Assistert Selvhjelp
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Realism and Antirealism [1]

Martyn Shuttleworth [2]48.6K reads

Realism and antirealism are two sides of a philosophical debate behind the whole basis of accepted scientific truth.

These contrasting views dictate how the observations generated by science are applied to the world. Whilst applicable to science, the wider debate involves many areas, including religion, politics and everyday life.

In science, the debate is a very important undercurrent, questioning the boundary between theory and applied science.

Whilst a student performing an experiment to determine the acidity of lemons should not worry too much, areas such as quantum physics are questioning how we see the universe. Theorists and researchers are pushing the boundaries of reality, and are hypothesizing particles that are seen only indirectly, so the debate takes on great relevance.

What is Realism?

The basis behind realism is the acceptance that non-observable phenomena actually exist.

A great example of assuming existence is black holes. No scientist has ever seen a black hole, but theory predicts that they exist. The observation of vast clouds of matter swirling around super-dense objects leads many physicists to state that they should be regarded as truth.

Interestingly, quantum physicists believe that the Large Hadron Collider will create micro-black holes, so the boundary between realism and antirealism may soon be tested.

The main support for this idea is that science should be regarded as approximately true, a process closely allied with Popper's falsifiability [3]. Because no scientific research [4] can ever be accepted as fact, the boundary between theory and research is blurred.

There is no clear distinction or definition, between theory and law. Paradigm shift [5] is an example of changing truth-values, where scientists now have to debunk beliefs that they originally thought of as true. The realism and antirealism [6] debate asks questions about the very core of the scientific method [7].

What is Antirealism?

Antirealists take a diametrically opposite view, that a theory should never be regarded as truth.

Proponents believe that science is full of theories that are proved incorrect, and that the majority of theories ultimately are rejected or refined. Great theories, such as Newton's laws, have been proved incorrect.

Looking into history, there are many theories that sound absurd to modern scientists, such as the idea that heat is an invisible liquid called phlogiston.

These were all perfectly logical theories, at the time, using the empirical data [8] available, but have passed into the backwaters of science.

Even such huge theories as Darwin's Natural Selection and Einstein's Relativity have needed modification and adaptation. The antirealists believe that theories are merely useful tools, often used after they are proved wrong.

For example, Newton's laws, and Relativity, are still useful in majority of cases, but have limitations at sub-atomic levels.

Realism and Antirealism - What is the Answer?

The realism and antirealism debate is very complex and, as with most philosophy, there is a vast grey area.

For example, I have never been to Australia, but I am sure that it exists. I have no solid evidence to base this upon, but it is accepted by fact by most people in the world. Only the esoteric metaphysical philosophers, questioning 'being', and 'self', raise any objections.

By contrast, if I say "I have never seen a quark, but I believe that they exist", this is part of a more complex debate. Theorists have only ever seen quarks indirectly, but there is a chance that other phenomena may be responsible. Delving even further into the realism and antirealism debate, talking about superstrings is on the boundaries of pseudoscience [9].

In this respect, there is a small dividing line between extreme science and religion [10]. Saying that God exists is not too dissimilar to saying that Quark's exist, although it is more likely that empirical evidence [8] will become available for the latter.

Because there is no clear dividing line between what can be accepted as truth, and what is conjecture, most scientists do not stray into this area. They slowly build upon accepted theories that only a major paradigm shift [5], or the refuting of a fundamental principle, can alter.

For example, the speed of light in a vacuum is assumed to be approximately 1.08×109. If this were proved incorrect, either the laws of physics would collapse, or at extensive modification would be in order.

The slow accumulation of observations, and the testing [11] of small hypotheses, in order to construct a larger theory, is one way of avoiding potential problems with realism and

antirealism.

Even in theoretical physics, empirical data [8] always takes priority over theory, avoiding the worst of the debate. The slow and patient research into the structure of the atom by J. J. Thomson [12], Rutherford, and Bohr slowly built up proof for the existence of an electron. Even if they could not directly see elementary particles, their proof has come to be accepted as true.

This is the attitude of most scientists; they try to ignore the debate and let the philosophers decide the fine details about the nature of reality!

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