

**SKEPTOID 4**  
**ASTRONAUTS, ALIENS,**  
**AND APE-MEN**

**BY BRIAN DUNNING**

**FOREWORD BY JOHN RENNIE**  
**ILLUSTRATIONS BY ABBY GOLDSMITH**

Skeptoid 4: Astronauts, Aliens, and Ape-Men  
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*A man should look for what is, and not for what he thinks should be.*

Albert Einstein

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*To Mom – for pushing a small lad in a swing, so that he saw the sky  
and the world and the universe, and learned to be amazed.*

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## FOREWORD: THE DECEPTIONS OF UNCERTAINTY

BY JOHN RENNIE

Here's my tribute to Brian Dunning's intellectual integrity: Within hours of my first real meeting with him, I was publicly correcting him — and he laughed about it.

The scene was New York in the spring of 2011, at a discussion I was leading at the annual Northeast Conference on Science and Skepticism on “Information Overload: How Do We Know Whom to Trust?” Brian was part of the international panel of skeptics gathered for the occasion, which also included Kendrick Frazier, George Hrab, and Sadie Crabtree. People's schedules being busy as they were, I hadn't had a chance to do much more than say hello and talk logistics with any of them before we all found ourselves onstage.

I introduced the talk by citing the wisdom of a saying commonly attributed to Mark Twain: “It ain't what you don't know that gets you into trouble. It's what you know for sure that just ain't so.” Any of us can easily be led astray by misinformation we've taken to heart and assumptions we've neglected to question.

The only problem with that quote, I continued, is that there's no evidence Twain ever said or wrote those words. Nor can they be pinned definitively to Will Rogers or any of the other famous wags who sometimes get credited. The earliest citation anyone has found for that sentiment seems to be from a 19<sup>th</sup>-century newspaper column written by a newspaper editor who may have known Samuel Clemens.

When he heard that, Brian guffawed that the quote, with its Twain attribution, appeared in his then-new book, *Pirates*,

*Pyramids, and Papyrus.* And then he went on to speak eloquently about the trustworthiness of well-established science.

Brian's response comes as no surprise to anyone who knows him from his Skeptoid podcasts and writings. He stands foursquare not just for being right (that is, holding factually accurate views) but for a logical, methodologically sound approach to drawing conclusions. He knows that simply being wrong isn't necessarily a badge of shame—but refusing to be right is.

This collection of Brian's essays is full of such correctives that I wish more of the world would take to heart. As I write this foreword, for example, the early stages of the U.S. presidential race are roiling with the anti-vaccination views of some of the leading contenders. I suspect that some of those politicians are too far gone to benefit from reading Brian's debunking of those worries (see Chapter 4, "Vaccine Ingredients"), but is it too much to hope that some of their constituents might not be?

Perhaps some of them would also then see that when confronted with the mysterious, they needn't rush to embrace paranormal, ahistorical fantasies. Sure, ancient aliens or lost civilizations might at first seem like the only possible explanations for 150,000-year-old metal pipes found in a Tibetan cave... but the more prosaic explanation that has emerged (see Chapter 5, "The Baigong Pipes") is in many ways just as wonderful.

Those readers would also learn that skeptics as smart as Brian Dunning aren't afraid to concede that sometimes science doesn't know all the answers — yet. Case in point: the recent debate about the supposed advantages of running without shoes (see Chapter 8, "Is Barefoot Better?"). Humility can be refreshing! (Or so I'm told; I wouldn't know.)

Making fun of those with irrational beliefs is easy. But that attitude misses what is also so poignant about them. Many of them are smart, perceptive, well-educated folks with backgrounds in science or engineering; their backgrounds just have

some unfortunate holes they don't recognize. It's the tragedy of the woo: people driven to madness by their misplaced certainty that they know best. It ain't what they don't know....

Brian Dunning, on the other hand, does know. If he's sure something is true, he'll cheerfully show you why. And in the extremely unlikely event that you can prove that he's wrong, he'll enjoy the moment as much as you.

*John Rennie is a science writer, the former editor in chief of Scientific American, and an advisor to the New York City Skeptics.*

## INTRODUCTION

It would be inaccurate to call this book a labor of love. It's more like a joyride.

There are fifty chapters here, exploring fifty stories; many of which you've heard, many that you haven't. I knew something about most of them before sitting down to do the research, or at least I thought I did. The lesson for me was that even the simplest of urban legends can hide a wealth of fascinating history, science, and human nature. When you attack any subject with an honest thirst for insight, you nearly always get more than you ever imagined.

Like so many of my fellow science journalists, I spent my youth obsessed with books about science, adventure and science fiction novels, and books on the paranormal: Bigfoot, UFOs, ghosts, the usual. They were so well thumbed I practically had some of them memorized. But there was one thing that I did rather poorly, and that was to analyze what I read with a critical mind.

Anyone who wrote a book, I reasoned, certainly knew what he was talking about; and if it was in print it must be true.

And so I grew up with the firm knowledge that the largest Bigfoot on record was fourteen feet tall (spotted by a troop of Boy Scouts), that Betty and Barney Hill had been abducted and subjected to medical tests by gray aliens, and that one could live forever if he only tuned into the evening news and learned what new toxin caused cancer and could be avoided. Nobody ever suggested to me that there was a different way to look at these stories, and thus I never did so.

But age eventually brought me focus and I discovered the reason I was interested in such things was not because the sub-

ject matter was especially appealing, but because to learn about them was to *learn*. And I found that popular tales, glibly reported, were but a cheap gilding – a fast food paper wrapping, made for on-the-go consumption by the masses. Pull that wrapping aside, discard the mass market sound bite, and what lies inside is virgin territory. It's a real story, supported by things we can actually learn through science, that almost nobody gets to see.

People are too busy these days. People don't have time to learn. They want Oprah and the Action News to tell them something they can understand in fifteen seconds. The media delivers this, in spades, and the excitement of actually learning is becoming an endangered species.

If you've listened to my weekly Internet show Skeptoid (at Skeptoid.com), you've probably heard in my voice how genuinely excited I am to have learned the real facts behind some of these stories. We use the power of skepticism and critical thinking to tear away that gilt wrapper, and we lay it bare with the laser beam of the scientific method. Not once have I ever researched a subject where I did not learn something new that thrilled me, and not once in these fifty chapters will you read a story you knew everything about.

We don't know everything. Every one of these chapters is incomplete. Maybe one or more of them will be a starting point for you to enjoy your own expedition into science as I have.

I hope so.

– Brian Dunning

## 1. NETWORK MARKETING

*Call them Network Marketing, Multilevel Marketing, or MLM, these pyramid plans are proven not to work.*

In this chapter, we're going to point our skeptical eye at network marketing plans, formerly known as multilevel marketing or MLM (name changed to escape the stigma). They say that when there's a gold rush, the way to make money is to sell shovels. Network marketing companies sell shovels, along with dreams of gold: All you have to do is go out there and dig, dig, dig, and buy more shovels, and get your friends to buy shovels too. Levi Strauss and other suppliers became millionaires, and hundreds of thousands of miners went broke.

Network marketing plans are started by a company selling some product — fruit juice, soap, vitamin pills, water filters; anything, it doesn't matter — through a network of independent distributors who are promised exponential commissions by recruiting multiple levels of other distributors beneath them. The company is guaranteed sales because the distributors are required to make minimum purchases, on which commissions trickle upward. There's little need to actually go out and try to sell the product to anyone; money is made by building your network of distributors beneath you, and their distributors beneath them. Soon the commissions trickling up from all those monthly purchases combine into a raging torrent of cash. And if you just buy a few more shovels, you're sure to strike gold.

Network marketing plans differ from illegal pyramid schemes only by one subtle point: Commissions can only legally be paid on sales of a physical product. If commissions are offered upon recruitment of new distributors, then it's defined as an illegal pyramid scheme. Pyramids are illegal because they

necessarily collapse when nobody else can be recruited. However the illegal plans are pretty rare; most companies are smart enough to stay on the right side of the law. But the problem of community saturation, and inevitable collapse, remains.

A tipoff that should clue you into the wisdom of network marketing is that the companies themselves, who manufacture and sell the product, don't even eat their own dog food. They are making money the old fashioned way, by selling an expensive product. It's *you* whom they recruit to start a network marketing business. When an existing distributor pitches you and gets you to become a distributor yourself, you are required to make your initial purchase of "inventory" of whatever the product is. You either consume that product yourself or sell it to others. Your principal sales tool is the pitch that if your customers become distributors beneath you, they can buy the product at a discounted wholesale price. In most plans, in order to retain your distributor status and qualify for the wholesale discount, regular monthly purchases have to be made.

But even this discounted wholesale price is usually far higher than the market value of comparable products available from the supermarket. Participants nearly always find themselves in the unenviable position of having invested a lot of money in their own required inventory purchases, and desperately trying to recruit new distributors in an effort to earn commissions on *their* inventory purchases, and hopefully recover their own investment. So this raises the question: How often does it work out that way? How many MLM participants ever recover their own investments?

The Federal Trade Commission cautions "Most [network marketers] end up with nothing to show for their money except the expensive products or marketing materials they're pressured to buy."

Consumer Reports advises "Stay away from multilevel marketing schemes that make earnings contingent on your ability to sign up an ever-growing pyramid of 'distributors' who are

supposed to do the same and pass sales commissions up the line.”

The nonprofit Consumer Awareness Institute analyzed available data published by the MLM companies themselves. Of the companies surveyed, they reported the least successful was Amway/Quixtar where 99.99% of distributors lose money, and the most successful was Herbalife, where 99.42% of distributors lose money.

They also surveyed 200 tax preparers in three counties in Idaho and Utah, where 6% of residents are active network marketing participants. From over 300,000 tax returns, not a single one reported significant profits from network marketing activities.

In a Wisconsin lawsuit, the tax returns of the top 200 of 20,000 network marketing participants were examined by the Attorney General. The average income of this *top 1%* was a loss of \$900.

*Newsweek* found that fewer than 1% of Mona Vie distributors ever qualified for any commission at all, and less than 1 in 1,000 recovered the cost of their required monthly purchases.

So if network marketing plans don't work, why do people buy into them? Network marketing plans are easily sold by simply laying out some compelling mathematics on a whiteboard. A typical program sets five downline members as the goal for each participant: To be successful, you need only recruit enough people to end up with just five who actively participate. Below those five are their five apiece, totaling 25. This is your network. Each downline of five are qualified by participating at the minimum required level, so this model already excludes everyone who is flakey or only half-hearted, leaving only the five good ones in each downline. Your commissions based on those minimum participation levels — where all five below you dutifully make their minimum monthly inventory purchases — guarantees you an impressive income. The math-



ematics are black and white, and it's so simple that nothing can go wrong. You'd have to be stupid not to do it.

But here is the problem that these whiteboard presentations always manage to omit. *Of all the thousands of network marketing plans available now or in the past, if only one of them had ever had even a single line active to only 14 levels deep, that alone would have required the participation of more human beings than exist.* That math is black and white, too. Level 14 is populated by  $5^{14}$ , or about 6.1 billion people, the entire population of the planet, in addition to level 13 with 1.2 billion, all the way up to you and your original five. You can answer "Oh sure, but a lot of the people don't get all five or they flake somehow," but you forget that the entire premise has already eliminated those who flake or who don't get all five. The unfortunate conclusion is that a fully invested network, upon which the whiteboard presentations are dependent, *has never actually happened.*

A fundamental reason that such networks fail is that they depend upon recruiting people to compete with you. If you own a shoe store, and you pitch every customer on opening their own shoe store instead of being your customer, very soon you're going to have a neighborhood full of shoe stores, with everybody trying to sell and nobody left to buy. It doesn't take an MBA to see that this is pretty much the polar opposite of a sound business strategy.

Let's say you tried to make it sound, and said "Forget the multilevel recruiting, I'm going to focus on selling the product." Is anyone doing that successfully? It would not appear so. During yet another lawsuit in the UK, the government found that less than one in ten participants ever sold even a single product to another person. Since the company has its distributors as a captive audience required to make regular purchases, the products are typically grossly overpriced compared to similar products available in supermarkets. This makes their sale a dubious prospect for those few distributors who ever do attempt retail sales to customers. Surveys show that nearly all products pur-

chased by network marketers are consumed by the distributors themselves.

This fact is rarely mentioned in the sales pitches. Instead, they typically promote the merchandise (referred to as “lotions & potions” by MLM critics) as wondrous super products that will be in high demand. But, you should always beware of success stories coming from MLM distributors. Most MLM companies pay shills who lie about having had multimillion dollar success with the scheme. These are typically the ones who travel around giving seminars, pitching motivational materials, and putting on recruiting extravaganzas that have been criticized by the Federal Trade Commission for promoting an almost cult-like religious mania as a substitute for sound business practices.

I’ve spoken with enough friends and other people who are into network marketing to know that the default response to this is “Oh, but this plan is different.” Sure, every plan has different tweaks and details, but fundamentally they are all the same. The company is going to make tons of money selling an outrageously overpriced product every month to their captive audience buyers: You, and any friends you recruit. Not one of you has any realistic hope of coming out ahead. My advice to everyone involved in network marketing: Simply stop now. Stop convincing yourself that profits are just around the corner if you just buy a few more cases of expensive product. Just stop now, walk away, consider it a lesson well learned, and don’t give them another dollar.

One final tidbit I’ll leave you with. On average, 99.95% of network marketers lose money. However, only 97.14% of Las Vegas gamblers lose money by placing everything on a single number at roulette. So if you’re thinking about joining a network marketing plan, and aren’t dissuaded by the facts I’ve presented, consider instead going to Vegas and placing all your money in a single pile on number 13. Sooner or later you’re going to have to take my advice and just stop now.

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## 2. WI-FI, SMART METERS, AND OTHER RADIO BOGEYMEN

*Are common radio transmitters carcinogenic or otherwise harmful?*

In this chapter, we're going to point the skeptical eye at popular claims that ordinary radios — such as walkie talkies, police and emergency radios, and those embedded in devices such as cell phones, Wi-Fi hubs, and smart utility meters — are dangerous. Some say they cause cancer, some say they present other more nebulous health risks. How concerned do you need to be that something as ubiquitous as radio could be doing you more harm than good?



This issue rose to the headlines in popular media with a frightening announcement in May of 2011 by the World Health Organization. The press release stated that the International Agency for Research on Cancer (IARC) had placed radiofrequency (RF) in their Group 2B of possible carcinogens due to an increased risk of the brain cancer glioma associated with the use of mobile phones. Unfortunately, very few people actually read the release, and saw only that headline, which presents a highly skewed perspective of what was actually said. As a result, new movements arose worldwide, notably in Canada,