Text 5

Bad Science

In his seminal book 'Bad Science', physician and science writer Ben Goldacre uncovers some of the flaws in science and medicine that have led to widespread misconceptions. From the techniques employed by advertisers and the media, he shows how little veracious scientific evidence there is to be found in their seemingly bodacious claims. Goldacre's book, catering to the general reader, shows us the need to be critical of what we read.

Below is the introduction excerpted from the book.

Let me tell you how bad things have become. Children are being routinely taught in thousands of British schools that if they wiggle their head up and down it will increase blood flow to the brain, thus improving concentration; that rubbing their fingers together in a special 'sciencey' way will improve energy flow through the body, and that holding water on their tongue will hydrate the brain directly through the roof of the mouth, all as part of a special exercise programme called Brain Gym. We will devote some time to these beliefs and, more importantly, the fools in our education system who endorse them.

But this book is not a collection of trivial absurdities. It follows a natural development from the foolishness of 'experts', via the credence they are given in the mainstream media, through the tricks of the £30 billion food supplements industry, the evils of the £300 billion pharmaceutical industry, the tragedy of science reporting, and on to the poor understanding of statistics and evidence that pervades our society.

Todays, scientists and doctor find themselves outnumbered and outgunned by vast armies of individuals who feel entitled to pass judgement on matters of evidence, an admirable aspiration, without troubling themselves to obtain a basic understanding of the issues.

At school, you were taught about chemicals in test tubes, equations to describe motion, and maybe something on photosynthesis, but in all likelihood you were taught nothing about death, risk, statistics, and the science of what will kill or cure you. The hole in our culture is gaping: evidence-based medicine, the ultimate applied science, contains some of the cleverest ideas from the past two centuries. It has saved millions of lives, but there has never once been a single exhibit on the subject in London's Science Museum.

This is not for a lack of interest. We are obsessed with health—half of all science stories in the media are medical and are repeatedly bombarded with sciencey-sounding claims and stories. But as you will see, we get our information from the very people who have repeatedly demonstrated themselves to be incapable of reading, interpreting and bearing reliable witness to the scientific evidence.

Before we get started, let me map out the territory.

Firstly, we will look at what it means to do an experiment, to see the final results with your own eyes, and judge whether they fit with given theory, or whether an alternative is more compelling. You may find going through these steps childish and patronising. The examples we look at are certainly absurd but they have all been promoted credulously and with great authority in the mainstream media. We will look at the attraction of sciencey-sounding stories about our bodies, and the confusion the can cause.

Interestingly our next focus is homeopathy, which Wikipedia declares as a pseudo-science that 'works'. We will look at this not because it's important or dangerous—it's not—but because it is the perfect model for teaching evidence-based medicine and how we can be misled into thinking that any intervention is more effective than it really is.

Then we will move onto bigger fish. Some alternative therapists claim to be nutritionists and have somehow managed to brand themselves as men and women of science. Their errors are interesting because they have a grain of science to them, and that makes them not only more interesting, but also more dangerous because the real threat is not that their customers might die (there is the odd case) but that they systematically undermine the public's understanding of the very nature of evidence.

We will see the rhetorical slights of hand and amateurish errors that have led to you being repeatedly misled about food and nutrition. This new industry acts as a distraction from the genuine lifestyle risk factors for ill health, as well as its more subtle and alarming impact on the way we see ourselves and our bodies. This arises from the widespread move to medicalise social and political problems, to conceive of them in a reductionist, biomedical framework, and push commodifiable solutions, particularly in the form of pills and faddish diets. I will show you evidence that a vanguard of startling wrongness is entering British universities, alongside genuine academic research into nutrition. In the field of medicine, we see similar tricks used by the pharmaceutical industry to pull the wool over the eyes of doctors and patients.

Next, we will examine how the media promote the public misunderstanding of science, their single-minded passion for pointless non-stories, and their basic misunderstandings of statistics and evidence, which illustrate the very core of why we do science: to prevent ourselves from being misled by our own atomised experiences and prejudices. Finally, in the part of the book I find most worrying, we will see how people in positions of great power who should know better, still commit basic errors, with grave consequences, and we will see how the media's cynical distortion of evidence in two specific health scares reached dangerous and frankly grotesque extremes. It's your job to notice, as we go, how incredible prevalent this stuff is, but also, to think what you might do about it.

You cannot reason people out of positions they didn't reason themselves into. But by the end of this book you'll have the tools to win—or at least understand—any argument you choose to initiate, whether it's on miracle cures, the evils of big pharma, the likelihood of a given vegetable preventing cancer, and more. You'll have seen the evidence behind some very popular deceptions, but along the way you'll also have picked up everything useful there is to know about research, levels of evidence, bias, statistics, the history of science and anti-science movements, as well as falling over just some of the amazing stories that the natural sciences can tell us about the world along the way.

It won't be even slightly difficult, because this is the only science lesson where I can guarantee that the people making the stupid mistakes won't be you. And if, by the end, you reckon you might still disagree with me, then I offer you this: you'll still be wrong, but you'll be wrong with a lot more style and flair than you could possibly manage right now.