
# SGHA Articles

Expanding knowledge through disseminating information.



**Articles ~ Ghost hunting and beyond ~Scientific Method, Belief Systems and World View**

The scientific method is the best way yet discovered for separating the truth from lies and delusion. The simple version looks something like this:

1. Observe some aspect of the universe.
2. Create a tentative description, called a hypothesis, which is consistent with what you have observed.
3. Use the hypothesis to make predictions.
4. Test those predictions by experiments or further observations and modify the hypothesis in the light of your results.
5. Repeat steps 3 and 4 until there are no discrepancies between theory and experiment and/or observation.

A hypothesis becomes a theory when it is consistent and provides a coherent set of propositions that explain a class of phenomena. A theory then becomes a framework for which continued observations are explained and predictions are made.
The great advantage of the scientific method is that it is unprejudiced. One does not have to believe a given researcher because the experiment can be performed by another researcher to determine whether his/her results are true or false. The conclusions will stand regardless of the researcher's state of mind, religious persuasion, or the subject of the investigation. Faith, a belief that does not rest on logical proof or material evidence, does not determine whether a scientific theory is adopted or discarded.

A theory is accepted through results obtained through observations and/or experiments which anyone can reproduce. Here lie the first criteria of the Scientific method. **The results obtained using the scientific method are repeatable.** In fact, most experiments and observations are repeated many times. If the original claims are not replicated, the discovered discrepancies are hunted down and exhaustively studied.

There is a very important characteristic of a scientific theory or hypothesis which differentiates it from an act of faith. A theory must be ``falsifiable". This means that there must be some experiment or possible discovery that could prove the theory untrue. For example, Einstein's theory of Relativity made predictions about the results of experiments. These experiments could have produced results that contradicted Einstein, so the theory was (and still is) falsifiable. This characteristic applies with ghosts and the paranormal as well.

The statement that "Ghosts do not exist" is falsifiable, because someone may eventually prove their existence. However, the term "Ghosts exist", is not falsifiable because there is no way to prove that ghosts do not exist.
A frequent criticism made of the scientific method is that it cannot accommodate anything that has not been proved. The argument then points out that many things thought to be impossible in the past are now everyday realities. This criticism is based on a misinterpretation of the scientific method. When a hypothesis passes the test it is adopted as a theory. It correctly explains a range of phenomena but it can, at any time, be falsified by new experimental evidence. When exploring a new phenomenon, scientists do use existing theories. However it is always kept in mind that the old theories might fail to explain the new experiments and observations. In this case, new hypotheses are devised and tested until a new theory emerges.
In the realm of ghost hunting and paranormal research there are many types of ``pseudo-scientific" theories which wrap themselves in a cloak of apparent experimental evidence. However, when examined closely, they are nothing but statements of faith that are based on the belief system of the ghost hunter / researcher.

A belief system is a core set of values on which we base everything we do, say, or believe. We can classify our values as a 'set of rules' that define how we process and store information as it comes into our conscious mind. Our conscious mind takes these rules and polishes it to make it easier to process and store. The subconscious then takes this processed piece of information and associates it with other information that we classify as solid and accurate. During this association, we begin to understand the new information and are better able to assimilate it for future reference. Your belief system is forged by your personnel experiences, your religious views and your worldview.

Your worldview is a framework that ties everything together, that allows you to understand society, the world, and your place in it. It would synthesize the wisdom gathered in the different scientific disciplines, philosophies and religions. Rather than focusing on small sections of reality, it would provide a picture of the whole. In particular, it would help us to understand, and therefore cope with, complexity and change.
The problem with a belief systems and worldviews is that they are paradigms, limited to the perspective of the viewer. In reality, the totality of a concept may lie outside of the boundaries of these systems, or worse, be distorted by them.
Invoking a belief system or worldview is a blatant deviation from the scientific method and is the predominant basis for 99% of a ghost hunter's methodology and "theories'.
This alone is their biggest weakness and the easiest to expose. The skeptic only has to look for elements of this in group or individual.

- Use of dowsing rods, pendulums, Crystals, Ouija Boards or the like
- Psychics, Mediums or Sensitive's
- Demonologists, other religious icons or ideology

- Demonologists, other religious icons or ideology
- Reliance upon folklore (ghosts can't cross running water for example)
- Unwavering belief in ghosts (lack of skepticism)
- Interjection of "New Age" ideas or methodology

By utilizing elements of a belief system, the ghost hunter/ paranormal investigator has given their critics the first bullet to shoot them with. In some cases it may actually prove a whole magazine of ammunition.
The argument most often cited by some ghost hunters, is that science is just another kind of faith. It is a philosophic stance which ignores the trans-cultural nature of science. Science's theory of gravity explains why people do not float off the earth. All you have to do is jump to verify this theory. In popular usage, a theory is just a vague and fuzzy sort of fact and a hypothesis is often used as a fancy synonym to "guess". To a scientist however, a theory is a conceptual framework that explains existing observations and predicts new ones.

A hypothesis is a working assumption. Typically, a scientist devises a hypothesis and then sees if it ``holds water'' by testing it against available data (obtained from previous experiments and observations). If the hypothesis does hold water, the scientist declares it to be a theory.
Experiments sometimes produce results which cannot be explained with existing theories. In this case it is the job of scientists to produce new theories which replace the old ones. The new theories should explain all the observations and experiments the old theory did and, in addition, the new set of facts which lead to their development. One can say that new theories devour and assimilate old ones. Scientists continually test existing theories in order to probe how far they can be applied.

When an old theory cannot explain new observations it will be eventually replaced by a new theory. This does not mean that the old ones are wrong or untrue. It simply means that the old theory had a limited applicability and could not explain all current data. The only certain thing about currently accepted theories is that they explain all available data, which, if course, does not imply that they will explains all future experiments!

Sometimes new theories provide a completely new insight into the workings of nature. This is how we went from Newton's theory of gravitation to Einstein's Theory of Relativity. Regardless, no matter how grand or simple a new theory may be, it must explain the same phenomena that the old one did. Even the most beautiful theory can be annihilated by a single ugly fact.

Scientific theories also have varying degrees of reliability. You can envision them as being on a scale of certainty. Up near the top end we have our theory of gravitation based on a staggering amount of evidence; down at the bottom we have the theory that the Earth is flat. Some scientific theories are nearer the top than others, but none of them ever actually reach it.

An extraordinary claim is one that contradicts a fact that is close to the top of the certainty scale and will give rise to a lot of skepticism. So if you are trying to contradict such a fact, you had better have facts available that are even higher up the certainty scale: ``Extraordinary claims require extraordinary evidence''.

When a theory is said to be "true" it means that it agrees with all known experimental evidence. However, even the best of theories have, time and again, been shown to be incomplete. They might explain a lot of phenomena using a few basic principles, and even predict many new and exciting results, but eventually new experiments (or more precise ones) show a discrepancy between the workings of nature and the predictions of the theory. In the strict sense this means that the theory was not ``true'' after all; but the fact remains that it is a very good approximation to the truth, at lest where a certain type of phenomena is concerned.
When an accepted theory cannot explain some new data (which has been confirmed), the researchers working in that field strive to construct a new theory. This task gets increasingly more difficult as our knowledge increases, for the new theory should not only explain the new data, but also all the old one: a new theory has, as its first duty, to devour and assimilate its predecessors.

**Enter Ockham's Razor**
Many hypotheses are proposed, studied and rejected. Scientists discuss their validity and propose experiments that will determine the validity of one over the other. Yet, even when the unfit hypotheses are discarded, several options may remain. In some cases they make the exact same predictions, but having very different underlying assumptions. In order to choose among these possible theories there is a very useful tool called Ockham's razor.
Ockham's Razor is the principle proposed by William of Ockham in the fourteenth century: "Pluralitas non est ponenda sine neccesitate", which translates as "entities should not be multiplied unnecessarily".
In many cases this is interpreted as "keep it simple'', but in reality the Razor has a more subtle and interesting meaning. Suppose that you have two competing theories which describe the same system. If these theories have different predictions, one can simply find the one that is better by performing experiments with the required sensitivity and then determine which one give the most accurate predictions.
Let's look at three different hypotheses typically used by ghost hunters and use the razor to find the one that is most correct.

*"Ghosts are the lost souls of people who died untimely deaths."*

*"Ghosts are a electromagnetic phenomena created by a remnant of consciousness"*

*"Ghosts are perceived phenomena."*

The first hypothesis is flawed. It draws upon a belief system (souls / religion). This negates the hypothesis as it is not falsifiable. In this instance Ockham's Razor would unequivocally reject it.
The second is a little more correct, since consciousness is an electromagnetic phenomenon; however it must be supported by more concise data to verify the claim that consciousness can survive death.

to verify the claim that consciousness can survive death.
The third is the most correct. Various psychological conditions have been proved to induce ghost like symptoms, particularly mental disorders. Additionally, hysteria and psychosomatic response can contribute to a “perceived experience”.

A more straightforward application of the Razor is when we are face with two theories which have the same predictions and the available data cannot distinguish between them. In this case, the Razor directs us to study it in depth. It does not guarantee that the simplest theory will be correct, it merely establishes priorities.
A related rule, which can be used to slice open conspiracy theories, is Hanlon's Razor: “Never attribute to malice that which can be adequately explained by stupidity”.

People putting forward extraordinary claims often refer to Galileo as an example of a great genius being persecuted by the establishment for heretic theories. They claim that the scientific establishment is afraid of being proved wrong, and hence is trying to suppress the truth. This is a classic conspiracy theory. The Conspirators are all those scientists who have bothered to point out flaws in the claims put forward by the researchers. The usual rejoinder to someone who says “They laughed at Columbus, they laughed at Galileo” is to say “But they also laughed at Bozo the Clown”.

One of the commonest allegations against mainstream science is that its practitioners only see what they expect to see. Scientists often refuse to test fringe ideas because ``science'' tells them that this will be a waste of time and effort. Hence they miss ideas which could be very valuable. This is the ``blinkers'' argument, by analogy with the leather shields placed over horses eyes so that they only see the road ahead. It is often put forward by proponents of new-age beliefs and alternative health.
It is certainly true that ideas from outside the mainstream of science can have a hard time getting established. But on the other hand the opportunity to create a scientific revolution is a very tempting one: wealth, fame and Nobel prizes tend to follow from such work. So there will always be one or two scientists who are willing to look at anything new.

If you have such an idea, remember that the burden of proof is on you. The new theory should explain the existing data, provide new predictions and should be testable; remember that all scientific theories are falsifiable. Read the articles and improve your theory in the light of your new knowledge. Starting a scientific revolution is a long, hard slog. Don't expect it to be easy. If it was, we would have them every week. People putting forward extraordinary claims often refer to Galileo as an example of a great genius being persecuted by the establishment for heretic theories. They claim that the scientific establishment is afraid of being proved wrong, and hence is trying to suppress the truth. This is a classic conspiracy theory. The Conspirators are all those scientists who have bothered to point out flaws in the claims put forward by the researchers. The usual rejoinder to someone who says “They laughed at Columbus, they laughed at Galileo” is to say “But they also laughed at Bozo the Clown”.

**Paranormal Research and the Scientific Method**

Today many ghost hunters and paranormal investigators are familiar with the Scientific Method, in theory but not necessarily its application. The majority of ghost hunters seek rationale explanations when an unusual event occurs during a ghost hunt. They call this “replicating” and indeed it does follow the guidelines of Scientific Method. For example, a door that appeared to close by itself on camera is investigated further and discovered to have been moved by changing air pressure when an outside door is opened. The “paranormal phenomena” has been debunked. This is a useful and necessary function. I advocate it, but there is still something missing.

Being a ghost hunter, paranormal investigator or researcher implies a belief in ghosts and the paranormal. If one is to look for such phenomena, isn’t necessary to have some sort of working hypothesis so you at least have an idea of what you are looking for?
The lack of an operating hypothesis is the second biggest weakness of inquisitive groups and individuals of this sort. To demonstrate my point I will ask the question “What is a ghost?” I will list the three most popular responses and show how they violate the Scientific Method and Ockham's Razor.

*“No one truly knows what a ghost is.”*

This is the answer often given by the hobbyist, the inexperienced and clueless. If you have no idea on what you think a ghost is, then how are you going to look for it, much less construct a hypothesis about it. At some point you will have to create a hypothesis based on your observations and take a guess. The lack of a hypothesis violates the Scientific Method here.

*“A ghost is the spirit or soul of a deceased person, or any spirit or demon.”*

This answer has several problems. It has a basis in literature (as a definition) and as a belief system (souls, demons, spirits). As I discussed earlier, the introduction of a belief system will automatically shoot down anything generated by this answer.

*“A ghost is a residual haunting. It is a playback of a past event. The apparitions involved are not spirits, they are "recordings" of the event.”*

While this answer sounds more scientific, it is based solely in pseudoscience. Traditional science has already shown the “events” cannot be recorded into a house or location in the way that suggested by advocates of this hypothesis. If this was the case the energy would have to somehow defy the second of thermodynamics to even exist. Additionally it would be measurable and thus testable. As stated earlier, if a hypothesis contradicts a known law, in this case the second law of thermodynamics, additional data is necessary to prove how the phenomena defies that law.

I have argued that the scientific method is an excellent guideline for studying the world around us. It is, of course, conceivable that there are other “planes of thought” but their presence and properties, and what may happen in them is a matter of belief.
Pseudo sciences regularly rise and are eventually debunked. One might be bothered about their presence since it reflects negatively on human psychology. But even if one defends these beliefs on the basis of free speech, one should be aware that they sometimes represent more than idle talk.

I would like to add something that's not essential to the science, but something I believe. You should not try to fool the layman when you're talking as a scientist. I'm talking about a specific, extra type of integrity to show how you're maybe wrong.
A college tutor once told me that a bad scientist is one that comes up with a hypothesis and then attempts to prove it correct. A good scientist develops a hypothesis and then attempts to disprove it.

If you're representing yourself as a scientist, then you should explain to the layman what you're doing and if they don't support you under those circumstances, then that's their decision.
If you've made up your mind to test a hypothesis, or you want to explain some idea, you should always decide to publish it whichever way it comes out. If we only publish results of a certain kind, we can make the argument look good. We must publish BOTH kinds of results.

Cody Polston is the Founder and President of the Southwest Ghost Hunter's Association. Formerly an Explosive Ordnance Disposal technician, he has a varied scientific background related to that particular field. With over twenty years of ghost research, he initially started out as a skeptic before forming SGHA.

References: http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookEner1.html, www.allaboutscience.org/, http://pespmc1.vub.ac.be/,http://en.wikipedia.org/, http://phyun5.ucr.edu/, http://www.selfgrowth.com/

Back to SGHA articles