



When All You Have is a Hammer, Everything Looks Like a Nail

Lee Moller

It's a funny old world. We rely on others so much in life. For knowledge about just about everything, we routinely turn to authority for answers. We also rely on authority to protect us from obvious threats such thieves, con artists and fraudsters. Perhaps the single most important area of knowledge, and threat, is health care. We have come to trust in doctors and dentists to provide scientific, evidence-based treatment for our ills, and on our politicians to assist the health care industry to police itself. OK, now a lot of you reading this are laughing at my naive. I am well aware that much of medicine is still not on firm scientific ground, and I certainly know that our politicians and our system often fail us. Despite these obvious objections, at least medicine is based on a scientific process, and with the help of our elected officials, our health care has continually improved, and the old, obviously unscientific, practices have faded away... right? Wrong!

Today, most doctors are mum about, and all politicians turn a blind eye to, a pseudo-scientific group that describes itself as the third pillar in our health care support system. I am talking about chiropractic.

Some years ago, I wrote the following list (since refined) of questions designed to help distinguish a proto-science from a pseudo-science. I invite the reader to ask each one with respect to chiropractic.

1. Has the subject shown progress?
2. Does the subject have an underlying basis, premise or theory that can be described as scientific?
3. Does the discipline use technical words such as "vibration", "energy" or "subluxation" without clearly defining what they mean?
4. Would accepting the tenets of a claim require you to

Table of Contents

When All You Have is a Hammer, Everything Looks Like a Nail	1
An Escalating Commentary on an "Elevator into Space"	4
Twelve Facts	5
Skeptical of Skepticism	6
Playing the Skeptical Gadfly, or: The Fine Art of Devil's Advocacy	7

abandon any well-established physical laws?

5. Are popular articles on the subject lacking in references?
6. Is the only evidence offered anecdotal in nature?
7. Do the proponents of the subject claim that "air-tight" experiments have been performed that prove the truth of the subject matter, and that cheating would have been impossible?
8. Are the results of supporting experiments successfully repeated by other researchers?
9. Does the proponent of the subject claim to be overly or unfairly criticized?
10. Is the subject taught only in non-credit institutions?
11. Are the best texts on the subject decades old?
12. Does the proponent of the claim use what one writer has called "factuals" - statements that are a largely or wholly true but unrelated to the claim?
13. When criticized, do the defenders of the claim attack the critic rather than the criticism?
14. Does the proponent make appeals to history (i.e.: it has been around a long time, so it must be true)?
15. Does the subject display the "shyness effect" (sometimes it works, sometimes it doesn't), or show results that are always just at the limit of detectability?
16. Does the proponent use the appeal to ignorance argument ("there are more things under heaven ... than are dreamed of in your philosophy ...")?
17. Does the proponent use alleged expertise in other areas to lend weight to the claim?
18. Does the subject or discipline have several competing schools of thought or practice?

In my opinion, chiropractic fails all of these "tells", and yet Canadians chalk up millions of visits to chiropractors every year, and many provinces still foot at least part of the bill. The government grants them the right to call themselves doctors, which they are not, but unlike doctors they are dogmatic, unscientific, and a significant menace to your health. Let's not mince words, *chiropractic is quackery*.

Aims and Executive

The BC and Alberta Skeptics support the aims of CSICOP, the Committee for the Scientific Investigation of Claims of the Paranormal. Stated briefly, these aims are: To provide a reliable source of information to the public and media on claims of the paranormal; To provide public education in areas of scientific method and paranormal claims; To facilitate open-minded testing of paranormal claims; To provide a forum for the exchange of views.

The Alberta and BC Skeptics are open organizations and your involvement and support is encouraged. A subscription to the newsletter is \$15 annually (\$6 for students). The newsletter is published one to four times a year, and public meetings are held on the same schedule. **Your letters, articles or comments are encouraged.**

Check your mailing label! The top right hand corner shows your subscription expiration date.

The BC Skeptics

Chairman: Barry Beyerstein; (604) 291-3743 (w); Beyerste@sfu.ca

Newsletter Editor/Memberships: Lee Moller; (604) 929-6299; LeeMoller@shaw.ca
1188 Beaufort Road, North Vancouver, BC V7G 1R7

Web Site: <http://seercom.com/bcs>; Web Master: Graeme Kennedy

Directors at Large: Dale Beyerstein, Ken Phelps, Gary Bauslaugh, Ted Powell

The Alberta Skeptics

Chairman: Greg Hart

Secretary: Heidi-Lloyd Price

Treasurer: Dale Tardiff

Web Site: <http://abskeptic.htmlplanet.com>

Contact Info: abskeptics@hotmail.com
Box 5571, Station "A", Calgary, Alberta, T2H 1X9

Is Chiropractic a Risk to Your Health?

The first principle of medicine is "do no harm".

The belief in chiropractic is wide-spread for reasons most skeptics are familiar with: self-limiting disease; personal validation, the placebo effect; the white coat effect; the assumption that correlation is causation; false reinforcement and so on. I think it was Isaac Asimov who said if a million people believe in a stupid thing, it is still a stupid thing.

A recent court decision in Ontario has opened the door to a lawsuit for 12+ million dollars in the death of a woman as a result of chiropractic neck adjustments. She was one of several tragic, unnecessary deaths in Canada in the last decade or so for similar reasons. This puts aside the huge numbers of people who allow chiropractors to treat them for conditions that chiropractic cannot, and should not treat. More on this later.

110 and Still Going Strong

D. D. Palmer started chiropractic in 1895. He trained his son, B. J. Palmer in the trade, but they soon had a falling out and BJ took the reins. BJ, a master salesman, turned chiropractic into money. Soon, there were many competing schools of thought and bizarre tools in the game, often labeled by their inventors with provocative names. There are literally hundreds of these so-called "named techniques" today, many of which use useless diagnostic or treatment tools. Perhaps the most famous tool was invented by BJ himself: the "neurocalometer", a simple device that merely measured skin temperature. He then used this useless device to prove the worth of his named technique: the "Hole-In-One", which emphasizes neck manipulation and is used today. This official device of the Palmer School sold for \$2,000+ in the 1920's, enough money to buy a house!

The trade and practice of chiropractic has changed little in 110 years. Chiropractic's main concern was, and is getting people in for "adjustments" to both cure and prevent disease, preferably from birth. BTW: Chiropractors are always careful to point out that they don't treat ailments, they only help the body heal itself. This is a subtle distinction that has kept them mostly out of court... mostly.

The Science

Two often cited reports supporting chiropractic are the RAND report and the Magna report. The former showed some evidence that SJM (Spinal Joint Manipulation) for **only** the lower back may be as or more effective than control treatments. Note that the report did not test chiropractic, only a treatment for lower back pain that is hardly unique to chiropractic. Chiropractic did not invent SJM.

The Magna report was a Canadian report written by an economist. His meta-study focused on public cost and was effusively pro-chiropractic. Unfortunately, nobody else could see the "overwhelming" evidence he saw.

The basic premise of chiropractic is this: Nerves connect to everything; all nerves go through the spine; therefore your spine can affect every part of your body for good or ill. This is nonsense, of course.

Another oft-quoted study is that of a Dr. Chung on the effects of pressure on nerves. Here is a quote from a chiropractor about that study (see original at <http://www.doctorroberds.com/Chiro.html>). "And Dr. Chung Ha Su, Biomechanical Researcher at the University of Colorado, adds, "Just the weight of a quarter pressing against a nerve can shut down that nerve's function up to 60%." "Imagine if that nerve goes to a vital organ, like the heart. In that case, the heart could only function at 40%, even with good nutrition, acupuncture and exercise."

This is scary on several levels. First, this chiropractor is clearly *trying* to scare us! More importantly, it assumes that chiropractic can relieve pressure on nerves. It can't. The speaker seems to think people are little more than giant dimmer switches. But even scarier than that: The speaker has also indicated that the heart connects to the spine via a nerve. On referencing a chiropractic chart from 1979, I was able to learn that the T2 vertebra is the culprit. *There are no nerves connecting the spine to the heart!*

There is very little—but perhaps not zero—evidence that chiropractic is more effective for lower-back pain than the alternatives. There is zero evidence for the other theories and practices of chiropractic.

The “theory” of chiropractic is hopelessly unscientific.

The Big Lie

In the 30’s and 40’s, Nazi Germany perfected the practice of the “big lie”. If you say something long enough and loud enough, eventually, you will be believed. DD and BJ Palmer got there first. For more than 100 years, chiropractors have been spinning the same pseudo-scientific and “drug-free and non-invasive” practice of chiropractic. If someone dies on a chiropractor’s table, a small army of lawyers and spin-doctors descend, claiming pre-existing conditions or some such. Only when painted into a corner do they admit culpability. And then those same people work to bury the outcome and its consequences. For example, in the late 90’s, after another neck manipulation death (that of Lana Dale Lewis), chiropractors agreed to provide pamphlets outlining the dangers of chiropractic neck manipulation. They reneged on that agreement, and Canadians are still dying.

The Theory

The mainstays of chiropractic theory are the “subluxation” (sometimes inflated to the scarier sounding, and even vaguer “vertebral subluxation complex”, aka the infamous “misalignment”), and “innate intelligence”. What an adjustment adjusts are subluxations.

So what are subluxations? They are a chimera. They do not exist. Chiropractors looking at the same x-ray they looked at an hour earlier cannot identify the subluxations they initially spotted. Innate intelligence, very much like the Chinese idea of Qi, is your body’s ability to heal itself, and it flows through your nerves, which are sometimes blocked or hindered by subluxations. There is not a shred of scientific evidence to support this ludicrous theory. DD Palmer just made it up.

The Practice

This is the scary part. Most Canadians probably believe that Canadian chiropractors only treat the back, unlike their brethren to the south. Nothing could further from the truth.

Chiropractors have but one tool: the adjustment, or the Hammer. We have many ailments, or nails. When they see a nail, they reach for their hammer. Simple.

One of the major complaints that doctors level at chiropractors is the useless, dangerous prophylactic treatment of children. A 1999 survey of 1,200 Ontario chiropractors published in the Journal of the Canadian Chiropractic Association showed that chiropractors would treat the following ailments — even in children — with chiropractic adjustments:

Their effort to occupy all areas not yet occupied by science — in other words, their bold claim that what no one knows is their special province, that ignorance itself is a superior kind of knowledge, that their most fantastic guess must hold good until it is disproved...

H. L. Mencken, A Treatise on the Gods

Web Sites

BC Humanists:

<http://www.vcn.bc.ca/humanist/>

BC Skeptics:

<http://seercom.com/bcs/>

Alberta Skeptics:

<http://abskeptic.htmlplanet.com>

Asthma	60%
Otitis media (earache)	51%
Colic	46%
Menstrual complaints	45%
Immune system	43%
Gastrointestinal	37%
Hyperactivity	34%
Enuresis (bed-wetting)	31%

They preach that adjustments relieve “pinched” nerves. It sure sounds good. But, short of serious problems such as a slipped disk, which chiropractors cannot treat, chiropractic adjustments cannot affect spinal nerves. It is anatomically impossible.

One might think that these more than questionable practices are on the decline. The opposite is true. In addition to the bogus treatments offered above, 27% use homeopathy; 31% applied kinesiology; and 66% acupressure/meridian therapy, all of which are most definitely pseudo-science.

Technically, each province’s chiropractic association should police these practices, as they are disallowed under every Canadian chiropractic charter. They do not seem to care, nor does the government care that we, the taxpayer, are often paying for these snake-oil cures.

Recently, chiropractic came within a hair’s breadth of getting in bed with York University, in their long running attempts to gain scientific credibility by association. This would have been a disaster for science and healthcare. Luckily, Dr. Stephen Barrett, an enduring critic of bad medicine, pointed out the pseudo-science of the underlying theory of chiropractic to the shockingly ignorant board of the university. Thankfully, they rightly, and quickly, bailed out on the deal.

In truth, the real practice of chiropractors is to grow their practice, as revealed in several not-for-public-consumption practice-building documents that have surfaced over the years. These cynical documents offer advice on how to convince patients that they are getting better, even to the point of taking credit for fixing problems that have yet to occur, directly as a consequence of chiropractic, without regard to their actual condition.

Conclusions

If chiropractic were to present its arguments and treatments to modern medicine today, cold, without the historical baggage, it would be laughed out of existence.

After 100 years of trying to gain acceptance, the US National Institute of Health had this to say about chiropractic as it related to lower back pain **only** (see <http://nccam.nih.gov/health/chiropractic/chiropractic.pdf>):

“Yes, there are scientific controversies about chiropractic, both inside and outside the profession. For example, within the profession, there have been disagreements about the use of physical therapy techniques, which techniques are most appropriate for certain conditions, and the concept of subluxations. Outside views have questioned the effectiveness of chiropractic treatments, their scientific basis, and the potential risks in subsets of patients (for example, the risks of certain types of adjustments to patients with osteoporosis or risk factors for osteoporosis, compared to patients with healthier bone structures).”

I stated at the beginning that chiropractic is quackery, and so it is. A ludicrous theory, an out of control membership, a complete lack of standards of practice, and dead people on the examining table say it all. There is an old joke in the chiropractic trade: For every chiropractor, there is an equal and opposite chiropractor. It would be funny if it weren't so true. But it should be said that there is a small percentage of chiropractic that tries to be scientific and practice evidence-based treatments only. I encourage these practitioners but my guess is that, by the time they eliminate all the unscientific aspects of chiropractic, there will be so little left as to be unrecognizable.

So What is to be Done?

In theory, the government doesn't want to pay for any treatment that isn't shown to be scientifically valid. However, it seems they are prepared simply to take chiropractors at their word that what they do is scientific.

So first, get the government to enforce that rule, and not pay for any non-scientific treatment.

Second, get the chiropractic associations to police themselves properly and restrict their treatments to skeleto-muscular issues.

Third, stop issuing business licenses to new chiropractors unless they can show that the treatments they offer have a basis in science (treatments based on subluxations would be rejected).

Fourth, start a campaign to undo 100 years of chiropractic propaganda, and describe appropriate alternatives.

Fifth, wait about 30 years, and we should be largely rid of this brand of medical lunacy.

I am not holding my breath for any of this. Reason, there aint no reason in a health fight! However, if you feel you must go to a chiropractor, please don't let them adjust your neck.

Like I said, it's a funny old world.

Postscript

An article in *The Skeptical Inquirer* (Nov. 04) described a recent new diagnostic tool for chiropractors: mapping the blind spot in your eye to diagnose problems in the brain! The “science” behind this conjecture is nothing short of ludicrous. But have no fear, if your blind spot should show that you have a brain problem (and it will), luckily, the treatment is chiropractic neck adjustments. Whew, that's lucky!

Recommended Reading:

The Health Robbers, A Close Look at Quackery in America;
Edited by Stephen Barrett and William T. Jarvis

Spin Doctors, The Chiropractic Industry Under Examination;
Paul Benedetti and Wayne MacPhail

An Escalating Commentary on an “Elevator into Space”

Jim Bernath

There has been a fair volume of coverage of the idea for an elevator that would reach up into space, and, with the use of new space-age materials make it actually possible to bypass the use of expensive rockets etc. (I was astonished to see the estimable Peter Mansbridge politely deal with it on the CBC evening news.)

The idea manages to fly and circulate because of the general confusion surrounding the terms “up into space”, “up into orbit”, and “up into weightlessness”. Most people think that the terms all nicely go together, but they don't quite. “Up into space” is a measurement of altitude; orbits and weightlessness are aspects of speed, not altitude, and they follow when you reach a horizontal speed of 15,500 mph (and, up above the air nicely and easily keep going round and round for free).

If the Space Elevator took you 250 miles up, and you stepped out, you err if you think you would be weightless. No, you'd fall like a stone, the same as if you stepped off the CN Tower. And similarly, you err if you think you could nicely line things up and step from the elevator into the Space Station. Hardly. You would be pretty well standing still, and the Station would be whizzing by at 15,500 mph. These are two very large disconnects.

The fuzz and confusion and ambiguousness have their origins in the cold-war-space competitions of the USSR vs. USA circa 1960. Russia put the first human, Uri Gagarin, into one full orbit around the Earth. He experienced the prolonged weightlessness that goes with it, and he then returned from his journey into space, safely to Earth. Enormously miffed, and certainly not ready to admit being so far behind, the US shortly

A round trip to the nearest star, conducted at 70% of the speed of light, would use an amount of energy equal to the total accumulated electrical power consumption of the United States for half a million years, and this only if we postulate an ideally efficient rocket powered by a pure matter/anti-matter engine.

Paul Horowitz

put astronaut Alan Sheppard into a ballistic trip 65 miles up and then back down again, and said “See! We can get a man into space too!”, with diagrams to show that “space” begins some 65 miles up—up above most of the atmosphere, and higher than all the airplanes.

Conveniently left out of the proclamations (and the general public consciousness) was the issue of **orbits**, which require a speed of 15,500 mph; and **weightlessness** which similarly requires the same **speed**.

When we fast forward to “tomorrows” Elevator, which the beguiled enquirer speculates will take us into space, thence into the Space Station, thence into geo-stationary satellites, and thence ultimately (why not!?) up to the moon, it behooves the skeptic to call a halt to the fanciful scenarios and point out the ludicrousness, starting at floor one. For example, the base of the Elevator is spinning around, with the Earth, once a day, at 1,000 mph. At an altitude of 250 miles, since the shaft is still attached to floor 1, it is still spinning at some 1,000 mph, but everything in orbit nearby is whizzing along at 15,000 mph! Then, further up, at 22,241 nautical miles, in geosynchronous orbit, if we build it that high, the top floor will have to be traveling at 3-4,000 mph faster than floor 1—which won’t much matter except for the scraping you’ll get along the sidewall on the way up, and if you get really clever and focused and build the thing all the way to the moon, that will be really marvelous and you’ll be able to drive your Humvee along the whole trip (think of the view points along the way!) — All this except the little matter of good old mother Earth still spinning along at one turn per day, same as before, along with floor 1 and the base of the shaft, while the top of the shaft, at the moon, has been going around once a month... which ought to put some knot in your pants?!

One bottom line in all this is, how do you know when to be a skeptic, and when to follow along because “maybe this is right.” My answer is to look for the area where **I know** there’s a flaw, and **I know** that the proponent **must** know because of his expertise. When I find that area, and see the proponent quietly staying in it, then I junk the whole exercise because it is a promotion, not an inquiry.

In this example of the Elevator into Space my alarm bells ring at the alluding to “going into space” without mention of orbits and weightlessness, and I start looking for the button that will take me back to the parking lot.

Aside: For a good discussion of space elevators in the guise of science fiction, check out *The Web Between the Worlds* by Charles Sheffield or *The Fountains of Paradise* by Arthur C. Clark.

Ed.

I asked a homeopath if it was easy to learn homeopathy. He said, “Sure, there’s nothing to it!”

It is impossible to reason someone out of something that he did not reason himself into in the first place.

Jonathan Swift

Twelve Facts

Lee Moller

I recently did a short radio gig on CKNW here in Vancouver. As a consequence I got a few interesting emails from people who wished to address my apparent ignorance of science. So, in the interest of knowing our enemy, here are some “facts” — unedited — that my admiring fans feel we all should know. So open your minds, **wide...**

Twelve Facts Every Human Should Know:

1: The Big Bang theory contradicts every known principle of scientific reasoning. Disorder never creates order. Order never comes from chaos. Never.

2: Non-living matter has never produced life, and never will. Spontaneous generation is an evolutionary myth.

3: Old ages (billions of years) have been assigned by evolutionists using false parameters in order to make their assumptions seem believable. All true science points to the Earth as being thousands of years old, not millions or billions.

4: Evolutionists begin life with the simple cell, than progress upward. However, a simple cell is vastly more complex than the most powerful computers of our time. One simple cell contains trillions of molecules, countless complex structures performing chains of intricate biochemical reactions with precision. A living cell suddenly appearing by chance is not even good fiction.

5: Evolutionists state that simple life-forms, given enough time, develop into complex life-forms. In reality, mutations are always negative and destructive. They deform, distort, and kill. A more desirable life-form has never resulted from a mutation.

6: The geological chart shows the layering of the Earth’s crust with corresponding life-forms in each layer. No such progression of rock layers and corresponding fossils is found anywhere on planet Earth.

7: The geologic chart found in every college and public school is a total misrepresentation of known scientific facts.

8: The layering of sediment in the Earth’s crust occurred during the global catastrophic flood of Noah’s day. Huge tidal waves circulating the globe deposited layer after layer of sediment, fossilizing life-forms under great pressure.

9: Radiometric dating methods such as carbon 14, potassium argon, and uranium lead are unreliable and inconsistent. Lava rock from an 1801 volcanic eruption in Hawaii tested 160 million to 3 billion years old.

10: All evolutionary descendants assigned to man have proven to be contrived or fraudulent. Ramapithecus: fabricated from a two-inch jawbone. Australopithecus: skulls belonging to extinct apes. Peking Man: reconstructed from two molar teeth. Java Man: a giant gibbon. Cro-Magnon: humans living in caves. Neanderthal Man: human skeletal remains deformed and arthritic. Piltdown Man: manipulated and a total fraud. Nebraska Man (Scopes Trail): a pig’s tooth. All fossils found are all ape or all man. There are no missing links.

11: Scientifically documented evidences prove that man and dinosaurs lived together. Human footprints and artifacts have been found within the same strata as dinosaurs. Even human footprints inside dinosaur prints have been documented.

12: Not all dinosaurs are extinct. The fossil fish Coelacanth was thought to be extinct for over 70 million years, until a living specimen was caught in 1939. In 1977, a decaying 30 foot Plesiosaur was dredged by Japanese fishing nets off the coast of new Zealand. Other species will undoubtedly be discovered as time goes on, yet no revisions appear in textbooks, and evolution is still taught as fact.

If you have teenage kids, challenge them with this list. It should be very educational. Ed.

Skeptical of Skepticism

Warren Davidson MD, FRCP(C)

It all started when we walked into the Health Care and Epidemiology course titled “Scientific Basis for Epidemiological Thinking”. During that first session, we were introduced to the concepts of skepticism and critical thinking including the FiLCHeRS (falsifiability, logic, comprehensiveness, honesty, replicability, and sufficiency) rules of evidential reasoning developed by James Lett.¹ As obedient students are likely to do, we accepted these ideas without question and enthusiastically went off to analyze various issues using our new-found knowledge. But hold on. The goal of this course was to evaluate scientific research and “claims” using critical thought. So what about the claim that critical/skeptical thinking allows one to use “knowledge and intelligence effectively to arrive at the most reasonable and justifiable position possible”? If we are to be true “skeptics”, should we not analyze skepticism itself? The purpose of this paper is not to delve into the history of, or the philosophical areas relevant to, critical thinking. These ideas are covered in detail by experts who are far more experienced than myself.^{2,3} Rather, I intend to examine some of the limitations of critical thinking.

There are two ways to be fooled. One is to believe what isn't true; the other is to refuse to believe what is true. Sren Kierkegaard

Since most skeptics rely on science and the scientific method to understand nature, this seems to be a good place to start. Some people believe that critical thinking allows one to just look at the facts. However, it has been pointed out that we decide what data to look for based on our theories. Therefore, is science the best method of obtaining and effectively utilizing knowledge? Ultimately, science is a human endeavor with the methods and interpretations “subject to the psychological, sociological, historical, religious and political assumptions of the individual and collective scientists.”⁴ Skeptics must be wary about dismissing personal experience or established norms. As Michael Sofka stated, “there are many important, practical problems that affect us everyday for which the exacting, demanding and specific requirements of science are difficult or impossible to apply. Science may help frame problems, provide answers about the effect of a policy, etc. But we are usually left making decisions without full knowledge.”⁴ Many skeptics utilize the “scientific method” as though it was foolproof. In reality, we do not have one universal method of scientific analysis. Rather, we use a variety of techniques and methodologies for investigation. Prevalent factors such as human error, biases, and politics (micro and macro) complicate the rigorous application of the scientific method. Although these concerns do not nullify the scientific method, they remind us that limitations do exist. Peer review has been seen by many as a means of maintaining integrity within the scientific community. While open examination by a critical audience is an important part of advancing/modifying scientific ideas, peer review does have its flaws. Consider the study by Michael Mahoney in which he sent out two papers for review.⁵ Both manuscripts “were

identical in methodology, but different in which theory the results supported”. The reviewers were individuals who had previously stated their support for the theory backed by the results or the theory disproved by the results. The findings demonstrated that the reviewers were more likely to reject the paper that did not support their preferential theory. Furthermore, they were also more critical of the methodology in those papers; this despite the fact that there was no difference in the methodology.

Where we have strong emotions, we're liable to fool ourselves. Carl Sagan

Guides to critical thinking often have well-intentioned, “motherhood” statements, such as, “be open to different viewpoints” and “consider many hypotheses, don't get overly attached to one, and be open to rejection of your favorite.” However, one must remember that skeptics are human beings and, as such, are susceptible to errors of human reasoning, problem solving, and memory. Ray Hyman has pointed out that, “many well-intentioned critics have jumped into the fray without carefully thinking through the various implications of their statements. They have sometimes displayed more emotion than logic, made sweeping charges beyond what they can reasonably support, failed to adequately document their assertions, and, in general, failed to do the homework necessary to make their challenges credible.”⁶ Michael Shermer recalled an incident when a supporter of his skeptical society called to offer support for the organization's skepticism about everything except the health benefits of vitamins. “'Your field wouldn't be vitamin therapy would it?' I inquired. 'You bet it is!' he responded.”⁷

Many skeptics state that critical analysis must be done in an environment free of bias, emotion, or pre-determined conclusions. They rely on strict logic and analytical thinking to examine issues at hand. Given that these are philosophical and mathematical concepts, they realistically do not encompass the complexity of human behavior. We do not live in a vacuum and the reality is that very few of us adhere to altruism. In his model of human understanding, Greg Haskins notes the importance of human emotion along with the philosophical values of an individual and society.³ When skeptics fail to recognize these factors, they introduce flaws into their methodological approach. “Basic human limitations applies to everyone, including the most proficient critical thinkers. These limitations remind us that we are not perfect and that our understanding of facts, perceptions, memories, built-in biases, etc., preclude us from ever seeing or understanding the world with total objectivity and clarity. The best we can do is to acquire a sufficient or adequate understanding depending on the issue at hand.”³

It's one thing not to see the forest for the trees, but then to go on to deny the reality of the forest is a more serious matter. Paul Weiss

When presented with data, numerous skeptics attempt to “debunk” the studies. Some skeptics consider that any flaw, even trivial or speculative, is fatal, thus allowing one to discard all the evidence. In the real world, the evidence for anything is seldom flawless; it is almost always possible to find an error that can be used as an excuse to discount the evidence. The same scientific mind-set that thrives on high

precision and critical thinking may actually hinder research into areas labeled as “fringe”, “far-fetched”, or “extraordinary”. Many serious scientists are discouraged from investigating certain claims out of fear for their reputations. When this happens, who is left to conduct these investigations? Extreme skeptics? Extreme believers?

Imagination will often carry us to worlds that never were. But without it we go nowhere. Carl Sagan

The purpose of this paper was not an attempt to discredit skepticism. Rather it was an exercise in assessing various components of skeptical/critical analysis. As mentioned, human nature is a persistent factor that influences the process by which we seek out and gather knowledge. Ignoring this reality will only hinder the noble goals of critical thinking. Even science, which attempts to explain nature using structured, reproducible methodologies, has been recognized as a human endeavor. Consequently, as society has evolved, science has experienced tremendous changes. Still, we do not have a perfect method of examining data.

Experienced skeptics realize that efficient analysis is not just about checking off the FiLCHeRS list. “Becoming a critical thinker requires more than mastering a set of skills; it requires a certain spirit or attitude.”² To truly utilize effective critical thinking, an individual must be honest about one’s own limitations. I think Michael Shermer described it best when he said, “The most ardent skeptics enjoy their skepticism as long as it does not encroach upon their most cherished beliefs. It is easy, even fun to challenge others’ beliefs, when we are smug in our certainty about our own. But when ours are challenged, it takes great patience and ego strength to listen with an unjaundiced ear.”⁷

References

1. James Lett. *A Field Guide to Critical Thinking*. Skeptical Inquirer. 1990.
2. Robert Todd Carroll. *Becoming a Critical Thinker*. Chapter 1 Critical Thinking. Copyright 2004.
3. Greg Haskins. *A Practical Guide to Critical Thinking*.
4. Michael Sofka. *Myths of Skepticism. Theistic Science*. Dec 16, 1997.
5. M.J. Mahoney. *Publication Prejudices: An experimental study of confirmatory bias in the peer review system*. Cognitive Therapy and Research, 1, 1977. pp 161-175.
6. Ray Hyman. *Proper Criticism*. Skeptical Briefs. May, 1987.
7. Michael Shermer. *A Skeptical Manifesto*. Skeptic vol. 1, no. 1, 1992. pp. 15-21.

Keith Henry

The BC Skeptics were formed some 17 years ago. From the outset, the Henry family were among its first and most ardent supporters. Keith Henry, the patriarch of the Henry family, and long time voice of reason, passed away late in 2004. Keith Henry leaves behind a wife, four children and a slew of grandchildren. He led a long and illustrious career as an engineer. He will be missed.

Playing the Skeptical Gadfly, or: The Fine Art of Devil’s Advocacy

Larry Thornton

A skeptical website found on the Internet (where else??) listed, at the start of an essay on the attributes of skepticism, ten supposedly ironclad propositions. I have attempted to examine them from, say, an imaginary theist’s point of view; and then just to convolute matters further, from the imaginary viewpoint of a malcontent, crusty old skeptic who knows that things are never quite as cut-and-dried as they may seem to be. In other words, there are many viewpoints in this world, and it seems no one can ever be fully confident that his or her particular favored viewpoints are absolutely impervious to challenge.

First, I’ll list the ten attributes of skepticism, unsullied by my “logical bullying”. (If you later think “illogical”, you might be correct.) Then I’ll list them again in order to show after each one, in a sometimes lighthearted but more often semi-serious way, how the ten statements defining skepticism just might be challenged.

Skepticism and Science: What is Skepticism?

1. Skepticism is a philosophy of knowledge and belief with the following premises and principles:
2. The universe is ultimately predictable and knowable.
3. There is objective reality.
4. Skepticism is the search for truth both for its own sake, for truth has tremendous intrinsic value, and because truth is empowering.
5. All claims to knowledge should be critically analyzed and only accepted as probably true when there is sufficient evidence to support the claim and the claim presents no internal logical inconsistencies.
6. Extraordinary claims require extraordinary evidence.
7. The burden of proof lies entirely with the claimant.
8. When there is insufficient evidence to reach a conclusion, then no conclusion should be reached.
9. Consider all alternative explanations for any phenomenon.
10. When multiple possible explanations exist for one observation, the simplest is most likely to be correct and is therefore preferred. (Occom’s Razor)

This all sounds plausible and forthright... right? And yet -- a few dissident comments on these ten “unchallenged” and supposedly self-evident descriptions of what skepticism is all about, might be worth a bit of a look:

1. Skepticism is a philosophy of knowledge and belief.
To suggest that skepticism encompasses both a philosophy of knowledge and a system of belief, may be fine, but I beg to differ on one small point: Science is a tentative discipline at best, a continual “work in progress” that does not lay claim to a knowledge of absolutes. Each new theory or discovery of

what we take to be fact, is open to challenge by still more discoveries and consequent refinements of the old theory; which leads, with each new experiment and possible discovery (and here is where 'belief' might come in!), to ever closer versions of ultimate truth.

2. The universe is ultimately predictable and knowable.

Science doesn't dogmatically lay claim that the world is ultimately predictable by mortal human beings, since we have finite mental capacities. Deeply complex, counter-intuitive, highly probabilistic quantum mechanics dictates that Nature doesn't only abhor a vacuum (suspect in itself!) but that Nature also abhors absolutes. Godel's mathematical theorem also has something rather profound to say about the ultimate limits to knowledge. Chaos theory, again, points to the impossibility of predicting absolute truths, especially as to future events (the weather, for one).

3. There is objective reality.

Again, quantum mechanics seriously questions such an assumption. The almost surrealistic interplay between so-called "objective reality" and our conscious capacity to absorb and process it, is not as cut-and-dried as some skeptics might like to suppose. And Einstein's Relativity Theory contains all kinds of apparent entanglement 'paradoxes' of the interplay among the constructs of space, time, energy and matter that, again, makes objective reality often seem about as malleable and surrealistic as a fictional nightmare by Edgar Allen Poe.

4. Skepticism is the search for truth both for its own sake, for truth has tremendous intrinsic value, and because truth is empowering.

So-called 'truth' without pragmatic application is only of intrinsic value so much as we philosophically decide it has value. By what criteria is it empowering? Theists also lay claim to their version of truth — claiming it not to be a 'version' at all, but a God-given, divine and absolute Truth [with an emphasis on the capital "T"]— by whatever that may be taken to mean, since it cannot even be subjected to logical scientific analysis.

5. All claims to knowledge should be critically analyzed and only accepted as probably true when there is sufficient evidence to support the claim and the claim presents no internal logical inconsistencies.

and when... over time... constant efforts to refute said claims fail to alter former conclusions. Over half a century of critical tests of Einstein's Relativity tenets have led to a progressively stronger view that they are correct, so far as experiment can determine... but by no means ultimately conclusive. Not every scientist believes, for example, that travel to distant worlds will be forever severely limited by the finite and unchanging speed of light...

6. Extraordinary claims require extraordinary evidence.

The theist might rightly claim that those with a bedrock conviction of the existence of God, are not making an "extraordinary claim"; but rather, it is the nonbeliever who has gone way out on a limb, considering the seemingly magical world around us that has not been fully explained by science. Therefore, it might "reasonably" be considered that it is the skeptic who is making the extraordinary claim: There is no God.

7. The burden of proof lies entirely with the claimant.

If a skeptic makes the assertion that the universe is entirely natural, with laws that have logical and consistent origins, and further, does not require the intervention of a deity, this could be considered a fantastic claim by a theist, since scientific knowledge is far from complete. Also, since most of humanity believes in God, it would seem correct to suppose "the majority rules" in matters of claims without proof. The theist could assert that in light of the fact that scientific understanding is not fully at hand, the burden of proof (that the universe is self-consistent) lies instead, with the claimant.

8. When there is insufficient evidence to reach a conclusion, then no conclusion should be reached.

Scientists may 'conclude' that there is insufficient evidence for God; but do they themselves have enough evidence for the 'natural order' as an explanation for reality, to substantiate their 'conclusion' that belief in a deity is without foundation? Time and again scientists reach conclusions (even if tentative) about the nature of the physical world, to the extent that it borders incredulously on 'infinite' knowledge; the likes of which, would result pretty much in a definitive conclusion. For example, in cosmology, the attributes of the beginnings of the big bang are conclusively described right up to 1×10^{-43} second. It doesn't get any more astounding than that!

9. Consider all alternative explanations for any phenomenon.

A no-brainer: "All" alternative explanations would, by definition, include natural, religious, the paranormal, and even imaginary explanations. Each should be given legitimate consideration, if "all alternative explanations" is to be taken literally. This is clearly preposterous, by anyone's reckoning.

10. When multiple possible explanations exist for one observation, the simplest is most likely to be correct and is therefore preferred. (Occom's Razor)

This begs the question of just whose definition of 'simple' we should embrace. Science is a very complex undertaking, covering a large number of both disparate and complementary disciplines. It is far from complete, and in fact, is said by many scientists and technologists to be still in its infancy. The many forms of religion, on the other hand, are considered complete by most (if not all) of their adherents, even if they contradict each other. As an essentially fully-formed "doctrine of reality", to to speak, religion provides about as simple an explanation as is possible: that the universe runs by the "pure magic" of a Divine Hand. Bingo bango, that's all there is to it! To some people, then, the idea behind Occam's Razor becomes a virtual "gift to religion", due to its definition: "One should not increase, beyond what is necessary, the number of entities required to explain anything." It is necessary, say the theists, that there be only ONE explanation: God. It therefore satisfies the tenet of Occam's Razor, does it not?

Well, there you have it. I realize I've tackled the ten points mostly as a feisty theist might do so, leaving the hapless secular paranormalist totally out of the equation. I could perhaps go back and include arguments with a paranormal slant, but who knows: Science may someday find evidence for ESP, psychokinesis, and the entire gamut of so-called extra-sensory phenomena, long before it ever has to throw out centuries of accumulated evidence for the natural order of things, in favour of some religious explanation based solely upon faith.