

B L O O M S B U R Y

ENCYCLOPEDIA OF PHILOSOPHERS



Hossfeld, Uwe , and Georgy S. Levit. "Haeckel, Ernst (1834–1919)." Bloomsbury Encyclopedia of Philosophers. London: Bloomsbury Publishing, 2020. Bloomsbury Encyclopedia of Philosophers 2019 Collection~Bloomsbury Encyclopedia of Philosophers 2020 Collection~Bloomsbury Encyclopedia of Philosophers~. Web. 8 Jun. 2020.
<<http://dx.doi.org/10.5040/9781350994997.0006>>.

Accessed from: www.bloomsburyphilosophers.com

Accessed on: Mon Jun 08 2020 10:52:14 Eastern Daylight Time

Access provided by: BEP - Authors - May 2020

Copyright © Bloomsbury Publishing 50 Bedford Square London WC1B 3DP www.bloomsbury.com
2020

Haeckel, Ernst (1834–1919)

by Uwe Hossfeld and Georgy S. Levit

DOI:10.5040/9781350994997.0006

Publisher: Bloomsbury Publishing

Identifier: b-9781350994997-0006

FULL ARTICLE

Biography

The German biologist, philosopher and artist Ernst Heinrich Philipp August Haeckel was Charles Darwin's (1809–1882) younger contemporary and a key figure of the "first Darwinian revolution." He was born on February 16, 1834, in Potsdam, Germany, to wealthy parents (his father was a jurist and privy counselor in Prussia). After graduation from a gymnasium (secondary school) in Merseburg, Haeckel studied medicine and allied sciences at the universities of Berlin, Würzburg, and Vienna with Johannes Müller (1801–1858), Albert von Koelliker (1817–1905), and Rudolf Virchow (1821–1902). When Haeckel was twenty-three years old (1857), he earned his medical doctor degree and started to work as a physician. However, after being confronted with real patients, after only a few months he gave up practical medicine and decided to move to Italy to study radiolaria. In 1860, when back from Italy, the 26-year-old Haeckel admirably read the German translation of Darwin's *On the Origin of Species* (1859). The young naturalist was immediately impressed to such an extent that he defended Darwin's system of theories against fierce attacks from some of his colleagues. His experimental work on the systematics of radiolaria resulted in his Habilitation (higher level thesis necessary for promotion) in 1861 at the University of Jena, which was encouraged by the famous comparative anatomist Carl Gegenbaur (1826–1903). After that, Haeckel became a Privatdozent (lecturer). When his first major monograph on the systematics of the radiolaria was published (1862), he was in the same year promoted to an "außerordentlicher" Professor (associate professor). On September 19, 1863, Haeckel, at the Meeting of the German Association of Naturalists and Physicians in the city of Stettin, held his seminal talk *Ueber die Entwicklungstheorie Darwin's* (On Darwin's Evolutionary Theory) known as the "Stettin Speech." The speech designated Haeckel's Darwinian turn and delighted Darwin himself. Following this speech, Haeckel became known as one of the most influential advocates and popularizers of evolutionism worldwide. Moreover, in his *Generelle Morphologie* (General Morphology, 1866), Haeckel concluded that all complex forms of life on Earth originated from bacteria. This was a remarkable insight that, decades later, laid the foundation for the now widely accepted "two primary domains of life-model" describing the origin of the first eukaryotic cell.

In 1865 Haeckel earned his second doctorate in zoology (Dr. phil.) and was appointed to the (first) Chair of Zoology at the University of Jena, the position he held until becoming an emeritus on April 1, 1909. In the course of almost fifty years in office at his Alma Mater Haeckel made Jena into the stronghold of Darwinism. As well as his British counterparts Darwin and Alfred Russel Wallace (1823–1913), Haeckel gained much field experience in various geographical regions. He traveled a lot (over ninety journeys), including to tropical regions (in 1881 Ceylon; 1900 Java and Sumatra), where he not

only explored nature but also demonstrated his outraging artistic skills. Haeckel discovered over 4,000 new marine species, held four Dr. h.c. degrees and was a member of over seventy societies and academies (Leopoldina and the Royal Society of Edinburgh, amongst others). In 1900 the Royal Society awarded him the Darwin-Medal, and in 1908 he received the Linnean Society of London's prestigious "Darwin-Wallace Medal." He published approximately 700 journal and newspaper articles, and 18 major books.

The specificity of Haeckel's approach to Darwinism was in his aspiration to make it into a universal worldview opposing major religious doctrines. He tried to harmonically combine science, philosophy (monism), and art as mutually strengthening instruments. Haeckel died on August 9, 1919, in Jena in his house Villa Medusa, which reflected in its design both his scientific and artistic aspirations.

Between biology and philosophy

Ernst Haeckel is known first of all as a crucial figure in the growth of Darwinian biology in the nineteenth century, as a "German Darwin." He was definitely the major figure of the first Darwinian revolution in German lands. In his time more people learned evolutionary theory from his publications than from any other sources, including Darwin's own writings. He defended and developed the Darwinian theory with the passion and energy as nobody else on the continent and created a conceptual framework within which the majority of Darwinians worldwide worked over decades. Contemporary biology and related sciences are unthinkable without concepts coined by Haeckel such as "phylogeny," "monophyletic," "polyphyletic," "ontogeny," "biogenetic law," or "ecology." Moreover, his novel theories were encouraged and admired by Darwin himself. It was Haeckel, who crucially contributed to the visualization of the Darwinian theory by designing multiple "phylogenetic trees" reflecting evolutionary pathways of various organismic groups including humans. In that sense Haeckel can be regarded as pioneer of Darwinian biological anthropology as well. Being an outstanding artist, Haeckel greatly contributed to the visualization of biodiversity. His famous collection *Art Forms in Nature* (1899–1904), with 100 pictures representing for instance macroscopic and microscopic marine organisms such as radiolaria, made biodiversity esthetically pleasurable for a broad audience.

Yet, in contrast to Darwin himself, Haeckel from the very beginning tried to turn Darwinism into a universal worldview. His universalism did not merely embrace academic philosophy along with science, it made philosophy and natural science into an inseparable whole. For him all true natural science was philosophy, and all true philosophy was natural science. All true science (*Wissenschaft*), however, was natural philosophy.

At the core of Haeckel's doctrine was the concept of evolution as a universal phenomenon affecting everything from inorganic matter to man. He believed in the unity of body and soul, and the unity of spirit and matter. This monism guided Haeckel's work from his first major Darwinian book *Generelle Morphologie* (1866) to his last book on *Kristallseelen* (*Cristal's Souls*, 1917). The adoption of substance monism as a scientific meta-methodology and basis for a new worldview (*Weltanschauung*) was Haeckel's major philosophical acquisition. Substance monism, such as the materialist, idealist, or neutral monism, suppose that all concrete objects fall under one high type (namely, matter, idea, neutral substance). Haeckel combined matter, energy, and psychoma (the world's soul) into the trinity of substance, thus embracing all basic physical and psychological features within one doctrine. All

three elements of the trinity were paralleled by the corresponding conservation laws: the conservation of matter, energy of psychoma, or *Empfindung* (perception). In his last philosophical manifest *Gott-Natur* (*Theophysis*) (*God-Nature* [*Theophysis*], 1914), Haeckel claimed that his universal concept of substance serves reconciling old and still continuing controversies between materialism, energetics, and panpsychism.

Although grasped by Haeckel himself as a part of the Spinozian movement, his own teaching was in the first place the teaching of the omnipresence of evolution. An all-embracing but organism-centered evolutionism that has life-possessing, energetic matter as its substantial, causal foundation, ultimately led by him to anthropocentrism rooted in pan-psychism that expressed itself in a vectored, teleologically appearing evolutionary development. Haeckel explicitly denied teleology in biological evolution, but the whole logic of his doctrine suggests inevitable progress toward intelligent creatures.

Monism and evolutionary theory were for Haeckel parts of the same research program labeled the "*monistischen Entwicklungslehre*" (monistic doctrine of evolution). At the core of the monistic worldview was the idea that all sciences exploring humans and their soul activities (and especially so-called humanities) as well as special fields of zoology can be interpreted as natural sciences. The strong connection between the concepts of evolution and monism can be seen in an example of Haeckel's work *The Monism and the Link between Religion and Science. The Creed of a Natural Scientist* (1892). In this printed lecture (known as "*Altenburg speech*"), Haeckel confessed that the monistic idea of God is compatible with natural sciences and recognized the spirit of God in all things; God cannot be seen as a personalized being anymore, namely, an individual with a constrained spatial and temporal extension. Furthermore, he claimed that the Truth, the Good, and the Beautiful are the three noble divinities before which we kneel. There will be new altars built in the twentieth century, Haeckel argued, to celebrate the "*trinity of monism.*"

Haeckel's views were under the strong influence of the German poet Johann Wolfgang von Goethe (1749–1832). The affinity of Haeckel's monistic worldview to Goethe's conceptual heritage is easy to see. Firstly, it was Goethe whose *Naturphilosophie* served as an interpretive pattern within which Haeckel moves; it is not an accident that his *General Morphology* and each of its chapters is introduced with quotes from Goethe. There were typological elements characteristic for Goethe in his doctrine as well. In the second half of the nineteenth century, the theoretical landscape of morphology, embryology, and evolutionary theory was dominated by the Jena school, specifically by Haeckel and his senior colleague, Carl Gegenbaur. They succeeded in moving the center of gravity in morphological research to comparative phylogenetic studies, but they failed to completely overwhelm a strong typological bias, as pre-Darwinian "*Typological thinking*" survived in their concepts.

Influence

Haeckel's monistic creed brought him into conflict with traditional religions. In the German public discourse around 1900, Haeckel became a crucial figure in the debate of natural sciences against religion. In 1904, while attending the International Free-Thinkers Conference in Rome, Haeckel was celebrated as the "*anti-pope,*" as a leader of the anti-Catholic movement.

Being a relatively broad social movement on the Continent at the turn of the century, monism in its Haeckelian version successively lost its influence in society with the outbreak of the First World War. Within philosophy, Haeckel's ideas survived first of all due to the work of his most ardent popularizer and former pupil, Heinrich Schmidt (1874–1935). Within biology itself, Haeckel's philosophy of monism had little influence, although the major figure of the second Darwinian revolution in German lands, the zoologist Bernhard Rensch (1900–1990), in his Biophilosophy proclaimed monism as a reasonable scientific meta-methodology and basis for a new *Weltanschauung*, therefore, establishing some continuity between the first and the second Darwinian revolutions in Germany.

Bibliography

Primary works

Generelle Morphologie der Organismen. Allgemeine Grundzüge der organischen Formen-Wissenschaft, mechanisch begründet durch die von Charles Darwin reformierte Descendenztheorie (General Morphology of Organisms. Main Features of the Science of Organic Forms, Mechanically Accounted for by Charles Darwin's Reformed Theory of Descent). 1866. 2 Vols. Vol. 1: Allgemeine Anatomie der Organismen; Vol. 2: Allgemeine Entwicklungsgeschichte der Organismen. Berlin.

Natürliche Schöpfungsgeschichte. Gemeinverständliche wissenschaftliche Vorträge über die Entwicklungslehre im Allgemeinen und diejenige von Darwin, Goethe und Lamarck im Besonderen, über die Anwendung derselben auf den Ursprung des Menschen, und andere damit zusammenhängende Grundfragen der Naturwissenschaft (Natural History of Creation. Exoteric Scientific Lectures on the Theory of Evolution in General and the One of Darwin, Goethe and Lamarck). 1868. Berlin.

Die Kalkschwämme (Calcareous Sponges). 1872b. [Monograph] 2 Vols. and an atlas with 60 plates. Berlin.

Anthropogenie oder Entwicklungsgeschichte des Menschen. Gemeinverständliche wissenschaftliche Vorträge über die Grundzüge der menschlichen Keimes- und Stammes-Geschichte (Anthropogeny or Evolutionary History of Humans. Exoteric Scientific Lectures about the Essentials of the Embryonal- and Phylogenetic History of Humans). 1872a. Leipzig.

Das Protistenreich (The Kingdom of Protists). Eine populäre Übersicht über das Formengebiet der niedersten Lebewesen. Mit einem wissenschaftlichen Anhang: System der Protisten (Leipzig, Germany, 1878).

Das System der Medusen (The System of Medusa). 1879/1881. 2 Vols. Vol. 1, System der Craspedoten, Vol. 2, System der Acraspeden. Jena.

Systematische Phylogenie. Entwurf eines natürlichen Systems der Organismen aufgrund ihrer Stammesgeschichte (Systematic Phylogeny. A Draft of a Natural System of Organisms on the Basis of Their Phylogenetic History). 1894–1896. 3 Vols. Vol. 1, Systematische Phylogenie der Protisten und Pflanzen, Vol. 2: Systematische Phylogenie der wirtellosen Thiere (Invertebrata), Vol. 3, Systematische Phylogenie der Wirbelthiere (Vertebrata). Berlin.

Die Welträthsel. Gemeinverständliche Studien über monistische Philosophie (The Riddle of the Universe. The Exoteric Studies in the Monist Philosophy). 1899. Bonn.

Kunstformen der Natur (Art Forms in Nature). 1899–1904. 100 plates in 10 installments. Leipzig.

Gemeinverständliche Vorträge und Abhandlungen aus dem Gebiete der Entwicklungslehre (Exoteric Lectures and Essays in the Field of Evolutionary Theory). 1902. Bonn.

Die Lebenswunder. Gemeinverständliche Studien über Biologische Philosophie (The Wonders of Life. Exoteric Studies in the Philosophy of Biology). 1904. Supplementary volume to The Riddle of the Universe. Stuttgart.

Das Menschen-Problem und die Herrentiere von Linné (The Humans-Issue and the Primates of Linné). 1907. Frankfurt.

Gott-Natur (Theophysis) (God-Nature [Theophysis]). 1914. Leipzig.

Kristallseelen—Studien über das anorganische Leben (Crystal Souls—Studies of Inorganic Life). 1917. Leipzig.

Other relevant works

Bölsche, Wilhelm. 1900. Ernst Haeckel. Ein Lebensbild. Leipzig.

Haeckel, Ernst. Entwicklungsgeschichte einer Jugend. Briefe an die Eltern 1852/1856. 1921a. Introduced by Heinrich Schmidt. Leipzig.

Haeckel, Ernst. Italienfahrt Briefe an die Braut 1859/60. 1921b. Introduced by Heinrich Schmidt. Leipzig.

Haeckel, Ernst. Von Teneriffa bis zum Sinai. 1923a. [Travel sketches]. Leipzig.

Haeckel, Ernst. Berg- und Seefahrten 1857/1883. 1923b. Leipzig.

Haeckel, Ernst. Gemeinverständliche Werke. 1924. 6 Vols. Edited by Heinrich Schmidt. Leipzig.

Haeckel, Ernst. Gott-Natur (Theophysis). 2008. Annotated reprint from 1914. Stuttgart.

Schmidt, Heinrich. 1914. Was wir Ernst Haeckel verdanken. Ein Buch der Verehrung und Dankbarkeit. Im Auftrage des Deutschen Monistenbundes. Festschrift zum 80. Geburtstag. 2 Vols. Leipzig.

Schmidt, Heinrich. 1926. Ernst Haeckel. Leben und Werke. Berlin.

Schmidt, Heinrich. 1931. Harmonie. Versuch einer monistischen Ethik. Dresden.

Schmidt, Heinrich. 1934. Ernst Haeckel. Denkmal eines großen Lebens. Jena.

Further reading

Aescht, Erna, Gerhard Aubrecht, and Erika Krauß, eds. 1998. Welträtsel und Lebenswunder. Ernst—Werk, Wirkung und Folgen. Stapfia 56, zugleich Kataloge des OÖ. Landesmuseums, NF 131. Linz.

Breidbach, Olaf. 2006. Bildwelten der Natur. Munich.

Di Gregorio, Mario. 2005. From Here to Eternity. Ernst Haeckel and Scientific Faith. Göttingen.

- Dodel, Alfred. 2019. Ernst Haeckel als Erzieher. Reprinted with annotations. Gera.
- Elsner, Norbert, ed. 2000. Das ungelöste Welträtsel. Frida von Uslar-Gleichen und Ernst Haeckel. Briefe und Tagebücher. 3 Vols. Göttingen.
- Heberer, Gerhard. 1968. Der gerechtfertigte Haeckel. Einblicke in seine Schriften aus Anlaß des Erscheinens seines Hauptwerkes "Generelle Morphologie der Organismen" vor 100 Jahren. Stuttgart.
- Hemleben, Johannes. 1974. Ernst Haeckel, der Idealist des Materialismus. Hamburg.
- Hoßfeld, Uwe and Lennart Olsson. 2003. "'The Road from Haeckel. The Jena Tradition in Evolutionary Morphology and the Origin of 'Evo-Devo''." *Biology & Philosophy* 18: 285–307.
- Hoßfeld, Uwe and Olaf Breidbach. 2005. Haeckel Korrespondenz: Übersicht über den Briefbestand des Ernst-Haeckel-Archivs. Berlin.
- Hoßfeld, Uwe. 2016. Geschichte der biologischen Anthropologie in Deutschland. Von den Anfängen bis in die Nachkriegszeit. 2. Auflage. Stuttgart.
- Hoßfeld, Uwe, Georgy S. Levit, and Ulrich Kutschera, eds. 2019. "Ernst Haeckel (1843–1919): The German Darwin and His Impact on Modern Biology." *Special Issue of Theory in Biosciences* 138.
- Hoßfeld, Uwe. 2010. Ernst Haeckel. Biographienreihe absolute. Freiburg.
- Hopwood, Nick. 2015. Haeckel's Embryos: Images, Evolution, and Fraud. Chicago.
- Junker, Thomas and Uwe, Hoßfeld. 2009. Die Entdeckung der Evolution. Eine revolutionäre Theorie und ihre Geschichte. 2nd edn. Darmstadt.
- Kleeberg, Bernhard. 2005. Theophysis. Ernst Haeckels Philosophie des Naturganzen. Weimar.
- Krauß, Erika. 1984. Ernst Haeckel. Leipzig.
- Levit, Georgy and Uwe, Hoßfeld. 2019. "'Ernst Haeckel in the History of Biology'." *Current Biology* 29: R1276–R1284.
- Nöthlich, Rosemarie, Heiko Weber, Uwe Hoßfeld, Olaf Breidbach, Erika Krauß, eds. 2006. "Substanzmonismus" und/oder "Energetik": Der Briefwechsel von Ernst Haeckel und Wilhelm Ostwald (1910–1918). Zum 100. Jahrestag der Gründung des Deutschen Monistenbundes. Berlin.
- Olsson, Lennart, Georgy S. Levit, and Uwe, Hoßfeld. 2017. "'The "Biogenetic Law" in Zoology: From Ernst Haeckel's Formulation to Current Approaches'." *Theory in Biosciences* 136: 19–29.
- Preuß, Dirk, Uwe Hoßfeld, and Olaf Breidbach, eds. 2006. Anthropologie nach Haeckel. Stuttgart.
- Richards, Robert 2008. The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought. Chicago.
- Sandmann, Jürgen. 1990. Der Bruch mit der humanitären Tradition. Die Biologisierung der Ethik bei Ernst Haeckel und anderen Darwinisten seiner Zeit. Stuttgart.
- Stewart, Ian, Uwe Hoßfeld, and Georgy S. Levit. 2019. "'Haeckelian 'monist ethics': The Case of Heinrich Schmidt's Harmonie (1931)'." *Theory in Biosciences* 138: 189–202.
- Uschmann, Georg. 1983/1984. Ernst Haeckel. Biographie in Briefen. Leipzig.

Wogawa, Stefan. 2015. Ernst Haeckel und der hypothetische Urkontinent Lemuria. Erfurt.