

Science & Critical Thinking

Today's session of One Life looks at science and critical thinking. What is science? Is it any good? The obvious answer would be yes but not everyone would agree these days. Gone are the "good old days" when mad scientist was the most respected career path you could go for. We will also be looking at critical thinking and questioning. So let's make a start.

What is science?

As ever we should probably start by building some kind of definition on the subject we are talking about here. Otherwise we are going to end up talking about cross purposes and things are going to get confusing.

It's traditional for us to start by looking the word up in the dictionary and seeing what the strict definition of the word is. And as is traditional also the dictionary yields a number of results which contradict each other in some way.

Dictionary.com Unabridged offers us...

1. A branch of knowledge or study dealing with a body of facts or truths systematically arranged and showing the operation of general laws: the mathematical sciences.
2. Systematic knowledge of the physical or material world gained through observation and experimentation.
3. Any of the branches of natural or physical science.
4. Systematized knowledge in general.

While the AHD offers us...

1. The observation, identification, description, experimental investigation, and theoretical explanation of phenomena.
2. Such activities restricted to a class of natural phenomena.
3. Such activities applied to an object of inquiry or study.

The first definition suggests that science is simply a part of the "whole truth" as it were. Meanwhile the other definitions suggest that science is simply a way of looking at something or a methodology for

discovering truth, whatever truth that may be. In short there appears to be no strict definition of science.

What do you consider science to be?

Is science reliable?

Science has seemed to be fairly reliable so far. As a general rule we can see it working – we can observe something and repeat these experiments and have what we expect to happen unveil in front of us. But then we are really just saying that the reason we use evidence – is because of evidence. Which seems to be a fairly circular argument. Can we really say then that science is reliable?

Further more empirical science is considered to be an alternative to rationalism (the believe that all truth must be formed from logic and reason, not to be confused with the more general form of rationalism which is opposed to irrationalism). After all logically, just because every swan you have seen is white so far does not mean that the next swan you see will be white. Yet following empirical methods we would probably say it would be white.

Can we rationally say science reveals absolute truth?

Problems with science

Generally the scientific method is applied by someone coming up with a hypothesis and then designing experiments to test the hypothesis. There are several problems with this approach however. Firstly it requires you to say what you think is happening before you test it and secondly it requires you to know what you want to happen when designing the experiments. Both of these could lead to a bias.

Due to the use of experience and history rather than logical reasoning and due to the open minded nature of science, we can never really be certain of a fact established by the scientific method. Given that this is most, if not everything, that we know, this means we can never really be sure of anything.

Do you think this, to an extent, invalidates the scientific method?

Alternative approaches

What is critical thinking?

Critical thinking is defined as a mental process of discernment, analysis and evaluation to quote the ever-bastion of human knowledge, Wikipedia. When you think critically you make judgements, usually (but not exclusively) reflective and seek to see both sides of the argument.

That having been said, I am sure many of us would disagree that we need to be told what critical thinking is. So let's open it up to debate.

What do you consider critical thinking to be?

Critical thinking is often linked in with the idea of being a free thinker. This of course leads on to the obvious question that what is a free thinker? And what is free thought? Again to quote Wikipedia, free thought is defined as “a philosophical viewpoint that holds that beliefs should be formed on the basis of science and logic and not be influenced by emotion, authority, tradition, or any dogma.”

Is this an accurate definition though? By this definition it would mean anyone who follows some kind of labelled movement be it religious, political or otherwise would probably not be a free thinker. And as a general rule, we can all find ourselves under one label or another.

Who then is to be considered a free thinker?

The power of questioning

One thing that is often well promoted among “free thinking” organisations is the idea that you should question everything – indeed, this is a idea often promoted by the Leeds Atheist Society. But is it actually as important to question everything as people often say or is it actually only in certain areas we need such methodical and comprehensive questioning. Do we really need to question everything our parents or the experts in a particular field tell us? Can we not simply accept some of the things they say?

It's also worth considering that there may simply be no point in questioning sometimes. I can ask as many questions as I like about

what people tell me about quantum theory. But what is the point given it is unlikely I will ever full understand it?

Is questioning everything important? Or at least as important as proposed by “free thinking” groups?

It is also worth noting that while many of us would preach that we question everything, it is unlikely to be true that we actually do. For example I have never questioned whether Australia is a real place. I've never been there. I've only seen it and heard of it. But I don't question whether it is there or not, I simply accept it.

Do we actually question everything? Is it even possible to?

Conclusion

So, at this point we should probably attempt to draw some conclusions from what we have discussed in this session. First of all we looked at science and what it is – a methodology for discovering truth which is not perfect but works very well in the real world and can be used in combination with other methodologies.

We then looked at critical thinking and questioning everything and the importance of it. The conclusion that we can draw from this is that science and a critical thinking and important because they provide us with a strong basis for discovering truth in the real world.