

CHAPTER IV
THE ROLE OF BIOLOGISTS
IN THE DARWINISM-SOCIALISM CONTROVERSY IN GERMANY

Even though F. A. Lange linked Darwinism with socialism already in the mid-1860s, few biologists took notice at that time. The participants and audience for the discussion about the relationship between evolutionary and socialist theory remained rather circumscribed until 1877-79, when the debate became rather strident. On one side of the debate, socialists began emphasizing even more than previously their commitment to biological evolution and its compatibility with their world view. Two of the most important and influential books promoting socialism appeared at that time, both devoting considerable attention to Darwin's theory. Engels' *Anti-Dühring* (1878) and August Bebel's *Die Frau und der Sozialismus* (1879, *Woman and Socialism*) enthusiastically embraced the theory of biological evolution and specifically endorsed Darwin's formulation of it, complete with natural selection and the struggle for existence (though they exempted human evolution from the Darwinian mechanism).

However, while socialists were avidly supporting evolutionary theory, some prominent Darwinian biologists were busy mounting an attack on socialism. Their polemics against socialism were not motivated solely by their distaste for the socialist political and social position, though many of them did despise socialism. To be sure, the growth of the socialist movement in the 1860s and 1870s made it a more significant threat. However, above all they were incensed and embarrassed that many socialists were becoming vocal advocates of biological evolution. They feared that socialists' use of Darwinism would discredit their theory in the eyes of the public, and therefore they attacked socialism in order to rescue Darwinism from a disreputable association. Provoked by Rudolf Virchow's statements in an 1877 speech, where he

- insinuated that teaching evolution in primary and secondary schools might be dangerous because of connections between Darwinism and socialism, Ernst Haeckel and other prominent Darwinists began ridiculing the idea that Darwinism fostered socialism. To the contrary, they argued: Darwinism and socialism are incompatible and antithetical.

Biologists were no less averse to using biology as a justification for their social views than were socialists, though most of them upheld liberal--and thus anti-socialist--political views. Since they reached different political and social conclusions, some scholars have concluded that Darwinism could be applied to society in just about every conceivable way. According to this view, applying Darwinism to society was merely an exercise in reading one's own social or political presuppositions into Darwinian theory and stressing elements of the theory that seem to be compatible with them. However, this fails to take into account that the anti-socialist biologists and the socialists were not only disagreeing on social theory. Quite often, they were appealing to different biological theories to support their position. The Darwinian biologists who criticized socialism emphasized natural selection and the struggle for existence in their evolutionary theory, while Marxists favored some form of Lamarckism. The social views of the participants, therefore, often colored their receptivity to biological theories.

German biologists were not alone in appealing to nature as a model for society. In the nineteenth century it was commonplace for political and social theorists to use scientific theories and biological analogies to support their ideas. In the eighteenth century the *Aufklärung* (the German equivalent to the French Enlightenment) had exalted reason, and science stood at the pinnacle of rationality. Therefore many late nineteenth-century heirs to *Aufklärung* rationalism attempted to apply the methods, theories, and insights from the natural sciences to social thought. Social and political theorists of the Romantic movement in the early nineteenth century, in rebelling against the apotheosis of reason and the rationalization of society, supported Romanticist philosophies by appealing to analogies derived from nature; they conceived of society as an organism.¹

In the late nineteenth century, the two strands of social thought inherited from the *Aufklärung* and Romanticism intertwined. Darwinism acted as a catalyst to synthesize the organic analogy of society with the scientific rationalization of society. Of course, Darwinism did more than just accelerate the combination, since it added new dimensions of its own to the resulting synthesis. Specific aspects of Darwinian theory--especially the struggle for existence based on the Malthusian population principle--infiltrated the conceptual framework and rhetoric of numerous important social theorists.

Aside from biologists, some of the most prominent German social theorists from 1859 until the close of the century relied heavily on Darwinian theory to buttress their views. For Albert E. F. Schäffle in *Bau und Leben des socialen Körpers* (1875-78, *Structure and Life of the Social Body*) and the sociologist Ludwig Gumplowicz in *Der Rassenkampf* (1883, *The Racial Struggle*), Darwinism was a central ingredient. The ethnographer Friedrich von Hellwald, editor of *Ausland*, a journal devoted to ethnology and promoting Darwinian theory, made the struggle for existence the chief explanatory principle for social development in his influential work, *Culturgeschichte* (1875), as did the famous geographer Friedrich Ratzel in his writings. Even Max Weber's rhetoric in 1895 was pervaded with Darwinian terminology, though this later changed. Thus numerous scholars studying the human sciences in late nineteenth-century Germany looked to biology and specifically Darwinism for models to explain social development.²

Thus German biologists found themselves in an intellectual milieu in which biological and social thought were closely related. If social theorists were so zealously appropriating Darwinism for their own purposes, it should not seem odd that biologists entered the discussion. They, after all, could claim to have keener insight into the intricacies of Darwinian theory than non-scientists would have and thus might be able to offer judgments of benefit to social theorists. Better knowledge of Darwinian theory, however, by no means accounts for the political positions represented by German biologists. Indeed a small number of Darwinian biologists in the late nineteenth century, including the British naturalist Alfred Russell Wallace, the

co-formulator with Darwin of the theory of natural selection, and the Swiss botanist Arnold Dodel, were socialists. Unlike their anti-socialist colleagues, they saw nothing in natural selection that conflicted with leftist political views.

The anti-socialist rhetoric of numerous German Darwinists stemmed more from their political presuppositions than from their scientific study of Darwinism. They represented the educated bourgeoisie, the *Bildungsbürgertum*, and, for the most part, Darwinian biologists upheld liberal political views. Before 1879 German liberals clung to the doctrine of laissez faire, and throughout the nineteenth century they stridently opposed the socialist movement. Though opposed to Bismarck's aristocratic conservatism in the early 1860s, liberals became more conciliatory and compromised with him in the wake of his military triumphs and the unification of Germany, which accomplished what liberals had long desired, but failed to achieve. Bismarck also wooed the liberals to his side during the 1870s through free trade policies and the *Kulturkampf*.³ German biologists were no exception to the rightward shift within liberalism, which is most clearly illustrated in Haeckel's shift from antipathy toward Bismarck in the 1860s to his later unbounded admiration for the iron chancellor. The anti-socialist Darwinists were both influenced by and participated in the anti-socialist propaganda of Bismarck in 1878, which resulted in the Anti-Socialist Law (1878-90) and the anti-socialist fears of the 1890s, as the SPD grew in electoral strength after the lifting of the Anti-Socialist Law.

Though Darwinism was not the decisive factor shaping the political and social outlook of German biologists, we must not minimize the extent to which Darwin's liberal political, social, and economic ideas were incorporated into the presentation of his theory. His distinctive contribution to evolutionary theory, the idea of natural selection, was conceived through reading Thomas Robert Malthus' *Essay on Population*. Malthus' views justified laissez faire, the cornerstone of classical liberal political economy, and won many adherents in the first half of the nineteenth century, including Darwin. Silvan Schweber has demonstrated that Darwin also derived his concept of divergence of characters both directly and indirectly from classical political economists' discussions of the division of labor.⁴ Marx and Engels

considered Darwin's theory tainted because of the admixture of Malthusian socio-economic thought that mirrored bourgeois society. German biologists were not at all off the mark in finding social ideas in the scientific theories of Darwin. Indeed the historian of science Robert Young has declared that "Darwinism *Is* Social," and while this is hyperbole, there is a germ of truth in it.

Darwinism was not the only biological theory of evolution to rely on social ideas. Oscar Hertwig, a distinguished student of Haeckel's who became professor of anatomy at the University of Berlin in 1888, turned away from Darwinian selectionism to embrace neo-Lamarckism. He consistently upheld an organicist view of society and thought that cooperation and harmony within organisms provided a better model for society than the competitive individualism of the Darwinian struggle for existence. In his view, evolution resulted from the purposive response of organisms to their environments rather than from chance selection. Although Hertwig's adoption of a non-Darwinian evolutionary theory was not based solely on social and political considerations, the latter did exert considerable influence on his biological ideas, and he continually wove them together. Hertwig's case illustrates that liberal biologists no less than socialists could be eager to find non-Darwinian explanations for evolution, when they could not accept the social implications of the struggle for existence.⁵

Charles Darwin and Socialism

Darwin did not publicly participate in the German debate over Darwinism and socialism, which only erupted toward the end of his life. However, it was already evident from his published works that he was no supporter of socialism. Although he skirted the issue of human evolution in *The Origin of Species* (1859) and thus did not engage the issue of social development at that time, later in *The Descent of Man* (1871) he clearly spelled out the implications of his evolutionary theory for human physical and social development. He considered humans merely one species among many, subject to the same biological principles, and attempted to show that all human

traits are different from animals merely in degree, not in kind. Thus he tried to emphasize the similarities between the human and animal world.

For Darwin, then, laws from the animal realm could legitimately be extrapolated to humans, since humans are not essentially different from other organisms. He applied the Malthusian population principle, the struggle for existence, and natural selection to humans, just as he had previously applied them to non-human species. Not only this, but in *Descent* he insisted that population pressure among humans produces misery, just as Malthus had insisted:

Natural selection follows from the struggle for existence; and this from a rapid rate of increase. It is impossible not bitterly to regret, but whether wisely is another question, the rate at which man tends to increase; for this leads in barbarous tribes to infanticide and many other evils, and in civilised nations to abject poverty, celibacy, and to the late marriages of the prudent. But as man suffers from the same physical evils with the lower animals, he has no right to expect an immunity from the evils consequent on the struggle for existence.⁶

Darwin thus justified poverty as one of several necessary evils in human society. Malthus' population theory, which had been penned to refute the leftist utopian ideals of William Godwin, resonated with Darwin. Elsewhere in *Descent* he defended the inheritance of property and the moderate accumulation of wealth, which he considered essential if civilization is to advance.⁷ Darwin was, of course, the benefactor of inherited wealth, and his scientific work would have been impossible without it.

Darwin's espousal of laissez-faire economics shines through even clearer in a letter to Heinrich Fick, a law professor in Zurich. Not only did Darwin express support therein for economic competition, but he also opposed the formation of trade unions and cooperatives, which restrict competition and thus hinder progress. His economic views in this letter paralleled his biological views.⁸

Despite small forays into the province of social thought, Darwin was discreet and never placed heavy emphasis on political or economic applications of his theory.

He probably avoided such discussions because of his self-acknowledged ignorance in these areas. However, he was not averse to others engaging in this kind of speculation. When the German economist Hugo Thiel sent him a pamphlet, "Über einige Formen der Landwirtschaftlichen Genossenschaften" ("Concerning a Few Forms of Agricultural Cooperatives"), which expressed laissez-faire views, Darwin expressed deep interest in Thiel's application of evolutionary theory to social and moral questions.⁹

While Darwin could express keen interest in Fick's and Thiel's applications of Darwinism in the fields of law and economics, he could not stomach attempts to link his theory with socialism. After the dispute over Darwinism and socialism broke out in Germany in the late 1870s, Darwin wrote in a letter, "What a foolish idea seems to prevail in Germany on the connection between Socialism and Evolution through Natural Selection."¹⁰ He applauded Thomas H. Huxley for giving Virchow a "tremendous rap on the knuckles" for having linked Darwinism with socialism.¹¹ When Darwin finished reading the English translation of Haeckel's *Freedom of Science*, which contained an entire chapter attacking socialism as anti-Darwinian, Darwin wrote to congratulate Haeckel on his book: ". . . you must let me have the pleasure of saying how much I admire the whole of it. It is a *most* interesting essay, and I agree with all of it."¹² He shared with Haeckel the view that Darwinism, far from supporting socialism, militated against it.

Darwinian Biologists' Attack on Socialism

The year 1877 marked the intensification, but not the beginning of, the anti-socialist rhetoric of German biologists. As early as 1869 the zoologist Gustav Jaeger, a professor at Hohenheim Academy (from 1870 on at the Stuttgart *Polytechnikum*) and one of the earliest Darwinian proponents in Germany, was lecturing against the dangers of socialism and bolstering his position with arguments drawn from biology: "On this occasion I cannot help pronouncing a condemnatory judgment from the standpoint of comparative zoology over the recently appearing communist idea." He argued that nature demonstrates the necessity of both private property and the

division of labor. Socialism, in his opinion, would lead to a degeneration in individuals and society.¹³

Georg Seidlitz, a biology instructor (*Dozent*) at the University of Dorpat, agreed with Jaeger and carried the arguments against socialism even further. He approved of D. F. Strauss' judgment in *Der alte und der neue Glaube* (1872, *The Old Faith and the New*) that social democracy is detrimental to culture, asserting that this conclusion follows quite naturally from the Darwinian theory. After all, the Darwinian theory, as Fick had demonstrated in an 1872 article, proved that the elimination of the struggle for existence would cause the degeneration of the human species. Furthermore, Seidlitz argued that one of the most important social instincts on which civilization is founded is the respect for property. The socialist program would undermine this instinct and lead to the decline of civilization. He pointed to the extermination of the propertyless American Indians in the struggle for existence as a warning against those wanting to eliminate private property.¹⁴

Although they did not explicitly mention socialism, some other biologists articulated social and economic ideas contradictory to socialism as corollaries of the Darwinian theory before 1877. Wilhelm Preyer, professor of physiology at the University of Jena, published a lecture in 1869 emphasizing the need for economic competition, both between individuals and between industries, for the progress of society. He considered economic inequality and poverty unavoidable in a world ruled by the Malthusian principle. In a later lecture of 1879 he harshly castigated socialism, which, if it were implemented, would be disastrous for society by eliminating competition:

But man's greatest enemy is another man. . . The conditions of life are such that at all times one portion of mankind were, are, and will be poor and sick, another portion rich and healthy.¹⁵

In 1871 Alexander Ecker, professor of anatomy at the University of Freiburg, argued similarly that individualist economic competition is a necessary part of the human struggle for existence, without which human progress would be hindered.¹⁶ By claiming that Darwinism proved the necessity of an inegalitarian, competitive

economic system, Preyer and Ecker tacitly (and later Preyer explicitly) dismissed socialism on Darwinian grounds.

By 1877, then, several biologists had made direct and indirect attacks on socialism on the basis on Darwinism. However, none of these were particularly prominent scientists at the time. The anti-socialist views of Jaeger, Seidlitz, and Ecker were only expressed in short passages of longer works or in lectures, so they never received wide circulation. Although Preyer later became famous for his contributions to physiology and developmental psychology, he was young and virtually unknown in 1869, when he published his work justifying economic competition and thus indirectly opposing socialism. His later attacks on socialism would carry greater weight, however.

When Virchow delivered his speech to the annual meeting of the Association of German Scientists and Physicians on 22 September 1877, he aroused a storm of controversy and provoked reactions from those who might otherwise have kept their opinions on socialism to themselves. Virchow, the founder of pathology, was one of the most famous and highly-regarded scientists in Germany, so his words carried weight. In the aftermath of Virchow's speech, the foremost champion of Darwinism in Germany, Ernst Haeckel, and another prominent biologist, Oscar Schmidt, assailed socialism on the basis of Darwinism. Other attacks would follow.

The portion of Virchow's message dealing with socialism was oversimplified by his opponents, who reduced it to the dictum: Darwinism leads to socialism. They misconstrued him to be drawing a simplistic cause and effect relationship between the two ideas, and they considered him a foe of both positions. As the leader of the liberal Progressive Party, Virchow was, of course, antagonistic to socialist ideology.

As a scientist, he led the fight to dismiss the Neanderthal skulls as pathological examples of human remains rather than evolutionary predecessors of Europeans, thereby contradicting the claims Darwinists made about human evolution. Although his fame rests primarily on his work in pathology and his political activity, he helped found the Berlin Society for Anthropology, Ethnology, and Prehistory, helped edit an anthropological journal, and wrote numerous articles on anthropology, so he found

himself in considerable conflict with Darwinists. However, no matter how untenable one may consider Virchow's position in 1877, he did not assert that socialism was the necessary and logical consequence of Darwinism, as both supporters and detractors construed his statements (only a few contemporaries, such as T. H. Huxley, properly gave Virchow the benefit of the doubt).

Virchow was not arguing against Darwinism in his speech, but advocated restraint and moderation in presenting it to the public, especially in the schools. He did not consider Darwinism an established scientific fact, but rather a question requiring further scientific study. While admitting that Darwinism may be true, he demanded that Darwinian spokesmen curb their dogmatic, overly speculative, and opinionated utterances. His former student, Haeckel, was one of the chief offenders on this score, and Virchow's speech was partly a response to a speech Haeckel had delivered several days earlier to the same meeting. The avowed intent of Virchow's recommendations was to retain the recently-acquired freedom of science, which was threatened by a public backlash against irresponsible statements by scientists.¹⁷

In the midst of his plea for restraint in teaching Darwinism in the schools, Virchow offered a brief caveat linking Darwinism with socialism. He correctly expected that his audience, comprised mostly of doctors and scientists, shared his anti-socialist outlook. He intended to instill in the hearts of Darwinian proponents the fear of inadvertently abetting a dangerous movement. However, Virchow never stated that socialism was the logical consequence of Darwinism, and the preface to his remarks on the relationship between Darwinism and socialism was quickly forgotten by his opponents. He introduced his remarks on socialism by explaining that some people had made utterly ridiculous applications of his own theory that cells only come from other cells. He continued:

I only cite this in order to show how things appear to the outside, how the "theory" expands, how our tenets return to us in a form appalling to us. Now just imagine how even today the theory of evolution looks in the head of a socialist!¹⁸

The audience greeted this last statement with laughter, but this did not deter Virchow, who followed immediately with even stronger statements:

Yes, gentlemen, that may appear ludicrous to many, but it is very serious, and I hope that the theory of evolution may not bring upon us all the horrors that similar theories have actually wrought in our neighboring country. Nevertheless, this theory also, if it is carried through consistently, has a particularly dubious side, and hopefully it has not escaped you that socialism has forged connections with it.¹⁹

It did indeed seem ludicrous to his audience, and Virchow did no favor to his cause by obliquely insinuating that the Paris Commune was the result of "similar theories." He also never elaborated on what was so dubious about the theory of evolution, other than the fact that socialists esteemed it. After he made these statements, Virchow reiterated that he was not opposed to the theory of evolution per se, but only to the premature teaching of evolution without sufficient scientific evidence. Once it became a fully established theory, Virchow would not object to teaching it to everyone, no matter how dangerous it was or who supported it.²⁰

Although his comments on socialism evoked much criticism, they formed only a peripheral part of his speech and were intended as an emotionally-charged justification for his main arguments. Kurt Bayertz has pointed out that Virchow was concerned over the growth of the socialist party, which became the fourth largest party in the German Reichstag earlier that year. However, Bayertz overshoots the mark when he asserts that Virchow's reservations about teaching Darwinism in the schools flowed from a renewed urgency in combatting socialism.²¹ This places too much weight on the brief passage on socialism in his speech. It is more plausible to view the speech as a response to Haeckel and other Darwinian advocates than as a response to socialism.²² Haeckel, after all, was extremely provocative, especially in his utterances on religion, and even Darwin expressed concern that he was making intemperate remarks that would damage the very cause he wanted to promote.²³

Most people ignored the qualifications, weak as they were, surrounding Virchow's statements on socialism and boiled them down to a simplistic equation of

Darwinism with socialism. Two sectors of German society approved of this formula. First, many conservatives rallied behind Virchow, since they vehemently opposed both Darwinism and socialism. They did not need any convincing that Darwinism was dangerous to society. A conservative, anti-Darwinian biologist, Albert Wigand, explained in his book, *Der Darwinismus: Ein Zeichen der Zeit* (1878, *Darwinism: A Sign of the Times*) that the elimination of morality caused by Darwinism produced decadent movements such as socialism.²⁴ The second group, the socialists, agreed with Virchow's Darwinism-socialism equation, since they adhered to evolutionary theory. As Bebel contended, if Virchow is right about Darwinism leading to socialism--and Bebel thought he was--then socialism has scientific support.²⁵

The most thorough refutation of Virchow's speech came in 1878 from Haeckel, who was the most famous Darwinist in Germany and whose *Natürliche Schöpfungsgeschichte* (1868, translated as *The History of Creation*) was the most influential work on the subject in Germany during the nineteenth century. In *Natürliche Schöpfungsgeschichte* Haeckel had not attacked socialism by name, but he had enunciated socio-economic positions incompatible with socialist beliefs. Agreeing with Malthus, he believed that population pressure inevitably produces economic competition, which is indispensable in fostering progress. He further argued that the division of labor in society is the result of the struggle for existence.²⁶ Haeckel could not conceive of a society in which cooperation would reign:

. . . everywhere you find an unsparing, highly embittered struggle of all against all. Nowhere in nature, wherever you may look, does that idyllic peace exist, about which the poets sing--rather everywhere there is struggle and striving to destroy one's neighbor and competitor. Passion and selfishness, conscious or unconscious, is everywhere the motive force of life. . . . Man in this respect is no exception to the rest of the animal world.²⁷

Haeckel's anti-socialist perspective was thus clearly established long before he took pen in hand to assail Virchow.

His polemic against Virchow, *Freie Wissenschaft und freie Lehre* (1878, translated as *Freedom of Science and Teaching*) contained an entire chapter devoted to the relationship between Darwinism and socialism. As an ardent Darwinist and an opponent of socialism, Haeckel rejected Virchow's linkage. According to Haeckel, evolutionary theory proves the necessity of both economic inequality and competition. He assured his readers that because of this, Darwinism is thoroughly aristocratic.²⁸ Of course, Haeckel was referring to a bourgeois aristocracy of talent and wealth rather than the landed aristocracy, with which he had no sympathy.

After dogmatically making these political applications of Darwinism, Haeckel hypocritically urged caution in applying laws of nature to politics and called such attempts subjective and unscientific. Apparently this warning applied only to Virchow and those linking Darwinism and socialism, because Haeckel did not pay it the slightest heed, neither in *Freie Wissenschaft* nor elsewhere. Indeed in the speech he delivered to the Munich meeting of the Association of German Scientists and Physicians only four days prior to Virchow's speech, he had asserted the importance of applying evolutionary theory to all disciplines:

Neither practical medicine, as applied natural science, nor practical political science, jurisprudence and theology, inasmuch as they are parts of applied philosophy, will henceforth be able to escape its [evolutionary theory's] influence.²⁹

Never in the course of his career did he hesitate to make political and social statements, often basing them on scientific grounds. In his earliest work on evolution, he had asserted that

the statesmen, the teachers of economics, and the historians of the future will have to study above all comparative zoology, i.e. comparative morphology and the physiology of animals, as an indispensable foundation, if they want to attain to a truly naturalistic understanding of the corresponding human phenomena.³⁰

Later, Haeckel was also involved in the Krupp competition, the purpose of which was to promote applications of Darwinism to political questions. Although Haeckel

confided to Arnold Dodel that he was inexperienced and unsure in the realm of practical philosophy, including politics, one would never guess this from his public writings.³¹ In one of his last books, *Ewigkeit*, he not only interpreted World War I in light of evolutionary theory, but also declared that sociology is a branch of natural science and specifically of physiology.³²

Haeckel's political stance altered somewhat during his career, but this never affected his fundamental hostility toward socialism. The transformation his views underwent was a common occurrence in liberal circles in nineteenth-century Germany. In the 1860s Haeckel was a left-liberal whose position was similar to that of Virchow and the Progressive Party. At that time he was even more radical than Virchow, for he chided his former mentor for not being more bold in opposing Bismarck's blood-and-iron methods.³³ Bismarck's success in uniting Germany and his *Kulturkampf* against the Catholic Church tamed Haeckel's radicalism, as it did with many liberals, and Haeckel became one of Bismarck's most sincere admirers. In 1892 Haeckel was incensed when the German government snubbed Bismarck, and he invited the former chancellor to Jena, where the city and university feted him to show their appreciation.³⁴

Haeckel attacked socialism with renewed zeal in the 1890s, and he appealed to Darwinism repeatedly to refute socialist tenets. He reasserted his claim that Darwinism reveals the necessity of inequality:

Darwin's theory of selection is closely linked with the biological laws of the division of labor; it is not democratic, but rather an aristocratic principle.³⁵

He believed that the kind of equality sought by the social democrats would be tantamount to a lapse into barbarism. Haeckel also commented favorably on the efforts of other biologists and writers exposing the folly of socialism on a Darwinian basis. He approved of the anti-socialist views expressed by Oscar Schmidt, Heinrich Ernst Ziegler in *Die Naturwissenschaft und die Socialdemokratische Theorie* (1893, *Natural Science and the Social Democratic Theory*), Alexander Tille in *Volksdienst*

(1893), as well as *Von Darwin bis Nietzsche* (1895, *From Darwin to Nietzsche*), and T. H. Huxley.³⁶

Despite Haeckel's antipathy toward socialism, he exercised considerable influence within the socialist movement. His most popular works, *Natürliche Schöpfungsgeschichte* and *Die Welträthsel* (1899, translated as *The Riddle of the Universe at the Close of the Nineteenth Century*), along with most of his biological treatises, contained little or nothing of offense to socialists. On the contrary, they were ecstatic over Haeckel's fearless attacks on religion and idealism, and they readily adopted his scientific theories. The socialist journal, *Die neue Welt*, regularly featured Darwinian fare and published Haeckel's speech to the 1882 meeting of the Association of German Scientists and Physicians on "Die Naturanschauung von Darwin, Goethe und Lamarck" ("The View of Nature of Darwin, Goethe and Lamarck") in 1883. Haeckel's speech reinforced the materialistic world view of the socialists, and only a fleeting reference to the human struggle for existence would have caused any socialist to wince:

And concerning the 'struggle for existence,' the most essential element of Darwinism, one really does not need any special proofs; for the entire history of humanity is nothing else [than the struggle for existence]!³⁷

When Haeckel helped organize the Monist League to promote his monistic philosophy, socialist sympathizers were included in its ranks, since it ostensibly eschewed party politics. In 1907 Haeckel even suggested that the socialist botanist Arnold Dodel become acting president, despite the fact that he was well acquainted with Dodel's political persuasion.³⁸

Oscar Schmidt, professor of zoology at the University of Strassburg, was another Darwinist incensed that Virchow would connect Darwinism with socialism. Schmidt had already established a reputation in comparative anatomy before Darwin published his theory, and he readily adopted Darwin's theory. Later he wrote a widely-used text on Darwinism. He delivered his rebuttal of Virchow at the 1878 meeting of the Association of German Scientists and Physicians and then published

it both as a pamphlet and as an article in a popular journal. In addition to upholding inequality and competition--as Haeckel had--he argued that the inheritance of land by the aristocracy is part of the natural order. Further, he rejected all appeals to morality, asserting that natural selection "is a pure question of might," not right.³⁹ When Engels learned that Schmidt planned to lecture on the relationship between Darwinism and socialism, he sent Schmidt a copy of *Anti-Dühring*, since it showed how he as a socialist interpreted Darwinism. Schmidt thanked Engels for the book, which convinced him anew "that my theory of natural evolution and yours has no point of contact; to make this clear *sine ira et studio* is my task."⁴⁰

The controversy over the relationship between Darwinism and socialism abated considerably during the 1880s, only to flare up again in the 1890s as the SPD gained in electoral strength after the lifting of the Anti-Socialist Law. Otto Ammon, who established a reputation as an anthropologist but lacked an academic position, published the first book-length refutation of socialism on Darwinian grounds, *Der Darwinismus gegen die Sozialdemokratie* (1891, *Darwinism against Social Democracy*). Four years later he wrote *Die Gesellschaftsordnung und ihre natürlichen Grundlagen* (1895, *The Social Order and Its Natural Foundations*), arguing that social stratification is the natural and beneficial consequence of the struggle for existence in human society.

One of the most zealous opponents of socialism in the ranks of biologists was Heinrich Ernst Ziegler, who taught at the University of Freiburg before being selected by Haeckel in 1898 to fill the position of Ritter Professor at the University of Jena. In 1893 he wrote *Die Naturwissenschaft und die Sozialdemokratische Theorie, ihr Verhältnis dargelegt auf Grund der Werke von Darwin und Bebel* (*Natural Science and the Social Democratic Theory, Their Relationship Explained on the Basis of the Works of Darwin and Bebel*), a polemic directed against Bebel's popular book, *Die Frau und der Sozialismus*. Ziegler's intense interest in applying biology to political and social questions led him to views similar to those of Ammon, and in fact, Ziegler recommended Ammon's book, *Gesellschaftsordnung*, to his fellow scientists in a

speech to the Association of German Scientists and Physicians in 1902.⁴¹ He agreed with Ammon "especially in his opposition to the democratic ideal of equality."⁴²

Ziegler was constantly trying to draw biology and sociology closer together and indeed to subject the latter to the former. In an 1893 speech to the German Zoological Society he stressed the subjection of humans and their society to biological laws, especially to Malthusian population pressure and the subsequent struggle for existence.⁴³ He played a central role in organizing and judging the Krupp competition for the best scholarly answer to the question, "What do we learn from the principles of evolutionary theory in relation to the inner political development and legislation of the states?"⁴⁴ Ziegler wrote the introduction to the series *Natur und Staat*, which contained the best entries in the Krupp competition. Therein he maintained that "as little as one can separate medicine from natural science, so little can philosophy or political science be made independent from the same."⁴⁵

Ziegler's antagonism toward socialism, especially (but not exclusively) that of the Marxian variety, manifested itself in most of his biological-sociological works. In an 1893 speech to the German Zoological Society, he criticized Bebel for his view that human nature could change in response to new social conditions, because this failed to acknowledge that evolution is an extremely slow process.⁴⁶ In 1895 he congratulated Haeckel for attacking socialism:

I consider the social democracy of Bebel's kind, which has sworn itself to the doctrine of Marx, just as dogmatic and doctrinaire as ultramontaniam. I do not believe that this party is in the position to bring us the necessary social reforms, and fear very much, that through instigating the workers it harms our industry, on which the welfare of the nation rests.⁴⁷

In 1899 Ziegler published a review essay on Woltmann's *Darwinsche Theorie und der Sozialismus*, in which he opposed Woltmann, Marx, and Engels by arguing that social stratification has a biological, genetic basis and is not merely the product of social conditions.⁴⁸

Ziegler's social views were written into the instructions for participants in the Krupp competition. All entries were supposed to consider two important points. The first was biological inheritance, which

conditions the natural inclination of man, his inborn (inherited) mental and character qualities, his egoistic instincts, family instincts, social instincts, etc. . . . The consideration of the natural inheritance and the consequent difference of abilities is of great importance for the understanding of social relations.⁴⁹

The second point to be observed was adaptation and tradition. Under this point entrants were reminded that evolution is gradual:

A slow constant evolution of the laws and institutions, which keeps pace with the ability of people to absorb them contributes accordingly the most to the healthy progress of society (*Volk*).⁵⁰

Ziegler gloated after the competition was over that the Marxian position--the avowed creed of the SPD--rarely surfaced in the submitted entries, while criticisms of Marxism were abundant. However, this could hardly have been a surprise, since the instructions to participants made clear that Marxist ideas were not welcome and would not be given a fair chance. Nevertheless, Ziegler had to admit that many of the entries advocated some form of state socialism, many promoting far-reaching state intervention. But he concluded that since most political positions were represented in the submitted works, no political party could claim its principles were *the* legitimate application of Darwinism to society.⁵¹

August Weismann, one of the most famous biologists in late nineteenth-century Germany because of his work on heredity and evolutionary theory, was much more circumspect than Ziegler or Ammon in applying biology to sociology, yet even he made one foray into the Darwinism-socialism dispute. Weismann, who led the neo-Darwinian (anti-Lamarckian) school of evolutionary theory, considered himself something of a dilettante in sociological questions, but was nonetheless intensely interested in social applications of biology.⁵² When he read Benjamin Kidd's *Social Evolution* in 1894, it struck such a responsive chord that he immediately arranged to

have it translated into German.⁵³ In the foreword that he wrote for the German translation, Weismann pointed out that Kidd's social theory, based as it was on Darwinian biology, posited competition as the driving force behind all human progress. Weismann then concluded that Kidd's theory militated against socialism, because population pressure and the resultant competition are beneficial. Kidd advocated measures to uplift the lower classes, but his purpose--unlike that of most socialists--was to increase social competition, not to banish it.⁵⁴ Weismann also supported the sociological views of Ammon, whom he thought "excellently applied the biological principles of evolution to human society" in his *Gesellschaftsordnung*. Weismann agreed in most essential points with Ammon.⁵⁵

The only foreign biologist to contribute substantially to the Darwinism-socialism debate in Germany was Thomas Henry Huxley, the leading British Darwinist after Darwin himself. He chided Virchow for linking Darwinism with socialism, though he expressed amazement that Virchow's speech was being construed as a refutation of Darwinism and defended him from this accusation.⁵⁶ In 1890 he published four essays on political philosophy, assailing socialism and some of its presuppositions. Two of these were published in German in *Die Zukunft* in 1894-95, and all four appeared in German in Huxley's *Soziale Essays* in 1897. Tille, well-known for his own inegalitarian social philosophy, wrote the foreword to *Soziale Essays*, noting Huxley's opposition to socialism.

In "On the Natural Inequality of Men" Huxley argued contra Rousseau that political and economic equality are rooted in natural inequality, though he did not explicitly appeal to Darwinism to support his point. Likewise, his essay "Natural Rights and Political Rights," in which he argued against the concept of natural rights in order to oppose Henry George's *Progress and Poverty*, contains no allusions to Darwinism, though it does use analogies from nature. Most of Huxley's arguments in "Government: Anarchy or Regimentation" were philosophical rather than biological, though he asserted that the chief problem with socialism is that it ignores the issue of population pressure, an important fundament of Darwin's theory. Huxley's most scathing critique of socialism was "Capital--Mother of Labour," which

carried the subtitle, "An Economical Problem Discussed from a Physiological Point of View." His treatment of socialism did not live up to the subtitle, since apart from opening his essay with an analogy from physiology, the bulk of his arguments had nothing to do with natural science.⁵⁷ Thus, in his zeal to disprove socialism, Huxley did little to actually apply biology to social questions. Nonetheless the fact that the leading Darwinist in Britain disputed socialism lent added support to the anti-socialist biologists. They would have been horrified to learn that Huxley once suggested the remote possibility (though he did not find the idea appealing or convincing) that socialism itself might be a product of natural selection.⁵⁸

Darwinists with Socialist Sympathies

Most of the Darwinian biologists who entered the debate over the relationship between Darwinism and socialism were clearly hostile to socialism. However, among biologists there were a few of more radical political persuasion. In England Alfred Russell Wallace, co-discoverer with Darwin of the principle of natural selection, E. Ray Lankester, a close friend of Marx's in the last years of Marx's life, and Edward Aveling, whose *Die Darwinsche Theorie* (1887) was the first book in the *Internationale Bibliothek* series of the socialist publisher Dietz, all expressed socialist sympathies; so did Grant Allen, whose speech to the Fabians supporting socialism on Darwinian grounds was translated by Eduard Bernstein and published in *Die neue Zeit*. In Germany it was difficult for political radicals to advance within the university system. This factor, together with the fact that most university students came from aristocratic or bourgeois families, probably accounts for the lack of support socialists found among academic scientists in Germany.

One of the most politically radical German biologists of the mid to late nineteenth century was Karl Vogt, who spent most of his career in Geneva after being exiled from Germany for his involvement in the Revolutions of 1848-49. In 1847, the year he was called to Giessen as professor of zoology, he published *Physiologische Briefe (Physiological Letters)*, which evinced his attraction to philosophical materialism, a position he defended even more vigorously in 1855 in a popular book,

Köhlerglaube und Wissenschaft (Blind Faith and Science). In his inaugural lecture at Giessen, he tried to use natural science as a means of undermining the status quo. He pointed out the revolutionary implications of scientific catastrophism, the position he upheld at the time: "The principle of revolution is common to every development of inorganic and organic nature." He supported the Revolutions of 1848 and was a delegate to the Frankfurt Parliament, where he delivered addresses in support of revolution. He argued there that scientific catastrophism validated political revolutions. After the collapse of the Frankfurt Parliament, an embittered and exiled Vogt embraced anarchism and called for the abolition of all forms of government. With the passing of time Vogt's anarchism became less and less radical. He became more sympathetic to Napoleon III, while disdaining Marx and the German social democrats.⁵⁹

Unlike Büchner, Vogt did not believe in the transmutation of species prior to Darwin. He adopted Darwinism soon after the publication of *Origin* and wrote one of the first books in German advocating Darwin's theory and applying evolution to the human species. However, he quit using science as a justification for his political views, so he did not apply Darwinism to social and political affairs. When the Virchow-Haeckel dispute erupted, Vogt proclaimed, "Darwinism is neither socialistic nor aristocratic, neither republican nor monarchical."⁶⁰ Thus Vogt tried to silence both sides of the Darwinism-socialism controversy.

The sole German-speaking biologist publicly endorsing the socialist movement came from outside Germany, but even at the University of Zurich, where he spent his entire teaching career, Arnold Dodel faced persecution because of his political inclinations. Nevertheless, despite his bold political stance, he became a highly respected botanist who enjoyed the esteem of Darwin, Haeckel, and other biologists. He was a frequent lecturer at workers' meetings and contributed an article on Darwin to the socialist journal *Die neue Zeit*. He knew Bernstein personally and corresponded with Karl Kautsky. In addition, he published many of his political and scientific essays in *Aus Leben und Wissenschaft* (1896-1905, *From My Life and Science*) with the socialist publisher Dietz.⁶¹

His most famous work, *Moses oder Darwin?* (1889, *Moses or Darwin?*), an attack on the traditional Christian account of creation, went through fourteen editions by 1922. In this work, Dodel decidedly rejected the political conclusions of so many German biologists:

It is pure fallacy and a misunderstanding, when one maintains that Darwinism is an endorsement of aristocratic politics, a glorification of class privilege; or that the theory of [natural] selection in the struggle for existence leads naturally and inevitably to approval of aristocratic distinctions within the progressing [i.e., "advanced"] nations. The opposite is correct.⁶²

Like Büchner, Dodel did not think humans could ever escape from the struggle for existence, nor should they try. He saw human competition as a stimulus to progress and even asserted that "to live means to struggle." However, he did not believe that present social and political institutions allowed unfettered competition. Thus he wanted to see greater equality of opportunities and conditions so that all talented people could rise and promote progress. The human struggle for existence, in Dodel's view, is not essentially a selfish individualistic enterprise. On the contrary, the gradual replacement of animal egotism by human altruism was advantageous and brought success to humans in the struggle for existence. Dodel thought this trend in the evolutionary history of humans provided a cue concerning the present and future development of humanity. Altruism would continue to increase at the expense of selfishness.⁶³

Dodel's socialist Darwinism was far closer to Büchner's than to Marxist forms. He was convinced that the Malthusian population principle applied to humans and that the struggle for existence was unavoidable. Rather than eliminate the struggle for existence--the goal of Marxists--his vision was for socialism to create greater social and economic equality so the struggle would be "fair," i.e., based on talent rather than wealth. Dodel was also no revolutionary, and his desire for peaceful change resembled Büchner's reform socialism more than revolutionary Marxism.

Unlike Dodel, Anton Dohrn remained fairly reserved concerning his political and social views for most of his career as a biologist. Dohrn was a student of Haeckel's, who founded the Naples Zoological Station to provide a research facility on the Mediterranean Sea for scientists from all over Europe. He earned the respect of many biologists, including Darwin, who contributed financially to his enterprise. As a young man in the early 1860s he--like his mentor Haeckel--belonged to the radical opposition to Bismarck, and he wrote newspaper articles to promote his political views. Upon reading F. A. Lange's *History of Materialism* in the mid-1860s, Dohrn gave up his materialist philosophy and his entire world view was transformed. He described this experience to Haeckel:

He [Lange] completely knocked me over--I had been just like you--but I have been set free for the first time through him, have only now recognized, how immense the areas are, which are above materialism, have gained the correct ground for the first time in politics and social matters, truly--*I am now for the first time free.*⁶⁴

By the time Dohrn had written this letter to Haeckel, he had already read Lange's *Arbeiterfrage*, which left a deep impression on him. He congratulated Lange on his application of Darwinism to social questions, which especially appealed to him as a Darwinian biologist.⁶⁵ After being won to Lange's moderate socialist position, Dohrn immersed himself in other socialist literature, including Marx's *Capital*.⁶⁶ After the 1860s Dohrn retreated from public political discourse and remained aloof from the Darwinism-socialism controversy, though he continued to express interest in political issues in his correspondence. One reason for his reticence was that he was trying to develop and maintain good relationships with politicians of all parties in the German Reichstag, to whom he often appealed for subsidies for his zoological station. In the 1890s, because of the success of his station, he became the personal friend of Kaiser Wilhelm II, as well as numerous other German political figures.⁶⁷

Conclusion

Many Darwinian biologists in Germany joined the dispute over the relationship of Darwinism to socialism. They took for granted that biological laws could be applied to human political and economic institutions. Since humans were now considered merely one species of animal among many, they must be subject to the same principles governing the rest of the organic world. With a few exceptions, the biologists in nineteenth-century Germany applying Darwinism to society presented a united front. (Some of those breaking rank--such as Oscar Hertwig--rejected Darwinian in favor of some non-Darwinian form of evolutionary theory). Most--even those sympathetic with socialism--agreed that humans cannot escape the struggle for existence, which they considered a progressive force. Economic competition, as one facet of this struggle among humans, is therefore beneficial. They translated the Darwinian stress on variation and differentiation into socio-economic inequality and the division of labor. Thus they opposed socialism with its emphasis on greater equality and the elimination of competition.

The scientific and social thought of German Darwinists cannot be divorced, as they themselves recognized. They constantly appealed to social ideas they gleaned from Darwin. For example, Malthus' views on population pressure received widespread circulation among biologists because of Darwin's use of it in *Origin*. Other less overtly social ideas in Darwin's theory, as we have seen, also did not escape their attention. Their criticism of socialism was usually based on the selectionist aspect of Darwin's theory, on the struggle for existence among humans. This presented socialists with a challenge, for they would have to develop conceptual strategies to parry this blow.

The unity in the ranks of Darwinian biologists did not result totally from their biological studies, though these also had an impact. Their social standing made them receptive to bourgeois ideals, including classical liberal economics. Also, in their quest to become part of Germany's intellectual elite, they had to compete with others on the basis of talent and diligence. Thus they were victors in the social struggle for

existence. However, another factor ensuring greater unity was the inability of socialists and other radicals to receive professorships at German universities.

The anti-socialist polemics of leading Darwinists did nothing to dampen the enthusiasm of socialists for evolutionary theory. They continued to hold Haeckel and other Darwinists in high esteem for their scientific accomplishments, which they believed would ultimately undermine rather than support Haeckel's liberal political views. As we shall see, Bebel and Kautsky were especially important in providing explanations as to why this would be so.

ENDNOTES

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3. On German liberalism in the nineteenth century, see Sheehan, *German Liberalism*; Hamerow, *Social Foundations*, 1: 152-77; and Konrad H. Jarausch and Larry Eugene Jones, eds., *In Search of Liberal Germany: Studies in the History of German Liberalism from 1789 to the Present* (NY, 1990), esp. introduction and chs. 7-8.
4. Schweber, "Darwin," 195-289.
5. Weindling, *Darwinism and Social Darwinism*, 12, 15-16, 254-58, 261, 267-71.
6. Darwin, *Descent*, 1:180.
7. *Ibid.*, 1:169.
8. Darwin to Heinrich Fick, 26 July 1872, in Helene Fick, *Heinrich Fick. Ein Lebensbild* (Zurich, 1908) 2:314-15. The letter is reproduced in Richard Weikart, "A Recently Discovered Darwin Letter on Social Darwinism," *Isis* 86 (1995): 609-11. For further discussion of Darwin's social views, see Richard Weikart, "Laissez-Faire Social Darwinism and Individualist Competition in Darwin and Huxley," *The European Legacy* (forthcoming 1998).
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10. Darwin to Dr. Scherzer, 26 December 1879, in *Life and Letters of Darwin*, 2:413.
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12. Darwin to Haeckel, 29 April 1879, Ernst-Haeckel-Haus.
13. Gustav Jaeger, *Die Darwin'sche Theorie und ihre Stellung zu Moral und*

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17. Rudolf Virchow, *Die Freiheit der Wissenschaft im modernen Staat* (Berlin, 1877), 6-8, 12-15, 31-32.

18. *Ibid*, 11-12.

19. *Ibid*, 12.

20. *Ibid*, 12-13.

21. Kurt Bayertz, "Darwinism and Scientific Freedom: Political Aspects of the Reception of Darwinism in Germany, 1863-1878," *Scientia* 118 (1983): 302.

22. Kelly, *Descent*, 57-59.

23. Darwin to Haeckel, 21 June 1867, in *Life and Letters of Darwin*, 2:251-52.

24. Kelly, *Descent*, 60, 97.

25. August Bebel, *Die Frau und der Sozialismus*, 34th ed. (Stuttgart, 1903), 249.

26. Ernst Haeckel, *Natürliche Schöpfungsgeschichte* (Berlin, 1868), 125-29, 218-19, 226, 228.

27. *Ibid*, 16.

28. Ernst Haeckel, *Freie Wissenschaft und freie Lehre* (Stuttgart, 1878), 72-75.

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