons why the conspiracies exist in the first place are equally rare and incoherent.

It is also not at all uncommon for deniers to demonize those who they see as members of the conspiracy against, well, whatever it is they are for. Evolution deniers regularly equate those who support evolutionary theory with Hitler and his attempted extermination of the Jews during World War 2. After all Hitler was only following the logic of survival of the fittest, wasn't he? Meanwhile over at the anti-vaccination website Age of Autism, regular contributor Kent Heckenlively refers to those who support the use of vaccines as "Dark Forces" and "wicked people" who intentionally want to "keep our children from getting better". In fact, he equates those who are pro-vaccine to the fictional character Randall Flagg, a demonic figure that appears in a number of Steven King's novels, most notably *The Stand*, and who sets out to wreak havoc where ever he can. To many deniers those on the other side of the debate are not just wrong or ill-informed people with otherwise good intentions who just need to be educated. No, they are the enemy, evil

minded minions of the conspiracy who are actively seeking to do harm for some malicious and nefarious purpose and who must be stopped at all cost. In another of his posts Heckenlively had this to say:

“They'll never provide us with the answer to what happened to our children. We will have to take it from them. We need to get militant, and I mean in a way that scares those in power.

...

We need to have the kind of strength to pull down those in positions of power and toss them into the street.”

Now I am not implying that Heckenlively is encouraging violence here, but when this sort of rhetoric comes from recognised figures within a movement we should hardly be surprised if some passionate members take it literally.

## Fake Experts

Fake experts are defined as people who claim to be experts in a given field but whose opinions differ greatly from the consensus of scientists working in that field and from established knowledge. Often these people are real scientists who are speaking about subjects outside of their area of expertise, though it is not unusual for scientists to be recruited on the understanding that they will support the point of view of their employers. For example the American Petroleum Institute put together something called the Global Climate Science Communications Plan in 1998 which included the goal of recruiting “a cadre scientists who share the industry’s views of climate science [who can] help convince journalists, politicians and the public that the risk of global warming is too uncertain to justify controls on greenhouse gases.”

Another approach, often used by those opposed to evolution and global warming, is to put together long lists of scientists who appear to agree with their alternative point of view. The Dissent from Darwin list, created by creationist think tank the Discovery Institute, is one such example and currently has around 700 signatories who, the Discovery Institute

claim, question the theory of evolution by natural selection. However many of the names on this list would constitute fake experts under the definition used by Diethelm and McKee in that, while qualified scientists, they are not biologists and so not specialists in the area in question. On top of this, the statement that these people are adding their names to is incredibly vague and something that any right thinking scientist or skeptic could agree with.

“We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged.”

Well yeah, that sounds fine to me, after all it says nothing about modern evolutionary biology concepts such as genetic drift or sexual selection, but agreeing to that in no way implies that you do not consider evolution to be a valid theory nor that you do not think it to be the best explanation we have for the diversity of life on our planet. In response to this list The National Center for Science Education, a US based non-profit organisation dedicated to keeping evolution in public school science classes, created something called Project Steve. Project Steve is a list of scientists, all of whom work in fields directly related to evolutionary theory, who strongly support the theory of evolution as a valid, accurate and important theory that is central to our understanding of biology, and who all happen to have names that are a derivation of the name Steve. Their point was to show that it is very easy to put these lists together and that, even if you limit yourself to only those people whose names are a version of Steve, it is possible to get a longer list than those produced by evolution deniers. The Project Steve list currently stands at just under 1200 signatories.

The last tactic used by deniers that comes under the heading of fake experts is the denigration of those real experts arguing against you. For example Stanton Glantz, a professor of medicine at the University of California, San Francisco, who has played an important role in exposing the more questionable tactics used by the tobacco industry has been referred to as being “infamous for being the boldest of liars in ‘tobacco control’ that most ethically challenged gang of con artists” by his detractors. Nice.

## Cherry Picking

Cherry picking is the act of selecting papers and evidence that seem to support your point of view, whilst at the same time ignoring the far greater body of evidence that goes against your position. We have already talked about how the anti-vaccination movement focuses on Andrew Wakefield's fraudulent paper that seemed to indicate that he'd found a link between vaccination and autism in 12 children, whilst ignoring the vast body of evidence that no such link exists. Well, that is cherry picking in action.

Another great and graphic example of cherry picking at work can be found by looking at The Heartland Institute, a non-profit public policy think tank that questions the scientific consensus on climate change, and their support of a 2009 white paper submitted to NASA by geologists and former astronaut Harrison Schmitt that argued that we were experiencing a cooling trend at that point in time. In his paper Schmitt stated the following:

"How long this cooling trend will persist remains to be seen; however, Greenland glaciers have been advancing since 2006,<sup>†</sup> Arctic [sic] sea ice has returned to 1989 levels of coverage, and snowy, cold winters and cool summers have dominated northern North America and Europe"

When it was pointed out that in 1989 average sea ice in the Arctic covered an area of 12.14 million square kilometres whereas in 2009 it had fallen to 11.18 million square kilometres, a difference of nearly 1 million square kilometres, the Heartland Institute was quick to defend Schmitt's claim that sea ice had returned to its 1989 level.

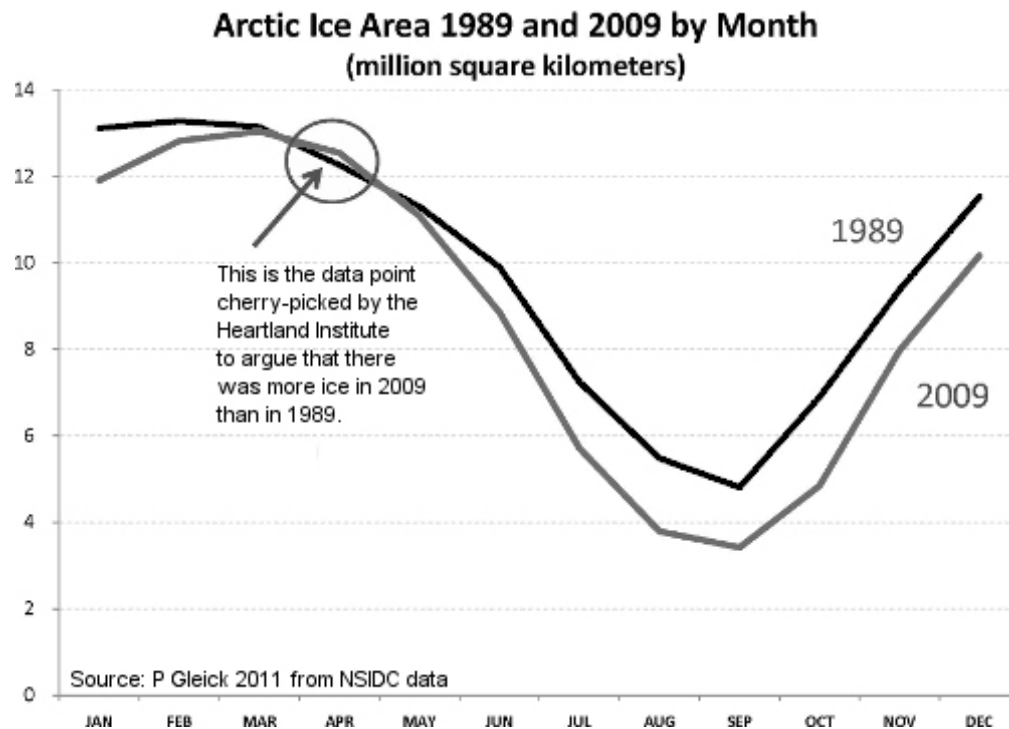
"In fact, National Snow and Ice Data Center records show conclusively that in April 2009, Arctic sea ice extent had indeed returned to and surpassed 1989 levels."

Now if you were to go look at the records of the National Snow and Ice Data Center you would indeed find that the Arctic sea ice levels in April 2009 did indeed surpass those of April 1989, this claim is entirely accurate and not in dispute. However, Dr Peter Gleick, a

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<sup>†</sup> For the record Greenland has been losing around 200 billion tons of ice per year since 2003 so this part of the quote is also highly inaccurate.

water and climate scientists and co-founder and president of the Pacific Institute, a nonpartisan environmental research group, decided to do something crazy; he decided to look at the data for the entire years of 1989 and 2009, and this is what he found:



For every single month other than April the sea ice levels in 2009 had been lower than those in 1989. He concluded that Schmitt and the Heartland Institute had apparently searched through the available data and found a single solitary month during which the sea ice had been higher in 2009 than in 1989 and had used this as the basis of their argument. Dr Gleick summed things up with a perfect analogy. If this graph represented your bank statements for these years, could you really claim to have had more money in 2009 than you did in 1989?

### Impossible Expectations and Moving the Goalposts

Moving the goalposts refers to the tactic of dismissing the evidence against a specific claim by changing the target or topic of discussion, generally without even acknowledging what your opponent has said. When evidence is presented against an argument it is simply waved



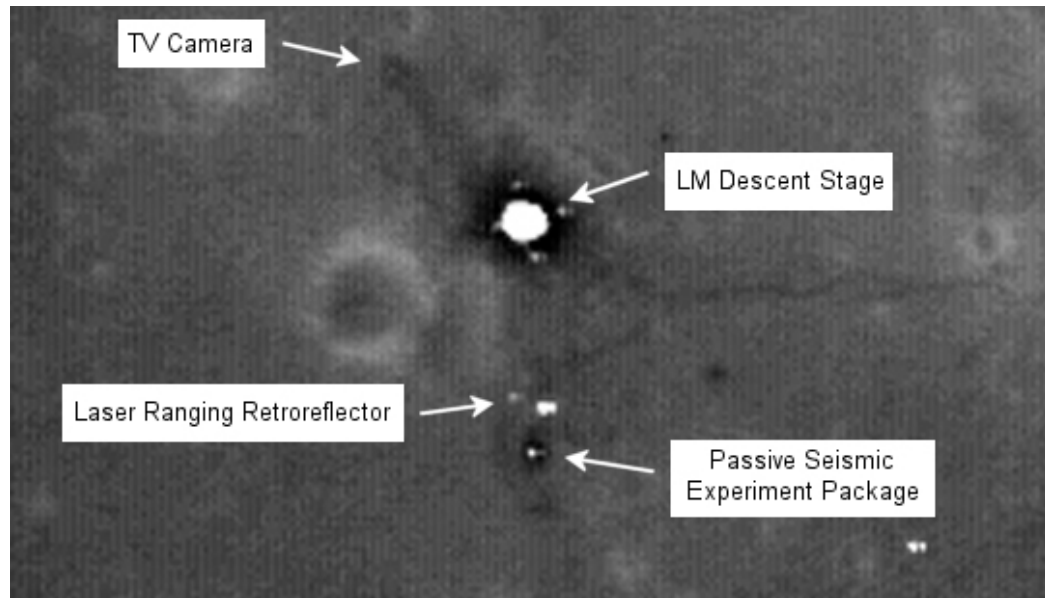
away and a request for further, often more detailed, evidence is made with a dismissive “Ok, but how do you explain this...” A clear example of this can be found amongst those who deny that we ever went to the moon. For years moon landing deniers have claimed that the US government never managed to put men on the moon and instead elaborately faked the whole thing. Why, they say, if men really had landed on the moon then you should be able to point a telescope or something at the sites of the Apollo landings and take pictures, and isn’t it “convenient” that no telescopes exist with the resolution to do this. Well all that changed in 2009 when the Lunar Reconnaissance Orbiter (LRO), a NASA built robotic spacecraft, arrived at the moon and started sending back pictures of the Apollo landings sites. After years of asking for them the moon landing deniers had exactly what they wanted, photographic evidence that man went to the moon, and so of course they all accepted the evidence and admitted they had been wrong about it being a hoax all these years....nah of course they didn’t. Professor Luke Sargent, American historian, professional violinist, and owner of the "Fake Apollo" website<sup>‡</sup>, had this to say about the matter.

“It appears to be nothing more than a few pixels of white and dark light lumped together. This sort of editing can be done in Microsoft Paint – a program that gets shipped with every version of Windows. If NASA had really wanted to dispel the hoaxers with photos, then the LRO should have been equipped with more powerful telescopic lenses.”

Rather than accept the evidence presented it is instead dismissed as not being good enough and additional, better evidence is requested. Also, because they refuse to accept the evidence presented, deniers will also often continue to make requests for the very evidence you have just given to them. I for one am willing to bet that even if the LRO had been fitted with more powerful cameras the moon landing deniers would still have found a way to dismiss the pictures and once again move the goalposts.

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<sup>‡</sup> Unfortunately the website from which this quote was taken no longer seems to exist and as such I was very reluctant to use it as an example of the moving the goalpost fallacy in action. In the end I decided to use it because I found it in a number of places and as far as I can tell the quote is accurate. However in order to be fair I ask that you read it as an example of the sort of thing I am talking about rather than a confirmed quote from Professor Sargent.



A picture of the Apollo 11 landing site taken by the Lunar Reconnaissance Orbiter in 2009.

The other part of this point relates to having impossible expectations regarding the type of evidence available. If the evidence for a given claim is not 100% certain, or contains holes that are still being investigated, deniers will happily take this as grounds to ignore it entirely. Gaps in the fossil record are used by evolution deniers as a reason to dismiss all the other evidence for evolution. The error bars on the dates given by radiometric dating are considered enough to conclude the whole field can't be trusted and therefore the Earth is 6,000 years old. Uncertainties in climate models are seen as a valid reason to reject all evidence for man-made global warming. This approach ignores the fact that there are generally multiple different lines of evidence in support of these claims, often coming from multiple different fields of science. If one piece of evidence is less than perfect then it, and anything that can be associated with it, is thrown out.

## Misrepresentation and Logical Fallacies

I cover the topic of logical fallacies in detail in my book "Building your Skeptical Toolkit" and as such I won't go into much detail on this point. Needless to say, if the evidence is on your side then you don't need to employ questionable debating tactics in order to make your point. For example in 1992 the Environmental Protection Agency (EPA) released its findings

that determined that environmental tobacco smoke was carcinogenic, something well supported by other national authorities. In response two spokesmen for the tobacco industry, John Luik and Gio Gori, retorted by labelling the EPA's announcement as a "threat to the very core of democratic values and democratic public policy". I will leave it up to you to work out what fallacy they committed here.

Now as I wrap up this chapter I want to make one thing clear. It is more than possible for someone to be a genuine skeptic and have their doubts about the various subjects mentioned in this chapter. Someone can be legitimately skeptical about, say, how much effect mankind has on climate change or how big a role natural selection really played in producing the vast variety of life we see around us. It is not the topic that makes someone a skeptic or a denier, it is how they handle evidence that contradicts their pre-existing beliefs. Do they resort to claiming there is a conspiracy to suppress the truth in order to explain why the evidence is against them? Are the people presenting the argument actually experts in the topic at hand? Do they cherry pick the data and only present those findings that agree with them? And do they constantly move the goalposts and make use of logical fallacies in defence of their claims? If you keep a look out for these five things then you should have a good idea whether you are dealing with a genuine skeptic or a closed minded denier.

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