Testability

The crucial part of obtaining proof for a hypothesis is ensuring that it has an inherent testability.

With the growth of the 'Intelligent Design' movement in certain parts of the world, the debate about the very nature of science has once again entered the public consciousness.

Proponents of ID are trying to attack the established theories about evolution and natural selection, claiming that they are non-testable and non-falsifiable. They conveniently neglect the fact that their own theory fulfills none of the established scientific methods.

Testability – the Bedrock of Theory

Whenever you create a hypothesis to prove a part of a theory, it must be [testable](#) [1] and analyzable with current technology.

Reasoning Cycle - Scientific Research

You may develop a great hypothesis to try to verify part of a theory but, if it involves a lot of resources and money that you do not have, it is effectively invalid. This is speculation and cannot be regarded as a genuine hypothesis.

Whenever you design an experiment, from the start, it must always revolve around this central tenet of testability. If you follow the '[Steps of the Scientific Method](#) [2]' and use all of the scientific elements, including initial conception, [hypothesis generation](#) [3] and obtaining analyzable results, then you will have fulfilled the fundamental basics of testability.

Whilst a hypothesis is never completely confirmed, if repeated experiments show that a hypothesis is true, it becomes accepted as fact. This process has fulfilled all of the conditions of testability and falsifiability and it is therefore scientific. A [theory](#) [4] will always remain falsifiable at some point in the future, however compelling the present evidence.

Evolution and natural selection fall within this field and have been tested rigorously over the intervening years. To be truly testable, a hypothesis should be falsifiable, with counter-testing and proof of the null hypothesis possible.

A hypothesis such as 'An Intelligent Designer created the Earth and all life according to biblical laws' has no testability, so remains within the realms of theology and pseudo-science.

The Evolution of Darwin's Theories

Darwin could not have known that an understanding of genetics and DNA would lead to a more rigorous testing of his theory, nor could Newton have had any inkling of particle accelerators and quarks.

The fact that their theories are not the complete answer does not make their [research](#) [5] unscientific. Their ideas were genuinely testable and the [experimentation](#) [6] followed all of the established scientific principles.

In fact, the fact that these theories are under question shows that they were true science.

Neither theory was completely jettisoned but they have evolved and adapted to new technologies and methods. This is how science keeps moving ahead and avoids entrapment in dogma and speculation. [Testability](#) [7], even more than [falsifiability](#) [8], is probably the most fundamental aspect of science, separating it from theology, maths and philosophy.

As an aside, this places archaeology and history closer to science than maths!

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