

CHAPTER I
KARL MARX'S AMBIVALENCE TOWARD DARWINISM

Upon reading Darwin's *Origin of Species* for the first time in December 1860, Marx triumphantly proclaimed to Engels, "Although developed in a coarse English manner, this is the book that contains the foundation in natural history for our view."¹

Over a year later Marx read Darwin's *Origin* again, but this time was not nearly so enthusiastic. Darwin, he complained, views the natural realm as a reflection of contemporary English society:

It is remarkable how among beasts and plants Darwin rediscovers his English society with its division of labor, competition, opening up of new markets, "discoveries" and Malthusian "struggle for existence."

It is Hobbes' *bellum omnium contra omnes*, and it is reminiscent of Hegel in the *Phenomenology*, where civil (*bürgerliche*) society figures as 'spiritual animal kingdom,' while with Darwin the animal kingdom figures as civil (*bürgerliche*) society.²

It rankled Marx that Darwin had derived the concept of the struggle for existence from his arch-enemy Thomas Robert Malthus. The shift in Marx's opinion of Darwin between 1860 and 1862 did not reflect any change in Marx's views on nature or society, but merely indicated that he viewed Darwin from two different angles. Just as Marx considered the bourgeoisie a progressive force in its time, so he regarded Darwin's theory progressive and an advance over previous scientific theories. John Spargo later recalled that in the late 1860s Marx had said, "Nothing ever gives me greater pleasure than to have my name linked onto Darwin's. His wonderful work makes my own absolutely impregnable. Darwin may not know it, but he belongs to the Social Revolution."³ However, like the bourgeoisie, Darwin's theory contained elements that Marx considered flawed.

Thus Marx was neither an uncritical admirer of Darwin nor a completely hostile critic. However, various factors converged in the late nineteenth and twentieth centuries to leave the false impression that Marx was more the admirer than the critic of Darwin's theory. Marx contributed to this misunderstanding through his infrequent published statements concerning Darwin, all of which were laudatory. In *Capital* he referred to *Origin of Species* as an "epoch-making work," while none of his criticisms of Darwin were disclosed until the publication of his private correspondence and manuscripts.⁴

Direct communication between Marx and Darwin, both genuine and counterfeit, further reinforced the image of Marx as a Darwin devotee. In 1873 Marx sent Darwin the second German edition of *Capital*. On the title page he inscribed, "Mr. Charles Darwin/On the part of his sincere admirer/(signed) Karl Marx/London 16 June 1873/1 Modena Villas/ Maitland Park."⁵ Darwin, who read German with difficulty, left most of the pages uncut and made no pencil marks in the book, as was his custom when reading. However, he wrote a polite but non-committal letter to Marx on 1 October 1873 thanking him for the gift.⁶ The significance of Marx sending an autographed copy of *Capital* to Darwin fades in light of the fact that Marx also sent Herbert Spencer a copy at the same time.⁷ Marx never expressed any interest in Spencer's ideas, many of which were anathema to him, especially in the field of economics. Marx was probably more interested in circulating his ideas among prominent intellectuals of English society than in honoring the recipients of his book. One motivation behind this was that *Capital* had hardly received any attention in the British press and no English translation was in the offing. Conventions of politesse could account for Marx's designation of himself as a "sincere admirer" of Darwin, though in this case there is really no reason to doubt Marx's sincerity.

In the mid-twentieth century numerous scholars connected Marx with Darwin by explaining that Marx wanted to dedicate an edition of *Capital* to Darwin. The alleged dedication implied that Marx esteemed Darwin highly and suggested a parallelism between the two thinkers. The evidence for the intended dedication was

a letter from Darwin dated 13 October 1880 that was found in the Marx archives and in which Darwin refused the dedication of an unnamed book.⁸ Before the mid-1970s only a few scholars expressed any misgivings about the alleged dedication, but some keen detective work in the 1970s produced new evidence that controverted the traditional tale of Marx's dedication to Darwin.⁹ Based on the contents of Darwin's 13 October 1880 letter, Margaret Fay and Lewis Feuer suggested that it was not written to Marx at all, but rather to the biologist Edward Aveling, who, as Marx's son-in-law, had possession of some of Marx's correspondence in the late nineteenth century. Aveling must have inadvertently placed a letter Darwin sent him among Marx's correspondence. After Fay and Feuer published their findings, a letter from Aveling to Darwin was discovered among Darwin's papers, clinching the case. In this letter Aveling requested permission to dedicate his book, *The Student's Darwin*, to Darwin. Thus a Marx-Darwin link on which many scholars had relied disintegrated.¹⁰

Engels and other socialists in the late nineteenth century propagated the image of Marx as the Darwin of the social sciences. Marx encouraged this in 1867, when he counseled Engels to draw attention to the correlation between his social views and Darwin's theory in a review of *Capital* that Engels was to write for a German newspaper.¹¹ Shlomo Avineri, dismissing the Marx-Darwin link as a myth that Marx helped create and Engels propagated, asserted that in this case Marx was concerned primarily with creating interest in his book and catering to the newspaper editor's Darwinist views.¹² However, even if this is true--as it seems to be--Marx thereby demonstrated that he felt no dishonor in being associated with the name of Darwin.

In his speech at Marx's graveside, Engels again compared Marx to Darwin: "As Darwin discovered the law of evolution of organic nature, so Marx discovered the law of evolution of human history."¹³ Among the small group gathered for Marx's funeral were two biologists, Ray Lankester and Edward Aveling, and a chemist, Carl Schorlemmer.¹⁴ While their presence may have helped prompt Engels to include his remarks on Darwin, there can be little doubt that Engels was sincere. Only four

months prior to Marx's death Karl Kautsky requested that Engels contribute a lead article on Darwin to his new socialist journal, *Die neue Zeit*, since Engels had promised Bernstein an article on Darwin.¹⁵ Engels declined, but only because of time pressure, not from lack of interest.¹⁶ After Marx's death the parallelism between Darwinism (loosely defined) and Marxism received further emphasis by two of his sons-in-law, Edward Aveling and Paul Lafargue, as well as by the leading Marxist theorist of the Second International, Karl Kautsky.¹⁷

Marx's Initial Acceptance of Darwin's Theory

After discounting all the misinformation and hyperbole, we are still confronted with the reality that Marx greeted Darwin's theory with enthusiasm, publicly praised Darwin, and only selectively criticized his theory. There were aspects of Darwin's theory that resonated with Marx's ideas, and Marx immediately recognized them. Wilhelm Liebknecht, who from 1850 to the beginning of 1862 spent much time with Marx in London, claimed that Marx knew about and recognized the importance of Darwin's work before the publication of *The Origin of Species* in 1859. This is highly doubtful, since Darwin kept his theory confidential until 1858, and it was not widely circulated until the publication of *Origin*. Marx learned of Darwin's theory by December 1859 at latest, when Engels sent him a favorable report on Darwin's work; Marx waited a full year before reading it himself. Liebknecht may have been engaging in hyperbole when he claimed that after Darwin published his theory, "for months the conversation among us [Marx and his circle of friends] was about nothing other than Darwin and the revolutionary force of his scientific conquests."¹⁸

Whether Liebknecht exaggerated or not, there must have been some conversations, since Marx expressed keen interest in Darwin's theory in the 1860s. Almost a month after his initial letter to Engels about Darwin, Marx highly recommended Darwin's *Origin* to Ferdinand Lassalle.¹⁹ By June 1862 Marx had read *Origin* a second time, and the same year he attended a series of lectures by Thomas

Henry Huxley on evolution. Friedrich Lessner testified that he and many German workers in London attended lectures on natural science by Huxley, John Tyndall, and August Wilhelm von Hofmann. "Here again it was Karl Marx who urged us to do so and he himself occasionally attended them."²⁰ In unpublished manuscripts written between 1861 and 1863, Marx referred to Darwin favorably and called *Origin* an excellent work.²¹ Despite Darwin's silence on human evolution in the 1860s, Marx credited him with having proved human descent from the apes.²² In 1868 Ludwig Büchner sent Marx a copy of the second edition of his *Sechs Vorlesungen über die Darwin'sche Theorie (Six Lectures on the Darwinian Theory)*, and although critical of some aspects of the work, Marx expressed pleasure that it informed him about developments in Darwinian theory in Germany.²³

Marx's receptivity to Darwin's theory of evolution was not based on any previous propensity toward theories of biological evolution. As a young student in Berlin, he had embraced Hegelian idealism with its stress on the evolution of *Geist* (mind or spirit), but this did not entail an acceptance of biological evolution, despite the Hegelian view that nature was a reflection or manifestation of the developing *Geist*. Hegel rejected the transmutation of species as naturalistic and non-dialectical, insisting that all metamorphoses in nature occur in dialectical stages as a result of changes in the Concept or Idea underlying nature. He asserted, "It is totally vacuous to conceive of the species as evolving little by little in time." He completely repudiated the notion that nature cannot make leaps.²⁴

As Marx worked his way from Hegelian idealism to the materialist conception of history in the years 1843-1845, he showed no inclination to embrace the transmutation of species. In the "Economic and Philosophical Manuscripts" of 1844 he attacked the concept of creation, which he believed to be based on a false assumption of the non-existence of humans and nature at some point in time. Marx's refutation of creation in this passage was based on his own assumption that humans and nature are self-existent and self-created. The proof he adduced for his assumption seems rather circular:

Inasmuch as the *entire so-called world history* is for the socialist nothing other than the creation of the human through human labor and the development (*Werden*) of nature for the human, he has therefore the striking, incontrovertible proof of his self-mediated *birth*, of his process of coming into existence.²⁵

Marx also appealed to natural science as evidence for the self-existence of the world. He remarked that geology had dealt a fatal blow to the idea of the creation of the earth, since it portrayed the formation of the earth as a process, and Marx considered this equivalent with the self-creation (*Selbsterzeugung*) of the earth. While emphasizing the development of the earth as evidence against creation, Marx did not embrace evolution in the biological realm. Instead he asserted, "Spontaneous generation is the only practical refutation of the theory of creation."²⁶

Marx was not at all out of step with the leading scientific developments of the 1840s. In his remarks on geology, Marx probably had in mind Charles Lyell's theory of uniformitarianism, which Lyell had published in 1830-33 in *Principles of Geology*. However, despite Lamarck and a few other mavericks in the scientific community who had advanced theories of biological evolution by the mid-nineteenth century, few scientists considered evolution a feasible hypothesis. Lyell himself rejected the transmutation of species and endeavored to refute Lamarck in *Principles of Geology*. Another problem with theories of biological evolution in the early nineteenth century from Marx's point of view was that most of them were tinged with idealism.

Although Marx used some scientific arguments, his denial of creation was based more on his religious views. He consistently denied the existence of a non-human supernatural creator. The self-production or self-creation of humans was an idea Marx developed through using Feuerbach's critique of religion. In his critique of Hegel published in early 1844, Marx remarked that Feuerbach's critique of religion, if radically applied, "concludes in the doctrine, that *the highest being for the human is the human*." Marx embraced the "irreligious critique" that "The human makes religion, religion does not make the human" and uttered his famous dictum that

religion "is the opiate of the people." Marx publicly submerged his hostility to religion after 1844 because he believed that (1) the critique of religion was already completed (by Feuerbach), and (2) religion, as an expression of human alienation, could only be abolished through economic transformations overcoming alienation. Because of the latter conviction, Marx regarded his critique of the bourgeois economy an indirect attack on religion.²⁷

By 1845–46 Marx and Engels had fully developed their materialist conception of history and articulated it in *The German Ideology*, which was not published during their lifetimes. Historical development, in Marx's view, was driven by the development of the forces or mode of production. Having subscribed to this view of history, Marx asserted that the first historical act of humans was the production, as opposed to the mere collection, of the goods required to fulfill their physical needs. This raised humans out of their animalistic state. However, admitting that humans were once animals is not the same as upholding the evolution of humans from non-human primates. Indeed in *The German Ideology* Marx reaffirmed his acceptance of spontaneous generation and considered it a satisfactory explanation for the origin of humans.²⁸

There is no evidence that Marx ever became enamored with any of the pre-Darwinian evolutionary theories in the 1840s or 1850s. Robert Chambers' *Vestiges of Creation* (1844) received much popular acclaim in England in the 1840s, but scientists gave little heed to it and had no trouble refuting it. Chambers' theory was undoubtedly too entrenched in idealism for Marx to seriously consider it, since Chambers conceived of evolution as a teleological process with an internal developmental principle causing change.²⁹ Marx probably never read Ludwig Büchner's *Kraft und Stoff* (1855), which contained an environmentalist evolutionary theory that would probably have been more palatable to Marx than was Darwin's Malthusian-based theory. However, Marx had nothing but contempt for Büchner's mechanistic materialism.³⁰

Marx's statement, "The anatomy of the human is a key to the anatomy of the ape," has sometimes been misconstrued to argue that Marx had a predisposition to biological evolution before reading Darwin. In this passage of an unpublished manuscript written two years before Darwin published *The Origin of Species*, Marx claimed that the relationship between human and simian anatomy paralleled the relationship between the bourgeois and ancient economy. It is more likely that Marx was thinking of Georges Cuvier rather than some form of evolutionary theory. Just as Cuvier amazed his contemporaries by his use of comparative anatomy to identify and classify organisms, so Marx thought he could explain aspects of ancient economy by studying the present bourgeois economy. Cuvier's knowledge of comparative anatomy did not predispose him to evolution at all; in fact, he was a decided foe of evolutionary theories.³¹ Marx's appeal to comparative anatomy seems evolutionary today because presently evolutionary theory emphasizes comparative anatomy as evidence for biological evolution, but such was not the case in Marx's day.

By the time Marx read Darwin in 1860 he had already developed his materialist conception of history and many of his most significant economic ideas, including his theory of surplus value. Most of the ideas in *Capital* had already been elaborated in *The German Ideology*, *The Communist Manifesto*, the unpublished *Grundrisse* (1857-58), and *The Critique of Political Economy* (1859). Marx's evolutionary view of society did not in any way derive from or depend on biological evolution. Marx was not unique in this respect, for numerous theories of dynamic social development were in circulation in Europe before Darwin published his views. Evolutionary anthropology was already current in the eighteenth century and the founders of British evolutionary sociology—Herbert Spencer, Henry Maine, and John Lubbock—also formed their views before 1859.³² In France Henri Saint-Simon and Auguste Comte had formulated evolutionary social views independent of biological theories.

Darwin's theory did not revolutionize Marx's entire world view, though it did transform his views on biology and nature. However, Marx's world view had a

tremendous impact on his receptivity to Darwinism. Just as he looked to geology to support his anti-creationist views in 1844, after 1859 he could point to biological evolution as evidence against creation.

One aspect of Darwin's theory that Marx especially appreciated was its elimination of teleology from nature by offering an alternative to the argument for design in nature. In 1859 Engels had already mentioned this to Marx as a strong point of Darwin's theory, and when Marx praised Darwin's *Origin* in a letter to Lassalle, he wrote:

Despite all imperfections [in Darwin's manner of developing his argument], here for the first time teleology in the natural sciences is not only dealt a mortal blow, but its rational sense is also empirically explained.³³

Since William Paley's argument from design was still popular in England among those believing in a creator, Marx rejoiced to find a champion who could demolish this argument. Darwin had broken free from the formerly dominant creationist mode of thinking (or creationist episteme in Gillespie's terminology), which tended to be idealist and saw mind, purpose, or design in nature. He insisted on purely naturalistic explanations based on the operation of laws of nature, not conscious purpose or divine forethought.³⁴ At the same time, as Marx noted, Darwin provided an explanation for the appearance of design in nature. Darwin continued to use the metaphor of design and the language of natural theology, while undermining its central tenet.³⁵

Since Marx had rejected Hegelian idealism in favor of a materialist position, nature could have no inherent purpose in his world view.³⁶ Purpose can only exist where there is consciousness, and Marx had rejected any form of consciousness outside of humans. In *Origin* Darwin did not deal with human evolution and thus did not yet raise the issue of teleology in human history. As Marx noted, Darwin had merely abolished it from the natural realm. However, since Marx believed that humans could engage in conscious, goal-directed activity, teleology in human history

was still possible in Marx's world view. However, despite his emphasis on human praxis and purposeful creative activity, at times Marx explicitly rejected teleology in human history. In *The German Ideology* Marx and Engels argued that history is merely a sequence of generations inheriting and modifying materials and the forces of production without any inherent purpose in the development.³⁷ Nevertheless, teleology pervades many of Marx's discussions of social evolution.³⁸

Darwin's rejection of teleology in nature provided Marx with a weapon against idealism and a buttress for his materialism. He rejoiced that Thomas Henry Huxley seemed more materialistic in 1868 than previously, since Huxley asserted that we cannot escape materialism in the way we reason and think. However, Marx lamented that Huxley left a back door open to escape the consequences of his materialist views. Huxley took refuge in Humean skepticism concerning cause and effect to argue that one may believe what one wants in regard to the thing-in-itself. Since Marx was thus criticizing Huxley for not embracing ontological materialism, all the arguments claiming that Marx's materialism was not ontological fall to the ground. The use of materialism exclusively as a method, which was Huxley's position, was apparently not satisfactory to Marx's mind.³⁹

Besides its anti-teleological implications, other aspects of Darwin's theory struck a responsive chord with Marx. Although he did not explain in his letter to Engels how Darwin's theory served as a foundation in natural science for their view, he did elaborate slightly in his letter to Lassalle. There he stated, "Darwin's work is very important and suits my purposes as a foundation in natural science of the historical class struggle."⁴⁰ This is still not very explicit and has engendered various explanations. One possibility is that Marx was drawing a parallel between the struggle for existence in nature and the class struggle in human society. There is a vague resemblance between the two, since both explain development through contradictions.⁴¹ However, Marx never specifically mentioned the struggle for existence in this letter and later criticized Darwin for his view of struggle in nature.

If Marx was comparing the class struggle to the struggle for existence, he was not equating them, and it was only a fleeting idea in any case.⁴²

A more plausible explanation is that Marx was not thinking specifically of the struggle for existence as the foundation for his views, but that he was reacting to the Darwinian theory as a whole. The most obvious parallel between Darwin and Marx was that both endeavored to dismantle the fixed categories that dominated the thinking of their era. Of course, some scientists before Darwin had attempted to historicize natural science and biology, but they had not yet carried the day.⁴³ By denying that species are fixed entities with evidence and a theory that gradually gained ascendancy, Darwin overthrew one of the linchpins of Linnæan biology. Marx similarly rejected fixed laws that dominated bourgeois political economy. Thus Darwin was a compatriot in destroying the static world view of bourgeois society and substituting a world in flux.

Another similarity between Marx and Darwin was that they both embraced historical progress. They wrote about historical developments and phenomena that were moving forward to ever higher planes. Darwin did this despite himself, since his own theory dispensed with the necessity of progress and denied that there was any criterion for it. In most of *Origin* Darwin successfully avoided the rhetoric of progress, but he could not bring himself to completely eschew references to progress, improvement, higher and lower organisms, good and bad traits, etc. In the next to the last paragraph of *Origin* Darwin asserted, "And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection."⁴⁴ Darwin's rhetoric of progress probably eased Marx's acceptance of his theory. However, Marx would later criticize Darwin because he had no explanation for the necessity of progress.⁴⁵ Of course, Darwin did not think there was anything to explain.

Marx's Criticism of Darwin

Upon reading Darwin again in 1862, Marx was not nearly as laudatory as he had been previously. It disturbed Marx that Darwin credited the bourgeois political economist Malthus with providing the critical idea for his theory of natural selection. In reporting on his impressions to Engels, Marx wrote,

With Darwin, whom I have looked at again, it amuses me that he says he applies the "Malthusian" theory *also* to plants and animals, as though with Mr. Malthus the joke did not consist in that it did *not* apply to plants and animals, but only to humans--with the geometrical progression--in opposition to plants and animals.⁴⁶

In an unpublished manuscript Marx reiterated the charge that Darwin failed to recognize that his theory controverted Malthus' population principle by showing that the geometrical progression is valid not only in human society, but also in the plant and animal realm. Marx dubbed Darwin's theory "the natural-historical refutation" of Malthus.⁴⁷

Setting Darwin's theory in opposition to Malthus may have assuaged Marx's grief that his enemy was honored in *Origin*, but it was clearly a case of faulty reasoning. Malthus' population theory stated that humans have the tendency to reproduce at a geometrical rate (2, 4, 8, 16, 32, etc.), while at best the food supply can only increase at an arithmetic rate (2, 3, 4, 5, etc.). Thus, Malthus concluded, in the absence of any intervening restraints, human population increase continually outstrips the food supply, with misery and privation the natural result. Marx erred because he did not notice the difference between *tendency* and *actuality* in the Malthusian equation. Malthus did not believe that human populations *actually* increase geometrically, and he emphatically did believe that plants and animals (the food supply) have the *tendency* to reproduce faster than arithmetically. Darwin was not refuting nor misconstruing Malthus at all, since Malthus asserted that it "is the constant tendency in all animated life to increase beyond the nourishment prepared for

it. . . . The race of plants and the race of animals shrink under this great restrictive law; and man cannot by any efforts of reason escape from it."⁴⁸

Since Darwin's theory of natural selection as the mechanism causing the evolution of species was based on Malthus' population theory, Marx was less inclined to accept its validity. Marx publicly manifested animus for Malthus by calling Malthus' doctrines "pestiferous" and by accusing him of plagiarism in formulating his population theory.⁴⁹ Further, in *Capital* Marx erroneously claimed that Malthus had taken monastic vows of celibacy, when in reality Malthus was married and had three children.⁵⁰ Marx provided a more substantive criticism in *Capital*, however, by identifying Malthus' error as the assumption that his law of overpopulation was an eternal law of nature rather than a historical law valid only in capitalist society. Marx believed that each mode of production had its own distinct population laws and was not ruled by some eternally-valid abstract law. Marx did, however, leave the door open for the Darwinian struggle for existence in nature by adding, "An abstract law of population exists only for plants and animals."⁵¹ In this passage Marx is thus not accusing Darwin of fallacious reasoning for applying an abstract population principle to nature.

In his correspondence both before and after writing *Capital*, however, Marx was critical of Darwin's reliance on Malthus and on other economic ideas in formulating his theory. In 1869 Marx reiterated a point he had made in a letter to Engels in 1862, when he wrote to his daughter and son-in-law:

From the struggle for existence in English society--the war of all against all, *bellum omnium contra omnes*--Darwin was brought to discover the struggle for existence as the ruling law of animal and plant life.⁵²

Marx's criticism of Darwin for reading social conditions into the natural realm was not an *ad hoc* argument. Marx had recognized long before Darwin's theory appeared that social thinkers sometimes translate their views of society into interpretations of nature. In the 1840s Marx and Engels had objected to some socialists' depiction of

nature as idyllic, full of harmony and happiness. They protested that nature could also be construed as capitalist if one emphasized competition among organisms or as a feudal monarchy if one looked at the heavens. It seemed to them that by selective use of evidence one could justify just about any social arrangement as natural.⁵³

Marx was not amiss in his insistence that Darwin was viewing nature through the lenses of British bourgeois economy, and this does not mean Malthus alone. Silvan Schweber has demonstrated that Darwin relied directly and indirectly on ideas from political economy in developing his explanation for the divergence of characters. Darwin's explanation was derived from H. Milne-Edwards, who presented the concept of the "physiological division of labour" in his *Introduction à la zoologie générale* (1852). Milne-Edwards admitted that he appropriated this idea from political economy, and it reflects the views of Adam Smith.⁵⁴ Interestingly, in the only two passages in which he mentioned Darwin in *Capital*, Marx expounded on Darwin's theory of the physiological division of labor and the specialization of plant and animal organs as parallel to the specialization of tools in manufacturing.⁵⁵ By drawing attention in *Capital* to the similarities between Darwin's view of evolution in nature and his own view of economic evolution, Marx seemed to be drawing on Darwin's theory in support of his social views, a move he declared illegitimate when others engaged in it. Marx latched onto the economic ideas Darwin had read into nature and transposed them back into economics.

Darwin read numerous writings of political economists during the time he was formulating his theory. He became acquainted with Adam Smith's economic views by reading a secondary work on Smith in 1838.⁵⁶ In 1840 he perused J. R. McCulloch's *Principles of Political Economy* and Bernard Mandeville's *Fable of the Bees*. In 1847 he read Sismondi's *Political Economy and the Philosophy of Government*, but he considered this work poor, probably because it espoused government intervention in the economy.⁵⁷ This reading list does not prove that Darwin integrated political economy into his theory, but it shows that he was interested and actively engaged in thinking about it. Further, Darwin compiled

notebooks on metaphysics and morals, including economics, as an integral part of his research on biological evolution. Most importantly, some influences of political economy are evident throughout Darwin's *Origin*. Darwin referred repeatedly to the "economy of nature." Within the context of this economy plants and animals competed for places where they could obtain their physical needs.⁵⁸

Marx's dissatisfaction with Darwin's account of the economy of nature, specifically the struggle for existence, climaxed in his flirtation with Pierre Trémaux's theory of biological evolution. Trémaux, virtually unknown today, even among historians of science, wrote *Origine et transformations de l'homme et des autres êtres* (1865, *Origin and Evolution of Man and Other Organisms*). After reading Trémaux in 1866, Marx excitedly reported to Engels that it is "a very important work," and indeed "a *very important* advance over Darwin."⁵⁹ Marx was elated to discover an evolutionary theory that dispensed with the Darwinian struggle for existence and natural selection.

Trémaux based his entire theory of evolution on the following law:
 THE PERFECTION OF BEINGS (*ÊTRES*) IS OR BECOMES
 PROPORTIONAL TO THE DEGREE OF DEVELOPMENT
 (*ÉLABORATION*) OF THE SOIL ON WHICH THEY LIVE! *And*
the soil is in general all the more developed (élaboré) as it belongs
*to a more recent geological formation.*⁶⁰

Trémaux thus rejected selective competition within and among species to explain speciation in favor of a strictly environmental approach.⁶¹ Not only did he see the environment as the primary source of change in biological organisms, but he also emphasized the preponderant role of one segment of the environment—the soil—on evolution, although he admitted that climate and other influences could play a role, too.

One facet of Trémaux's work that particularly impressed Marx was its ability to explain evolution as a necessary, lawful process. He reported to Engels that Trémaux is able to explain both progress and degeneration as necessary

developments, while in Darwin's theory they were purely the products of chance. He exulted that Trémaux had demonstrated as a "necessary law" that species would remain fixed for long periods of geological time, thus explaining paleontological gaps.⁶²

Marx's enthusiasm for Trémaux did not immediately abate even after Engels wrote him twice that Trémaux's theory was nonsense and was replete with geological inconsistencies, mistakes, and unsupported conjecture. Marx came to Trémaux's defense after receiving the first letter from Engels by pointing out that Cuvier rejected biological evolution and, although he was able to refute the inadequate formulations of contemporary evolutionary theories, it turned out that he was wrong in his static view of species. He further claimed:

Trémaux's fundamental idea about the *influence of the soil* . . . is, in my view, an idea that only needs to be *uttered* to gain for itself once and for all permanent acceptance (*Bürgerrecht*) in science, and this quite independently of Trémaux's portrayal.⁶³

This statement confirms Marx's willingness to accept a scientific theory based not on empirical evidence, but on the compatibility of that theory with his world view.

Even after Engels wrote him a second time criticizing Trémaux, Marx still insisted to his friend Ludwig Kugelmann that Trémaux was an advance over Darwin.⁶⁴ However, he dropped the subject in his correspondence to Engels and after October 1866 Trémaux's name disappears from Marx's writings. He probably came to recognize that his initial enthusiasm over Trémaux's theory was even more misplaced than his originally uncritical acceptance of Darwin's theory.

Marx's adoption of Trémaux's theory signalled discontent with Darwin's concept of natural selection and the struggle for existence. Even more problematic in Marx's eyes, however, were the attempts by various Darwinists and social thinkers to apply the Darwinian struggle for existence to society. Marx condemned this as circular reasoning, since Darwin modelled the struggle for existence on bourgeois economy. The result was that Darwinists were merely resurrecting the Malthusian

population principle that was embedded in Darwin's theory. Marx specifically criticized the philosopher Friedrich Albert Lange for this sort of reasoning in the second edition of *Die Arbeiterfrage* (1870, *The Labor Question*), which Lange had sent to Marx. Despite Lange's socialist sympathies and his praise for Marx, Marx considered Lange's work ignorant and devoid of content, because he subsumed social development under the struggle for existence.⁶⁵ Marx argued in another place that Darwinists used their circular reasoning to justify a human society that had not risen above its animal state.⁶⁶

The Relationship of Nature to Society:

Natural and Social Laws

Marx was not a natural scientist nor was nature a central concern of his. He remained consistently anthropocentric in his thinking, research, and writing. As an economic and social theorist, his primary interest in nature revolved around its relationship to humans. For this reason, most of Marx's studies in natural science focussed on technology or the human control of nature to fulfill physical needs.

Besides works on technology and physical science, in the 1860s Marx read numerous works by British and German scientists on anatomy, physiology, histology, microbiology, and pathology, in addition to the Darwinian literature already mentioned above. He also read Lyell's work on *Geological Evidences of the Antiquity of Man* (1863). In 1864 he told Engels that since he always followed in Engels' footsteps, he would probably now read a lot of anatomy and physiology in his free time.⁶⁷ Wilhelm Liebknecht claimed that Marx avidly followed developments in natural science and spoke about Jakob Moleschott, Justus Liebig, and Huxley as much as he did about David Ricardo and Adam Smith.⁶⁸

Marx's interest in Darwinism and biology waned in the 1870s, but it was never totally absent.⁶⁹ In 1875 he exulted that the physiologist Moritz Traube in Berlin had produced an artificial cell that had no nucleus, but could grow, since this lent support to the idea that primitive cells may have arisen through spontaneous generation. Marx

hailed Traube's discovery as a "great step," but in reality it was a giant misstep, since all Traube had observed were chemical substances expanding by osmosis.⁷⁰ In 1870 Engels moved to London, where he researched and wrote some manuscripts on natural science posthumously published as *Dialectics of Nature*. With Engels constantly studying natural science and living in close proximity to Marx, it seems reasonable to assume that he discussed these matters with his best friend. Marx was still expressing interest in biology at the close of his life. Just a few months before he died, he asked his daughter to bring him one of his books on physiology.⁷¹

An interest in and knowledge of natural science and Darwinian theory does not imply anything about whether or how Marx utilized his views of nature or biological evolution to formulate his social and economic views. The dispute over Marx's use of Darwin hinges on the question of how Marx related nature to society. Many have argued that Marx's appropriation of Darwin and biology was superficial and opportunistic, having little impact on his economic and social thought.⁷² However, other commentators, including most of the leading figures in late nineteenth-century Marxism, have contended that Darwinism was an integral component of Marxist theory.⁷³ We can gain clarity on Marx's position about the relationship of nature to society by first asking whether Marx believed natural laws were applicable to society. If not, then the case is closed and the laws of nature expressed in the Darwinian theory have nothing to do with social theory. However, if they can be applied to society, then we must ask how and to what extent.

Before 1860 Marx distinguished between two forms of laws: natural and historical. The former were eternal laws having universal validity, while the latter were transitory and varied according to the stage of historical development, "a development determined by productive forces."⁷⁴ The natural law theories of the early nineteenth century were shaped in the eighteenth century under the influence of the Newtonian world view, which was applied not only to the cosmos, but to human affairs. Economics, morality, and other spheres of human endeavor were subsumed under unvarying laws just as physics and astronomy had been.

Marx opposed the dominant school of political economy for insisting that their economic categories and laws were eternal, natural laws.⁷⁵ He claimed that the mystery of present political economy

consists simply in transforming transitory social relations belonging to a determined epoch of history and corresponding with a given state of material production, into eternal, general, never-changing laws, natural laws, as they call them.⁷⁶

Marx's materialist conception of history countered this dominant natural law mentality by conceiving of the mode and relations of production as constantly undergoing transformations caused by changes in the forces of production.⁷⁷ Laws pertaining to human society are thus historical, not natural, for Marx. He believed that the theory of natural law was an ideology justifying oppression. He reproached governments for explaining away social problems as the result of natural laws, such as using the Malthusian population principle to rationalize the existence of poverty and widespread suffering.⁷⁸ According to Marx, Thomas Hobbes was guilty of advocating a misanthropic form of materialism, since he made humans and nature subject to the same laws.⁷⁹

After reading Darwin in 1860, Marx abandoned his distinction between natural and historical laws, not because Marx's economic and social views changed, but because he now conceived of natural laws in a different light. Darwin, by undermining the fixity of species and introducing greater flux into the natural world, demonstrated that some natural categories and laws were historical rather than permanent. Marx reflected this new understanding of natural laws by subsuming both of his former categories--natural laws and historical laws--under the general rubric of natural laws. To maintain his previous distinction he then subdivided natural laws into "eternal laws of nature" and "historical natural laws."⁸⁰

The shift in Marx's terminology concerning natural laws is evident already in his unpublished manuscripts of 1861-63. For the first time Marx applied the term "natural" to economic laws that were valid only within a particular stage of history.

He stated that natural laws of bourgeois production exist, but they differ from the natural laws of the ancient, feudal, and Asiatic modes of production.⁸¹ The closest Marx had come before 1860 to calling economic laws natural was when he referred to them as "the inherent organic laws of political economy" in 1853.⁸² The term organic laws, though, carried much greater connotations of development than the expression natural laws. In another passage in the manuscripts of 1861-63 Marx praised the eighteenth-century physiocrats for viewing certain forms of production as "physiological forms of society" that are subject to the natural necessity (*Naturnotwendigkeit*) of material laws. Although Marx had previously used the term necessity (*Notwendigkeit*) in his explications of the materialist conception of history, in his pre-Darwinian days he did not use the term natural necessity (*Naturnotwendigkeit*).⁸³

In *Capital* Marx continued to emphasize that economic laws are transitory, while referring to them as natural laws. He wrote about the "natural laws of capitalist production," but also argued that the capitalist relations of production were not products of natural history, but of human history.⁸⁴ The Malthusian population principle was one of the "historical natural laws of capitalist production." Presumably the law governing the division of labor in a community of India, which operated "with the inviolable authority of a natural law," was also a historical, not eternal, natural law.⁸⁵ Marx even designated the economic law of supply and demand as a "natural law of capitalist production," but he considered it a despotic rule that organized workers could break or weaken.⁸⁶ It was not carved in stone.

In addition to using the rubric natural law for laws of both natural and social science, Marx also drew analogies between nature and society.⁸⁷ In the forward to *Capital*, Marx averred that society is not a fixed crystal, but an organism constantly in the process of transformation. It would be easy to read more into this metaphor than Marx intended, especially since a few pages earlier he had already compared his study of capitalist society to the study of natural processes in physics, chemistry, and

anatomy.⁸⁸ In the epilogue (*Nachwort*) to the second edition of *Capital* Marx quoted approvingly from a reviewer of his book who remarked that, while the old political economists viewed economic laws as analogous to physical and chemical laws, Marx depicted them as corresponding more to the evolutionary laws of biology.⁸⁹ The reviewer had good grounds to make this judgment, since Marx himself had written in the preface to the first edition that he was presenting "the development (*Entwicklung*) of the economic formation of society as a process in natural history."⁹⁰ Marx thus lent strong support to those who sought parallelism between his ideas and Darwin's.

Despite Marx's refusal to apply laws of nature to society, there are several passages in *Capital* in which he seemed to apply Darwinian laws to humans and social development. Marx asserted, for example, that "the principle of natural selection that ruled so almightily among them [rural workers]" only permitted the strongest to survive.⁹¹ In another passage Marx discussed the origin of castes and guilds, which "follows the same natural law that rules the differentiation of plants and animal into species and sub-species."⁹² Marx also compared competition among commodity producers with the *bellum omnium contra omnes* in the animal kingdom.⁹³ Unless Marx was inconsistent--and in this case he was not--he must have meant that these Darwinian laws only applied to society at certain stages. Read in isolation, however, these passages do not make this clear and seem to imply that Darwinian laws have universal validity for human society.

Although he never publicly endorsed Trémaux's non-Darwinian evolutionary theory, Marx's transitory preoccupation with it in 1866 caused him to blur the distinction between nature and society that he elsewhere maintained. In Trémaux's view the laws of evolution through geological transformations explained not only natural science, but also history and politics.⁹⁴ His search for an evolutionary mechanism began with investigations concerning human evolution, and this was a central concern in his book. He held the influence of the soil responsible for social developments such as religion, wars, political institutions, and nationalities.⁹⁵

Even though this reliance on natural influences to explain social developments appears to contradict the materialist conception of history, Marx accepted Trémaux's idea that nature could have a profound influence on human society: "In the historical and political application [Trémaux is] much more important and richer than Darwin. For certain questions, like nationality, etc., here alone a natural basis [is] found." He also quoted approvingly Trémaux's statement, "Outside of the great laws of nature, the projects of men are nothing but calamities, as witnessed by the efforts of the czars to make the Polish people Muscovites."⁹⁶ Thus Marx evinced a determinism in human affairs that left open the possibility that laws of nature could help explain social developments, despite the fact that this conflicted with his insistence elsewhere that economic developments could account for all of these social institutions.⁹⁷

In addition to viewing economic laws as natural laws, perhaps partly because of it, after 1860 Marx began to emphasize much more than before that some laws applicable to human society are immutable. The first category of unchanging social laws are those that are based on some unchanging human trait or relationship. While laws of production vary historically, all forms of human production have "certain unchanging *laws or relationships*."⁹⁸ In an unpublished manuscript of 1861-63 Marx asserted, "Labor is the eternal natural condition of human existence," and in *Capital* he called labor an "eternal natural necessity" independent of all forms of society.⁹⁹

Other than the rather obvious truism that humans must work in every form of society, Marx did not specify in *Capital* what laws of society would be unchanging.

In a letter to Ludwig Kugelmann in 1868 Marx again defended the idea that there are eternal laws holding sway over the affairs of people. He explained: "Natural laws cannot at all be abolished (*aufgehoben*). What can be altered in historically different circumstances is only the *form* in which each law operates." The specific law Marx was discussing was the necessity of distributing social labor in certain proportions, which is valid in all social forms. The vagueness of this law reinforces the idea that Marx was unable to formulate any specific immutable laws applying to

human society.¹⁰⁰ However, it is highly significant that Marx argued for the possibility of such immutable social laws.

A second category of eternal laws applying to human society appeared in Marx's writings, especially in *Capital*. These are the laws governing the process of development itself. In the forward to *Capital* Marx revealed his goals for his book:

Even when a society has begun to discover *the natural law of its motion*,--and it is *the final and ultimate purpose of this work to unveil the economic law of motion of modern society*--it can neither leap over the natural phases of development nor remove them by decree.¹⁰¹

Because Marx was describing laws of movement for a particular society in this passage, it is possible that some or all of the laws of movement could vary at different stages of history. However, because the evolutionary phases of society cannot be decreed away, there must be an ineluctable lawfulness to the process of development.

The parallel with Darwin and his formulation of laws of development is striking. Darwin's evolutionary theory, by denying the fixity of species, did in some sense historically relativize biological laws in some fields. Biologists could describe taxonomy, anatomy, and physiology as they presently existed in species and order them in a lawlike manner, but these descriptions and orderings would be invalid at a different stage of evolution. However, Darwin continued to assert the lawfulness of nature by assuming that laws governing the process of development, such as natural selection and divergence of characters, were valid for all time.

In Marx's case, the materialist conception of history implies that immutable laws of development govern social evolution.¹⁰² I am unaware of any time that Marx actually applied the term law to the materialist conception of history (for that matter, he did not even use the phrase "materialist conception of history"), but he constantly used terms suggesting law, e.g. necessary, inevitable, determined, and conditioned. A letter Marx wrote to Annenkow in 1846 captures the lawfulness inherent in Marx's conception of historical development:

Are men free to choose this or that social form? Not at all. At a certain state of development of the productive powers of men, you will have a corresponding form of commerce and consumption. At a certain degree of development of production, commerce, and consumption, you will have a corresponding form of social constitution, a corresponding organization of the family, of the estates or the classes, in a word, of civil society. With such a civil society you will have a certain political state. . . .¹⁰³

The law governing this process of development seems even more deterministic in the form Marx presented it in *Poverty of Philosophy*:

With the acquisition of new productive forces humans alter their mode of production, and with the alteration of the mode of production, of the way of earning their living, they alter all their social relations. The hand mill yields a society with feudal lords, the steam mill a society with industrial capitalists.¹⁰⁴

In the preface to *A Critique of Political Economy*, his most famous summation of the materialist conception of history, Marx made clear that social developments are determined and independent of human will.¹⁰⁵ In *Capital* Marx not only restated the view that the economic structure is the basis for the legal, political, and intellectual superstructure, but also claimed that the capitalist mode of production is a necessary stage of economic development.¹⁰⁶ Technological determinism surfaces often in *Capital*: "The *cooperative character* of the labor process is now therefore, *through the nature of the means of labor itself* [i.e. machinery], a dictated *technological necessity*."¹⁰⁷

Occasionally Marx provided hints that the economic determinism of his materialist conception of history was analogous to the determinism of scientific laws of nature. In 1853 he asserted that the bourgeois economy would "create these material conditions of a new world in the same way as geological revolutions have created the surface of the earth."¹⁰⁸ In another article the same year he argued that

society must submit to the transformations it experiences in the same way that a house yields to an earthquake.¹⁰⁹ Marx's receptivity to Lewis Henry Morgan's evolutionary anthropology further supports the view that Marx was a determinist, since Morgan portrayed social developments as natural and necessary.¹¹⁰

Though many scholars accept this image of Marx as an economic determinist, many others--especially critical Marxists of the Frankfurt School--dispute it and emphasize the voluntaristic side of Marx. I believe that Alvin W. Gouldner hit the mark when he argued that Marx was both a determinist and a voluntarist, never resolving this contradiction in his thought. However, James Miller has contended that the ambiguity in Marx's position is not hopelessly contradictory, and he has provided a thought-provoking synthesis of Marx's determinism and voluntarism. I stress the deterministic side of Marx, because when Marx discussed natural and social laws, the deterministic side of Marx prevailed. Furthermore, determinism received much greater expression than voluntarism in Marx's published theoretical works, above all in *Capital*.¹¹¹

Another immutable law governing social development was Marx's dialectic. In 1858 and 1868 Marx expressed interest in writing an essay on the dialectical method that Hegel had discovered, but had stood on its head through his idealism.¹¹² Because Marx never found time to draft that treatise, the earliest summation of the Marxian dialectic came from the pen of Engels. Engels identified three elements of the Hegelian dialectic that were included in the Marxian dialectic: (1) the conversion of quantitative change into qualitative change and vice-versa; (2) the interpenetration of opposites; and (3) the negation of the negation.¹¹³ In Marx's theory of history, these three dialectical laws explained development as a process operating through contradiction (class struggle) and revolution. The first two of these laws were clearly stated by Marx in *Capital* and were thus not merely Engels' ideas.¹¹⁴

Marx specifically used the term law to describe the dialectic.¹¹⁵ In *Capital* he asserted that the negation of the negation operated in society "with the necessity of

a natural process."¹¹⁶ Not only did Marx compare the dialectic with natural processes, he believed the dialectic could be used to explain natural phenomena: "Here, as in natural science, the correctness of the law discovered by Hegel in his *Logic* proves itself, that the merely *quantitative* changes convert into *qualitative* differences at a certain point."¹¹⁷ He added in a footnote that the molecular theory of modern chemistry rests on the law of dialectics (since different numbers of atoms in a molecule result in different qualities). Therefore Marx did believe that dialectics applied to nature, and Engels was not subverting Marx's own intentions by writing on the dialectics of nature. All of Marx's comments on Engels' work on the dialectics of nature suggest that Marx fully supported Engels' endeavors.¹¹⁸

Did Marx, then, embrace Darwinism so readily because he recognized a dialectical component to Darwin's evolutionary theory? In 1847 Marx had explained his position on class struggle in society: "Without contradiction, no progress: that is the law that civilization has followed up to today."¹¹⁹ Perhaps he saw the struggle for existence as contradiction producing progress in natural history and thus as dialectical. Hoffman suggests that Marx endorsed Darwin, because Darwin had pointed out the significance of pre-human labor, which was a dialectical process occurring before the advent of humans.¹²⁰ However, Marx's continual insistence that labor is unique to humans undermines Hoffman's point.

The Relationship of Nature to Society:

Human Nature

The contrast between the conceptions of human nature sketched by Marx and Darwin could scarcely have been greater. Their investigations of humanity were shaped by quite different presuppositions, purposes, and questions. Darwin was searching for evidence of and clues to human evolution and, since his evolutionary theory was non-saltatory, he needed to show gradations among humans and similarities between humans and animals. Marx, intent on overthrowing the existing

political and social structure, was more anthropocentric and stressed the uniqueness of humans.

In *The Descent of Man* (1871) Darwin wanted to demonstrate that all human traits exist in some form or other among animals and can be explained as products of natural selection without the outside interference of a creator or any inherent developmental impulse. He explained human consciousness, morality, and religion as traits beneficial to their possessors in the struggle for existence. His treatment of morality is especially illuminating. First of all, Darwin tried to demonstrate that many animals have social instincts, which are the basis for morality. Social instincts induce animals to live together so they can cooperate in protection and procurement of nourishment. He believed the moral sense would thus give a selective advantage to those possessing it when competing with organisms that were not so cooperative, especially members of the same species with less developed social instincts. Then he argued that humans also had moral instincts which had developed beyond anything known in the animal world through intense group competition, such as tribal and national warfare, and through the development of the human intellect and consciousness.¹²¹

For Darwin, then, humans were solidly rooted in nature, and human nature was a product of natural developments. Humans are not qualitatively different from animals, and all those traits that appear to set humans apart from nature are merely biological instincts. They may be more fully developed in humans, but they are not qualitatively different from animal instincts. Human nature is thus biologically inherent for Darwin, and the nature of an individual cannot be altered significantly by economic or social transformations. There is still an element of malleability for human nature within Darwin's conception, but that malleability is confined to gradual change in the species over eons of time.

While Darwin stressed the similarities between animals and humans, Marx emphasized the differences. The chief characteristic setting humans apart from the natural world, according to Marx, is that humans produce their means of existence, while animals merely assemble their subsistence.¹²² In his early writings Marx adopted from Feuerbach the concept of species-being, which was a fixed human essence. In his "Economic and Philosophical Manuscripts" Marx stated, "But the productive life is the species-life. . . . and free conscious activity is the species-character of the human."¹²³ Free activity means that humans do not just act to fulfill their bare physical requirements, but they labor and create even when there is no external compulsion to do so.¹²⁴

Although the concept of species-being dropped out of Marx's thought after his critique of Feuerbach in 1845, Marx continued to distinguish humans from animals on the basis of productive activity and thus raised creative labor to the status of a universal human attribute. Shlomo Avineri thus employs the term *Homo faber* to describe Marx's conception of humans.¹²⁵ In *Capital* Marx explained some aspects of human labor that set it apart from animal behavior. First of all, humans exercise control over nature through conscious activity (which he had earlier used to define species-character), while animals act according to instinct. Further, humans plan in their heads what they are going to create and thus engage in "goal-directed activity."¹²⁶

Unlike Darwin, who was fundamentally an individualist trying to explain how humans developed social instincts (i.e. morality), Marx in the early stages of his thought assumed that humans were essentially social beings and any kind of social fragmentation (such as individualism) was an aberration created by alienating conditions. Marx apparently did not think it necessary to show how or why humans are social, since he never provided reasons for his assertion that humans are essentially social.¹²⁷ Marx later dropped discussion of human's social nature, but the idea remained implicit in the theme of alienation that persisted in Marx's thought.¹²⁸

Although Marx may not have read Darwin's *Descent* and did not express any opinions on Darwin's theory of the evolution of human social instincts, Darwin's explanation would not have met with his approval. Marx believed that morality, religion, family, state, and law were not in any way related to inherent biological traits passed on from generation to generation, but rather were products of alienation under the existing economic and social conditions. Darwin, on the other hand, conceived of morality as social instincts that cemented society together. Rather than morality being the basis of human society--as it was for Darwin--Marx thought it was the contradiction of the human's social being.¹²⁹ The consequence of Marx's view is that human nature is much more malleable, and he could speak of humans changing their own nature.¹³⁰ Thus, a revolution in political, economic, and social institutions could transform human nature thoroughly in a short period of time.

One reason Marx was fascinated with Trémaux's evolutionary theory was that, unlike Darwin, Trémaux saw human nature as extremely malleable. Trémaux argued that if humans (or other organisms) were transported from one region of the world to another with different geological strata, in relatively few generations they would be transformed to correspond to the geological development of that region. They would either degenerate or progress rather quickly.¹³¹ This paralleled Marx's view that humans could be quickly transformed if the economic basis of society changed, i.e. if the technological and economic environment altered.

Conclusion

Despite Marx's and Engels' promotion of the idea of parallelism between their views and Darwinism, Darwinism made no substantial impact on Marx's theory of social development, which was firmly established long before Darwin publicly revealed his theory. Marx's social thought was rather impervious to biological theories of evolution because of Marx's emphasis on the uniqueness of humans and his sharp distinction between natural and social laws. However, after reading Darwin, Marx replaced his dichotomy between eternally-fixed natural laws and historical social

laws with a new distinction: eternal natural laws and historical natural laws. Marx still wanted to uphold some division between laws applying to nature and laws pertaining to society, but the use of the rubric natural law for both categories bred the illusion among many adherents of Marxism that Marx's social laws were subsumed under the laws of natural science. Although he adopted the new terminology because of a sincere shift in his understanding of nature, the new conceptualization also served a rhetorical strategy that helped Marx disseminate his doctrine. The advantage of being more palatable to his contemporaries, many of whom were enthralled with natural science and Darwinism, was offset, however, by the confusion among some of his followers, who thought natural laws of society were laws of nature applied to society.

Marx's social philosophy decisively influenced his reception of Darwin's theory. He rejoiced that Darwin had eliminated the need for a creator by his anti-teleological explanation of nature. However, he was incensed that Darwin relied on the Malthusian theory and privately criticized the theory of natural selection and the struggle for existence. Marx's acceptance of Trémaux's evolutionary theory shows that he had more affinity for environmental explanations than for competitive models. Marx's criticisms, however, were largely unknown to his contemporaries, and thus Marx helped perpetuate the misconception that his views were fully congruent with Darwin's.

ENDNOTES

1. Marx to Engels, 19 December 1860, in *MEW*, 30:131.
2. Marx to Engels, 18 June 1862, in *MEW*, 30:249.
3. Quoted by Pittenger, *American Socialists*, 17.
4. Marx, *Das Kapital*, in *Marx Engels Gesamtausgabe* (Berlin, 1975ff.; henceforth *MEGA*), II/5:277. Dieter Groh, "Marx, Engels und Darwin: Naturgesetzliche Entwicklung oder Revolution? Zum Problem der Einheit von Theorie und Praxis," in *Der Darwinismus: Die Geschichte einer Theorie*, ed. Günter Altner (Darmstadt, 1981), 222, considers Marx's and Engels' relationship to Darwin as privately polemical and publicly one of usurpation.
5. Although signed 16 June 1873, Marx did not obtain Darwin's address until Carl Schorlemmer sent it to him in a letter dated 25 September 1873 (S. Kirschke,

"Darwinism and Marxism--Including a Consideration of the Personal Contacts between Marx, Engels and Darwin," in *Darwin Today*, ed. E. Geissler and W. Scheler [Berlin, 1983], 55).

6. Ralph Colp, Jr., "The Contacts between Karl Marx and Charles Darwin," *Journal of the History of Ideas* 35 (1974): 334.

7. Ralph Colp, Jr., "The Myth of the Darwin-Marx Letter," *History of Political Economy* 14 (1982): 462.

8. Margaret Fay, "Did Marx Offer to Dedicate *Capital* to Darwin? A Reassessment of the Evidence," *Journal of the History of Ideas* 39 (1978): 136 (n. 11), gives the full text of the letter.

9. Howard Selsam, "Charles Darwin and Karl Marx," *Mainstream* (NY) 12 (June 1959): 24, considers the rumor of Marx's dedication of *Capital* to Darwin apocryphal, and Shlomo Avineri, "From Hoax to Dogma: A Footnote on Marx and Darwin," *Encounter* 28 (March 1967): 32, calls it tongue-in-cheek.

10. Fay, "Did Marx Offer," 133-46; Lewis S. Feuer, "Is the 'Darwin-Marx Correspondence' Authentic?" *Annals of Science* 32 (1975): 1-12; P. Thomas Carroll and Lewis S. Feuer, "Further Evidence that Karl Marx Was Not the Recipient of Charles Darwin's Letter Dated 13 October 1880," *Annals of Science* 33 (1976): 385-87; Ralph Colp, Jr., "The Contacts of Charles Darwin with Edward Aveling and Karl Marx," *Annals of Science* 33 (1976): 387-94.

11. Marx to Engels, 7 December 1867, in *MEW*, 31:404; Engels, *MEW*, 16:226-28.

12. Avineri, "From Hoax to Dogma," 30-32. Enrique M. Ureña, "Marx and Darwin," *History of Political Economy* 9 (1977): 559, largely agrees with Avineri. Terence Ball, "Marx and Darwin: A Reconsideration," *Political Theory* 7 (1979): 469, also considers the link between Marx and Darwin chimerical.

13. Engels, "Begräbnis," in *MEW*, 19:335.

14. Ibid, 339; Korrespondenzbericht, *Der Sozialdemokrat* 14 (29 March 1883), in *Ihre Namen Leben durch die Jahrhunderte fort: Kondolenzen und Nekrologe zum Tode von Karl Marx und Friedrich Engels* (Berlin, 1983), 112-13.

15. Kautsky to Engels, 11 November 1882, in Benedikt Kautsky, ed., *Friedrich Engels' Briefwechsel mit Karl Kautsky* (Vienna, 1955), 66.

16. Engels to Kautsky, 15 November 1882, in *MEW*, 35:399-400.

17. Aveling, "Charles Darwin," 745-757. This article was originally published in English in *New Century Review* and was also published the same year in French in *Devenir Social*.

18. Wilhelm Liebknecht, *Karl Marx zum Gedächtnis: Ein Lebensabriss und Erinnerungen* (Nuremberg, 1896), 50.

19. Marx to Ferdinand Lassalle, 16 January 1861, in *MEW*, 30:578.

20. Friedrich Lessner, "Before 1848 and After," in *Reminiscences of Marx and Engels* (Moscow, n.d.), 161.

21. Marx, "1861-63 Manuscript," in *MEGA*, II/3.3:772-73, 1431.

22. Marx to Lion Philips, 25 June 1864, in *MEW*, 30:665.

23. Marx to Engels, 14 November 1868 and 18 November 1868, in *MEW*, 32:202-3, 206.
24. Georg Wilhelm Friedrich Hegel, *Werke* (Frankfurt a.M., 1970), 9:14, 23, 31-34.
25. Marx, "Ökonomisch-philosophische Manuskripte," in *MEGA*, I/2:397-98.
26. *Ibid*, I/2:397.
27. Marx, "Zur Kritik der Hegelschen Rechtsphilosophie: Einleitung," in *MEGA*, I/2:170, 177, 182; Marx, "Interview by *Chicago Tribune*," 18 December 1878, in *MEW*, 34:514.
28. Marx and Engels, *Die deutsche Ideologie*, in *MEW*, 3:20, 21, 28, 30, 43.
29. Loren Eiseley, *Darwin's Century: Evolution and the Man Who Discovered It* (Garden City, NY, 1958), 137.
30. Marx to Ludwig Büchner, 1 May 1867, in *MEW*, 31:544.
31. Marx, "Einleitung zur Kritik der Politischen Ökonomie," in *MEW*, 13:636.
32. J. W. Burrow, *Evolution and Society: A Study in Victorian Social Theory* (Cambridge, 1966), 18, 21.
33. Marx to Lassalle, 16 January 1861, in *MEW*, 30:578.
34. Neal C. Gillespie, *Charles Darwin and the Problem of Creation* (Chicago, 1979), xi, 3, 107-8, 147, ch. 4.
35. David Kohn, "Darwin's Ambiguity: The Secularization of Biological Meaning," *British Journal for the History of Science* 22 (1989): 215-39; Michael Ruse, *The Darwinian Paradigm: Essays on Its History, Philosophy, and Religious Implications* (London: 1989), 151-52.
36. Although Marx called himself a materialist in a letter to Ludwig Kugelmann, 6 March 1868, in *MEW*, 32:538, many scholars dispute that he upheld ontological materialism; many, on the other hand, argue that he was an ontological materialist. Diane Paul, "Marxism, Darwinism and the Theory of Two Sciences," *Marxist Perspectives* 2,1 (1979):123-124, errs by claiming that Marx and Engels only rejected teleology directed by an outside force, while maintaining a teleology inherent in nature. She asserts that this teleology inherent in nature is driven by an internal necessity, but this seems self-contradictory. If phenomena in nature are determined by antecedent causes (internal necessity), then it is not determined by future purposes and goals. However, if Paul means by internal necessity that nature has its own conscious goals, then this is thoroughly un-Marxian.
37. Marx and Engels, *Deutsche Ideologie*, in *MEW*, 3:45.
38. Whether and how Marx embraced teleology in social development is a highly disputed question among Marx scholars. Ball, "Marx and Darwin," 472-74; Terence Ball, "Marxian Science and Positivist Politics," in *After Marx*, eds. Ball and Farr, 243; James Farr, "Marx No Empiricist," *Philosophy of the Social Sciences* 13 (1983):469-70; Alfred Schmidt, *Der Begriff der Natur in der Lehre von Marx* (Frankfurt a.M., 1962), 82-83; claim that humans provide purpose to history (Ball also adds that, according to Marx, humans give design to nature). Allen Wood, *Karl Marx* (London, 1981), 105-9, sees teleology in Marx's belief

that there is a tendency for the efficient use of productive powers, but notes that Marx and Engels thought this form of teleology was explicable in materialistic terms, just as Darwin explained teleology in biology. Anthony Leeds, "Darwinian and 'Darwinian' Evolutionism in the Study of Society and Culture," in *The Comparative Reception of Darwinism*, ed. Thomas F. Glick (Chicago, 1988), 444, 458-59, sees teleology in Marx's dialectic, because contradictions must synthesize.

Sidney Hook, *From Hegel to Marx: Studies in the Intellectual Development of Karl Marx* (Ann Arbor, MI, 1962), 38; Bernard Naccache, *Marx Critique de Darwin* (Paris, 1980), 28; Paul Thomas, "Nature and Artifice in Marx," *History of Political Thought* 9 (1988): 495; argue that Marx rejected teleology in social evolution.

39. Marx to Engels, 12 December 1868, in *MEW*, 32:229.

40. Marx to Ferdinand Lassalle, 16 January 1861, in *MEW*, 30:578.

41. Marx, *Elend der Philosophie*, in *MEW*, 4:91-92.

42. Josef Boszotta, "Einflüsse des Darwinismus auf den Marxismus," (Dissertation, Hochschule für Welthandel in Wien, 1950) 91-92; Sidney Hook, "Marx and Darwinism," *New Republic* 67 (1931): 290; Paul, "Marxism, Darwinism," 131.

43. See Introduction, n. 7.

44. Charles Darwin, *The Origin of Species* (London, 1968), 131-33, 229, 443, 459-60. Quote at 459.

45. Marx to Engels, 7 August, 1866, in *MEW*, 31:248.

46. Marx to Engels, 18 June 1862, in *MEW*, 30:249.

47. Marx, "1861-63 Manuscript," in *MEGA*, II/3.3:772-73.

48. Thomas Robert Malthus, *An Essay on the Principle of Population* (6th ed., 1826), in *Works*, ed. E. A. Wrigley and David Souden (London, 1986), 2:7-8.

49. Marx, "The Labor Question," in *MEGA*, I/12:450; Marx, *Kapital*, in *MEGA*, II/5:413 (n. 325).

50. William Petersen, *Malthus* (Cambridge, Mass., 1979), 22.

51. Marx, *Kapital*, in *MEGA*, II/5:428 (n. 16), 508.

52. Marx to Paul and Laura Lafargue, 15 February 1869, in *MEW*, 32:592.

53. Marx and Engels, *Deutsche Ideologie*, in *MEW*, 3:459-60.

54. Schweber, "Darwin," 197, 211-12; Darwin, *Origin*, 158.

55. Marx, *Kapital*, in *MEGA*, II/5:277 (n. 31), 303 (n. 89).

56. Charles Darwin, *Metaphysics, Materialism, and the Evolution of Mind: Early Writings of Charles Darwin*, ed. Paul H. Barrett and Howard E. Gruber (Chicago, 1980), 36.

57. Schweber, "Darwin," 265-66, 269-70.

58. Darwin, *Origin*, 116, 127, 131, 147, 158, 444.

59. Marx to Engels, 7 August 1866, in *MEW*, 31:248.

60. P. Trémaux, *Origine et transformations de l'homme et des autres êtres* (Paris, 1865), 17-18. Emphasis in original.

61. *Ibid*, 227-29.

62. Marx to Engels, 7 August 1866, in *MEW*, 31:248.
63. Marx to Engels, 3 October 1866, in *MEW*, 31:257-58.
64. Marx to Ludwig Kugelmann, 9 October 1866, in *MEW*, 31:530.
65. Marx to L. Kugelmann, 27 June 1870, in *MEW*, 32:685-86. On Lange, see ch. 3.
66. Marx to Paul and Laura Lafargue, 15 February 1869, in *MEW*, 32:592.
67. Marx to Engels, 4 July 1864, in *MEW*, 30:418; 25 March 1868, in *MEW*, 32:52-53; Marx to Ludwig Kugelmann, 17 April 1868, in *MEW*, 32:546; Ferdinando Vidoni, "Das Laboratorium von Marx: Die Bedeutung der Naturwissenschaften für das Marxsche Werk," *Marxistische Studien* 12 (1987): 114-15, 120.
68. W. Liebknecht, *Karl Marx*, 50.
69. Colp, "Contacts of Darwin with Aveling and Marx," 394, agrees with this judgment in relation to Darwinism, though Kurt Reiprich, *Die philosophisch-naturwissenschaftlichen Arbeiten von Karl Marx und Friedrich Engels* (Berlin, 1969), 22, claims that Marx studied science as intensively as Engels in the period 1869-1883. Marx's correspondence and other writings do not seem to bear this out.
70. Marx to P. L. Lawrow, 18 June 1875, in *MEW*, 34:145.
71. Marx to Eleanor Marx, 23 December 1882, in *MEW*, 35:418.
72. Ball, "Marx and Darwin," 469-70; Terrell Carver, *Marx and Engels: The Intellectual Relationship* (Brighton, 1983), 135; Groh, "Marx, Engels und Darwin," 222, 228; V. L. Komarov, "Marx and Engels on Biology," in *Marxism and Modern Thought*, ed. N. I. Bukharin, et al., trans. Ralph Fox (NY, 1935), 226; Th. G. Masaryk, *Die philosophischen und soziologischen Grundlagen des Marxismus: Studien zur sozialen Frage* (1899; rpt. Osnabrück, 1964), 50-51, 260; Ureña, "Marx and Darwin," 553, 559; Ian Mitchell, "Marxism and German Scientific Materialism," *Annals of Science* 35 (1978): 388; Avineri, "From Hoax to Dogma," 30-32; Colp, "Contacts between Marx and Darwin," 332.
73. Aveling, "Charles Darwin"; Boszotta, "Einflüsse," 1, 148, 159, *passim*; Jean Hyppolite, *Studies on Marx and Hegel*, trans. John O'Neill (NY, 1969), 129; Alvin W. Gouldner, *The Two Marxisms: Contradictions and Anomalies in the Development of Theory* (NY, 1980), 72.
74. Marx to Annenkow, 28 December 1846, in *MEGA*, III/2:75.
75. *Ibid*; Marx, *Zur Kritik der Politischen Oekonomie*, in *MEW*, 13:46.
76. Marx, "The War Question--British Population and Trade Returns--Doings of Parliament," in *MEGA*, I/12:277 (originally published 24 August 1853).
77. Marx, *Elend der Philosophie*, in *MEW*, 4:139-140; *Manifest der Kommunistischen Partei*, in *MEW*, 4:478.
78. Marx, "Kritische Randglossen," in *MEGA* I/2:455.
79. Marx, *Heilige Familie*, in *MEW*, 2:136.
80. This distinction is most clearly made in Marx, *Kapital*, in *MEGA*, II/5:428 (n. 16).

81. Marx, "1861-63 Manuscript," in *MEGA*, II/3.6:2269.
82. Marx, "The Future Results of British Rule in India," in *MEGA*, I/12:252.
83. Marx, "1861-63 Manuscript," in *MEGA*, II/3.2:338.
84. Marx, *Kapital*, in *MEGA*, II/5:12, 122, 223.
85. *Ibid*, 428 (n. 16), 292.
86. *Ibid*, 516.
87. Hans Jörg Sandkühler, "Die Entwicklung des wissenschaftlichen Sozialismus aus dem Kapital-Verhältnis. Zum Determinismus-Problem in der Arbeiterbewegung," in *Bernstein und der Demokratische Sozialismus*, ed. Horst Heimann and Thomas Meyer (Berlin, 1978), 246-47.
88. Marx, *Kapital*, in *MEGA*, II/5:12, 14.
89. Marx, *Kapital* (2nd ed.), in *MEGA*, II/6:7-7-8.
90. Marx, *Kapital*, in *MEGA*, II/5:14.
91. *Ibid*, 211-12.
92. *Ibid*, 275-76.
93. *Ibid*, 290.
94. Trémaux, *Origine*, 17-18.
95. *Ibid*, 406, 419, 426-27.
96. Marx to Engels, 7 August 1866, in *MEW*, 31:248. The Trémaux quotation is located in *Origine*, 421.
97. John L. Stanley and Ernest Zimmermann, "On the Alleged Differences between Marx and Engels," *Political Studies* 32 (1984): 233-34.
98. Marx, "1861-63 Manuscript," in *MEGA*, II/3.6:2269.
99. Marx, "1863-65 Manuscript," in *MEGA*, II/4.1:73-74; *Kapital*, in *MEGA*, II/5:23, 135.
100. Marx to Ludwig Kugelmann, 11 July 1868, in *MEW*, 32:553. This letter refutes Groh's claim that Marx never discussed natural law in his correspondence, which, Groh concludes, demonstrates that Marx only wrote about natural law for public consumption, not because he considered it an integral part of his theory; see Groh, "Marx, Engels und Darwin," 235-36.
101. Marx, *Kapital*, in *MEGA*, II/5:13-14.
102. This is also the view of Z. A. Jordan, *The Evolution of Dialectical Materialism: A Philosophical and Sociological Analysis* (London, 1967), 299.
103. Marx to Annenkow, 28 December 1846, in *MEGA*, III/2:71.
104. Marx, *Elend der Philosophie*, in *MEW*, 4:130.
105. Marx, *Zur Kritik der Politischen Oekonomie*, in *MEW*, 13:8-9.
106. Marx, *Kapital*, in *MEGA*, II/5:49 (n. 28); 298, 12.
107. *Ibid*, 315.
108. Marx, "Future Results," in *MEGA*, I/12:252.
109. Marx, "Forced Emigration," in *MEGA*, I/12:59.
110. William H. Shaw, "Marx and Morgan," *History and Theory* 23 (1984): 217-18.
111. Sharing my view of Marx's economic determinism are G. A. Cohen, *Karl*

Marx's Theory of History: A Defence (Princeton, 1978), 134 and passim; William H. Shaw, *Marx's Theory of History* (Stanford, 1978), 5 and passim; John McMurtry, *The Structure of Marx's World-View* (Princeton, 1978), 11 and passim; and Hook, *From Hegel to Marx*, 38. Those disputing Marx's economic determinism include Norman Levine, *The Tragic Deception: Marx contra Engels* (Oxford, 1975), 108, 157; Daniel Little, *The Scientific Marx* (Minneapolis, 1986), 26-29; and numerous others. For mediating positions, see Gouldner, *Two Marxisms*, 32-35, 64-65, 250-51 and passim, and James Miller, *History and Human Existence: From Marx to Merleau-Ponty* (Berkeley, 1979), 64-100.

112. Marx to Engels, c. 16 January 1858, in *MEW*, 29:260; Marx to Joseph Dietzgen, 9 May 1868, in *MEW*, 32:547. S. H. Rigby points out that Marx as well as Engels returned to Hegelian dialectical method around 1858-59; *Engels and the Formation of Marxism: History Dialectics and Revolution* (Manchester, 1992), 97-102.

113. Engels, *Dialektik der Natur*, in *MEGA*, I/26:175-82; *Anti-Dühring*, in *MEGA*, I/27:317-37.

114. Marx, *Kapital*, in *MEGA*, II/5:246, 609.

115. Marx, *Kapital*, in *MEGA*, II/5f:246; Marx to Engels, 22 June 1867 in *MEW*, 31:306; Marx to Joseph Dietzgen, 9 May 1868, in *MEW*, 32:547. Herbert Marcuse, *Reason and Revolution: Hegel and the Rise of Social Theory* (Boston, 1960), 316-17, emphasizes that dialectical laws are necessary laws, but argues that Marx thought the dialectic applied only to pre-socialist societies.

116. Marx, *Kapital*, in *MEGA*, II/5:609.

117. *Ibid*, 246.

118. Marx to Engels, 31 May 1873, in *MEW*, 33:82; Marx to Wilhelm Liebknecht, 7 October 1876, in *MEW*, 34:209. Many scholars agree with me that Marx applied the dialectic to nature: Rigby, *Engels*, 97-102, 150-60; J. D. Bernal, *Marx and Science* (NY, 1952), 18; Boszotta, "Einflüsse," 38 and passim; John Hoffman, *Marxism and the Theory of Praxis: A Critique of Some New Versions of Old Fallacies* (London, 1975), 48-50, 56; David McLellan, *The Thought of Karl Marx: An Introduction*, 2nd ed. (London, 1980), 152; Bertell Ollman, *Alienation: Marx's Conception of Man in Capitalist Society*, 2nd ed. (Cambridge, 1976), 53; Reiprich, *Phil.-naturwiss. Arbeiten.*, 25-26; Vidoni, "Laboratorium," 121.

119. Marx, *Elend der Philosophie*, in *MEW*, 4:91-92.

120. Hoffman, *Marxism*, 69.

121. Charles Darwin, *The Descent of Man* (London, 1871), I:71-80, 84-85, 106, 166; Robert J. Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior* (Chicago, 1987), ch. 5.

122. Jon Elster lists six ways that Marx distinguished between humans and animals: (1) self-consciousness, (2) intentionality, (3) language, (4) tool use, (5) tool making, and (6) cooperation; Elster, *Making Sense of Marx* (Cambridge, 1985), 62.

123. Marx, "Ökon.-phil. Manuskripte," in *MEGA*, I/2:369.

124. Ibid, 369; Marx and Engels, *Deutsche Ideologie*, in *MEW*, 3:28.
125. Shlomo Avineri, *The Social and Political Thought of Karl Marx* (Cambridge, 1968), ch. 3.
126. Marx, *Kapital*, in *MEGA*, II/5:129-30; Marx and Engels, *Deutsche Ideologie*, in *MEW*, 3:30.
127. Marx, "Ökon.-phil. Manuskripte," in *MEGA*, I/2:389-91. Paul Heyer, *Nature, Human Nature, and Society: Marx, Darwin, Biology, and the Human Sciences* (Westport, Conn., 1982), 114, 119, 126, mistakenly argues that Marx grounded human social nature in human biology.
128. Wood, *Karl Marx*, 16-17.
129. Marx, "Ökon.-phil. Manuskripte," in *MEGA*, I/2:389-90.
130. Marx, *Kapital*, in *MEGA*, II/5:129; Marx, *Elend der Philosophie*, in *MEW*, 4:160.
131. Trémaux, *Origine*, 105-16.