DARWINISM

Separating ***fact*** from ***fiction*** in the theory of evolution

"It's an absolute fact that evolution is true, and it has been scientifically proven that humans and chimpanzees have a common ancestor! How dare you question what scientists have already agreed upon?!" – **demagogues of scientism**

The emotional attachment to Darwinian evolution (otherwise referred to as Darwinism or neo-Darwinism), and the apprehension by some of its adherents to question it, has resulted in the greatest failure in the history of modern science. This is the reason that the field of biology is currently divided in two; Darwinists, and non-Darwinists. That is a fact that most people aren't aware of – although Darwinism might seem like a consensus among experts, it is anything but that, and this paper will elucidate the matter with a brief introduction to the bifurcation within evolutionary biology.

So let's begin with some simple terms and misconceptions:

Evolution – changes in the genetic constitution of a population of organisms, or in an ensemble of populations of a species[1]

Darwinism – the theory of natural selection of Charles Darwin as proposed in his work *On the Origin of Species* (1859), i.e. descent with modification. The original mechanism of Darwinism – natural selection – is still considered valid but has been supplemented by additional data (such as the inheritance system of Mendelian genetics)[2]

Microevolution – local evolution within populations and species[3]

Macroevolution – genetic change sufficient to form new species[4]

Species – the basic lower unit of classification, consisting of a population or series of populations (demes) of closely related and similar organisms capable of interbreeding freely with one another, and which produce viable and fertile offspring[5]

Scientific Observation – act or instance of viewing or noting a fact or occurrence for some scientific purpose[6]

Scientific Theory – in science (including human evolutionary biology), any set of broad hypotheses that have been subjected to repeated tests and that currently have not been falsified and rejected[7]

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[1] Michael P. Muehlenbein, *Human Evolutionary Biology,* Cambridge University Press (Cambridge), 2010, p 3.
[2] L. L. Mai, M. Young Owl and M. P. Kersting, *The Cambridge Dictionary of Human Biology and Evolution,* Cambridge University Press (Cambridge), 2005, p 133.
[3] Ibid, p 336.
[4] Ibid, p 315.
[5] Ibid, p 498.
[6] Ibid, p 372.
[7] Ibid, p 527.

As defined above, in textbooks published by Cambridge University Press, and used in Harvard, there is a very clear distinction between 'evolution' and 'Darwinism'. The former is a fact which we have proved through scientific observations, while the latter is a scientific theory which is currently the best workable model, but by no means absolute. Evolution is merely the change in gene frequency within a population/species, which we have actually observed, like the Long-Term Evolution Experiment (LTEE) of E. coli by Richard Lenski[89] published in Nature Journal (the most renowned peer-reviewed journal in the world). The interesting thing about this experiment – and others like it – is that they have been studying that strain of bacteria since 1988 and have observed the evolution of 12 populations of E. coli over 66,000 generations (as of 2018), yet it has still only proven microevolution to be true, and NOT macroevolution. In fact there has never been a study capable of proving macroevolution to be true. So when scientists and laypeople speak about these terms, there are usually miscommunications and implicit inferences that may mislead people who are not scientifically literate. When a biologist says "evolution is a fact because it has been observed", what they are referring to is microevolution, but when a layperson hears that statement they are thinking about macroevolution (i.e. from one species to another) or even Darwinism, which is currently a scientific theory. And although theories in science are extremely reliable, unlike a theory in literature (which is called 'hypothesis' in science), they are still subject to the limitations of science which many of the greatest philosophers and scientists have explained; Thomas Kuhn[10], David Hume[11], Karl Popper[12], Max Planck[13], Nick Bostrom[14] etc.

Now Darwinism is a tricky one because it is a robust theory which has worked extremely well for 160 years and has not only withstood many falsification tests but has also contributed a great deal to humanity, from the medical industry which has helped billions of people, to giving us a better picture about our history and where we come from. But is Darwinian evolution the end of the story? Do natural selection and genetic drift adequately explain the whole history of life on this planet? The truth is, no one knows, but the best minds are working on it. In the year 2019 there are more experts than ever who have, in one way or another, criticized Darwinism and began proposing alternative theories to evolution. And this should be of no surprise, because although it has become almost like a religious ideology, even Darwin himself was not so arrogant about his theory. In fact, in the very introductory chapter of his magnum opus 'On the Origin of Species' he refutes many of his later successors and ideologues with these very intellectually sincere words:

> For I am well aware that scarcely a single point is discussed in this volume on which facts cannot be adduced, often apparently leading to conclusions directly opposite to those at which I have arrived.[15]

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[8] Good et al., "The Dynamics of Molecular Evolution Over 60,000 Generations," *Nature* 551.7678, 2017, pp 45-50.

[9] Bouma et al., *"Evolution of a bacteria/plasmid association," Nature* 335.6188, 1988, pp 351-352.

[10] See: Thomas S. Kuhn, *The Structure of Scientific Revolutions*, The University of Chicago (Chicago), 1962, second edition, enlarged, 1970.

[11] See: David Hume, *An Enquiry Concerning Human Understanding*, Oxford University Press (New York), 1999.

[12] See: Karl Popper, *The Logic of Scientific Discovery*, Routledge, an imprint of the Taylor & Francis Group (London), 2002, this edition published in the Taylor & Francis e-Library, 2005.

[13] See: Max Planck, *Where is Science Going?*, W. W. Norton & Company, Inc. (New York), 1932.

[14] See: Nick Bostrom, *Anthropic Bias: Observation Selection Effects in Science and Philosophy*, Routledge (New York), 2002.

[15] Charles Darwin, *The Origin of Species*, P. F. Collier & Son (New York), 1909, p 22.

This shows that he was well aware that his theory could indeed be subject to alternate conclusions. And that isn't all, he also has a whole chapter in the book dedicated to the flaws the theory faces called 'Chapter VI: Difficulties of the Theory', where he lists some of the problems; like 'gradualism' (which he terms "fine gradation"). This list of difficulties has only grown longer in the past century, and here are just a few of the ones that have been exposed by experts:

Punctuated Equilibrium – as proposed by renowned evolutionary biologist Stephen Jay Gould[16]

Gradualism – as problematized by the renowned geologist Michael Rampino[17]

Homoplasy – a contradiction to the fundamental premise of Darwinism which is 'homology', as defined by the pioneering works of Michael J. Sanderson and Larry Hufford[18]

Mathematic Impossibility – as refuted by the many mathematicians since the 1960s, and comprehensively covered in the works of Stephen C. Meyer[19]

Epigenetic Inheritance – as proposed in the alternative theory of evolution 'neo-Lamarckism' by geneticist Eva Jablonka[20]

Horizontal Gene/DNA Transfer – as proposed in the new alternative theory of evolution 'Natural Genetic Engineering' by world leading geneticist James A. Shapiro[21]

Selection Theory – progression of the mechanism of natural selection from kin selection, to group selection, to multilevel selection as proposed by the world's leading expert David Sloan Wilson[22]

Altruism – as explored (in the form of 'reciprocal altruism') in the works of Elliot Sober[23]

Homosexuality – as problematized by the renowned philosopher of science David Stove[24]

Explorer Modes – as proposed by the leading evolutionary biologist Bret Weinstein[25]

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[16] See: Niles Eldredge and Stephen Jay Gould, "Punctuated equilibria: an alternative to phyletic gradualism," T. J. M. Schopf (ed.), *Models in Paleobiology*, Freeman Cooper (San Francisco), 1972, pp 82-115.

[17] See: Michael R. Rampino, *Cataclysm: A New Geology for the Twenty-First Century*, Columbia University Press (New York), 2017.

[18] See: Michael J. Sanderson and Larry Hufford, *Homoplasy: The Recurrence of Similarity in Evolution*, Academic Press (California), 1996.

[19] See: Stephen C. Meyer, *Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design*, HarperCollins (EPub Edition), 2013.

[20] See: Eva Jablonka and Marion J. Lamb, *Evolution in Four Dimensions, Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*, The MIT Press (Cambridge, MA), 2014.

[21] See: James A. Shapiro, *Evolution: A View from the 21st Century*, FT Press Science (New Jersey), 2011.

[22] See: David Sloan Wilson, *Darwin's Cathedral: Evolution, Religion, and the Nature of Society*, University Of Chicago Press (Chicago), 2002.

[23] See: Elliot Sober, *Conceptual Issues in Evolutionary Biology*, MIT Press (Cambridge, MA), 2006.

[24] See: David Stove, *Darwinian Fairytales: Selfish Genes, Errors of Heredity, and Other Fables of Evolution*, Avebury (Aldershot), 1995.

[25] See: Bret Weinstein, "Explorer Modes - The Most Interesting Unanswered Question in Evolutionary Biology | Bret Weinstein", *YouTube*, 29 Nov 2018, web, 11 September 2019.

This list can go on forever, but the point is that there are numerous holes in Darwinism that call for a scientific revolution and a new paradigm (as defined by Kuhn). Just like in the early 20th century, when the theory of space, time, gravity, and light were completely overturned from the Newtonian paradigm to a new, more cogent, theory of Relativity, by Einstein, today scientists are close to overturning the Darwinian understanding of evolution and proposing a completely new theory that is more comprehensive and has more explanatory power. Natural selection and genetic drift might be enough to explain the 19th century evidence of the world, but today we have a much more complex database that Darwinism is just unable to explain, so biologists have been working hard to find solutions. This is just a short list of a few current alternate theories and the leading experts proposing/exploring them:

Natural Genetic Engineering – James A. Shapiro
Mutation-Driven Evolution – Masatoshi Nei
Neo-Lamarckism – Eva Jablonka
Self-Organization – Stuart Kauffman
Symbiogenesis – Lynn Margulis
Hologenome – Richard Jefferson
Intelligent Design – Stephen C. Meyer
Biocentricism – Robert Lanza
The Third Way – Denis Noble

There is no consensus on Darwinism. Today there are thousands of scientists around the world who have abandoned the theory and are working on alternatives. For example, there is an organization called 'The Third Way of Evolution'[26] which consists of hundreds of experts from all over the world including professors from MIT, Oxford, Princeton, Sheffield, Stanford, King's College etc. The organization was founded by James A. Shapiro, who is a leading biologist and the first geneticist to isolate a single gene from an organism, and he teamed up with Denis Noble (first biologist to mathematically model the working heart) and Raju Pookottil.

Darwinian Evolution, like all other scientific theories, is the best interpretation of the data we currently have, but it is not absolute. It is a probabilistic framework, it is subject to assumptions, and it has many disputes. For one thing, consider the fact that according to the National Science Foundation (and supported by many peer-reviewed papers), "the fossil record has many holes, making it impossible to count every species that evolved and subsequently disappeared, perhaps, scientists believe, some 99 percent of all species that have ever existed".[27] So scientists are essentially working with extremely limited data – less than 1% of all fossil records – so it is understandable that Darwinism is flawed and will get overturned.

Like all other theories in science, we should appreciate Darwinism for its workability, but not become so attached to it that we don't see its flaws. Michael Ruse, the renowned philosopher, published the book 'Darwinism As Religion' because that's exactly what it has become. We should not have blind faith in scientific theories, rather we should be loyal to the scientific method, which will continue to evolve.

[26] "The Third Way of Evolution", www.thethirdwayofevolution.com, web, 11 September 2019.
[27] "Earth's Sixth Mass Extinction: Is It Almost Here?", *The National Science Foundation*, 2 March 2011, web, 11 September 2019.