

Journal of the Canadian Historical Association Revue de la Société historique du Canada



Ernst Haeckel and the Morphology of Ethics

Nolan Hele

Volume 15, numéro 1, 2004

URI : <https://id.erudit.org/iderudit/012066ar>

DOI : <https://doi.org/10.7202/012066ar>

[Aller au sommaire du numéro](#)

Éditeur(s)

The Canadian Historical Association/La Société historique du Canada

ISSN

0847-4478 (imprimé)

1712-6274 (numérique)

[Découvrir la revue](#)

Citer cet article

Hele, N. (2004). Ernst Haeckel and the Morphology of Ethics. *Journal of the Canadian Historical Association / Revue de la Société historique du Canada*, 15(1), 1–27. <https://doi.org/10.7202/012066ar>

Ernst Haeckel and the Morphology of Ethics

NOLAN HEIE

On 10 May 1907, Johannes Reinke,¹ a Professor of botany at the University of Kiel and member of the Prussian upper chamber, the Herrenhaus, rose and addressed his fellow delegates on the dangers posed by the German Monist League, which had been founded on 11 January of the previous year in Jena by a group of scientists, philosophers, and enthusiasts.² The honorary chairman and figurehead of this peculiar group was Ernst Haeckel, a biologist respected by the scientific community for his work describing and classifying microscopic marine organisms, but one who had also achieved worldwide fame and

The author would like to express his gratitude to Thomas Bach, curator of the Haeckelhaus Archives at Friedrich Schiller University in Jena, Germany, for his assistance in locating unpublished letters and rare published material. At Queen's University he would also like to thank Harold Mah for reading an early draft of this paper and providing helpful suggestions, as well as Ian McKay, Gordon Dueck and Peter Campbell for taking the time to discuss the pervasive, multifaceted and ambiguous phenomenon of social Darwinism. Funding for this project was provided by the Social Sciences and Humanities Research Council of Canada, the Ontario Government, and the Queen's University School of Graduate Studies.

- 1 Johannes Reinke (1849-1931) is best remembered today for coining the term "theoretical biology," which he used in distinction to "empirical biology." While the latter field focuses on observing phenomena, conducting experiments and describing the results, the former attempts to explain the data by formulating conceptual models. In addition to his programmatic work, *Introduction to Theoretical Biology* (1901), Reinke published a more philosophical work, *The World as Deed* (1899), in which he attempted to explain the evolutionary development of life on Earth with in reference to a "Dominant," an intelligent entity that is guiding the process toward a preordained goal. Johannes Reinke, *Einleitung in die theoretische Biologie* (Berlin: Gebrüder Paetel, 1901); and *Die Welt als That* (Berlin: Gebrüder Paetel, 1899).
- 2 The entire speech is reproduced in Johannes Reinke, *Haeckels Monismus und seine Freunde. Ein freies Wort für freie Wissenschaft* (Leipzig: Johann Ambrosius Barth, 1907), pp. 7-20. It is also reproduced in its entirety in pamphlet published by the Monist League and edited by Haeckel's personal assistant, Heinrich Schmidt, in *Der Deutsche Monistenbund im Preußischen Herrenhaus (Reinke contra Haeckel). Eine aktenmäßige Darstellung mit Einleitung und Anmerkung* (Brackwede: Kommissionsverlag von Dr. W. Breitenbach, 1907), pp. 19-30. Schmidt's pamphlet includes numerous excerpts from contemporary press reports, which are overwhelmingly negative toward Reinke's speech. For a recent analysis of the Haeckel-Reinke controversy, see Andreas W. Daum, *Wissenschaftspopularisierung im 19. Jahrhundert. Bürgerliche Kultur, naturwissenschaftliche Bildung und die deutsche Öffentlichkeit, 1848-1914* (Munich: R. Oldenbourg, 1998), pp. 229-35. See also the account in Walther May, *Ernst Haeckel. Versuch einer Chronik seines Lebens und Wirkens* (Leipzig: Johann Ambrosius Barth, 1909), pp. 217-41.

infamy as an outspoken, and sometimes scurrilous, champion of Darwin's theory of evolution. In 1904 Haeckel had presented a list of thirty "Theses on the Organisation of Monism" to the International Congress of Freethinkers at Rome, in which he declared the League's primary purpose was to disseminate to the wider public a unified world-view based on the natural sciences, one that rejected all "dualistic" distinctions between matter and spirit, living and non-living, or God and universe. At the same time Haeckel suggested that the group should lobby the government to base its policy decisions "on rational application of knowledge about nature, not on 'venerable tradition' (hereditary custom)."³ In his speech to the Herrenhaus, Reinke warned his audience in no uncertain terms about the ominous implications of this new "organisation of forces that is subversively taking actions in the intellectual realm, analogous to those of Social Democracy in the economic realm, directed against that which has hitherto been taught in churches and schools of all denominations, in particular against the Christian world-view."⁴ And although the German Monist League had only been in existence for a little over a year, it was not too early, he implored his audience, for a legislative assembly to take action to counter this menace:

Gentlemen, when a philosopher in his study room hatches a system so hostile to religion and makes it known in a literary way, that would be at most of indirect interest to the organs of the state, and in particular, to its parliamentary bodies. When, however, these types of thoroughly destructive ideas are taken up by a horde of fanatics who stride under unified leadership in a firmly united organisation with the propaganda of the deed, we are faced in our state and our society with the attempt to help Monism to victory, as it were, by compulsion, by the power that resides within every firmly allied and resolute mass of people. Gentlemen, I believe that this is the point at which our nation must be on its guard, and where we as a parliamentary body have to urge: *principiis obsta!* [resist the first advances!]⁵

The delegates responded to this declaration with calls of "Hear, hear! [*Sehr richtig!*]" Reinke continued, "Gentlemen, upholding the old world-view, with its honest progress of the will, guarantees us the maintenance of our intellectual culture, while Haeckel's materialistic Monism seems to me to represent a regression into barbarism." Once again, Reinke was received with calls of "Hear, hear!"⁶

3 Reprinted in Ernst Haeckel, "Der Monistenbund. Thesen zur Organisation des Monismus," Heinrich Schmidt (ed.), *Gemeinverständliche Werke*, vol. 5, Vorträge und Abhandlungen, (Leipzig: Alfred Kröner, 1924), pp. 481-91; here p. 488.

4 Reinke, *Haeckels Monismus*, p. 9. Where no English translation is cited the translation is my own.

5 *Ibid.*, p. 12.

6 *Ibid.*, p. 15.

The historian Frederick Gregory has noted that, around the turn of the twentieth century in Germany, a more-or-less informal truce developed between theologians and scientists concerning hitherto contested terrain: whereas theologians consented to leave the task of providing a naturalistic description of the origins of life on this planet – of addressing the question of “how?” – to biologists and geologists, natural scientists agreed in turn to remain silent on matters concerning the underlying meaning of the universe – the question of “why?”⁷ But as the public quarrel between Reinke and Haeckel illustrates, not all naturalists, particularly those working in the field of biology, agreed to accept these limitations. Though both Reinke and Haeckel agreed that species evolve over time, they represented diametrically opposed positions concerning whether the process was guided by an intelligent entity. Reinke’s 1906 speech to the Herrenhaus represents a climax in the public debates in Germany over the implications of a materialistic interpretation of Darwin’s theory of evolution, and especially of the moral consequences of its public propagation. Haeckel felt the urgent need to base a system of ethics on the firm ground of science, and in particular on biology, rather than on dubious religious revelation. In his best-selling work, *The Riddles of the Universe (Die Welträthsel, 1899)*, he observed that knowledge and practice in the humanities and social sciences had not kept pace with recent advances in the fields of natural science and technology:

We have we have made little or no progress in moral and social life, in comparison with earlier centuries; at times there has been serious reaction. And from this obvious conflict there have arisen, not only an uneasy sense of dismemberment and falseness, but even the danger of grave catastrophes in the political and social world. It is, then, not merely the right, but the sacred duty, of every right-minded and humanitarian thinker to settle that conflict, and to ward off the dangers that it brings in its train.⁸

While certainly not the only philosopher exploring the topic of evolutionary ethics at this time, Haeckel was perhaps the most visible member of this group. To the general public, both in Germany and abroad, Haeckel was seen as a modern iconoclastic heir to the Enlightenment, who sought to bring the Promethean fire of scientific knowledge to the educated reader. Yet the vitriol of his statements, the practical conclusions that he reached, and the wide readership that his writings attained, alarmed many.

Since that time some historians have shared this uneasiness, and have argued in hindsight that Haeckel’s attempt to apply biological theories to

⁷ Frederick Gregory, *Nature Lost? Natural Science and the German Theological Traditions of the Nineteenth Century* (Cambridge, MS: Harvard University Press, 1992), pp. 5-6.

⁸ Ernst Haeckel, *The Riddle of the Universe at the Close of the Nineteenth Century*, translated by Joseph McCabe (London: Watts & Co., 1902), p. 1.

human society served to inspire the ruthless ideology of the National Socialist movement that emerged shortly after his death.⁹ Those who have made this connection place great emphasis on Haeckel's description of the cruel struggle that occurs in nature and his insistence that human beings are not immune from this harsh reality. However, one of the dangers of such an approach is that it can lead one to overlook other non-Darwinian ideas that had an equal, if not greater, influence on the way that Haeckel viewed humanity's place in nature.¹⁰ Failure to take these into account not only results in a very one-sided analysis, but also tends to produce a sense of inevitability in the succession of historical ideas where there was actually far more indeterminacy and contention among participants over the logical consequences of the various theories and how they relate to one another. This paper will focus the influence of morphology, the study of organic form, on Haeckel's ethical thought. This facet of his system, which admittedly not all of his followers and fewer of his opponents grasped, worked to temper the brutality of his social Darwinian conclusions, and helps to explain why the National Socialists were unable to acknowledge him openly as one of their intellectual predecessors.¹¹

-
- 9 For accounts of social Darwinism that make reference to Haeckel, see Hedwig Conrad-Martius, *Utopien der Menschenzüchtung. Der Sozialdarwinismus und seine Folgen* (Munich: Kösel-Verlag, 1955); Daniel Gasman, *The Scientific Origins of National Socialism: Social Darwinism in Ernst Haeckel and the German Monist League* (London: Macdonald and Co. (Publishers) Ltd, 1971); Hans-Günter Zmarzlik, "Social Darwinism in German, Seen as a Historical Problem," Hans Holborn (ed.), *Republic to Reich: The Making of the Nazi Revolution* (New York: Pantheon Books, 1972), pp. 435-74; Daniel Gasman, *Haeckel's Monism and the Birth of Fascist Ideology* (New York: Peter Lang Publishing, Inc., 1998); Kurt Bayertz, "Darwinismus als Politik. Zur Genese des Sozialdarwinismus in Deutschland 1860-1900," Erna Aesch, et. al. (eds.), *Welträtsel und Lebenswunder. Ernst Haeckel – Werk, Wirkung und Folgen* (Linz: Druckerie Gutenberg, 1998), pp. 229-88; Jürgen Sandmann, *Der Bruch mit der humanitären Tradition. Die Biologisierung der Ethik bei Ernst Haeckel und anderen Darwinisten seiner Zeit* (Stuttgart: Gustav Fischer, 1990); Mike Hawkins, *Social Darwinism in European and American Thought: Nature as Model and Nature as Threat, 1860-1945* (Cambridge: Cambridge University Press, 1997); Richard Weikart, *From Darwin to Hitler: Evolutionary Ethics, Eugenics, and Racism in Germany* (New York: Palgrave Macmillan, 2004). For an historical interpretation that questions the degree to which Haeckel's popular works exhibit social Darwinist ideology, see Alfred Kelly, *The Descent of Darwin: The Popularization of Darwin in Germany, 1860-1914* (Chapel Hill: University of North Carolina Press, 1981), p. 113.
- 10 For the influence of pre-Darwinian ideas on subsequent understandings of Darwinian natural selection, see Peter J. Bowler, *The Non-Darwinian Revolution: Reinterpreting a Historical Myth* (Baltimore: Johns Hopkins University Press, 1988). For a description of the difficulty of arriving at a definition of "social Darwinism," see Hawkins, pp. 3-20.
- 11 Robert J. Richards has made a similar point with reference to Darwin, demonstrating how the English scientist's conception of evolution was greatly influenced by early-nineteenth-century German romantic nature philosophy, which regarded the natural world as possessing an intrinsic morality. See Robert J. Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (Chicago: University of Chicago Press, 2002).

The need for a new ethical system

Ernst Heinrich Philipp August Haeckel (1834-1919) was born into a family of civil servants and lawyers in Potsdam, just outside of Berlin, but spent much of his early life in the small town of Merseburg, located in what was then Prussian-controlled Saxony.¹² The travel narratives of Alexander Humboldt and Charles Darwin stimulated his passion for the study of biology, as did the poetry of Wolfgang von Goethe, popular science works such as Matthias Jacob Schleiden's *The Plant and its Life (Die Pflanze und ihr Leben, 1848)* and his childhood pursuit of assembling a very comprehensive herbarium.¹³ Haeckel's family belonged to the Evangelical Church and his parents were enlightened in their views. His father read philosophy in his leisure time and his mother reportedly had as a young girl sat at the feet of the liberal Protestant theologian Friedrich Schleiermacher, a frequent guest at her family's home.¹⁴ At university, Haeckel studied medicine in deference to his pragmatic parents, but he also took the opportunity to attend lectures in the natural sciences, whose subject matter he found far more appealing than practical medicine.

At the University of Würzburg, Haeckel studied with leading researchers of the day. The histologist Albert von Koelliker ignited his passion for microscopy and the study of cells, while the chemist Johann Joseph von Scherer impressed him with his ability to demonstrate how inorganic chemical laws could account for all physiological and pathological processes in the living human body.¹⁵ Rudolf Virchow, a pioneer in the field of cellular pathology who had participated as a radical politician in the revolution of 1848, explained the symptoms of disease in purely mechanistic terms, and used the analogy of citizens in the state to explain the relation between cells in the body.¹⁶ In a letter to his father, Haeckel expressed disappointment, however, that Virchow did

12 For a biographical account of Haeckel's life and career, see Erika Krauß, *Ernst Haeckel, Biographien hervorragender Naturwissenschaftler, Techniker und Mediziner*, vol. 70, (Leipzig: B. G. Teubner Verlagsgesellschaft, 1984; second edition 1987). For an account in English see Wilhelm Boelsche, *Haeckel: His Life and Work* (London: Watts, 1909).

13 Matthias Jakob Schleiden, *Die Pflanze und ihre Leben. Populäre Vorträge* (Leipzig: Wilhelm Engelmann, 1848).

14 Heinrich Haeckel, "Persönliche Erinnerungen an Ernst Haeckel," Heinrich Schmidt (ed.), *Was wir Ernst Haeckel verdanken. Ein Buch der Verehrung und Dankbarkeit*, 2 vols. (Leipzig: Unesma, 1914), vol. 2, pp. 383-90; here p. 384.

15 Letters to his father dated 12 December and 16 November, 1853. In Ernst Haeckel, *The Story of the Development of a Youth: Letters to His Parents, 1852-1856*, translated by G. Barry Gifford (New York: Harper & Brothers, Publishers, 1923), pp. 162, 169, and 181-7.

16 For examples of how German professors of anatomy applied theories of the cell state to social and political questions, especially in defence of the institutional autonomy of the university within the German state, see Paul Weindling, "Theories of the Cell State in Imperial Germany," Charles Webster (ed.), *Biology, Medicine and Society, 1840-1940*, (Cambridge: Cambridge University Press, 1981).

not address “the chief point of all, namely the relation of the soul to this organized complex whole of independent seats of life which are bound to matter.”¹⁷

Attacks of rheumatism forced Haeckel to move to Berlin periodically during the course of his studies, where his parents had retired, at which time he attended classes at the University of Berlin. There he developed a particularly close relationship to two morphologists, Alexander Braun and Johannes Müller. Morphology had been established during the early nineteenth century by Romantic-era scientists Goethe and Karl Friedrich Burdach, initially in their study of plants and later animals. The approach focused on physical arrangement of parts and their relation to the idea of the whole, as well as the metamorphosis of the organism over time, from seed to mature plant or embryo to adult. Such idealist nature-philosophers sought to intuit the transcendent form of which each individual is a temporal and material embodiment and variation. While Braun and Müller shared the idealist assumptions of their predecessors, they sought to ground their conclusions on exact empirical observation rather than on poetic speculation.¹⁸ All of these ideas, morphology, the study of cells and the mechanistic approach to viewing the body, came together in Haeckel’s theory of ethics.

At university, Haeckel was also confronted with the problem of materialist philosophy and its relation to morality. In a long and heart-wrenching letter that the twenty-one-year-old sent to his parents on 17 June 1855, he confided that the vast majority of the students and professors in the medical faculty at Würzburg, including Virchow, accepted the materialist world-view propagated by the mid-century triumvirate of popular science writers Carl Vogt, Ludwig Büchner, and Jakob Moleschott.¹⁹ However, what had “deeply shaken” him was a recent conversation with a fellow student named Beckmann. Haeckel was puzzled at how this student could adhere to a materialist philosophy and yet “in all his thoughts and actions, Beckmann is as pure, moral, good, noble, as only the best Christian could be.” Haeckel went on to confide that only his Christian faith provided him the strength to carry on living in this wretched

17 *Ibid.*, p. 167.

18 For a study of the development of morphology during the nineteenth century, see Lynn K. Nyhart, *Biology Takes Form: Animal Morphology and the German Universities, 1800-1900* (Chicago: The University of Chicago Press, 1995). For an examination of the influence of Braun and Müller, and of early-nineteenth-century idealist *Naturphilosophie* in general, on Haeckel’s professed mechanistic view of life, see Ruth G. Rinard, “The Problem of the Organic Individual: Ernst Haeckel and the Development of the Biogenetic Law,” *Journal of the History of Biology*, 14:2 (Fall 1981), pp. 249-75.

19 For a study of these writers’ ideas, see Frederick Gregory, *Scientific Materialism in Nineteenth Century Germany*, Studies in the History of Modern Science, vol. 1 (Dordrecht, Holland: d. Reidel Pub. Co., 1977).

world, and that without hope of deliverance in a life to come he would be driven to suicide, as another student named Ribbeck had recently been. Near the end of the letter he apparently tried to resolve the paradox in his own mind by concluding that, notwithstanding what he knew about Beckmann, most materialists merely pursue pleasure as the highest goal of life, and therefore he lamented “how empty and miserably inwardly must the great crowd of such people feel!”²⁰

Haeckel found the solution to this vexing problem in the pages of a new book that appeared during the spring of 1860, written by a naturalist whom he had admired as a child. Early that year the twenty-six-year-old returned from a research trip to Messina in the Mediterranean to find the biological community in Germany in an uproar over a new work by Charles Darwin. Haeckel quickly acquired a copy of *On the Origin of Species* (1859), in the form of a German translation that Heinrich Bronn had produced within a few months of its English publication, and proceeded to devour the book.²¹ In it, Haeckel found more than the manifest content, an explanation of biological diversity using the mechanism of natural selection; he discovered the foundation of a comprehensive world-view based on the concept of “*Entwicklung*” or “development.”²² Haeckel included a favourable passing reference to Darwin’s theory in a well-received monograph, *The Radiolarians (Die Radiolarien, 1862)*, which described and classified the single-celled creatures characterised by their snowflake-like silica skeletons. Soon after, he publicly defended Darwin’s theory at the 1863 meeting of the Association of German Naturalists and Doctors held in Stettin with a speech titled, “On Darwin’s Theory of Evolution” (“*Ueber die Entwicklungstheorie Darwin’s*”).

20 In this letter Haeckel used both the adjectives “materialist” and “pantheist” interchangeably to describe Beckmann’s world-view. Haeckel, *Story*, pp. 283-95.

21 Charles Darwin, *On the Origin of Species by Means of Natural Selection, or, The Preservation of Favoured Races in the Struggle for Life* (London: J. Murray, 1859); German translation, *Über die Entstehung der Arten im Thier-und Pflanzen-Reich durch natürliche Züchtung, oder Erhaltung der vervollkommeneten Rassen im Kampfe um’s Daseyn*, translated from the second English edition by Heinrich Georg Bronn (Stuttgart: E. Schweizerbart’sche Verlagshandlung und Druckerei, 1860).

22 While modern scientists writing in German tend to use the English word “evolution” to refer to the process described by Darwin, Haeckel himself never used the word in his works. Instead he referred to Darwin’s idea as “*Entwicklungslehre*,” literally “theory of development,” or “*Descendenztheorie*,” “theory of descent.” This poses a challenge to English translators, since the word “*entwickeln*” is used much more commonly in German than the word “evolve” in English. Haeckel often used the word “*Entwicklung*” several times in the same passage to mean, alternately, “development” in the broad sense and “evolution” in the narrow sense. It will be remembered as well that Darwin never referred to his idea as a “theory of evolution” in the original edition of *On the Origin of Species*, and only used the word “evolve” once in the original text, in the famous last sentence.

Morphology and evolution

Haeckel brought together his knowledge of morphology and Darwin's theory of evolution in a major synthetic work, the two-volume *General Morphology* (*Generelle Morphologie*, 1866), in which he attempted to reconcile Darwin's theory of natural selection with the earlier idealist study of morphology. The latter he defined at the outset of the work:

*Morphology, or the theory of form in organisms, is the comprehensive science of the internal and external relations of form among living natural bodies, animals and plants, in the broadest sense of the word. The task of organic morphology is therefore to identify and explain these relations of form, i.e. to trace their occurrence back to precise natural laws.*²³

This approach, Haeckel argued, did not point toward a transcendent type, as the idealists had maintained, but rather revealed their relations of common descent and the physiochemical laws which govern their functioning. But while Haeckel explicitly broke with idealist metaphysics, he equally shunned the label of "materialist." Rather, after 900 pages of biological classification and systematic tables, he professed in the culminating chapter, "God in Nature," to being a pantheist. Claiming to be guided by the spirit of the great German genius Goethe, the Dutch philosopher Baruch Spinoza, and the Italian martyr to free thought Giordano Bruno, Haeckel declared: the universe is itself God and has always existed; all matter is equally "animated" or "ensouled" ("*beseelt*") (thus ruling out the possibility of an immaterial soul); and humanity and its institutions, being a part of nature, are inseparably linked to a universal process of progressive development. Since his pantheist world-view acknowledges both matter and spirit in all things, Haeckel, argued, it would be no more accurate to call it "materialism" than "spiritualism."²⁴ It is also noteworthy that Haeckel began each of the thirty chapters with a sometimes lengthy excerpt from Goethe's poetry to demonstrate that the great nature-philosopher and poet had not only established the study of morphology but had also pre-saged the idea of biological evolution, which Darwin later "reformed."²⁵ Haeckel, moreover, called his philosophy "Monism" to distinguish it from "moral materialism," while at the same time acknowledging that it was essentially the same as "philosophical materialism."

23 Ernst Haeckel, *Generelle Morphologie der Organismen. Allgemeine Grundzüge der organischen Formen-Wissenschaft, mechanisch begründet durch die von Charles Darwin reformierte Decendenz-Theorie*, 2 vols. (Berlin: Reimer, 1866), vol. 1, p. 3; emphasis in original.

24 *Ibid.*, vol. 2, p. 448-51.

25 On the title page to *General Morphology*, Haeckel referred to evolution as "the theory of descent, reformed by Charles Darwin."

Inspired by the crystalline shapes exhibited by the shells of radiolarians, Haeckel drew upon the field stereometrics, derived from crystallography, to examine the physical structure of all living organisms in terms of geometric patterns. More complex multicellular organisms also exhibit structural regularity, he argued, in the form of radial and bilateral symmetry. He coined a new word for this purpose, “tectology,” which he defined in the eighth chapter of the work:

*Tectology, or the theory of structure in organisms, is the comprehensive science of individuality among living natural bodies, which usually represent an aggregate of individuals of various orders. The task of organic tectology is therefore to identify and explain organic individuality, i.e. to identify the precise natural laws according to which organic matter individualises itself, and according to which most organisms construct a unified form-complex composed of individuals of various orders.*²⁶

Haeckel intended the science of tectology to address a very old debate in the history of the biological sciences, namely regarding what should be regarded as the smallest indivisible unit of life, the “organic individual.” The discovery of plant and animal cells in the 1830s by Matthias Schleiden and Theodor Schwann, respectively, opened up a new perspective on these problems. Yet, not all biologists regarded the cell as the basic unit of life. Virchow submitted that any distinction between individuals above the level of the atom was arbitrary,²⁷ a position with which Haeckel concurred in *General Morphology*.²⁸ Haeckel asserted that there were living organisms with a more simple structure than that of a cell, such as “vibrionae” (bacteria) and the hypothetical “monera,” the latter consisting entirely of undifferentiated and homogeneous clumps of protoplasm molecules, which in turn are animated by the chemical reactions between the atoms of which they are composed.

But although the concept of “individual” is a relative one, it is possible, Haeckel argued, to make a distinction between individuals of different orders or levels of complexity. This tectological division is similar to the taxonomic system of classifying organisms. “The single human, or person,” Haeckel pointed out, “is an individual within the specific character of his nation; the nation is an individual among the remaining nations of its race; the races are individuals among the human species; the human species is an individual among the various species of vertebrates, etc.”²⁹ Likewise, Haeckel proposed six such orders

26 *Ibid.*, vol. 1, p. 241.

27 Rudolph Virchow, “Atoms and Individuals,” in *Disease, Life, and Man. Selected Essays by Rudolph Virchow*, translated and with an introduction by Lelland J. Rather (New York: Collier Books, 1962), pp. 134-54.

28 Haeckel, *Generelle Morphologie*, vol. 1, p. 243-5; emphasis in original.

29 *Ibid.*, vol. 1, p. 244.

in *General Morphology*, from simplest to most complex: plastid, organ, antimer, metamer, person, and stem (*Stamm*) or corm. Individuals of each of these orders he labelled a “morphon.” A morphon that exists as a freely-living individual is a bion. Bions in each successively higher level contain morphons of every lower level. For example, a cell that lives independently as an amoeba is both a morphon and a bion of the lowest level of complexity, that of the plastid. On the other hand, a cell that is a component of the skin tissue of a mammal is a morphon on the level of the plastid, but a component of a bion of the level of a person. Likewise, independent organisms consisting of small clusters of cells, such as algae, constituted bionic organs, and were the equivalent of morphonic organs, or tissues in the body of a higher organism. Several of these tissues may be arranged with bilateral or radial symmetry to form metamers. As an example of an antimer, Haeckel cited the radiata of animals or plants with radial symmetry, such as a segment of a jellyfish, while a metamer corresponds to the segments or zones of a membered animal or vertebrate, such as a section of a segmented worm. In the case of the animal kingdom, a “person” could consist of a higher animal such as a mammal, fish, bird, or reptile. However, in the plant kingdom, Haeckel equated a person not with a tree, but with a branch, a distinction he derived from Müller.³⁰ Haeckel later simplified this system twelve years later in an article written for the *Jena Journal for Medicine and Natural Science* (*Jenaische Zeitschrift für Medizin und Naturwissenschaft*, 1878) by collapsing the categories of organ, antimer and metamer into that of “idorgan.”³¹

Within each tectological order, a further distinction may be made based on the level of complexity that morphons of a particular order exhibit. For example, on the level of the plastid, a cell with nucleus exhibits a higher level of perfection than a bacterium.³² In a similar manner, vertebrates may be classified as the highest category of person in the animal kingdom by nature of their highly differentiated bodily structure and their highly centralised nervous system, as clearly displayed in the most highly developed vertebrate of all, the human. This morphological classification scheme, together with his idiosyncratic understanding of Darwin’s theory, underlay Haeckel’s attempt to derive a system of ethics from the study of biology.

Cellular ethics

Over the decades that followed Haeckel published a series of scientific monographs describing and classifying coral, siphonophora, calcareous sponges, and medusa, and was also assigned the mammoth task of studying the microscopic

30 Rinard, p. 262.

31 Haeckel, “Ueber die Individualität des Thierkörpers,” *Jenaische Zeitschrift für Medizin und Naturwissenschaft*, vol. 12 (1878), pp. 1-20.

32 See “Thesen von den einfachen organischen Individuen,” esp. thesis 26. Haeckel, *Generelle Morphologie*, vol. 1, p. 368.

organisms dredged up by the English *Challenger* research vessel (1872-76). However, the general public came to know him as the “German Darwin” through such popular expositions of evolutionary theory as *The History of Natural Creation (Natürliche Schöpfungs-Geschichte, 1868)*³³ and *Anthropogeny (Anthropogenie, 1874)*,³⁴ as well as various speeches aimed at a popular audience. Later in life Haeckel returned to the philosophical concerns that he had sketched out in the concluding chapter of *General Morphology* by renewing his call for the acceptance of a new Monistic world-view based on the concept of evolution. A major turning point in his crusade occurred in 1892 when he delivered an impromptu speech at a conference in Altenburg, later published under the title *Monism as a Connecting Link between Religion and Science: A Confession of Faith (Der Monismus als Band zwischen Religion und Wissenschaft. Ein Bekenntnis)*.³⁵ This was followed by a greatly expanded version of the speech, *The Riddles of the Universe (Die Welträtsel, 1899)*, which became his most popular work.³⁶ An international bestseller, it quickly sold out numerous hardcover and cheap paperback editions. It was eventually translated into 25 languages, with 250,000 of the English translation printed by 1914 and 400,000 copies of the German edition printed by 1926.³⁷ In this 473-page book Haeckel drew upon recent discoveries in the realms of physics, chemistry, and biology, and above all the Darwinian theory of evolution, to address age-old philosophical problems, including humanity’s place in nature and human beings’ responsibilities toward one another. Haeckel received tens of thousands of letters in response to *The Riddles of the Universe*, many asking specific questions about biology. In an effort to elaborate on these concepts in greater detail

33 Translated as *The History of Creation: or, The Development of the Earth and its Inhabitants by the Action of Natural Causes: A Popular Exposition of the Doctrine of Evolution in General, and of that of Darwin, Goethe, and Lamarck in Particular*, 2 vols. (New York: D. Appleton, 1876).

34 Translated as *The Evolution of Man: A Popular Exposition of the Principal Points of Human Ontogeny and Phylogeny*, 2 vols. (New York: D. Appleton, 1898).

35 Translated as *The Confession of Faith of a Man of Science*, translated by J. Gilchrist (London: A. and C. Black, 1903).

36 Ernst Haeckel, *Die Welträtsel. Gemeinverständliche Studien über monistische Philosophie* (Bonn: Strauß, 1899); translated as *The Riddle of the Universe at the Close of the Nineteenth Century, op. cit.* In the original German title the word “riddle” is plural.

37 The book’s English translator Joseph McCabe cites the figure of a quarter of a million copies for the English edition. See “Ernst Haeckel in England,” Heinrich Schmidt (ed.), *Was wir Ernst Haeckel verdanken. Ein Buch der Verehrung und Dankbarkeit*, 2 vols. (Leipzig: Unesma, 1914), vol. 2, pp. 244-46, here p. 244. The German figure of 400,000 copies printed is found on the title page of the 1926 edition (Leipzig: Alfred Kröner, 1926). A table in Haeckel’s handwriting listing the languages, titles and translators’ names is reproduced on plate 4 in Olaf Breidbach, “Monismus um 1900 – Wissenschaftspraxis oder Weltanschauung?,” Erna Aesch, et. al. (eds.), *Welträtsel und Lebenswunder. Ernst Haeckel – Werk, Wirkung und Folgen* (Linz: Druckerie Gutenberg, 1998), pp. 289-316; here p. 294.

he wrote a follow-up volume, *The Miracles of Life (Die Lebenswunder, 1904)*,³⁸ though it did not achieve the phenomenal success of the previous work. Haeckel continued to elaborate on these philosophical issues in works such as *God-Nature (Gott-Natur, 1914)*³⁹ and *Eternity (Ewigkeit, 1915)*⁴⁰ until his death in 1919.

Although Haeckel did not write a book or essay specifically on the topic of ethics, many of his popular works contain digressions about the bearing of evolution on moral issues, and several of his later books contain chapters devoted to the theme. Like Darwin, Haeckel insisted that the evolutionary process tended to encourage co-operation and interdependency between members of the same species as an effective survival strategy.⁴¹ He also agreed with Darwin, as the latter had famously suggested in *The Descent of Man* (1871), that moral sentiments are not unique to humans, but could be found in a less developed state in other animals, thus indicating that they are inherited instincts and a product of evolution.⁴²

Haeckel, however, went much further than Darwin in this regard in conceiving evolution to be a basic law of the universe, pertaining to geology and celestial bodies as well as to living organisms.⁴³ In this way, Haeckel's thought resembles the cosmology that Herbert Spencer sketched out in *First Principles*, where the English philosopher reduced the condensation of matter into stars and planets, the evolutionary history of a living organism, the growth of industrial cities, and the centralisation of government, to the same basic law of development.⁴⁴ According to Haeckel, the progression of life from a homogeneous "primaevial slime [*Urschleim*]," to simple cells, to vertebrates, and ultimately to humans, is governed by causal necessity. Humans are animals like any other, and thus a part of the natural world and subject to its laws,

38 Ernst Haeckel, *The Wonders of Life: A Popular Study of Biological Philosophy*, translated by Joseph McCabe (New York: Harper & Brothers Publishers, 1905).

39 Ernst Haeckel, "Die Welträtsel und Gott-Natur," *Gemeinverständliche Werke*, vol. 3 (Leipzig: Alfred Kröner, 1924).

40 Translated as *Eternity: World-War Thoughts on Life and Death, Religion, and the Theory of Evolution*, translated by Thomas Seltzer (New York: The Truth Seeker Company, 1916).

41 Compare Darwin's similar conclusions in Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, originally published 1871, second edition (New York: A. L. Burt Company, 1874), p. 122.

42 Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (New York: A. L. Burt Company, 1874). Find quotation.

43 In the final chapter of *General Morphology* Haeckel explained how Darwin's theory fit into a more general "Weltkunde," which he defined as "the general science of the visible universe." *Generelle Morphologie*, vol. 2, p. 444.

44 Spencer defined evolution as "a change from a less coherent form to a more coherent form, consequently on the dissipation of motion and integration of matter." Herbert Spencer, *First Principles: A System of Synthetic Philosophy*, vol 1, fourth edition (New York: D. Appleton and Company, 1888), p. 372.

including the competition for scarce resources. And since humans are merely a product of this process, they possess no immaterial soul, free will, or other supernatural qualities that would set them apart from any other configuration of matter. On the other hand, progress in human society is guaranteed by the same natural laws that govern the evolution of the universe as a whole. Haeckel admitted that this progress was by no means uniform, and cited deviant phenomena such as atavism and degeneration as evidence that the evolutionary process was unguided and not teleological. As he wrote in *The Riddles of the Universe*:

It may be said that the struggle for life is the “survival of the fittest” of the “victory of the best”; that is only correct when we regard the strongest as the best (in a moral sense). [...] Thousands of beautiful and remarkable species of animals and plants have perished during those 48,000,000 years, to give place to stronger competitors, and the victors in this struggle for life were not always the noblest or most perfect forms in a moral sense.⁴⁵

At this point, there appears to be a contradiction in Haeckel’s reasoning. While Haeckel seems to be confirming the fears of his critics by admitting that Darwin’s theory could only provide an ethic based on the principle that might equals right, he compares their nobility and perfection to a “moral sense” that is apparently independent of the struggle for life.

The solution to this problem can be found in Haeckel’s morphological conception of the natural world. Haeckel, like Spencer, attached a moral value to the level of complexity, judging complex organisms to be more highly evolved. To demonstrate this Haeckel turned his attention to the structural arrangement of the some of the lowest organisms, cells, since they illustrated in the simplest manner the patterns to be found among more complex forms of life. In this way Haeckel hoped to “arrive at a correct knowledge of the structure and life of the social body, the State, through a scientific knowledge of the structure and life of the individuals who compose it, and the cells of which they are in turn composed.”⁴⁶ In a speech directed at a popular audience in 1868 titled “On the Division of Labour in the Life of Nature and of Man [Über Arbeitsteilung in Natur-und Menschenleben],” Haeckel described the division of labour as being a basic law of the universe: while atoms of matter congregate into molecules, organic molecules form protoplasm.⁴⁷ In a later work he discussed how divi-

45 Haeckel, *Riddle*, p. 96.

46 *Ibid.*, p. 3.

47 See Ernst Haeckel, “Über Arbeitsteilung in Natur-und Menschenleben,” in *Gemeinverständliche Werke*, vol. 5 “Vorträge und Abhandlungen,” (Leipzig: Alfred Kröner, 1924; article originally published 1868), pp. 57-85. In the *Riddles of the Universe*, Haeckel even went so far as to speculate that these tendencies are inherent within the basic substance of which the universe is composed, and postulated the existence of a primeval substance that

sion of labour tends to lead to polymorphism, or a differentiation of physical structure, a process can be seen on the sub-cellular level:

Even in the simplest real cell we find the distinction between the different organella, or “cell organs,” the internal nucleus and the outer cell-body. The *caryoplasm* of the nucleus discharges the functions of reproduction and heredity; the *cytoplasm* of the cell-body accomplishes the metabolism, nutrition, and adaptation. Here we have, therefore, the first, oldest, and most important process of division of labor in the elementary organism. In the unicellular protists the organization rises in proportion to the differentiation of the various parts of the cell.⁴⁸

The cell nucleus assumes the role of governing the processes within the cell, while the various organella are responsible for its specific life functions. Thus, cells in their most complex form exhibit the three key processes of association, division of labour, and centralisation.

It is also possible to observe these patterns among social groups of higher organisms. Mammals, for instance, could be seen organising themselves into social groups for similar purposes. “The herds of apes and ungulates, the packs of wolves, the flocks of birds, often controlled by a single leader, exhibit various stages of social formation,” Haeckel remarked; “These organized communities of free individuals are distinguished from the stationary colonies of the lower animals chiefly by the circumstance that the social elements are not bodily connected, but are held together by the ideal link of common interest.”⁴⁹ In a similar manner, “the various kinds of tissue in the body of the histona behave like the various classes and professions in a state.” Haeckel came to the conclusion that “the higher the civilization and the more varied the classes of workers, the more they are dependent on each other, and the state is centralized.”⁵⁰ Among human societies, it is likewise possible to judge the relative stage of social development on the basis of the degree of association, division of labour, and centralisation present. The logical conclusion was that “the complicated modern state, with its remarkable achievements, may be regarded as the highest stage of individual perfection which is known to us in organic nature.”⁵¹

differentiates itself into a ponderable, atomistic component called “matter,” and an imponderable, continuous, jellylike component called “ether.” These two reciprocal aspects of substance, Haeckel suggested, “may, to some extent, be regarded as the outcome of the first ‘division of labour’ in the development, the ‘primary ergonomy of matter.’” Haeckel, *Riddle*, p. 82.

48 Haeckel, *Wonders*, pp. 35 and 169.

49 *Ibid.*, p. 169.

50 *Ibid.*, p. 162.

51 *Ibid.*, p. 149.

The degree of social advancement among groups of individuals could be gauged by determining the degree to which a given society exhibited the three characteristics of association, differentiation, and centralisation. By extension, anything that promotes the production of more complex organisms is inherently “good,” whereas anything that leads to their degeneration is “evil.” Thus, because of its general tendency to produce ever more complex forms over time, evolution is an innately positive process. Haeckel did not use the similarity between cells in the body and citizens in the state merely as a metaphor to help illustrate for lay readers the relations between component parts of the living body, but rather conceived there to be a more fundamental link between the two. “With the union of the cells into colonies arise the first beginnings of morality,” Haeckel asserted in *Eternity*. “We may therefore speak of an elementary cellular ethics of protists as contrasted with the histonal ethics of the multicellular, tissue-forming organisms.”⁵² Yet, both cellular and histonal ethics must be studied in conjunction, as “the same fundamental laws of sociology hold good for association throughout the entire organic world; and also for the gradual evolution of the several organs out of the tissues and cell-communities.”⁵³ The patterns observed on this simple level give clues as to the present stage of human social development, as well as to the ideal to which human society should strive in the future. Thus, morality, from a Monistic perspective, is not deduced from a metaphysical “categorical imperative” or derived from any other transcendent source, but is intrinsic to the patterns of life, and, indeed, to the structure of the universe.

This emphasis on interdependence explains how Haeckel, despite his Darwinian beliefs about struggle and competition, could declare in his 1892 Altenburg speech, “Love remains the supreme moral law of rational religion, the love, that is to say, that holds the balance between egoism and altruism, between self-love and love of others.”⁵⁴ While the world’s major faiths had reached more or less the same conclusion thousands of years ago, it is now possible, Haeckel argued, to comprehend rationally what had hitherto been only dimly perceived. The most profound philosophical doctrine is the “Golden Rule,” that of treating others the way that one wishes to be treated, a principle that predates Christianity. However Haeckel did concede that, when “looked at from the point of view of our present stage of culture, the ethic of Christianity appears to us much more perfect and pure than that of any other religion.”⁵⁵

Haeckel hoped such knowledge would improve the present political situation. “If our political rulers and our ‘representatives of the people’ possessed this invaluable biological and anthropological knowledge,” he hoped, “we

52 Haeckel, *Eternity*, p. 134.

53 Haeckel, *Wonders*, p. 169.

54 Haeckel, *Confession*, p. 64.

55 *Ibid.*, p. 63.

should not find our journals so full of the sociological blunders and political nonsense which at present disfigure our Parliamentary reports.”⁵⁶ Haeckel remained faithful to this conception in his work *Eternity*, published during the despair of the Great War:

The civilized man of the twentieth century with his all-round enlarged outlook has become convinced that welfare, true happiness and satisfaction are to be found not in the cultivation of pure egoism (as preached in its extreme form by Max Stirner, and partly by Friedrich Nietzsche) but in mutual aid and in living peacefully together with one’s fellow-men, in the family, in the community, and in the state. The more numerous and varied the demands of the social human being the more apparent are the advantages of altruism; and so he rises to a higher level of morality.⁵⁷

Practical applications

In spite of his insistence that human society followed the same inexorable laws of evolutionary progress, Haeckel made a distinction between technological progress of civilised humanity (*Kultur Menschheit*) and its social institutions. He observed that “constant laws of nature [such as gravitation and chemical affinity] are therefore quite different from the variable laws of the state, which prescribe the rules of conduct for each individual in human society, such as ethical laws, religious laws, social laws, and so on. These are made by legislators; the natural laws are not.”⁵⁸ In order to ensure that this progress will continue in the future, it is necessary for the education system to instil a sound knowledge of the biological sciences. Haeckel predicted that “the statesmen, the teachers of political economy, the history writers of the future will need to study above all comparative zoology, i.e. comparative morphology and the physiology of animals, as an indispensable foundation if they want to achieve an understanding of the corresponding human phenomena that is genuinely true to nature.”⁵⁹ The application of this new Monistic philosophy to social issues promises to “open up a new road towards moral perfection” and to allow modern Europeans to “raise ourselves out of the state of social barbarism in which, notwithstanding the much vaunted civilization of our century, we are still plunged.”⁶⁰ According to Haeckel, while scientists had with great struggle managed to liberate the study of nature from the level of medieval cosmology, and great strides had been made to apply this newfound knowledge to everyday life in the form of technology, Europe’s legal and social institutions remained

56 Haeckel, *Riddle*, p. 3.

57 Haeckel, *Eternity*, p. 129.

58 *Ibid.*, p. 2.

59 Haeckel, *Generelle Morphologie*, vol. 2, p. 437.

60 Haeckel, *The History of Creation*, vol. 2, pp. 367-8.

in a backward state. One reason for this lack of progress was the unwillingness of political leaders to apply knowledge attained from the recent advances in the natural sciences when formulating law and organising legal and social institutions. Haeckel admonished leaders who continued to make irrational decisions based on mystical revelation rather than on what he considered to be hard scientific fact. Haeckel directed *The Riddles of the Universe* at a popular audience precisely in order to disseminate such rudimentary knowledge of the current state of the biological, physical, and chemical sciences, which he considered indispensable for a modern education.

Haeckel's preliminary attempts to apply this newly acquired knowledge to overcome the "sociological blunders and political nonsense" of his own day have proven to be the most notorious aspect of his philosophy, and have attracted considerable attention from historians. It is important to note that Haeckel never attempted to develop his ideas into a comprehensive, synthetic philosophy, as did Spencer, yet the sociological comments that are scattered throughout his popular science books tended to confirm his critics' worst fears about the dire consequences of abandoning Christian or humanistic moral teachings in favour of a morality based on Darwin's theories.

Haeckel's primary concern, consistent with the Golden Rule, was with the promotion of the health and progressive development of humanity, as defined by the criteria discussed above. To Haeckel, the belief that human life should be preserved at all costs was a remnant of medieval superstition relating to life after death, namely the belief that one will suffer eternal punishment for disobeying divine commandments. There emerged a dilemma between the goals of preserving life and that of reducing suffering. Haeckel's reply was taken straight from the pages of Spencer's *Social Statics*. Efforts to prolong the lives of the ill actually led to a greater evil: increased pain and misery for the living.⁶¹ Many practices of modern institutions had the effect of artificially selecting harmful biological traits. A prime example of this is what Haeckel referred to as "artificial medical selection." Well-intended efforts to prolong the lives of those suffering from such inheritable diseases as consumption, tuberculosis, syphilis, and mental disorders had the effect not only of extending their suffering, but also of increasing the number of the children they produce who in turn suffer from these infirmities. Haeckel asserted that "the longer the diseased parents, with medical assistance, can drag on their sickly existence, the more numerous are the descendants who will inherit incurable evils, and the greater will be the number of individuals, again, in the succeeding generation [...] who will be infected by their parents with lingering, hereditary disease."⁶²

61 Herbert Spencer, *Social Statics: or, The conditions essential to human happiness specified, and the first of them developed*, originally published 1851 (New York: D. Appleton and Company, 1886).

62 Haeckel, *History of Creation*, vol. 1, pp. 172-3.

Furthermore, muddled religious views should not prevent one from escaping from chronic pain or even misery caused by poverty by means of suicide, for which he coined the word “autolysis” or “self-redemption.”⁶³ Recent anatomical observations have proven, Haeckel also informed his readers, that the prothyma cells, which are the seat of consciousness, are undeveloped in the brain of the newborn infant; therefore, it should not be considered murder to put sickly infants out of their misery. “We ought rather to look upon it as an advantage both to the infants destroyed and to the community,” Haeckel advised.⁶⁴ Similarly, Haeckel used biological principles to justify the policy of capital punishment, advocating “sound natural common sense that is based upon a knowledge of Monistic anthropology” as opposed to the “subtle dialectics of the jurists.” For true philanthropists such as himself, “capital punishment is not only a just retribution for murderers who have deprived others of their lives, but should be applied also to other incorrigible criminals. Life-long imprisonment, advocated in its stead, appears on closer, impartial consideration to be much worse and crueller punishment.”⁶⁵

An even greater threat was the eugenic disaster posed by the development of military technology. “The stronger, healthier, and more spirited a youth is,” Haeckel pointed out, “the greater is his prospect of being killed by needle-guns, cannons, and other similar instruments of civilization. All youths that are unhealthy, weak, or affected with infirmities, on the other hand, are spared by the ‘military selection,’ and remain at home during the war, marry, and propagate themselves.” Haeckel drew from this that war should be avoided at all costs. Indeed, the money spent on modern killing machinery would be far more profitably invested in education. Presently, “all the strength and all the wealth of flourishing civilized states are squandered on [militarism’s] development; whereas the education of the young, and public instruction, which are the foundations of the true welfare of nations and the ennobling of humanity, are neglected and mismanaged in a most pitiable manner.”⁶⁶ The result of this policy is that “weakness of the body and weakness of character are on the perpetual increase among civilized nations, and that, together with strong, healthy bodies, free and independent spirits are becoming more and more scarce.”⁶⁷ He also claimed that northern Europeans have a higher life-value than other peoples on account of the inherited intellectual superiority of their race, as well as the amount of education that their respective societies have invested in them.⁶⁸

63 Haeckel, *Wonders*, p. 113.

64 *Ibid.*, p. 21.

65 Haeckel, *Eternity*, p. 134.

66 Haeckel, *History of Creation*, vol. 1, p. 171.

67 *Ibid.*, p. 172.

68 See chapter 17 in Haeckel, *Wonders*, pp. 386-410.

Statements such as these appear to justify Reinke's fears of a "regression into barbarism." However, examples analogous to all of the above may be found in the works of Spencer, and even of Charles Darwin.⁶⁹ Admittedly, Darwin had difficulty accepting the harsh eugenic conclusions of Spencer, Francis Galton, and others (he did not cite Haeckel in this context):

The aid which we feel impelled to give to the helpless is mainly an incidental result of the instinct of sympathy, which [as in the case of other social animals] was originally acquired as part of the social instincts, but subsequently rendered [...] more tender and widely diffused. Nor could we check our sympathy, even at the urging of hard reason, without deterioration in the noblest part of our nature. [...] We must therefore bear the undoubtedly bad effects of the weak surviving and propagating their kind.⁷⁰

However, Darwin's kind and gentle views were exceptional among this group of scientists, who continued to argue strenuously the long-term benefits of a hardened and resolute social policy guided by reason rather than misplaced feelings of compassion.

Interpretations of Haeckelian ethics among Monist followers

Aside from his general remarks about euthanasia and infanticide, Haeckel generally refrained from applying his biological theories to specific matters of public policy.⁷¹ Some of his self-professed followers were admittedly not as reticent in this respect. The trajectory of ideas from biological theories current during the late nineteenth century to the murderous practices instituted by the National Socialist regime has been sketched out many times, and Haeckel's complicity in this phenomenon has been a matter of bitter debate among historians.⁷² While it is impossible to provide a comprehensive view of these ideas here, it is important to recognise that the writers who claimed to take inspiration from Haeckel's ideas constituted a large and diverse group, and were far from unanimous in the conclusions that they drew from his theories.

69 See the discussion of "Natural Selection as Affecting Civilized Nations" in Darwin, *The Descent of Man*, pp. 151-62.

70 *Ibid.*, p. 152.

71 In the introduction to his "Theses on the Organisation of Monism," Haeckel emphasised that his practical proposals were subjective, and thus far less certain than the objective scientific knowledge on which they were based. Haeckel, "Der Monistenbund," p. 481. He repeated these reservations in a letter that he sent to the Swiss Social Democrat Arnold Dodel on 26 June, 1906, in which admitted that his suggestions for practical application of his philosophy were the weakest part of his world-view. Letter reproduced in Werner Beyl, *Arnold Dodel (1843-1908) und die Populisierung des Darwinismus*, Armin Geus and Irmgard Müller (series eds.), Marburger Schriften zur Medizingeschichte, vol. 2 (Frankfurt am Main: Peter Lang, 1984), pp. 150-1.

72 See note 9, above.

Alexander Tille, a professor of Germanic Languages at the University of Glasgow, produced one of the most bellicose appropriations of Haeckel's ethical thought in his book *From Darwin to Nietzsche: A Book of Evolutionary Ethics* (*Von Darwin bis Nietzsche. Ein Buch Entwicklungsethik*, 1895). In the preface to this work Tille confessed, "What I owe to knowledge of the works of Ernst Haeckel is written on every page of my book."⁷³ Tille condemned the modern "Christian-human-democratic ethic" taught by utilitarian ethicists, and instead advocated an aristocratic "master morality [*Herrenmoral*]" derived from a rather crude biologicistic understanding of Friedrich Nietzsche's doctrine of the *Übermensch*.⁷⁴ He argued that "the goal of evolution is the enhancement and more glorious embodiment [*Herrlichergestaltung*] of the human race. And nothing else can be the ultimate moral ideal."⁷⁵ To this end, misguided sympathy for the weak and sick should not impede the elevation of the race, and human inequality should be encouraged. In spite of his praise for Haeckel's eugenic and social Darwinian statements, Tille expressed disappointment that the scientist had endorsed the Christian ideal of altruism in his Altenburg speech.⁷⁶

Haeckel's close friend and popular science writer Wilhelm Bölsche drew conclusions from the scientist's writings that were radically different from those of Tille.⁷⁷ In his magnum opus, *Love Life in Nature* (*Liebesleben in der Natur*, 1898-1903), Bölsche described how the brutish instincts that had governed interaction between human groups in the past are gradually being supplanted by reason and compassion. Bölsche drew heavily on cell state imagery to explain how individual organisms, animal and human alike, unite to form higher communities. Among humans, civilisation emerges as a unifying force that stands "above races, nations, strata of interests and individuals in humanity, [...] which uniformly embraces all mankind and in which they all in turn live a higher life without conflicting." In the future, progress will not be achieved through a "brutal suppression" of the weaker group by the stronger

73 Alexander Tille, *Von Darwin bis Nietzsche. Ein Buch Entwicklungsethik* (Leipzig: C. G. Naumann, 1895), p. xi.

74 As previously mentioned, Haeckel was not an admirer of Nietzsche's ideas as he understood them.

75 Tille, p. 23; emphasis in original.

76 Tille p. 171.

77 Daniel Gasman has argued that Bölsche's writings provided Adolf Hitler with "direct access to the major ideas of Haeckelian social Darwinism." Gasman, *Scientific Origins*, p. 160. In fact, not only were Bölsche's ideas concerning human sympathy and peaceful coexistence fundamentally inconsistent with Hitler's worldview view of implacable racial struggle and annihilation, Hitler reportedly referred to Bölsche's *Love Life in Nature* as a "tasteless work [*Abgeschmacktheit*]." Hermann Rauschning, *Gespräche mit Hitler* (Zurich: Europa Verlag, 1940), p. 56. If Hitler did read any of Bölsche's writings, he apparently did not take their message to heart.

one, but through a peaceful process of “educating, elevating and clarifying.”⁷⁸ Bölsche shared Haeckel’s disbelief in the divinity of Christ, but also concurred with the scientist’s view that the ethical teachings of Christianity, particularly regarding voluntary suffering for the greater good and sympathy for others, have independent merit and are universally valid. Bölsche discerned a growing “sense of responsibility for the value and sacredness of human life,” and even speculated that as human beings colonise other planets we may see the dawning of a new era, which he referred to as “the stage of Christ, extended throughout the universe by the ultimate triumph of technology.”⁷⁹

Wilhelm Kleinsorgen, a student of Haeckel, was similarly fascinated by the ethical implications of the scientist’s morphological theories. In his book *Cellular Ethics as the Modern Imitation of Christ (Cellular Ethik als moderne Nachfolge Christi, 1912)*, Kleinsorgen argued that the results of microscopic research served to confirm rather than refute the teachings of Christ, which had subsequently been perverted by a priestly hierarchy. Jubilantly he proclaimed, “Nature herself wills morality, and morality is also Nature.” Since human beings are a part of the natural world, Kleinsorgen asserted, human history “represents an ever more powerful unfolding and development of moral ideas,” which include a growing sense of compassion for others.⁸⁰ In turn, Haeckel praised Kleinsorgen for the latter’s “exhaustive treatment” of the topic of cellular ethics.⁸¹

During the First World War, the membership of the Monist League was overwhelmingly pacifist, in spite of the support for the German war effort expressed by Haeckel and his successor as honorary chairman, the chemist Wilhelm Ostwald. This tendency can be seen in a pamphlet published shortly after the war by the Hamburg chapter of the German Monist League, titled *Bi-Unity: The Religion of the Future (Zweieinigheit. Die Religion der Zukunft, 1921)*. After comparing the morphology of human society to that of a fir tree, the author, Hans Fuschlberger, concluded with a series of aphoristic “building stones” of a Monistic religion, among them:

Place humanity above the nation [*Volk*].

*

Wars are setbacks. They are the selection of the best in order to destroy them.

*

Resolve disputes with the intellect and not with force. The head is nobler than the fist.

*

78 Bölsche, vol. 2, p. 706. Alfred Kelly has pointed out that Bölsche’s works achieved a greater readership than those of Haeckel; *op. cit.*, p. 6.

79 Bölsche, vol. 2, pp. 711-22.

80 Wilhelm Kleinsorgen, *Cellular Ethik als moderne Nachfolge Christi. Grundlinien eines neuen Lebeninhaltes* (Leipzig: Alfred Kröner, 1912), p. 43.

81 Haeckel, *Eternity*, p. 134.

Heal the sick and give what you can spare to the deserving [*unverschuldet*] poor.⁸²

*

The German Monist League, united more by the force of Haeckel's charisma than agreement on political or philosophical matters, lost direction after his death in 1919. It continued to exist and publish pamphlets on various scientific and anti-clerical topics until formally dissolved by the National Socialists in 1934.⁸³

Critical reactions to Monist ethics

One of the earliest criticisms to address the moral implications of Haeckel's work came in the form of an open letter from an ethnologist, A. Bastian (1874), who insisted that the theory of evolution was too uncertain to be applied to social issues and ethical problems. Because his own field of ethnology, he explained, "is too new for such a hazardous venture," he himself had refrained from attempting to popularise his ideas.⁸⁴ Inciting members of the general public with his theories would interfere with the scientific process of independent research and careful verification of results:

You concern yourself with winning as many proselytites as possible, as quickly as possible; you are the fanatical, crusade recruitment preacher [Kreuzprediger] of a new faith, a faith in science that knows nothing of faith, that neither knows it nor may know it; by bellowing excommunication you persecute the heretical sects in anthropology that still appear disinclined "to recognise the indispensable guide, the theory of evolution, as such"; you surrender critical judgement to might, and you yourself sneer at the human rights of those who still hesitate and doubt whether they should swear unconditional belief in the Jātaka-monkey.⁸⁵ Who knows how far it still may go; you have in yourself all the markings of proclaiming a dogma of infallibility, and you understand curses and damnations very well also.⁸⁶

82 Hans Fuschlberger, *Zweieinigkeit. Die Religion der Zukunft* (Hamburg: Paul Hartung, 1921), pp. 28-30.

83 Interestingly, the National Socialists did not feel it necessary to dissolve the anti-Darwinian Kepler League, discussed below, and Dennert continued to publish anti-Darwinian tracts up to his death in 1942. See Heiko Weber, *Monistische und antimonistische Weltanschauung*, Olaf Breidbach (series ed.), Ernst-Haeckelhaus-Studien, (Berlin: Verlag für Wissenschaft und Bildung, 2000).

84 A. Bastian, *Offener Brief an Herrn Professor Dr. E. Haeckel, Verfasser der "Natürlichen Schöpfungsgeschichte"* (Berlin: Wiegandt, Hempel u. Parey, 1874), p. 8.

85 The "Jataka Tales" are Buddhist moral lessons, one of which involves a talking monkey.

86 Bastian, pp. 8-9.

Bastian implored Haeckel to ensure “that your results leave the stillness of the study chamber, the halls of the University, only in the moment of full maturity; since, if still unfit for vernacularisation, they will be misinterpreted and misunderstood in the din of the marketplace, and degenerate into a monstrosity.”⁸⁷

One such monstrosity stalking Europe was the spectre of Communism, or, to be more precise, the Social Democratic movement. It was a recurring tactic among critics of Darwin’s theory to draw a link between it and the Social Democracy movement in order to discredit both, both morally and politically. The Paris Commune of 1871 and the rapid growth of the Social Democracy movement in Germany were alarming many, conservatives and liberals alike. Furthermore, a superficial comparison of Darwin’s theory and socialist ideology made the accusation seem plausible, as members of both camps claimed to have uncovered a scientific law of progressive development through struggle, and employed anticlerical rhetoric.

In a now-notorious passage in the *History of Natural Creation*, Haeckel appeared to endorse this connection:

The animal origin of the human race [...] must be a very unpleasant truth to members of the ruling and privileged castes in those nations among which there exists an hereditary division of social classes, in consequence of false ideas about the laws of inheritance. [...] What are these nobles to think of the noble blood which flows in their privileged veins, when they learn that all embryos, those of nobles as well as commoners, during the first two months of development, are scarcely distinguishable from the tailed embryos of dogs and other mammals?⁸⁸

Haeckel’s former teacher Virchow, a prominent member of the left-liberal Progressive Party in the German Reichstag, endorsed this view in 1877, when he addressed the fiftieth gathering of the German Association of Natural Researchers and Doctors with a speech titled “The Freedom of Knowledge in the Modern State.” Virchow related the anecdote of how the cell theory, which he had helped to develop, had been invoked by several ignoramuses to explain the arrangement of stars into constellations, as well as various geological phenomena. “I refer to this,” Virchow told the esteemed gathering, “merely in order to show how the subject appears from the outside, how the ‘theory’ expands, how our statements return to us in a frightening form. Now just think of how, already today, the theory of descent is conceived in the head of a socialist.”⁸⁹

⁸⁷ *Ibid.*, p. 9.

⁸⁸ Haeckel, *History of Creation*, vol. 1, p. 295.

⁸⁹ Rudolf Virchow, *Die Freiheit der Wissenschaft im modernen Staat. Rede gehalten in der dritten allgemeinen Sitzung der fünfzigsten Versammlung deutscher Naturforscher und Aerzte zu München am 22. September 1877*, (Berlin: Wiegandt, Hempel u. Parey, 1874), p. 8.

Virchow singled out Haeckel in particular for encouraging such nonsense through his efforts at disseminating the idea of evolution to the half-educated. Shortly after Virchow's speech, Haeckel publicly denied the charges in a speech titled "Free Science and Free Teaching," suggesting instead that the theory of evolution is aristocratic, if anything, since it affirmed the basic inequality of human beings.⁹⁰

Writers in Christian periodicals in particular took hold of the alleged connection between Darwinism and Social Democracy to demonstrate the moral depravity that would result from the modern materialist world-view. Albert Wigland, a professor of botany in Marburg, adopted this position in a pamphlet he wrote in 1878 for the series *Timely Questions of Christian Public Life* (*Zeitfragen des christlichen Volkslebens*):

Darwinism is the school, or more correctly: one of the schools, of unbelief and immorality, and Social Democracy is one of the ways on which this basic principle is applied on a large scale. The dissemination of this view of the world extends far beyond Social Democracy and Darwinism, into spheres where one will have nothing to do with either of them.⁹¹

Prior to 1900 Haeckel's name appeared sporadically in the pages of Christian journals, alongside those of other apostles of the modern materialist world view. In these cases, the criticisms of those who examined his ideas in any detail mostly accused him of falsifying the evidence for evolution in his illustrations of embryos.

However, the astounding success of *The Riddles of the Universe* prompted a veritable flood of articles and pamphlets by supporters and critics, many of the latter repeating earlier attempts to link Darwinism and Social Democracy. In a pamphlet of the Evangelic League (*Evangelischer Bund*), Dr. Bärwinkel cited a reference to Darwin in a speech by Social Democrat leader August Bebel, and then accused the Monists of aiding the radical socialists:

With such falsehood they deceive the ignorant or half-educated masses, because they hope that, by the elimination of faith in God, they can achieve control over the masses in the easiest manner and can exploit this control in their fashion. It is deplorable that a great number of people will be taught in this irresponsible manner about the best of what they possess, namely, about their faith in a God who created the world and who reigns with wisdom and love.⁹²

90 Ernst Haeckel, *Freedom in Science and Teaching* (New York: Fitzgerald, n.d.), p. 43.

91 Albert Wigland, "Der Darwinismus ein Zeichen der Zeit," *Zeitfragen des christlichen Volkslebens*, 3.5 and 3.6 (Frankfurt am Main: Zimmer'schen Buchhandlung, 1878), p. 104.

92 Bärwinkel, *Naturwissenschaft und Gottesglaube. Ein apologetischer Streifzug gegen Häckels "Welträtsel."* Flugschrift des Evangelischen Bundes, issue 196 (Leipzig: Buchhandlung des Evang. Bundes von C. Braun, 1902), p. 17.

Likewise, Erich Wasmann, a Jesuit entomologist who studied ants and a regular contributor to the periodical *The Christian World* (*Die christliche Welt*), renewed these fears in a pamphlet he published in 1919, following the Armistice, by warning of how “the Social Democratic emissary, the most zealous helper’s helper of unbelieving free thought, immediately derived the practical consequences for human life and threw the burning revolutionary torch in countless pieces of writing and in public meetings in the widest circles, in order to destroy the Christian social order.”⁹³ Wasmann was not impressed with Haeckel’s appeal to the universal principle of neighbourly love. “Did Haeckel completely forget,” Wasmann thundered, “that the most profound law of this noble Monistic moral teaching is the bestial ‘struggle for existence,’ through which humanity is supposed to have emerged from a horde of wild beasts through the ‘happy solution of the cardinal problem’? The ruthless struggle of all against all – in reality that is the ‘Golden Rule’ of the new Monistic world religion!”⁹⁴

Viktor Kühn (1909), a pastor in Dresden, expressed similar sentiments in a pamphlet published by the *Evangelic League*. A truly consistent Monist philosophy, he argued, could not include a system of ethics because it would have no basis by which to distinguish between good and evil, true and false, beautiful and ugly:

If it establishes one nonetheless, it must resort to mere hollow phrases or to a moral nihilism or to a weak quietism. [...] Naturalistic and idealistic Monists speak a great deal about the ideals of the Good, the True and the Beautiful. But do not precisely these concepts presuppose a dualistic opposite? What is the standard for the Monistic ideal? What then is good? What gives power to the ideal for it to overcome the resistance of its opposite? What gives it the inner right to its claim to rule? The tragedy of Monism is that it is intended to provide an ethical system, but is unable to do so.⁹⁵

Eberhard Dennert (1909) summarized the feelings of many when he cautioned, “Conflict between faith in God and natural science attacks our religious and ethical life at the roots, and injures our social welfare. Therefore, whoever wishes to work with our people in religious, ethical, or social matters must take this conflict into account and must presently settle it for good, if he does not

93 Erich Wasmann, *Haeckels Monismus eine Kulturgefahr. Vierte, vermehrte Auflage der Schrift ‘Ernst Haeckels Kulturarbeit’* (Freiburg im Breisgau: Herdersche Verlagshandlung, 1919), p. 16.

94 *Ibid.*, p. 16.

95 Viktor Kühn, *Haeckels Monismus. Eine Gefahr für unser Volk*, Flugschriften des Evangelischen Bundes zur Wahrung der deutsch-protestantischen Interessen, issue 265 (Halle: Verlag des Evangelischen Bundes, 1909), p. 20.

want to work in fear.”⁹⁶ Like Bastian, Dennert warned against “the manner these days of immediately popularising the ‘results’ of science, not yet absolutely mature, and of taking them to the people, and then especially with manifold consequences that their discoverers did not at all think about and against which they energetically protest.”⁹⁷ Dennert went so far as to establish the Kepler League in 1909, a mirror-image of Haeckel’s organisation intended to propagate a theistic view of nature.⁹⁸

In another anti-Monist pamphlet, V. Kirchner (1914), a pastor in Gröningen, observed that “when the young person who has absorbed the Haeckelian poison takes his own life, then the danger is evident. He has done no more, however, than to draw the consequences from the Haeckelian system that Haeckel himself has drawn either not at all or in a merely fragmentary way.”⁹⁹

Conclusion

Throughout his career, Haeckel continued to insist that everywhere one looks in the natural world “one finds, indeed, the grim ‘struggle for life,’ but at its side are ever ‘the good, the true, and the beautiful.’”¹⁰⁰ Such moral judgements reveal traces left on this thought by his idealist mentors, despite his materialist protestations to the contrary. Through the study of organic morphology, Haeckel claimed to have uncovered moral laws imbedded in the very matter and ether out of which the universe is composed. Nonetheless, contemporaries such as Reinke, Dennert and Kühn remained unconvinced; as Wasmann insisted, “Nature, or if one prefers, natural law, recognises no distinction between right and wrong; it is purely a question of power.”¹⁰¹ While it is true that some social theorists such as Tille cited Haeckel’s remarks regarding human inequality and the ruthless struggle that takes place in nature in order to justify equally brutal social policies, this interpretation was not unanimous among his followers. Indeed, the appeal of Haeckel’s Monistic worldview lay in the flexibility provided by the amalgam of biological theories it incorporated, including both morphology and natural selection, which allowed a broad spectrum of ideologies to be read into it.

96 Eberhardt Dennert, *Weltbild und Weltanschauung. Zur Verständigung über das Verhältnis der freien Naturforschung zum Glauben* (Godesberg b. Bonn: Naturwissenschaftlicher Verlag, 1909), p. 4.

97 Dennert, *Weltbild*, p. 76.

98 For a history of this organisation, see Weber, *op. cit.*

99 V. Kirchner, “Gott, Freiheit und Unsterblichkeit. Ein Konfrontation von Haeckel und Glogau,” *Pädagogisches Magazin*, issue 570 (Langensalza: Hermann Beyer & Söhne, 1914), p. 3

100 Haeckel, *Riddle*, p. 122.

101 Wasmann, *Haeckels Monismus*, p. 21.

Turn of the century debates over biomedical ethics foreshadowed in some respects current public discussions concerning such troubling issues as genetic modification, stem cell research and doctor-assisted suicide. Since that time it has become generally accepted that the public has a right to know about recent scientific discoveries, and to participate in formulating policy decisions. On the other hand, the subsequent use of Darwinian arguments to justify imperial expansion, eugenics and racial extermination admittedly did substantiate the worst fears of those who wished to keep this knowledge from those members of the public who were capable of understanding Darwin's ideas in only the most superficial manner. Ultimately, however, it proved to be impossible to unlearn this forbidden knowledge.