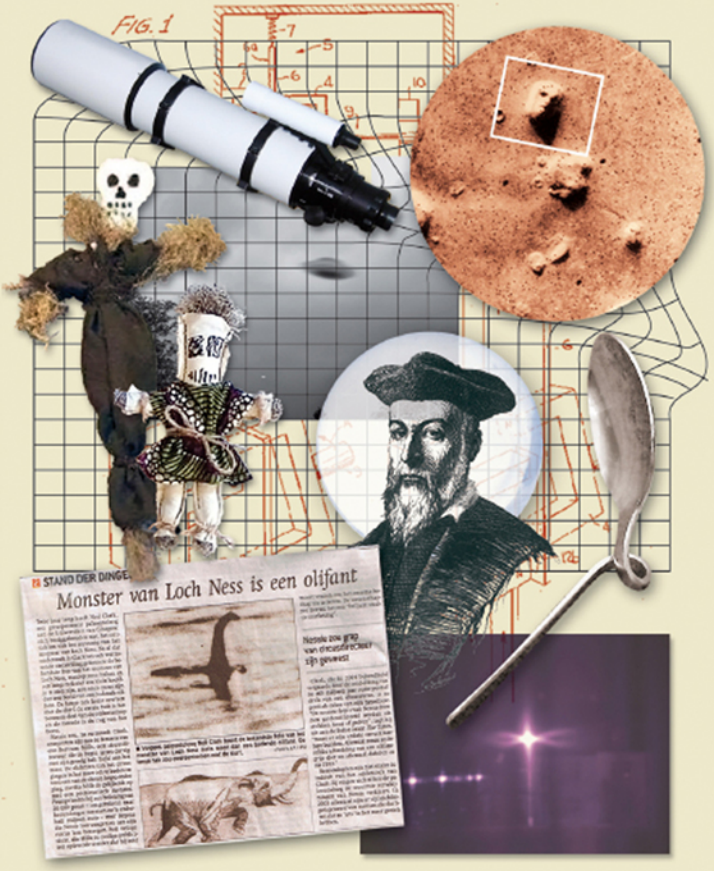
BOGUS SCIENCE

Some People Really Believe These Things



John Grant

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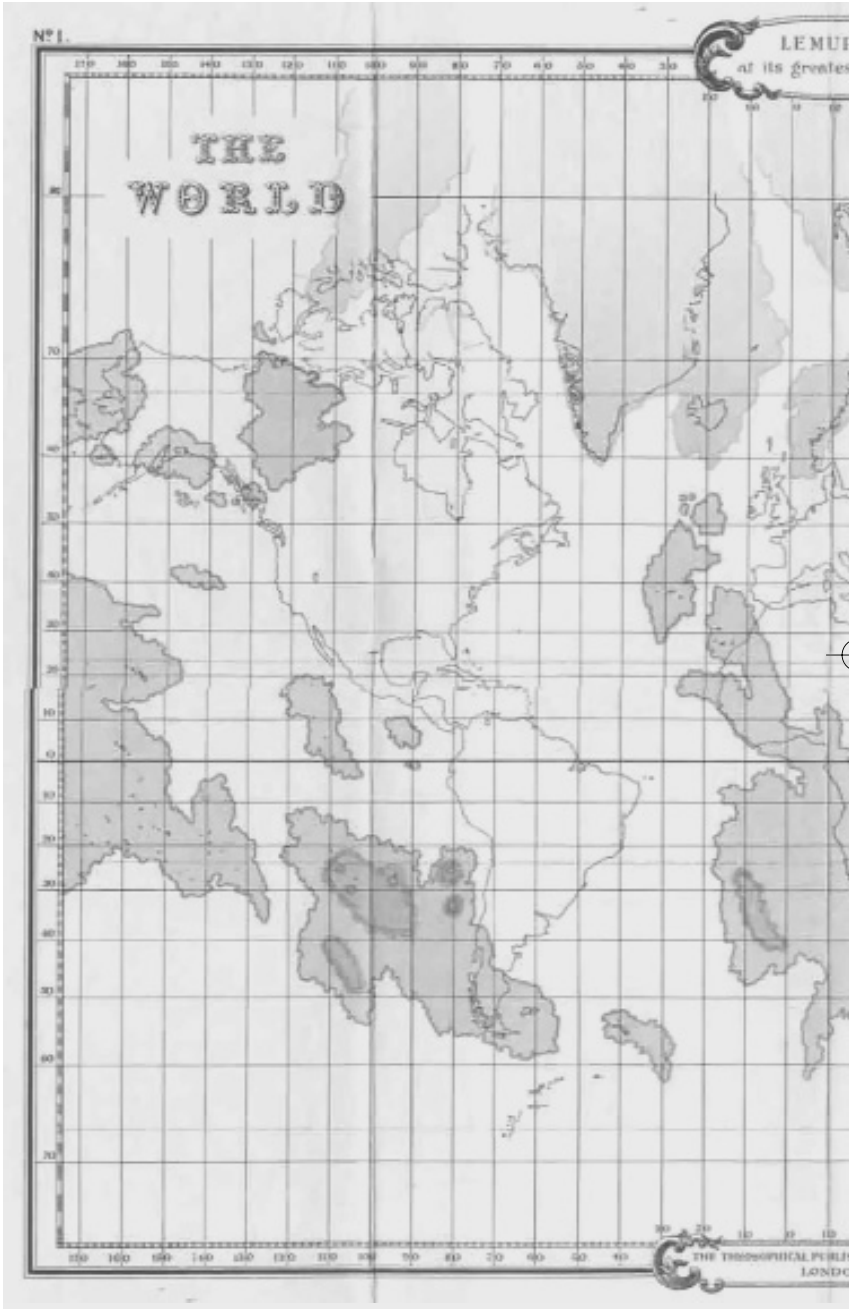
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WORLD

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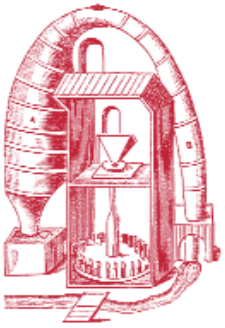

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Half-title page: See page 256
Title page background: See pages 142–3
Title page: See page 188

Contents

DEDICATION

This book was largely written in the wake
of a rollercoaster ride of surgical operations and
periods of convalescence. The person who bore the
brunt of all this disruption – and who had to
tolerate an often grumpy and frustrated
husband – was my dear wife, Pam.
So, even more than usual,
Thogsbabe, this
one's for
you.

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- Pam, for being *right* there,
- and all the people I've forgotten I promised to thank.

AUTHOR'S NOTE

THIS BOOK FOLLOWS *Discarded Science* (2006), which is primarily concerned with scientific hypotheses – from the woeful to the wonderful – that have fallen by the wayside, and *Corrupted Science* (2007), which examines the ways in which science has been corrupted either by human weakness or more usually by human mendacity, whether grounded in greed, religious belief, bigotry, ideology, politics or any mixture thereof. Both books naturally contain a fair amount about the pseudosciences, especially those related to alien visitors in either the ancient past or, via UFO, the present; but the pseudosciences are not their focus.

In *Bogus Science* the concern is far more with the stuff that walks vaguely like science, quacks vaguely like science, but in fact isn't science at all: it's bogus science, or pseudo-science. This isn't to say that there's not a lot of genuine science within these pages – there is – but it's there in the context of illuminating the bogus.

One thing I realized soon after undertaking *Bogus Science* was that, whereas in the other two books I could have as my aim some approximation, however rough, of comprehensive coverage of the field, the pseudosciences have today become – in part but only in part because of the internet – so prolific, ubiquitous and many-aspected that I didn't have a hope of succeeding in any kind of quasi-comprehensive approach. Instead I took my inspiration from the title of that 1973 classic *A Random Walk in Science*, compiled by R.L. Weber and edited by R. Mendoza. I decided that for the sake of my own sanity and quite possibly my readers' it was better to concentrate on relatively few areas in some detail than to try to touch every possible base with what would necessarily be infuriating briefness. What you have in your hands, then, is not an

entirely random walk in pseudoscience, but it's quite deliberately a stroll that goes along some lanes and not others.

In particular, I haven't had the space to treat the psychic/paranormal pseudosciences – from psychometry to psychokinesis to telepathy to afterlife speculation to astral travel to reincarnation research to prophecies of the end of the world*. . . and beyond. It's to be hoped my publisher will let me make these the subject of a fourth volume – *Spooky Science*, perhaps? Likewise, I've largely stayed clear of bogus medicine and the self-help racket, whether psychically or otherwise based. That, too, is a book in itself.

In the meantime, I hope you enjoy the views from the lanes down which we *do* have the time and ability to amble. Any rocks in the road are my fault, and my apologies in advance for them.

– JG

* Or, as my mental editor kept calling these last, "major doomo".

EVERY TIME we let ourselves believe for unworthy reasons, we weaken our powers of self-control, of doubting, of judicially and fairly weighing evidence. We all suffer severely enough from the maintenance and support of false beliefs and the fatally wrong actions which they lead to, and the evil born when one such belief is entertained is great and wide. But a greater and wider evil arises when the credulous character is maintained and supported, when a habit of believing for unworthy reasons is fostered and made permanent. . . . [I]f I let myself believe anything on insufficient evidence, there may be no great harm done by the mere belief; it may be true after all, or I may never have occasion to exhibit it in outward acts. But I cannot help doing this great wrong towards Man, that I make myself credulous. The danger to society is not merely that it should believe wrong things, though that is great enough; but that it should become credulous, and lose the habit of testing things and inquiring into them; for then it must sink back into savagery.

– W.K. Clifford, "The Ethics of Belief" (1877)

Above: Parodying the flood of bogus information can sell paper towels!

Left: Some people really believe these things . . .

INTRODUCTION

Of course I know that there will be those skeptics who'll say that this book is all hogwash . . .
– Sylvia Browne, *Secrets & Mysteries of the World* (2005)

Ignorance is the most delightful science in the world, because it is acquired without pain and keeps the mind from melancholy.
– Giordano Bruno (1548–1600), *Lo Spaccio de la Bestia Trionfante* (1584; trans as *The Expulsion of the TriumphantBeast*)

There is a difference between having a mind that is open to new ideas and one that is simply vacant.
– Michael W. Friedlander, *At the Fringes of Science* (1995)

I am often asked why I find it comparatively easy to believe in evaporating black holes and invisible cosmic matter, but not in straightforward things like ghosts and flying saucers that ordinary people apparently see all the time.
– Paul Davies, "A Window into Science", *Natural History*, July 1993

It's a funny old world out there, isn't it? And a wacky one, too.

In *Mysterious Fires and Lights* (1967) Vincent Gaddis (1913–1997) makes the claim that ball lightning is sentient. Luckily, it seems well disposed towards human beings – in fact, according to Gaddis, it can on occasion be "socially minded". As evidence, he cites some of the examples described by the French astronomer Camille Flammarion (1842–1925) in which domesticated animals were killed by exploding ball lightning while humans in closer proximity to the explosion were left unharmed.

In *Sacred Science: The King of Pharaonic Theocracy* (1961) René Schwaller de Lubicz (1887–1961) spells out some important horticultural mysteries:

> If a good gardener plants his cauliflower on the day of the full moon, and a bad gardener plants them at new moon, the former will have rich, white cauliflower and the latter will harvest nothing but stunted plants. It is sufficient to try this in order to prove it. *So it is for everything that grows and lives.* Why these effects? Direct rays of sunlight or indirect rays reflected from the moon? Certainly, but for quite another, less material reason: *cosmic harmony*. Purely material reasons no longer explain why the season, even the month and the precise date, must be taken into account for the best results. Invisible cosmic influences come into play . . .

. . . while alternatively, if The Cauliflower Code is insufficiently fringe, the shelves of your local bookshop are likely to be full of titles that promise unusual extensions to the knowledge you might recognize from *New Scientist* or *Scientific American*: books like Donald L. Wilson's pioneering *Natural Bust Enlargement with Total Mind Power: How to Use the Other 90% of Your Mind to Increase the Size of Your Breasts* (1979) and Gary Leon Hill's useful instructional text *People Who Don't Know They're Dead: How They Attach Themselves to Unsuspecting Bystanders and What to Do About It* (2005).*

So far as many people are concerned, the spread of bogus science throughout our society – from Creationism to belief in UFO abductions – isn't anything to be troubled by: it's merely a matter of amusement. And, of course, no one wants to be seen to be questioning the principle of free speech.

The US, the Western nation most seriously disabled by the widespread promulgation of nonsense, has recently received some hard blows to its self-image as the best-educated nation in the world. The 3rd International Mathematics and Science Study, released in 1998 by the International Association for the Evaluation of Educational achievement, examined kids aged 17–18 in 23 countries. In physics the US youngsters came last. In advanced math, they came second-last. In maths/science they came fourth last. In other words, US kids seem to have the levels of knowledge and understanding that might shame many an

* What seems symptomatic of such books is the length of their subtitles!

impoverished Third World country – Cuba, for example. Various explanations have been offered for this, but the most reasonable is the way that, in a perversion of the original notion of free speech, far too many of us now regard *everything* as being open to debate and rival interpretation, with the very nuttiest and least reality-based of those alternative interpretations being given the same weight as others of genuine worth. Thus the doctrine of Intelligent Design, which is really just Creationism slathered in a pompous mud, is treated as if it were a serious contender to the well established theory of evolution by natural selection.*

We like to kid ourselves that our society is becoming progressively better educated. In his book *Behind the Crystal Ball* (1996) Anthony Aveni discusses some historical polls about science, magic and bogus science.

When Columbia University students were polled in 1920, just 2% believed there was anything in palmistry and just 4% believed in astrology, but about 10% credited phrenology, avoided the number 13, and thought you could make someone turn to look at you if you stared hard enough at their back (not necessarily the same 10% in all three cases).

By the 1950s in the UK, 20% credited astrology, 17% believed in ghosts (and about 7% believed they'd seen one), and over 15% swore by such superstitions as lucky numbers and mascots. In Germany at roughly the same time, about one-third of the people believed in astrology while the levels of superstition were substantially higher than the UK equivalents.

In a 1977 Roper survey in the US, belief in astrology ran at 25%, ESP 53%, Heaven and Hell 74%, UFOs as alien artefacts 29%, and reincarnation 14% – this last figure was down from a 1969 survey which had shown belief in reincarnation running at 20%. Another US survey the following year put belief in ghosts and witches at about 10%, angels at 54%, flying saucers at 57% and the Devil at 37%, with credence given to astrology by nearly 50% and to precogni-

* The fact that a lot of people don't know the meaning of the word "theory", a failing deliberately encouraged by many in the Creationist camp, obviously doesn't help.

BIKAMASUTRAL MIND?

In *Right Brain Sex: Using Creative Visualization to Enhance Sexual Pleasure* (1989) Carol G. Wells went places even Julian Jaynes, author of the groundbreaking *The Origins of Consciousness in the Breakdown of the Bicameral Mind* (1976), never imagined. Here's a selection of her headings and subheadings. Note how this differs from a paper in *Nature*.

- How Visualization Bypasses Your Sexual Roadblocks
- How Using Your Right Brain Makes You Passionate and Overcomes Boredom
- How Bored Are You with Your Sex Life?
- Are You Having Trouble Concentrating during Sex? Techniques That Help
- Are Your Notions about Masturbation Part of the Problem or Part of the Solution?
- A Historical Look at Masturbation
- What Lust Does for Your Sex Life
- The Mutual Exclusiveness of Guilt and Lust
- Pleasure: The Final Destination
- Are You in Tune with Your Body?
- Can You Surrender to Pleasure?
- How Vulnerable Are You? A Personal Test
- Power and Pleasure – The Oil and Vinegar of Great Sex
- Orgasms Too Soon, Orgasms Too Late, or Possibly Erections That Won't Cooperate – Are They Possible to Eliminate?

Someone, somewhere, should take the time to set that last one to music.

tion by over one-third. By 1981 the belief in reincarnation had risen to 23%.

According to a 1987 report in *Time*, whereas only one-half the US population had believed in psychic phenomena in 1974, now (i.e., in 1987) the figure was more like two-thirds. Of those surveyed, 15% claimed to have seen a flying saucer, 62% believed in the Devil (although "only" 54% in demonic possession) and 25% believed in astrology. In 1993, 69% believed in angels and 49% in devils. Belief in ESP ran at 46%, in clairvoyance at 22%, and in communication with the spirits of the dead at 14%.

Even in the 21st century, only about 10% of US adults know what radiation is, about 30% know that DNA is the key to heredity, almost nobody outside scientists knows what a molecule is, and an astonishing 20% think the sun goes round the earth. And 40% of US *scientists* think they can communicate directly with God. A US survey done by Gallup in 2009 to mark the 200th anniversary of Charles Darwin's birth revealed that a full 25% of Americans rejected evolution outright, an extraordinary 36% thought the matter was still open to debate and "don't have an opinion either way", while only 39% accept the reality. Meanwhile, a UK survey published in 2009 showed how much more credulous the Brits have grown since the 1950s: 39% believe in ghosts, 22% in astrology, 27% in reincarnation, 53% in life after death and 55% in Heaven. (The 2% difference in the latter is puzzling: presumably a few people think we don't survive death but might go to Heaven anyway.)

These figures do not paint a progressively more educated society. It's difficult to regard them as anything other than a massive failure in our public education, which in itself reflects a massive failure of responsibility by our politicians and media. But they also represent a failure by *us*, because each of us individually is almost certainly not doing enough to beat back the flood of bogus science. And there's probably not one of us who hasn't on occasion been fooled by it.

According to the paper "Learning of Content Knowledge and Scientific Reasoning Ability: A Cross Cultural Comparison" by Lei Bao *et al.*, published in *Science* in January 2009, which compared US college scientific and

engineering freshmen with their Chinese counterparts, the ability to reason scientifically is at a low ebb in both cultures, with the US students being significantly more ignorant than the Chinese ones about matters scientific.

Both groups did poorly in the test of basic knowledge about electricity and magnetism, but the difference in quality of school science education between the two countries is dramatically reflected in the average score of the two groups for this test: the Chinese averaged just under 66%, the US students just under 27%. (As the paper's lead author, Lei Bao of the Physics Education Research Group at Ohio State University, pointed out, the US students' average of 27% is not too significantly above the score that could have been achieved by chance in this test, 20%.) In the test of knowledge of mechanics, both groups did better, but the contrast between average scores was still major: 86% for the Chinese and 49% for the Americans.

Yet in their ability to reason scientifically, as indicated by the Lawson Classroom Test,* the average scores for the two groups represented a statistical dead heat: just under 75% for the Chinese and about 74% for the Americans. Before the latter think of getting cocky, though, it should be noted that 75% is regarded as a fairly poor score in this particular test.

The counterintuitive subtext here is that mere knowledge of scientific facts does not much affect the ability to reason logically. Or maybe it's not so counterintuitive after all: as a few voices in the wilderness have been saying for decades now, a major flaw in almost all modern education systems is that they assume the *ability to think* is somehow inherited or is a natural property of the human brain, rather than something that needs to be learned – and taught. In other words, we're not really equipping our young with the ability to recognize *why* the bogus scientific claims presented to them from all directions in our society are indeed bogus; we're just *telling* them those claims are bogus because they "disobey the rules" – never the best way to encourage people, especially young people, to avoid something!

* A patented scheme whereby students are presented with scientific hypotheses and asked to evaluate them using deductive reasoning.

> The sum total of food converted into thought by women can never equal the sum total of food turned into thought by men. It follows, therefore, that *men will always think more than women.*
>
> – Miss M.A. Hardaker,
> "Science & the Woman Question",
> *Popular Science Monthly*, 1882

If at the moment the ones who're suffering most from the failure to educate scientifically are the young, who're expected to compete in a world for which their education has woefully ill equipped them, in the near future it'll be their elders – the people who enabled this abysmal situation to arise – who also suffer, as the US economy reels under the consequences of years of tolerating the inability to differentiate between nonsense and reality.

That's even before we start to consider the potentially genocidal effect of the bogus science deployed by very powerful figures to promote opposition to warnings of the lethal and imminent dangers of climate change. In this context, with perhaps billions of lives at stake, how sensible is it for a culture to regard the promotion of bogus science as a freedom of speech issue?

These are very difficult problems to address. One possible partial answer might be the encouragement of a more responsible attitude among the media – from TV programmes to websites to books and newspapers – such that the current false notion of journalistic balance (which thinks impartiality is giving equal credit to an expert and a fruitbat) be replaced by a more genuine balance of treatment in which rational arguments are portrayed as such and the lunatic fringe likewise. If something like this – some way of demarcating bogus science from the rational – doesn't happen soon, the consequences are likely to be irremediable.

It's ironic, in light of the level of technology surrounding us in our daily lives, that we live in such an unscientific

or even antiscientific age. To say there are Luddites loose would be to misrepresent matters: what motivated the Luddites was that they *did* understand the technology they hated – all too well. The same excuse cannot be made for the Creationists, anti-evolutionists and others who both loathe science and are – often wilfully – uninformed of its basics. Not content with wallowing in their own ignorance, many actively crusade to persuade others likewise to turn their backs on science, using not just blatant proselytizing but also various quite consciously deceptive means.

A case in point is the novel *The Darwin Conspiracy* (1995) by James Scott Bell,* whose conceit is that a multiple murderer and (even worse) atheist called Sir Max Busby, inspired by a personal detestation of God,† sets out to defile and degrade society by leading people away from a Christian fundamentalist reading of the Bible. In order to do so, Busby plants the theory of evolution by natural selection in Darwin's mind, promotes it with the assistance of Sir Charles Lyell and T.H. Huxley, murders Darwin, and during the rest of his inordinately long (but astonishingly celibate) life spreads his creed far and wide, convincing movers and shakers like Bertrand Russell, Adolf Hitler, Margaret Sanger, Karl Marx and any other contemporaneous figure Bell doesn't like. The narrative is amplified by supposedly nonfictional endnotes in which Bell believes he's making killing jabs at science; in fact, they come across like the uninformed barbs of a bratty adolescent who isn't half as clever as he thinks he is.

The narrative itself is full of the type of antiscientific illogic that wouldn't fool a bright five-year-old but seems intended to fool Bell's audience, as in this conversation between narrator Sir Max and Clarence Darrow:

* Not to be confused with the novel *The Darwin Conspiracy* (2005) by John Darnton, which is a wonderfully enjoyably romp, or *The Darwin Conspiracy: Origins of a Scientific Crime* (2008) by Ray Davies, nonfiction claiming Darwin plagiarized from various scientific contemporaries. Both books are far crueller to Darwin's reputation than is Bell, yet neither draws the kind of scientific opprobrium his does. Advocates of ID might ask themselves why this is so.

† In which case he couldn't be an atheist, surely?

> I perked up. "Are you saying that man has no free will?"
>
> "And why should that be so surprising? Hasn't Darwin taught us that we are basically machines?"
>
> "Why yes, Darwin has taught us something like that."
>
> "And what will does a machine have?" . . .

Of course, Darwin didn't teach us that we're "basically machines", or anything of the sort. Even had he done so, the leap from there to a claim that this obviates human free will is not logical. After a while one can't help sympathizing with supposed villain Joel Nairobi, who finds himself in a situation all of us recognize if we've ever debated a Creationist:

> "Do you know what the odds are against the basic enzymes of life arising from chance? About one in ten to the forty thousandth power. A mathematical impossibility. With these odds, I put my money on an intelligent designer. What do you think?"
>
> "I think," said Nairobi, "that I am getting a headache."

An early study of bogus science was *Wish and Wisdom: Episodes in the Vagaries of Belief* (1935) by the psychologist Joseph Jastrow (1863–1944); the same author's *Fact and Fable in Psychology* (1900) had some overlapping material. At the beginning of the 1935 book Jastrow spells out what he describes as the Seven Inclinations, whereby otherwise perfectly intelligent, rational people come to believe purest hogwash. His "inclinations" are:

- **Credulity** – or gullibility
- **Marvel** – the urge to accept magic, which overwhelms us when we're in infancy and against which, in later life, rationalism can sometimes wage a losing struggle
- **Transcendence** – the belief in powers that transcend the natural
- **Prepossession** – the mental phenomenon whereby, when we seek evidence of our preconceptions, we find it
- **Congeniality of Conclusion** – whereby we reach the conclusion we *like* rather than the one dictated by evidence and logic

- **Vagary** – the obsessive pursuit of a particular conclusion, decided upon early, whatever the contrary evidence
- **Rationalization** – the intellectual art of piecing together valid evidence in such a way as to produce an invalid conclusion

One further piece of bogus thinking that turns up again and again among the pseudoscientists and their cohorts is the so-called god-of-the-gaps fallacy. This is the line of reasoning whereby, if science has yet to come up with an accepted rational explanation for a phenomenon, then the only possible explanation must be the one which the bogus thinker has advanced.

The fallacy got its name because the argument used to be used by the Church to justify its "explanation" of such phenomena as the origin of life: if science didn't know the details then God must have been responsible for that first vital spark. Likewise, if science didn't know why fossils of sea creatures were being found on mountaintops, the only possible conclusion must be that the Bible's story of the Flood is literally true.

Of course, the fallacy relies upon false either/or juxtapositions, and most theologians (and believers in general) have moved on to more sophisticated reasoning (alas, not all). But it's alive and well in the works of the pseudoscientists. Read any book by Erich von Däniken, to choose one example among countless, and you'll come across numerous statements of the type "There can be no other explanation for . . ." Of course, in each instance there are myriad alternative explanations to the one von Däniken is proposing for some supposed archaeological mystery, the most likely usually being that he's got his facts wrong, but the attempted logical legerdemain is the same as the old "if you cannot account for this otherwise, God must take the credit".

Again, we're back to the matter of the importance of learning how to think rationally.

Modern cranks are fond of chorusing to the effect that "They laughed at Galileo, they laughed at Pasteur, they laughed at . . ." – the implication being, of course, that in due course science is likely to have to come to accept Bloggs's theory that the universe is a giant newt, just as science came to accept Galileo's support for the Copernican theory and his observations of the moon, Venus and the Jovian moons, and Pasteur's germ theory of disease and demolition of the theory of spontaneous generation (the notion that the smallest living creatures – microbes – were generated from inorganic material).

The problem for Bloggs's supporters is that in fact they – meaning the scientific establishment – *didn't* laugh at Galileo, Pasteur and other, similar paradigm-shifters. Galileo was persecuted by the religious authorities, not the scientific ones; he had the respect, as a scientist, of his peers.* Those scientists who regarded the astronomical phenomena he observed as likely the product of flaws in his telescope were not being unreasonable: his telescope was an extremely primitive affair and its lenses lousy, and many of the things seen through it – such as colour fringes – were indeed the product of optical flaws. In Galileo's day not enough was known about optics for him to be able to explain why observers should take some of the things they saw through his telescope as genuine and discard others as instrumental artefacts. It was perfectly rational for his contemporaries to reserve judgement; and even those who disagreed with him continued to regard him as a major scientific figure.

Similarly for Pasteur. The French Academy of Sciences very promptly verified his work disproving spontaneous generation; those who mocked him were elements of the popular press. When he produced his germ theory of disease, the medical establishment rightly declined to accept it until he produced some pretty strong experimental proof. Once he'd done that, the theory was soon embraced. And again he was never regarded by the scien-

* Although often the respect was grudging. In his social interactions Galileo was a pain.

tific world as anything other than an important researcher and theorist.

This is not the case with Bloggs and his newt theory.

The best example any Bloggsian might hope to produce is that of Alfred Wegener and his long-rejected hypothesis of continental drift; this finally came to be accepted by the majority of earth scientists long after Wegener's death, when the phenomenon of seafloor spreading was discovered and thereby a mechanism revealed for the drift. Wegener's problem had been that he couldn't exhibit any such mechanism beyond a sort of woffly appeal to a hitherto unknown force called *Pohlflucht*. Further, he was a meteorologist, not an earth scientist; in terms of the earth sciences he was as much of an amateur as you or I. Even so, during the decades between Wegener's enunciation of the hypothesis and its eventual confirmation, a respectable minority of earth scientists *did* accept his ideas; the rejection was by no means universal, and Wegener was not regarded as a crackpot.

The point is that, *even at the time*, it's generally fairly easy to tell the difference between a potential paradigm-shifter and a crank. Potential paradigm-shifters work within the field in which they're producing their speculations, or at least within a closely related one; they produce research work in order to support their hypotheses; they publish their results and their hypotheses in such a way that these may be reviewed and criticized by their scientific peers – rather than, like Bloggs, getting a fat advance out of a publisher. Failing that, for Bloggs, there's always the internet . . .

The scientific establishment is not stupid to resist radically new hypotheses; if science happily accepted every new notion that came by, human knowledge would rapidly become a complete shambles. Superficially appealing hypotheses have to be adequately tested and debated to make sure they're not subtly nonsensical before they can be added to the corpus of scientific understanding. Once Hypothesis A has achieved this, then science is similarly wise not to discard it again in favour of Hypothesis B without first making sure that A is indeed flawed or incomplete. The sluggishness of science to alter its stance may seem

Jess M. Ritchie personally promoted his own battery additive, AD–X2

exasperating from the outside, or to those with radical ideas that are worthwhile; but in fact it's a remarkably useful characteristic.

Here's an object lesson for us all concerning the day-to-day practical costs of laziness in resisting bogus science and of scientific illiteracy.

In the aftermath of WWII the US suffered a shortage of lead, and this affected (among much else) the manufacture of car batteries. The search was on for additives that might extend battery life, and sure enough a number of these appeared on the market: Bat-Re-Nu and Duble Power were two. The National Bureau of Standards (NBS) tested all of these and declared them at best worthless; the test results were circulated by the National Better Business Bureau and others, and the products fell into disuse.

All but one, AD–X2. The proprietor of AD–X2, one Jess M. Ritchie, in 1947 declined to patent the substance, so had no requirement to state what was actually in it. He did, however, just a whisker ahead of the Better Business Bureau,

request that the NBS test it. The NBS responded that it did not carry out its testing at the behest of commercial enterprises. Ritchie gathered support from California Senator William Knowland and from the Oakland Chamber of Commerce. Finally, though, it was the Federal Trade Commission that persuaded the NBS to investigate AD–X2 – which the NBS did, finding it valueless. The Federal Trade Commission asked the NBS to test the product again; again the NBS's scientists found it useless.

In 1952 the US Post Office began an on-again-off-again policy whereby sometimes Ritchie was told he could not use the mails to further what was evidently a fraudulent business. Ritchie appealed to the Senate and House Committee on Small Business, who required the NBS to test AD–X2 *yet again*! The results of the NBS's testing showed . . . but you're way ahead of me, aren't you?

So one of the Select Committee's staffers asked MIT to run its own test on AD–X2. The MIT report was a mite less condemnatory than the NBS reports had been, but still found no reason to suspect AD–X2 might actually be useful. This was described by some unknown on the Select Committee or its staff as somewhat favourable . . . and so the saga continued.

In 1953 the Eisenhower Administration arrived in the White House, and with it Sinclair Weeks (1893–1972) as Secretary of Commerce; two of his first actions were to fire the head of the NBS and to suspend the publication of the NBS's bulletins concerning the efficacy or otherwise of battery additives! The National Academy of Sciences protested, and so – in what reads at this distance in time as an instance of mere gesture politics – Weeks asked the Academy to perform its own tests of AD–X2. To no one's surprise, the NAS found that AD–X2 was indeed worthless, just as the NBS had by now several times reported. A few months later the fired NBS head was reinstated.

That should have been the end of it, but of course it wasn't. The Select Committee continued to debate the issue on the grounds that

> Political decisions and policies are sometimes found necessary to mediate, postpone or circumvent the effect of harsh and

> arbitrary findings of science that impose unacceptable obligations or conditions on the electorate or the individual. . . . [T]he primary role of science in commerce should not be to regulate the quality of products to protect the consumer but to discover the truths of nature, and use them more particularly to create additional products for human satisfaction and entrepreneurial exploitation.*

At one point matters got so out of hand that the Justice Department was instructed to prepare an anti-trust suit against the Association of American Battery Manufacturers, who'd been involved in the case from an early stage on the perfectly reasonable basis that problems associated with useless additives could well redound on its members.

Over a period of many years, then, millions of taxpayer dollars were wasted on a substance that every scientific test said was useless for its purported function, as if further debate might somehow alter the results of the scientific tests. This is not rational thinking. Reality does not bend to our whims.

In succeeding decades the Pentagon was going to demonstrate with a vengeance, over and over again, the inordinate waste of resources, taxpayer monies and human energies that invariably follow when lay people with axes to grind permit their preconceptions to overrule the findings of science and support the claims of bogus science. Just think of the hafnium bomb. Or Star Wars.†

It's at about this moment that you might want to grab your comfort-blanket copy of *How to Have an Out-of-Body Experience in Thirty Days* (1989) by Keith Harary and Pamela Weintraub – published not by some obscure New Age outfit in a California burg you've never heard of but by St Martin's Press in New York. Alternatively, read on . . .

* Staff report in *Technical Information for Congress: Report on the Subcommittee on Science, Research and Development of the Committee on Science and Astronautics*, 1969, 4.

† For more on both, see my book *Corrupted Science* (2007).