Evolution was popularized from 1860 to 1900 in the USA and Britain in a wide variety of media. Here I investigate traditional texts associated with the intellectual elite, including philosophical or scientific monographs, sermons, and published lectures. Evolution was rarely popularized in ways that reflected Darwin’s major contribution to biology, his theory of natural selection. This meant that the reading audience more often encountered an alternative to Darwin’s naturalistic, non-directional and non-progressive evolutionary perspective. There were at least four different versions of evolution circulating in the period from 1860 to 1900, and only one conformed to Darwin’s vision.

Keywords: popularization; evolution; Darwin

On 10 November 1862 the biologist Thomas Henry Huxley delivered the first of a set of weekly lectures on evolution that we now refer to as *Six lectures to working men* (1863). After reading the proofs of the first few lectures, Darwin wrote to Huxley on 7 December 1862, ‘they would do good and spread a taste for the Natural Sciences.’ Eleven days later he had read lectures four and five, and he told Huxley that ‘they are simply perfect.’ As he read the fifth lecture, Darwin thought, ‘what is the good of my writing a thundering big book, when everything is in this green little book so despicable for its size?’ Jokingly, he declared, ‘in the name of all that is good and bad I may as well shut shop altogether.’ Darwin began to encourage Huxley to write more science books for a popular audience. In 1864 he urged Huxley to compose a ‘Popular Treatise on Zoology’. ‘With your ease in writing, and with knowledge at your fingers’ ends’, Darwin wrote, it would be simple. Although it might seem like a ‘waste of time’ for a high-powered researcher such as Huxley to take on such a project, Darwin argued that ‘a striking Treatise would do real service to Science.’ When Huxley wrote on 1 January 1865 that he was far too busy, Darwin would not give up. He insisted on the importance of writing for the public. ‘I sometimes think’, he affirmed, ‘that general and popular Treatises are almost as important for the progress of science as original work.’ But Huxley was not convinced.

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In this extraordinary exchange between Huxley and Darwin, we are given a glimpse into the difficulties that Darwin encountered when he tried to enlist the help of his friends to popularize his evolutionary theory. Studies of Darwin’s letters have revealed that he was quite effective in building a vast correspondence network to push his evolutionary ideas forward among scientists. However, Darwin also wanted Huxley and other correspondents to help him disseminate his evolutionary message to the masses. A careful observer of nature, Darwin was also astute when it came to understanding how scientific theories became accepted. He realized, and we should take our cue from him, that popularizations of evolution were important. Darwin believed that the ultimate success of his theory of evolution by natural selection depended on its acceptance by the Victorian popular audience, not just scientists. However, the marketplace of science was already crowded with popularizers, many of whom had their own agendas that were not in tune with Darwin’s evolutionary naturalism.

In this paper I explore how evolutionary theory was popularized in Britain and the USA from 1860 to 1900. I shall deal only with those popularizers who accepted evolution as valid and who took it upon themselves to write books explaining the scientific basis of the theory and its larger intellectual implications. I shall focus on those books written by popularizers who were in contact with Darwin and on the best-selling popularizations of evolution. It is from the authors of these influential books that many Victorians learnt about the meaning of evolution, not just from Darwin and his allies. Previous studies on the reception or dissemination of evolutionary theory in Britain and the USA have dealt primarily with the views of members of the intelligentsia. However, we must also investigate the world of the literary hack that many publishers relied on to write best-selling books. Usually self-educated rather than trained scientists, these men and women knew how to write for a popular audience. In a period when scientists were still struggling to wrest cultural authority away from Christian clergymen, the views of the scientific writer were granted considerable weight by the reading public.

Darwin must have been constantly disappointed by the way in which prominent popularizers—even his friends—presented his theory. Evolution was rarely popularized in ways that reflected Darwin’s major contribution to biology, his theory of natural selection. This meant that the reading audience more often encountered an alternative to Darwin’s naturalistic, non-directional and non-progressive evolutionary perspective. There were at least four different versions of evolution circulating in the period from 1860 to 1900, and only one conformed to Darwin’s vision. The results of this study of the popularization of evolution in books mirror the conclusion that Ellegård reached in his analysis of the general periodical press from 1859 to 1872. Ellegård found that most journalists were willing to accept evolution, at least for the organic world below humans, but they rejected Darwin’s explanation of it. I shall begin by discussing Darwin and the Darwinians, and their secular and non-teleological interpretations of evolution. I shall then discuss the three other versions of evolution, moving from the most secular to the most Christian. In contrast with Peter Bowler, who uses categories based on the mechanism of evolution in his discussion of the positions of elite scientists in his book *The non-Darwinian revolution*, my categories are related to the religious and metaphysical concerns of the popularizers. Given the uncertain scientific status of Darwin’s theory of natural selection right up until the 1930s, it is not surprising that many popularizers believed that they had adequate justification for providing evolution with a metaphysical basis that differed so profoundly from Darwin’s.
Charles Darwin (1809–82) himself has to be considered one of the most important popularizers of evolution. His correspondence with friends, and with John Murray, his publisher, while he worked on *Origin of species* is revealing. At first, while writing *Origin*, he was optimistic about the book’s appeal to the public. On 31 March 1859 he wrote to John Murray, ‘the book ought to be popular with a large body of scientific and semi-scientific readers, as it bears on agriculture and history of our domestic productions and on whole field of Zoology, Botany and Geology.’ He added, ‘only some small portions are at all abstruse.’ Several days later, on 5 April, he told Murray that his book would attract the public, in addition to scientific and semi-scientific readers. ‘It may be conceit,’ he wrote, ‘but I believe the subject will interest the public.’ However, as Darwin began the process of checking through the proofs, he began to doubt his own abilities to communicate effectively to non-scientists. He apologized to Murray on 14 June 1859 for the very heavy corrections he had made to the proofs. He was finding his own style to be ‘incredibly bad and most difficult to make clear and smooth.’ To Joseph Dalton Hooker, he complained in a letter dated 22 June 1859 that he had had to ‘blacken’ the proofs, ‘so miserable have I found the style.’ Hooker had dreamt that his book would be entertaining, but Darwin sadly admitted ‘that dream is pretty well over with me, and I begin to fear that the Public will find it intolerably dry and perplexing.’ The revision of the proofs became such a burden to Darwin that he yearned to finish. Near the end, on 23 September 1859, he remarked to W. D. Fox, ‘so much for my abominable volume, which has cost me so much labour that I almost hate it.’ Darwin found that it was not easy to write a book that aimed to persuade scientists of the validity of his evolutionary theory while remaining accessible to the general public.

If we compare Darwin with John George Wood (1827–89), one of the most successful popularizers of science in the second half of the nineteenth century, then the problems with Darwin’s attempt to reach multiple audiences become clearer. One of the first ‘professional’ science writers, Wood’s only target was the general reader. He was quite effective in reaching this audience. Today we take for granted the existence of the professional science writer as we encounter their handiwork on an almost daily basis, in popular science magazines, in columns devoted to science in our daily newspapers, or in the latest popular book on string theory or evolution. However, before the middle of the nineteenth century there were few science writers because there was little demand for popular science books and journals. In fact, it is only in the nineteenth century that ‘popular science’ was really created. Experiments in the publication of ‘popular’ science books began only in the early nineteenth century, and many of them were commercial failures. In Britain the market did not exist for such works until later in the century, when rising literacy rates created a new polity of readers composed of members of the middle class and the wealthier working class. The development of new printing technologies based on steam, creating the possibility of cheap, mass-produced books, combined with the expansion of the British reading audience, led to the demand for professional science writers such as Wood, who could make a living (albeit meagre) by churning out popular science books and articles.

During his career as a popularizer of science, Wood wrote more than two dozen natural history books. An Oxford man, Wood was initially bound for the Anglican ministry. However, the success of the volumes he wrote for Routledge’s ‘Common objects’ series...
led him to pursue a career writing natural history books. The first, *Common objects of the sea shore* (1857), sold so well that Routledge could hardly keep up with the demand. By 1860 more than 77,000 copies had been printed. But Wood’s *Common objects of the country*, published in 1858, just a year before *Origin* appeared, was even more successful, and a comparison of the two books indicates the limited appeal of Darwin’s work as a work of popularization. When it first went on sale the retail price of *Origin* was 15 shillings, far too expensive for members of the working class. Wood’s *Common objects of the country* was priced at an affordable 1 shilling. In Britain, by the end of the century 56,000 copies of *Origin* had been printed. Sales of *Origin* were very good, but not spectacular. At least half a dozen science books for a general reading audience surpassed it. One of them was Wood’s *Common objects of the country*. By 1889, 86,000 copies of Wood’s book had been printed, 30,000 more than *Origin* in 1899.

If we compare the contents of *Origin* with those of Wood’s *Common objects of the country* it becomes clearer what conventions Darwin adopted to reach a popular audience and what features of his book were difficult for that audience to digest. Like Wood, Darwin tried to make his work accessible to the intelligent reader by avoiding the excessive use of scientific terminology known only to practitioners. Non-specialists could follow Darwin’s move in the opening chapters of *Origin* from the breeding of domesticated animals and plants to the operation of selection in nature. Darwin also depicted nature as a place of wonder, full of intricate contrivances. Although he did not, like Wood, ascribe these contrivances to the direct action of a caring God, he retained the natural theologians’ emphasis on the affective impact of studying the natural world. For Darwin, as for Wood, the proper emotional response to nature was a sense of awe. Although Darwin wished to appeal to a popular audience, he also desired to distinguish his book both from the popularizing tradition represented by Wood and from the hack journalism associated with the controversial and anonymous *Vestiges of the natural history of creation* (1844), a popularization of evolution by the publisher and journalist Robert Chambers. Many scientists, including Huxley, had savagely criticized *Vestiges*. Darwin tried to appeal to his scientific colleagues. Whereas *Vestiges* indulged in speculations about cosmic progression, Darwin’s *Origin* contained a sustained argument for evolution by natural selection for scientists that required the presentation of masses of evidence that even Darwin recognized would have been tedious for a general audience. Only the final sentence of *Origin*, after natural selection had been digested, allowed readers to speculate about cosmic progression. Even so, Darwin was quite ambiguous on the issue of progress. On the one hand, he acknowledged that over the eons higher animals had developed through the evolutionary process. Natural selection tended to produce ‘higher’ levels of organization over the long run. On the other hand, Darwin rejected the idea of a driving force behind evolution pushing the process in a particular direction or towards a goal.

Darwin attempted in *Origin* to secularize nature. He repeatedly pointed to the destruction and death underlying the deceptively harmonious natural world that we behold—‘the face of nature bright with gladness’, as he called it. By contrast, Wood was a natural theologian. The overwhelming majority of popularizers of science in the second half of the nineteenth century saw themselves as working in the natural theology tradition. Wood emphasized that destruction had a purpose and that nature was a really a happy world, a scene of divine activity in which every creature had its role. Although Darwin experimented with the use of visual images in his subsequent books, *Origin* contained a single illustration.
In comparison, Wood’s books were filled with vivid visual images—their inclusion was a hallmark of his work. Darwin’s book could have only a limited appeal for reading audiences thrilled by *Vestiges* and accustomed to the conventions used by popularizers of science such as Wood. *Origin* was a hybrid text designed to appeal to several audiences who, James Secord has pointed out, were much more difficult to reach simultaneously in the second half of the nineteenth century.25

Darwin tinkered with *Origin* during the 1860s as it went through a series of editions. Some changes reflected his response to scientists who argued that he had overemphasized the role of natural selection in evolution.26 Allowing for other factors may have satisfied some critics, but it may also have confused a reading audience still coming to terms with Darwin’s ambiguity on the issue of progress. By 1869, *The origin of species* had reached a fifth edition and Murray had printed 9750 copies.27 Darwin continued to worry that *Origin* was not reaching the general audience, and he pressed Murray to produce a cheap edition. When Murray proposed that it be priced at 7s. 6d., Darwin protested that it was too expensive. ‘I have been told on authority which I can trust’, Darwin wrote on 3 June 1871, ‘that in Lancashire, workmen club together to buy the *Origin*.’28 In the following January he was still pushing Murray to lower the price. ‘Do you not think 6s [6 shillings] is too dear for a cheap edit?’ he asked Murray. ‘Would not 5s be better?’29 But when the sixth edition appeared in February of 1872, Murray priced it at 7s. 6d.30 Darwin also had made extensive revisions to reach a wider public.31 He dropped 63 sentences, rewrote 1669 others and added 571 new ones.32 A reader-friendly glossary was added at the end of the book. However, the lower price and the revisions did not give a huge boost to the sales of *Origin* over the next few years. The sixth edition of 1872 reached the 11 000 printed mark. By 1875 only 4000 more copies had been printed.33

THE DARWINIANS

Unsure of his ability to communicate with the Victorian reading audience, and in competition with experienced scientific authors such as Wood to gain the ear of the public, Darwin sought allies in his attempt to popularize his theory of evolution by natural selection.34 He looked, first, to British scientists such as Huxley who had defended him publicly against the attacks of hostile Christian clergymen and their scientific supporters. Predominantly British, the popularizing Darwinians included the biologists Huxley, George John Romanes and E. Ray Lankester, the physicist John Tyndall, the botanist Joseph Dalton Hooker, the anthropologist and entomologist John Lubbock, and the mathematician William Kingdon Clifford. The American philosopher and pragmatist Chauncey Wright could also be included in this list. The Darwinians conveyed evolutionary theory to non-scientists through their public lectures, their occasional books and their contributions to the periodical press. However, Huxley, and other Darwinians, were not always receptive to the idea of dropping their research and devoting precious time to writing books for a popular audience. Initially, they did not share Darwin’s belief that it was important to popularize evolutionary theory. Before 1870 the main priority for the Darwinians was converting the rest of the scientific community to evolutionary theory.35 Many of the Darwinians had close personal ties to Darwin. They shared Darwin’s naturalism and his concept of a non-directional evolution.
The ranks of the Darwinians, it should be noted, underwent a series of changes during the 1860s as ‘Darwinism’ had to be redefined and purged of any unwanted metaphysical baggage, such as Haeckel’s materialistic monism. Individuals who had originally been a part of the Darwinian crew were dropped in the late 1860s for their sins—Alfred Russel Wallace for his spiritualism, and Asa Gray for his attempt to preserve a concept of design in evolution. Later, in the late 1870s, Samuel Butler’s critique of natural selection led to his banishment. Wallace, Gray and Butler all were, or became, involved in popularizing evolution, and their works swelled the ranks of the non-Darwinian popularizers. But even among those who remained Darwinians there could be disagreement on aspects of evolutionary theory. Huxley, for example, was never enthusiastic about Darwin’s theory of natural selection. He preferred to think of saltations, or mutational jumps, as the main evolutionary mechanism. Huxley’s uncertainty about natural selection affected how he popularized evolution. In *The crayfish: an introduction to the study of biology* (1880), Huxley’s contribution to the International Scientific Series, he pushed his readers to accept evolution but never discussed the role of natural selection. Huxley’s attraction to Darwin’s theory of evolution may have had more to do with his crusade to instil the principles of naturalism into British science. However, Huxley’s attitude towards natural selection did not prevent him from accepting Darwin’s conception of evolution as non-progressive. He believed that degeneration was part of the evolutionary process.

George John Romanes (1848–94) (figure 1) was another key popularizing Darwinian. Unlike Huxley, he scrupulously defended the theory of evolution by natural selection.
Referred to as ‘Darwin’s staunchest supporter and disciple’ from the mid 1870s to the end of the century by one scholar, Romanes accepted the role of presenting Darwin’s ideas to a popular audience in periodicals such as The Nineteenth Century as well as in several books. Darwin provided Romanes with guidance and encouragement early in the latter’s career. Directing Romanes toward research with plants, Darwin hoped that his friend would eventually gather evidence in support of pangenesis, his theory of heredity. However, by 1877 Romanes had failed to produce the graft-hybrids required to support pangenesis, so he began working on animal intelligence. On 22 April 1881 Romanes wrote to Darwin that he had decided how to organize the material for two books he was working on. The first, on animal intelligence, was to contain facts and ‘only a slender network of theory to bind them into mutual relation’, whereas the second, on mental evolution, was to contain ‘heavier philosophy’, rendering it the ‘less popular, of the two’. Kegan Paul, Trench & Company published the first book, Animal intelligence (1882), in the International Science Series, a series geared to the general audience. In England, it was priced at 5 shillings and sold 2791 copies in 10 years, and a total of 3677 copies by the end of the century. Published by Appleton in the USA, there it went through eight editions by 1897. It was intended as a textbook of comparative psychology, and Romanes argued that the evolutionist could claim that there was a psychological continuity ‘extending throughout the length of the animal kingdom’.

Romanes wrote a second popularization of evolution that appeared in the same year as Animal intelligence. The scientific evidences of organic evolution (1882), published by Macmillan in the Nature Series, sold for 2s. 6d. It was not as successful as Animal intelligence in Britain, reaching but one edition. It seems to have fared better in the USA, where Fitzgerald & Co. published it in 1882, and then it probably reached a wider circulation when it appeared in the Humboldt Library of Popular Science in the following year. Here Romanes attempted to present a ‘short digest of the Origin of Species’, desperately needed because of the ‘ignorance of his work which is displayed by many persons who can scarcely be said to belong to the uncultured classes.’ The book was written for the ‘thousands of educated persons who, on coming home from their daily work, prefer reading literature of a less scientific character than that which is supplied by Mr. Darwin’s works.’ Romanes began with a description of natural selection because he saw it as the crucial element in Darwin’s evolutionary theory. He pointed out that the theory of natural selection offered a scientific explanation of design that ruled out supernatural causes. Natural theologians, he claimed, could ‘no longer adhere to the arguments of such writers as Paley, Bell, and Chalmers, without deliberately violating the only logical principle which separates science from fetishism.’ Romanes then outlined the scientific evidence in favour of organic evolution, including the arguments from classification, structure, geology, geographical distribution, and embryology. Shortly after the publication of Romanes’s two popularizations of evolution in 1882 he began to re-evaluate his position on the metaphysical implications of evolution. He moved closer to a tenuous theism. However, between 1875 and 1885 he was numbered among the advocates of evolutionary naturalism. Romanes is part of the group that scholars have often concentrated on in the past when discussing how the Victorians learnt about Darwin’s ideas. But they were only one group among many, and the books they wrote on evolution were not among the best sellers of the period.
SPENCERIANS AND NEO-LAMARCKIANS

Robert Chambers, the anonymous author of *Vestiges of the natural history of creation* (1844), packaged evolutionary theory in a monad-to-human style cosmic narrative. A sensational best seller, the book sold 21,250 copies in Britain within a decade of publication. However, *Vestiges* continued to sell well into the nineteenth century, despite a concerted effort by men of science to demolish its scientific credibility. After *Origin* had appeared, another 17,500 copies were sold, so that by 1890 it had reached sales of 38,750 copies. Why did the British reading audience persist in buying *Vestiges* when, since 1859, they could have had Darwin’s *The origin of species*, or, later on, popularizations of evolution written by eminent scientific authorities such as Huxley and Romanes?

Darwinians faced stiff competition in the marketplace of science not only from Chambers but also from a group of popularizers who had much in common with the author of *Vestiges*. Like Chambers, they emphasized the progressive nature of the evolutionary process, and many of them depicted evolution in a cosmic form. The naturalistic, non-directional evolutionary theory promulgated by Darwin and the Darwinians may not have appealed as powerfully to the imagination of the reading public. The lack of a clear consensus among scientists by the end of the century as to the validity of Darwin’s theory of natural selection, the attraction of some scientists to Lamarckianism as a viable alternative, and Darwin’s ambiguity on the issue of progress all gave popularizers licence to explore the larger meaning of a non-Darwinian form of evolution. Bowler has argued persuasively that evolution became associated with the unfolding of a goal-directed plan or pattern. Within biology ‘*Origin* was hijacked by the prevailing enthusiasm for a progressive and purposeful developmental trend in nature.’ Whereas the Darwinians looked to Darwin, this second cluster of evolutionary popularizers can be grouped around two figures, the synthetic philosopher Herbert Spencer and the French evolutionist Lamarck. Because Spencer has been viewed as a neo-Lamarckian, the popularizers to be discussed in this section can be treated together. Scientific practitioners dominated the Darwinians, but the ranks of the Spencerians and neo-Lamarckians contained numerous journalists and scientific writers. It was one of the largest groups of popularizers of evolution in terms of size, and it was influential because of its numbers.

The novelist Samuel Butler and the popularizer of science Alice Bodington can be counted among the neo-Lamarckians, whereas the more numerous Spencerian popularizers included the novelist and journalist Grant Allen, the anthropologist and banker Edward Clodd, the astronomer Richard Proctor, the historian John Fiske, the publisher E. L. Youmans, and the Liberal MP and railway chairman Samuel Laing. I shall focus on John Fiske (1842–1901) (figure 2), whose books were among the best sellers written by those in this group. Like the other Spencerians, he popularized evolution as a cosmic, progressive process that embraced all aspects of the natural, and human, worlds. Fiske was one of Spencer’s American disciples. Shortly after the publication of *The origin of species*, American scientists embraced evolutionary ideas with enthusiasm. By 1880 the Presbyterian *Observer*, no friend of evolution, could point to only two working American naturalists who did not accept some form of evolution. It did not take long for American science educators to add evolutionary concepts to high-school textbooks. American popularizers of evolution such as Fiske faced a somewhat less hostile environment than their British counterparts. Fiske’s *Outlines of cosmic philosophy* reached a 19th edition by 1899. Fiske acknowledged that the system he was
expounding in his book was essentially Spencer’s and that the illustrations he added ‘are quite in harmony with the fundamental principles which he has laid down.’54 Always one to encourage young evolutionists, Darwin praised Fiske’s ability to make Spencer’s ideas clear to a general audience and to himself. On 8 December 1874 he wrote to Fiske that he had never understood Spencer’s general doctrine, ‘for his style is too hard work for me.’ But Fiske had made Spencer crystal clear for him. ‘I never in my life read so lucid an exposition (and therefore thinker) as you are.’55

Fiske’s most successful popularization of evolution appeared in 1884, his Destiny of Man viewed in the light of his origin. By 1899, 26 000 copies had been sold.56 A small book of 120 pages, it was sold by Houghton, Mifflin & Company for $1. Fiske argued that the negative implications read into Darwinism were groundless. Materialism was ‘utterly condemned by modern science’. Instead of degrading humanity, ‘the Darwinian theory shows us distinctly for the first time how the Creation and the perfecting of Man is the goal toward which Nature’s work has all the while been tending.’ With the appearance of humanity, a new era began in the history of the Universe, as the evolution of the mind, rather than the body, became paramount. Natural selection confined itself to psychical variations and the results were the development of human morality, the genesis of the family, and the emergence of
altruism. Fiske declared that Darwinian theory ‘replaced as much teleology as it destroys’, because evolution revealed that all things were ‘working together toward one mighty goal, the evolution of the most exalted spiritual qualities which characterize Humanity.’ Fiske ended with praise for Herbert Spencer, ‘the master and teacher of all who shall study the process of evolution’, and with a profession of belief in Spencer’s shadowy deity, the Unknowable. As time went on, Fiske became increasingly traditional in his espousal of theism. Fiske’s success as a popularizer of evolution provides persuasive evidence that in America audiences were attracted to popular expositions of evolution that were explicitly theistic.

SPIRITUALISTS AND RELIGIOUS EVOLUTIONISTS

The Spencerians and Lamarckians were joined by another group of popularizers who also promulgated a theory of evolution shot through with teleological elements. Instead of looking to Darwin, to Spencer or to Lamarck, these writers were inspired by spiritualism or by a religious sensibility that was not distinctly Christian. Whereas the Spencerians tended to be religiously tinged agnostics, the spiritualists and religious evolutionists were theists. The evolutionary spiritualists included two of Darwin’s close friends, Alfred Russel Wallace and Arabella Buckley. Benjamin Kidd is a good example of a religious evolutionist. In this section I focus on Wallace and Kidd.

The biologist Alfred Russel Wallace (1823–1913) managed to stay on good terms with Darwin even after the two began to diverge in their views on evolution. Initially a member of the Darwin circle, Wallace disappointed his friends when in 1867 he became a fully committed spiritualist. Huxley and Tyndall detested spiritualism, regarding it as diametrically opposed to the principles of science. Wallace now regarded spiritualism and natural selection as complementary components of a larger evolutionary teleology with theistic overtones. Wallace’s book *Darwinism* (1889) provided an eloquent defence of natural selection after three decades of criticism. In the preface he stated that his aim was to give ‘an account of the theory of Natural Selection as may enable any intelligent reader to obtain a clear conception of Darwin’s work.’ Published by Macmillan, *Darwinism* reached a second edition in 1889 and went through four reprints before a third edition appeared in 1901. In the final chapter, ‘Darwinism applied to Man’, Wallace spelled out where he differed from Darwin. ‘Because man’s physical structure has been developed from an animal form by natural selection,’ Wallace declared, ‘it does not necessarily follow that his mental nature…has been developed by the same causes only.’ Wallace believed that an unseen, immaterial power had intervened in the evolutionary process in at least three critical points: first, when the organic initially arose out of the inorganic; second, when sensation or consciousness was first introduced; and third, when the most ‘characteristic and noblest faculties’ of humanity came into being. Wallace argued that a reason for the entire evolutionary process could be found only if it were put in a spiritualistic framework. ‘To us,’ Wallace declared,

the whole purpose, the only raison d’être of the world—with all its complexities of physical structure,…the slow evolution of the vegetable and animal kingdoms, and the ultimate appearance of man—was the development of the human spirit in association with the human body.

Wallace managed to co-opt the theory of natural selection for the spiritualist cause.
Although Wallace had the authority that came with being the famous co-discoverer of the theory of natural selection, the sales of *Darwinism* were surpassed by the publication of a book in January 1894 entitled *Social evolution*. Benjamin Kidd (1858–1916) (figure 3), a virtually unknown government clerk who wrote several natural history essays for such journals as *Longman’s Magazine* and *Chambers’s Journal*, was the author. Kidd’s book ranks with *The origin of species* and Chambers’s *Vestiges* as one of the best-selling popularizations of evolution. Although the first Macmillan edition in England sold for the relatively high price of 10 shillings, 3322 copies sold in the first six months. The first edition was reprinted nine times, after which a second edition, priced at 5 shillings, came out in May 1895. By June 1895, 10,823 copies had been sold in England. *Social evolution* was an international best seller. The book was translated into at least 10 languages, including Arabic and Chinese. According to an article in the periodical *Review of Reviews* in May 1895, in the first 15 months of its existence the book’s sales
‘must have amounted to between forty thousand and fifty thousand, a degree of popularity which not more than half a dozen of the best novels attain in the course of a year.’

In *Social evolution*, Kidd intervened in the debates surrounding social Darwinism. Although influenced by Darwin, Spencer and Huxley, he presented a somewhat idiosyncratic take on the social meaning of evolution. Kidd maintained that social evolution had a definite trajectory leading towards a religious goal. He claimed that nobody, the scientists included, really understood that this was the true social meaning of the evolutionary process. Even Herbert Spencer had failed. His views were so ambiguous that both socialists and liberal individualists looked to his works for inspiration. Because ‘science has obviously herself no clear perception of the nature of the social evolution we are undergoing’, Kidd declared, we are left without any real knowledge of the principles underlying ‘the process of social evolution which is proceeding around us.’ Kidd rejected Lamarck outright. He agreed with Spencer that human progress was a natural phenomenon under the control of natural laws. He also accepted the notion that progress was the outcome of the natural selection process, which inevitably involved competition. However, he disagreed with Spencer’s notion that the evolutionary process was rational. On the contrary, it was profoundly irrational, because it demanded the extermination of those who lost the struggle for existence. From the point of view of the impoverished masses, it was more rational to abolish competition and adopt socialist principles, even if that destroyed the prospects of further progress. This was the hidden message of evolutionary science. The interests of the social organism and those of the majority of individuals comprising it were actually antagonistic. Evolution had produced a rational creature

whose reason is itself one of the leading factors in the progress he is making; but who is nevertheless subject, in common with all other forms of life, to certain organic laws of existence which render his progress impossible in any other way than by submitting to conditions that can never have any ultimate sanction in his reason.

At this point, Kidd brought in the theme of religion. There could be no rational religion, Kidd believed, but religion could provide a super-rational sanction for the individual to support the progress of the organism. Those races in which ‘religious character’ has been most fully developed have secured a subordination of the present interests of the individual to the larger interests of the longer-lived social organism, and this, Kidd stated, allowed the fullest possible development of the power and faculties of all individuals. Darwinian science therefore led to the following conclusion: ‘The evolution which is slowly proceeding in human society is not primarily intellectual but religious in character.’ Through the law of natural selection ‘the race must grow ever more and more religious.’ By dismissing religion, the Marxists had misinterpreted the true meaning of the evolutionary process. Evolutionists such as Spencer were just as deluded. They did not understand the role of religion in ‘the spirit of evolutionary science’. Their anti-Christian bias had blinded them to the fact that ‘religion has a definite function to perform in society, and that it is a factor of some kind in the social evolution which is in progress.’ The centrality of religion to the evolutionary process was the message of one of the best-selling popularizations.
CHRISTIAN EVOLUTIONISTS

In 1894 the Scottish evangelical Henry Drummond delivered the Lowell lectures in Boston, published with the title *The ascent of Man* (1894). Drummond maintained that the nature of evolution had been ‘misconceived’ by all contemporary scientific thinkers. ‘Evolution was given to the modern world out of focus,’ he declared, ‘was first seen by it out of focus, and has remained out of focus to the present hour.’ The ‘general basis’ of evolution had not been ‘re-examined since the time of Mr. Darwin’ by the ‘speculative sciences’, such as teleology, or by the ‘working sciences like Sociology’. All the sciences had been ‘led astray by a fundamental omission’. Drummond sought to correct the oversight by presenting a ‘reconstruction’ of modern thought based on the notion that evolution was ‘God’s method in creation’.72 Drummond was just one of a large group of American and British popularizers who argued that the best way to make sense of the meaning of evolution was to put it into a Christian context. Some claimed that they were still Darwinians, whereas others rejected Darwin’s version of evolution. On the British side, representatives of this school included the Christian socialist, novelist and liberal Anglican cleric Charles Kingsley, the botanist George Henslow, and Drummond.73 Examples of American members include Asa Gray, Professor of Natural History at Harvard, the liberal evangelicals Henry Ward Beecher and Lyman Abbott, the Unitarian Minot Judson Savage, and the Congregationalist Joseph Cook. Popularizing evolutionists were to be found across the spectrum of Christian denominations, although there were important differences in the way that they envisaged the relationship between Christianity and evolution.74

Henry Drummond (1851–97) (figure 4) came out of the evangelical Scottish Free Church. From April 1874 to July 1875 he travelled through Ireland and England with the American evangelists Dwight L. Moody and Ira Sankey, speaking himself, and editing Moody’s addresses. In 1882 he again helped Moody during a second evangelistic tour of Britain. In 1884 he was appointed to a professorship in theology at the Free Church College in Glasgow, a status that required ordination. Drummond had scientific credentials as well. Before his appointment as theology professor he had been, since 1877, a lecturer in natural science at the Free Church College; in 1879 he participated in a geological expedition to the Rocky Mountains led by Archibald Geikie; and in 1883 he undertook geological work in southern equatorial Africa.75 Drummond also had a best-selling work on science and religion that brought together the two dimensions of his life, entitled *Natural law in the spiritual world* (1883), which sold more than 120 000 copies by 1900.76 The publishing success of *Natural law* provides compelling evidence for the existence of large numbers of readers who shared Drummond’s Christian evolutionism.

In *Natural law*, Drummond sought to offer a ‘truly scientific theology’ by demonstrating that natural laws were continuous throughout both the material and the spiritual domains. Here, he claimed, he was just ‘following a lead’ taken by various evolutionary thinkers, such as Walter Bagehot, who had extended natural law into the political world, and Herbert Spencer, who had applied natural law to the social world. Like them, Drummond was upholding the ‘Law of Continuity’. The implications for evolution were not fully spelt out until the final chapter, ‘Classification’. Drummond insisted that the evolutionary process involved both a material and spiritual dimension. The entire creation was moving towards a final unity, guided by one law. ‘This is the final triumph of Continuity,’ Drummond declared, ‘the heart-secret of Creation, the unspoken prophecy of Christianity.’ To science ‘this mighty process of amelioration’ was evolution, whereas to Christianity ‘it
is Redemption.’ Once the analogies between the natural and spiritual laws were recognized, science could be used to ‘corroborate Theology’ and ‘purify it’. 77

Although Drummond’s Lowell lectures on the ascent of Man were not as successful as Natural law, they still should be counted among one of the best-selling popularizations of evolution in the second half of the nineteenth century. Within a year 10,000 copies had been sold, and by 1902 sales of the book reached 30,000 copies. 78 The title of the work was, of course, a parody on Darwin’s Descent of man. It signalled Drummond’s intention of turning Darwin’s evolutionary theory upside down. Instead of supporting a secular, non-teleological perspective in which humanity was brought down to the level of the animal, Drummond’s evolutionary theory would demonstrate the divinity of humanity by pointing to the purpose in nature and linking it to the creative hand of a Christian God. The true
meaning of evolution had been obscured by Darwin’s emphasis on the struggle for life. Even Kidd, whom Drummond referred to as a ‘brilliant writer’, had been blinded by the Darwinian stress on struggle and as a result could not perceive a rational sanction for morality. Instead, Drummond asserted that a moral process lay at the heart of evolution within nature. Evolution was actually based on love rather than conflict. All reproduction involved a form of altruism, which found its main expression in the ‘endless and infinite self-sacrifices of Maternity’. The crowning work of evolution was the creation of maternal love in the Mammalia, after which evolution tamed and domesticated fathers. Evolution, which revealed the workings of an immanent God, involved spiritual, not material, progress.79

Spencer was infuriated by Drummond’s book because it was the first by a Christian evolutionist to provide a rival vision that so successfully co-opted cosmic evolution.80

**CONCLUSION: CONTROLLING THE POPULARIZERS**

On 13 October 1880 Darwin received a letter from Edward Aveling (1849–98), a self-proclaimed atheist who at that time had close ties to the notorious secularists Charles Bradlaugh and Annie Besant. Aveling was working on a popular book on Darwin’s evolutionary theories and he asked whether he could dedicate it to Darwin. Darwin replied that he could not allow the dedication because it implied his approval of the publication.81 Like many of the scientific naturalists, Darwin did not wish to be associated in any way with lower-class atheists. Darwin’s enemies would have used that against him to raise questions about his respectability.

In *Student’s Darwin* (1881) Aveling sought to adopt the role of ‘intellectual middle-man’, or ‘interpreter between the bulk of readers and one of the foremost men of this age’. Because the sales of Aveling’s book required only one edition, it reached a limited readership. In the book Aveling ‘analysed’ and ‘epitomised’ Darwin’s published works ‘one by one’ while demonstrating that Darwin’s theories led logically to the acceptance of atheism.82 Aveling acknowledged that ‘here and there, I am aware that I have pushed some of his conclusions further than perhaps he himself would be willing to believe they go.’ But Aveling thought he was justified in doing so: ‘[whereas Darwin wrote] as the purely scientific man I have taken his facts and generalisations and looked at them in the light of Freethought.’ Science was ‘antagonistic with the belief in the supernatural’, and Aveling thought it was ‘legitimate to take the teachings of our greatest and push them to what seems to me their logical conclusion.’83 In *Student’s Darwin*, Aveling presented what amounted to a fifth interpretation of evolution, distinct from that of the Darwinians by its association with radical freethought.

Aveling later sent Darwin a copy of his book, with a note apologizing for his atheistic extrapolations. In his reply Darwin admitted that he could hardly stop writers from taking his views to a greater length than seemed to him safe, but he implied that Aveling had gone too far.84 Later, after Darwin’s death, Aveling wrote another popularization of evolution, entitled *The Darwinian theory* (1884), in which he publicly distanced himself from Darwin. He argued that the true evolutionist did not believe in the ‘intervention of the supernatural’, nor did the consistent evolutionist recognize any hiatus between the living and the non-living. However, Darwin had referred in the final paragraph of *Origin* to a Creator breathing life into the original forms. This was ‘evidence of his belief in the supernatural origin of life’. Therefore, Aveling declared, he could not, ‘as strange as this may seem, call Charles Darwin an evolutionist.’85
Reading Darwin’s vast correspondence reveals how he actively tried to persuade members of the scientific elite to accept and support his evolutionary theory. Like a spider sitting at the centre of a gigantic web that constituted his correspondence network, Darwin attempted to control the scientific fate of the theory of natural selection. He made use of the same network to manage the public impact of his work. It is striking how many popularizers of evolution were in contact with Darwin, and how many were encouraged by him in their efforts to disseminate his ideas to the rapidly growing reading audience of the second half of the century. Darwin was in touch with Allen, Aveling, Buckley, Butler, Fiske, Gray, Henslow, Huxley, Kingsley, Romanes and Wallace. Nevertheless he was unable to control how his theories were popularized by many of these figures, even when he was on good terms with them. Only the Darwinians popularized versions of evolution that paralleled Darwin’s. The rest either built teleological and religious elements into the evolutionary process, or, like Aveling, linked evolution to atheism. Some popularizers, such as Kidd and Drummond, wrote best-selling books after Darwin’s death that also provided alternatives to the Darwinian interpretation. Through their publishing ventures, these men attempted to challenge the Darwinians to become known as the chief popularizers of the evolutionary world view in late Victorian culture. Although elite scientists predominated among the Darwinians, this was not the case in any of the other groups. The ranks of the Spencerians and Lamarckians were filled with journalists and writers, whereas most of the Christian evolutionists were clergymen. Although Wallace was an important spiritualistic evolutionist, Kidd was a clerk turned popularizer with no formal scientific training.

What difference did the popularizations of evolution make? Books written before 1900 by popularizers who were not Darwinians allowed the reader to imagine alternative interpretations of evolution before a scientific consensus started to form around a specific mechanism for the evolutionary process. American and British readers who could not accept the Darwinian version of evolution, with its non-progressive and secular characteristics, could turn to Fiske, Wallace, Kidd or Drummond and find in their works an evolutionary vision that satisfied their yearning for meaning. Books by these authors permitted many members of the public to accept evolution, because popularizers linked it to some form of theism, whether written by a Spencerian, by a spiritualist or religious evolutionist or by a Christian evolutionist. Each of these interpretations appealed to a different community of readers. If sales are any indication, the Anglo-American audience was gripped more by accounts of the evolutionary process emphasizing its progressive nature, its larger purpose and its religious meaning than by the popularizations presented by the Darwinians. In the world of Victorian publishing and the vast reading audience that it catered for, Darwin was just one author among many competing for their attention and patronage.

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the John Murray Archive. I also thank the Huntington Library for allowing me to quote from a letter from Darwin to John Fiske, and the International Institute of Social History, Amsterdam, for sending me a photocopy of a letter from Darwin to Aveling.

NOTES

2 Ibid., p. 611.
5 Ibid., p. 13.
6 Concentrating on the books written by pro-evolution popularizers in Britain and the USA from 1860 to 1900 allows us to examine a significant form of communication in two important Western countries over a 40-year period when Darwin’s *Origin* had its initial impact. However, this focus has several major limitations. It ignores those popularizers who were antagonistic towards evolution, and it pays little attention to the important periodical literature of the age, in which Darwin’s theory was widely discussed. I am also leaving to the side popularizers of evolution who were not Anglo-American but whose works were translated in English and published in the USA and the UK. Among this group is Ernst Haeckel, who, Richards claims, was the foremost popularizer of Darwinism in Germany, and perhaps throughout the world. See Robert J. Richards, *The tragic sense of life: Ernst Haeckel and the struggle over evolutionary thought* (University of Chicago Press, 2008), p. 2.
10 Ibid., p. 278.
11 Ibid., p. 303.
12 Ibid., p. 308.
13 Ibid., p. 336.
14 In Britain, nearly 30% of the population was literate in 1830. However, by the end of the century that figure had increased to 99%. The situation in the USA was different. In the north, at least 90% of the white population, both men and women, were literate, but literacy rates in the south were much lower for white men. See David Vincent, *Literacy and popular culture: England 1750–1914* (Cambridge University Press, 1989), p. 22; Richard D. Brown, *Knowledge is power: the diffusion of information in early America, 1700–1865* (Oxford


Ibid., p. 173.


Michael Ruse, Monad to man: the concept of progress in evolutionary biology (Harvard University Press, Cambridge, MA, 2009), pp. 147 and 172.


Freeman, op. cit. (note 18), pp. 44–49.

Charles Darwin to John Murray, 3 June [1871], John Murray Archives, National Library of Scotland, Edinburgh, MS 42152, 246v.

Charles Darwin to [John Murray], 8 January [1872], John Murray Archives, National Library of Scotland, Edinburgh, MS 42152, 271v.


Not all of the revisions were for the benefit of the public. An entirely new chapter was added to respond to St George Mivart’s Genesis of species.

Peckham, op. cit. (note 17), p. 23.

Freeman, op. cit. (note 30), p. 86.

Numbers has pointed out that in Origin Darwin pursued two goals simultaneously, overthrowing the dogma of separate creation and establishing natural selection as the primary, though not exclusive, mechanism of evolution. Of the two, the first may have been the more important to him. However, for the story of the popularization of evolution, the second seems to be more central. See Numbers, op. cit. (note 7), p. 27.


49 Charles Darwin to John Fiske, 8 December 1874, Dibner Collection, Huntington Library and Art Gallery, San Marino, California, 8262 (A&B). This quote is reproduced by permission of the Huntington Library, San Marino, California.
50 Fiske was probably the most successful, in terms of book sales, of the American Spencerians. Milton Berman estimates that a total of half-a-million copies of his books were sold over the course of his life. See Milton Berman, *John Fiske: the evolution of a popularizer* (Harvard University Press, Cambridge, MA, 1961), p. 260.
51 I am indebted to Jon Roberts for this point.
53 I am indebted to Jon Roberts for this point.
The print runs for each edition are difficult to ascertain. However, in 1889 Macmillan made two orders for portraits of Wallace, totalling 5000, most probably for the frontispiece of the book. This would suggest that the print runs of the first two editions totalled 5000 copies. See Archives of Macmillan and Company 1854–1924, Part 1 of British Publishers’ Archives on Microfilm (Chadwyck-Healey, Bishops Stortford, 1973), vol. C37, p. 280. Macmillan also published the book in the USA, as did Humboldt Publishing Co. in 1889.


Ibid., p. 475.

Ibid., p. 477.


‘One of the notable books of the age-end: some account of the success of Mr. Benjamin Kidd’s “Social Evolution” ’, Rev. Reviews 11, 472–473 (1895), at p. 472.


Ibid., pp. 17, 22, 101, 228, 245–246 and 288.


For discussions of Kingsley and Henslow see Lightman, op. cit. (note 15), pp. 71–81 and 87–94.

In his Post-Darwinian controversies, James Moore has divided pro-evolutionary Protestants into two groups, Christian Darwinists and Christian Darwinisticists. The first group was able, Moore argues, to reconcile evolution and Christianity without distorting Darwin’s theory, whereas the second group could not bring them together in a harmonious unity unless they smuggled a non-Darwinian element of teleology into evolution. Since I argue that the Spencerians and Lamarckians, the spiritualistic and religious evolutionists, and the Christian evolutionists incorporated metaphysical and religious elements into evolution, I have not divided the last group into two factions. See James R. Moore, The post-Darwinian controversies: a study of the Protestant struggle to come to terms with Darwin in Great Britain and America 1879–1900 (Cambridge University Press, 1979).


Moore, op. cit. (note 76), p. 386. Hodder & Stoughton sold the book for 3s. 6d. The book was also published in the USA by J. Pott & Co., where it went through 12 editions by 1902.

Drummond, op. cit. (note 72), pp. 12, 48, 225, 296 and 334–335.

Moore, op. cit. (note 76), p. 408.


Ibid., p. 338.
