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Artisan Resistance and Evolution in Britain, 1819–1848

*By Adrian Desmond**

Materialism being the foundation of atheism, the idea of a superior being or power, who directs and controls, manufactures and keeps in order, the infinite variety of forms and phenomena displayed in the universe is necessarily rejected, and the atheist has to seek for reasons for what he sees, in what he believes can alone be the cause, namely the properties of matter. Satisfied with explaining visible effects, he never dreams of solving final causes—hence . . . [our attempts to] show the reasonableness of the belief that animal organisms have derived their existence from matter's action, and not from the manipulation or conjuration of an immaterial spirit, or being, called god.

—WILLIAM CHILTON, *Oracle of Reason*

OVER THE PAST DECADE historians have paid increasing attention to the social and political infrastructure of early nineteenth-century science.¹ This attention has so far focused on specific middle- to upper-class groups—the gentry, wealthy practitioners, phrenologists, Benthamites. As a result, while artisan territory remains little explored, the social geography of bourgeois science is becoming well known. L. S. Jacyna has been particularly successful in this area, mapping a monistic self-developmental biology onto the reform sector while seeing vitalism as supporting a conservative political morality. A leading aspect of the new literature is its concern with the emerging capitalist hegemony. Current discussion of the mechanics' institutes, for example, centers on the social objectives of their Broughamite managers, or, more precisely, the utilitarians' attempt to curb the insurrectionary tendencies of a targeted elite among the working classes. Roger Cooter too has tackled the phrenologists' doctrines in terms of the work they were expected to do in camouflaging capitalism's alienating features. By providing an organic model for orderly, lawful growth, phrenologists, Cooter argues, were attempting to direct artisan sights away from images of

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I should like to thank Steven Shapin, James Secord, and Michael Neve for their valuable criticisms. The Bishopsgate Institute, London, kindly allowed me to examine Holyoake's logbooks, and the Co-operative Union, Manchester, furnished copies of the Holyoake correspondence.

¹ The impact and meaning of bourgeois science are discussed in Morris Berman, "'Hegemony' and the Amateur Tradition in British Science," *Journal of Social History*, 1974, 8:30–50; Berman, *Social Change and Scientific Organization: The Royal Institution, 1799–1844* (London: Heinemann, 1978); Jack Morrell and Ian Inkster, eds., *Metropolis and Province: Science in British Culture 1780–1850* (London: Hutchinson, 1983); Jack Morrell and Arnold Thackray, *Gentlemen of Science: Early Years of the British Association for the Advancement of Science* (Oxford: Clarendon Press, 1981); Barry Barnes and Steven Shapin, eds., *Natural Order: Historical Studies of Scientific Culture* (Beverly Hills/London: Sage, 1979); and Robert M. Young, "The Historiographic and Ideological Contexts of the Nineteenth Century Debate on Man's Place in Nature," in *Changing Perspectives in the History of Science*, ed. M. Teich and R. M. Young (London: Heinemann, 1973), pp. 344–438.

inequality and toward an acceptance of bourgeois values.² These works, then, treat this type of bourgeois science as a tool in the pacification and policing of the laboring poor during the civil unrest of the 1820s and 1830s.

But pinpointing the scientific trade that the Broughamites and Combeites were plying in working-class markets is different from revealing the sorts of intellectual commodities that the artisans themselves were prepared to buy—or make, for we might picture the artisan craftsmen not as passive recipients of bourgeois wisdom but as active makers of their intellectual world, manufacturing their own “really useful knowledge.”³ That is my approach here, although with working-class science so little known this is something of an exploratory essay. In it I will examine the sort and sources of the materialist science that artisans believed best served their republican interests. Some of this science admittedly was cannibalized; but the process was obviously selective, and this study suggests that the stolen fragments were often reconstituted in such a way as to legitimate the infidels’ secular program. More of it still was indigenous to radical thought—part of the operatives’ pirated *idéologue*, Paineite, and Godwinian heritage, and already serviceable in a libertarian antichurch context. The result is that while some republicans were enamored of phrenology, many hard-nosed atheists believed that a home-brewed d’Holbachian evolutionism better served their anti-bourgeois confrontationist needs.

In order to understand how science functioned in this kind of working-class context, I shall concentrate on the street literature of the deist and atheist Carlileans and Owenite socialists (and to a lesser extent Chartists).⁴ Edward Royle in *Victorian Infidels* has already prepared the social ground; my study, however, is considerably narrower. It is restricted to the role of environmental determinism and its special case, Lamarckian transmutation, in the atheists’ blueprints for social change—a change that was to be economically, religiously, and, many hoped, politically revolutionary. Socialist demands threatened the state-supported church, patriarchal society, capital-labor relations, and the aristocratic foundations of the “old immoral world.” By showing how transmutation functioned within these cooperative and libertarian contexts, we can provide a new political depth to current “religious” explanations for the denigration of Lamarckian doctrines by Oxbridge dons and their allies in the learned societies and London medical corporations.⁵ We can also hook up our study of working-class

² See L. S. Jacyna, “Immanence or Transcendence: Theories of Life and Organization in Britain, 1790–1835,” *Isis*, 1983, 74:311–329; and Roger Cooter, “The Power of the Body: The Early Nineteenth Century,” in Barnes and Shapin, *Natural Order*, pp. 73–92, on p. 85; on mechanics’ institutes see Steven Shapin and Barry Barnes, “Science, Nature and Control: Interpreting Mechanics’ Institutes,” *Social Studies of Science*, 1977, 7:31–74; cf. Colin A. Russell, *Science and Social Change 1700–1900* (London: Macmillan, 1983), pp. 160–173; David Vincent, *Bread, Knowledge, and Freedom: A Study of Nineteenth-Century Working Class Autobiography* (London: Europa, 1981), pp. 138–165. For a survey of the literature see most recently A. D. Garner and E. W. Jenkins, “The English Mechanics’ Institutes: The Case of Leeds 1824–42,” *History of Education*, 1984, 13:139–151.

³ Richard Johnson, “‘Really Useful Knowledge’: Radical Education and Working-Class Culture, 1790–1848,” in *Working-Class Culture: Studies in History and Theory*, ed. J. Clarke, C. Critcher, and R. Johnson (London: Hutchinson, 1979), pp. 75–102; E. P. Thompson, *The Making of the English Working Class* (3rd ed., London: Gollancz, 1980); and Gareth Stedman Jones, *Languages of Class: Studies in English Working Class History 1832–1982* (Cambridge: Cambridge Univ. Press, 1983), pp. 16, 76–89.

⁴ I have excluded the Christian radicals. The relationship of Arminian doctrines to scientific practice is discussed in Adrian Desmond, *Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (forthcoming).

⁵ On religious explanations see Michael Bartholomew, “Lyell and Evolution,” *British Journal for*

science to the accepted frameworks of social history, which provide a point of orientation and a rich historiographic source.

I should stress that this is not a revival of the "science versus religion" approach criticized by historians in the 1970s. In that approach, supposedly compartmentalized scientific and religious modes were imagined at war within the thought of the gentlemen savants themselves. In contrast, the present essay locates antireligious sentiments within specific working-class contexts and interprets them as part of the cultural response to establishment privileges, church rate, and clerical power. Since the artisans' class-based social and economic interests in turn explain the propagandist importance of biological philosophies like transmutation, we can pinpoint the social mediating links between anti-church politics and materialist doctrines.

This study, then, will set localized working-class uses of transmutation against a broader canvas of radical political thought. The social Lamarckian legitimation of infidel and socialist politics is little known, nor has there been much assessment of the prevalence or meaning of transformist doctrines in the radical underworld. Indeed, concentrating too closely on the Darwinian heritage has caused a kind of middle-class myopia, even a denial of rival traditions.⁶ As a result, the gains in understanding Darwin's creativity have been offset by a concomitant historiographical impoverishment. Recontextualizing Lamarckism as a progressive antiestablishment science enables us to open up a novel perspective on the historical problem of "evolution." Such a class framework might also benefit the Darwin industry itself, in the sense of enabling scholars to understand Darwinian and Lamarckian doctrines as rival *social* products. In a starker light, we might see Darwin's natural selection as a reification of bourgeois utilitarian Malthusian doctrines, knowing that the Carlileans, socialists, atheists, and Chartists—many demanding total social reconstruction and a new economic order based on a full reward for labor—were denouncing Malthusian programs as anti-working class.⁷ These fierce democrats, for their part, were integrating social environmentalist sciences, including Lamarckism, into their leveling strategies.

This essay is broken down into parts providing a cumulative picture of the

the History of Science, 1973, 6:261–303, p. 268. On the reaction within the College of Surgeons, see Adrian Desmond, "Richard Owen's Reaction to Transmutation in the 1830s," *Brit. J. Hist. Sci.*, 1985, 18:25–50.

⁶ Thus Bowler's statement that the "atheism of the French materialists never had become popular in Britain" holds good only for bourgeois circles. D'Holbach's materialism had immense influence on working-class activists: Peter J. Bowler, *Evolution: The History of an Idea* (Berkeley/Los Angeles: Univ. California Press, 1984), p. 94. The most extensive discussion of the *Oracle's* evolutionism is in Edward Royle, *Victorian Infidels: The Origins of the British Secularist Movement 1791–1866* (Manchester: Manchester Univ. Press, 1974), pp. 123–125; see also James R. Moore, "1859 and All That: Remaking the Story of Evolution-and-Religion," in *Charles Darwin 1809–1882: A Centennial Commemorative*, ed. R. G. Chapman and C. T. Duval (Wellington, New Zealand: Nova Pacifica, 1982), pp. 167–194.

⁷ Malthus's doctrines were considered "revolting" by almost all doctrinaire radicals: Maltus Questell Ryall, "The Belly and the Back," *The Movement, Anti-Persecution Gazette, and Register of Progress: A Weekly Journal of Republican Politics, Anti-Theology, and Utilitarian Morals*, 1843, 1:3 (hereafter *Movement*). Owenites saw the upper classes deity Malthusian dogmas (making population checks a providential arrangement) in order to justify a noninterference policy and the continuing degradation of the poor, which in turn would preserve the barriers between ranks. Opposed to inhumane Poor Law practices, Owenites promoted a rival program of birth control: Robert Dale Owen, *Moral Physiology; or, a Brief Treatise on the Population Question* (8th ed., London: J. Brooks, 1832), p. 19. On Hodgskin's anti-Malthusian analysis (that moral advances will slow population growth, enabling technological improvements to keep pace) see Elie Halévy, *Thomas Hodgskin* (London: Benn, 1956), pp. 59–65, 105.

mediating links between artisan republicanism and Lamarckian science. First, I determine the strength of the reductionist, anti-Christian, and *idéologue* philosophy by analyzing the socialists' and infidels' penny prints. This, with the antide-sign stance of the atheists, is interpreted in the light of the prevalent class and clerical antagonism. I will then show how the moral and physical relativism indoctrinated in working-class schools and the d'Holbachian materialism of their pirated books favored the development of an emergent Lamarckian transmutation, powered from below in line with democratic principles. Last, to appreciate how far the middle classes were aware of, and responded to, artisan transmutation, the channels of class contact at the new London University, Mechanics' Institute, and Co-operative Society are explored.

THE STRENGTH OF WORKING-CLASS POLITICAL MOVEMENTS

The three decades from the repressive Regency until the final Chartist massing on Kennington Common were critical ones, experiencing new means of production, capital accumulation, and rationalization of labor. Working men and women reacted to these industrial developments by unionizing and demanding democracy, disestablishment, and a renegotiated basis of economic relations between the producers and "idle" classes.⁸ Waves of economic depression were often accompanied by mass violence, peaking in 1819 with the Peterloo massacre and 1839 with the Newport Chartist uprising. Richard Carlile, doyen of the pauper press, put it bluntly in 1820: it was an age of "fixed bayonets and despotic laws." The French Revolution, so inspiring to the working-class insurgents, might have given birth to "political laws whose essence is at war with tyranny," as the American deist Elihu Palmer preached, but it had only heightened fears among the Anglican authorities in Britain.⁹ This led to increased repression, the outlawing of combinations, political use of blasphemy laws, a "tax on knowledge" (the fourpenny newspaper tax designed to cripple the pauper press), and so on. In response, radical activists imported French rationalist and revolutionary works into Britain. They propagated and refined *idéologue* and atheist doctrines of the natural and moral laws regulating human society, deploying them in their struggle against the religious and aristocratic bastions of *ancien régime* power.

Among the working-class republicans deism became a potent political ideology. Thomas Paine's *Age of Reason* was promoted as an anti-Bible. Its deistic sentiments were uncompromising: the churches were nothing more "than human inventions, set up to terrify and enslave mankind, and monopolize power and profit."¹⁰ For moderate radicals—dissenters as well as deists—Paine's clarion call served a disestablishment purpose: to break the "adulterous connection" between church and state as a prelude to removing the civil restrictions on Non-

⁸ These three decades of course saw changes in radical ideology, with a shift in targets from religion, taxation, and corruption to the underlying capitalist economics: Patricia Hollis, *The Pauper Press: A Study in Working-Class Radicalism of the 1830s* (Oxford: Oxford Univ. Press, 1970), pp. viii, 222, Chs. 6, 7.

⁹ Richard Carlile, "An Address to Men of Science," in *The Radical Tradition in Education in Britain*, ed. Brian Simon (London: Lawrence & Wishart, 1972), pp. 91–137, on p. 112; and Elihu Palmer, *Principles of Nature; or, a Development of the Moral Causes of Happiness and Misery among the Human Species* (London: Carlile, 1823), p. 53. Palmer was a blind deistic preacher in New York by the time he wrote *Principles* (1801).

¹⁰ Thomas Paine, *The Age of Reason* (London: Carlile, 1819), p. 4.

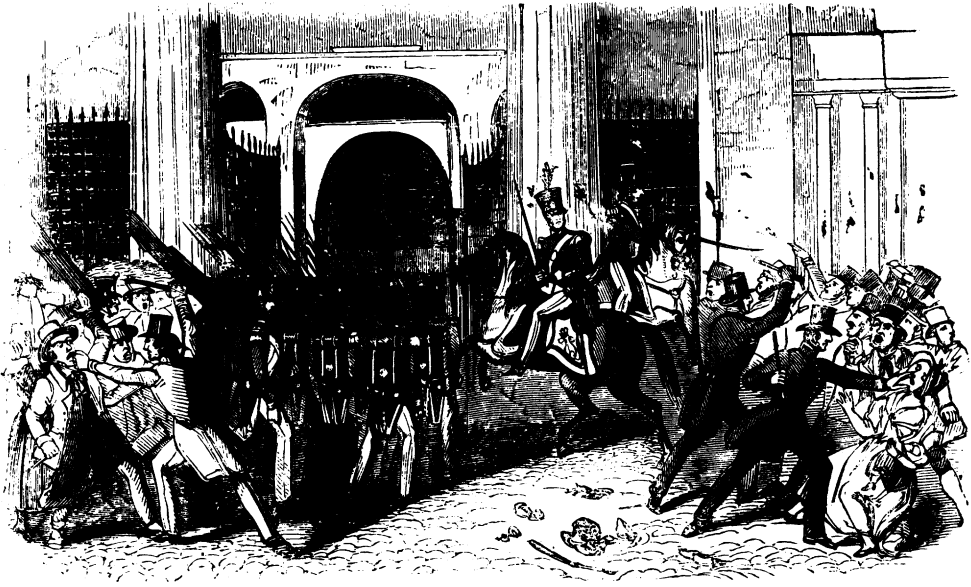


Figure 1. Working class feeling ran high against the authorities in 1842, when the *Oracle* was circulating. Here the Royal Horse Artillery, departing from Euston Station in London to put down the Manchester riots, are being taunted by a “mob.” The troops had been trailed from their barracks, the crowd yelling: “Remember, you are brothers.” From the *Illustrated London News*, 20 August 1842, p. 232, courtesy of the *Illustrated London News Picture Library*.

conformists. The street agitators gave it more insurrectionary overtones. The tinplater-turned-journalist Richard Carlile and working-class supporters of the socialist Robert Owen execrated “Priestcraft” as a state organ for social control, and deism was often superseded in both groups by atheism as the militants’ credo. William Chilton’s propagandist print, the *Oracle of Reason*, ran as its motto: “Faith’s Empire is the World; its Monarch, God; its Ministers, the Priests; its Slaves, the People.” This street literature—penny prints hawked by vendors dodging the authorities in working-class districts—was vital, angry, and often inflammatory. To an evangelical upper class for whom hearth and home were sacrosanct, Owenite atheism was anathema, cutting to the very heart of the family. Socialists in the 1830s caused a renewed wave of religious oppression by denouncing marriage itself as “a Satanic device of the Priesthood to place and keep mankind with their slavish superstitions, and to render them subservient.”¹¹

Proliferating union and pauper press vehicles gave such views wide currency. Owen’s short-lived Grand National Consolidated Trades Union had about one million affiliated members in 1834,¹² while out of a population of sixteen million

¹¹ Royle, *Victorian Infidels* (cit. n. 6), p. 62; Barbara Taylor, *Eve and the New Jerusalem: Socialism and Feminism in the Nineteenth Century* (London: Virago, 1982), Ch. 6. Marriage was “simply a law framed by priests and legislators to maintain their power”; Charles Southwell, *An Essay on Marriage; Addressed to the Lord Bishop of Exeter* (London: E. Roe, [1840]), p. 21. For Tory abominations of this “insane” attack on the Christian sacraments see J. W. Croker, “Conduct of Ministers,” *Quarterly Review*, 1839, 65:282–314, pp. 303–309.

¹² Edward Royle and James Walvin, *English Radicals and Reformers 1760–1848* (London: Harvester, 1982), p. 52.

in England in 1839 half a million were said to have been socialists. Anecdotal evidence confirms the overwhelming Owenite presence in certain industries. The clerical emissary John Brindley on a Manchester crusade tried to persuade engineering managers to sack all socialists and freethinkers—only to be told by the managers that this would entail firing most of their work forces.¹³ In the 1820s and 1830s London working-class districts in particular were strongholds of Carlilean republicanism and Owenite socialism. Paineite, Godwinian, and French pre-Revolutionary works provided these radicals with rationalist critiques of state religion. The *Age of Reason* was brought into mass circulation again by Carlile in 1819. It was for the “blasphemous libels” in this and in Elihu Palmer’s *Principles of Nature*, extracted by Carlile in his *Deist*, that he was jailed until 1825. Lord Liverpool’s administration was using sedition and blasphemy laws to gag artisan dissidents, partly because it could obtain convictions this way, but also because blasphemy itself had a political intent: deists advocated a secular republic in which the “unproductive” classes would be denied the fruits of working-class labor. Prosecuting Carlile in 1819, the Attorney General affirmed that Christianity was integral to the common law and constitution of the country, and that Carlile was inflaming the “illiterate” classes, loosening their faith and lessening their ability “to bear up against the pressure of misery and misfortune.”¹⁴ Government efforts to crush working-class resistance during the Regency fostered real insurrection. Carlile had urged readers of his *Republican* to arm themselves after the Peterloo massacre,¹⁵ and in 1820 the Cato Street conspirators (boot-maker agitators often to be seen in Carlile’s shop) had attempted to catalyze an uprising among the oppressed classes by plotting the assassination of the cabinet and planning a provisional government.¹⁶

THE IMPORTANCE OF SCIENCE IN THE WORKING-CLASS STRUGGLE

Faith in the socially regenerative properties of materialistic science and a utopian belief in its liberalizing force were strongly evident in the street literature of the Carlilean, Owenite, and Chartist demagogues. There are two larger, interlaced reasons for this: one to do with the egalitarian image of science bequeathed by the *idéologues*, the other more iconoclastic, being its imagined destructive value in sweeping aside institutions like the state church. Take the productive aspect first. Politicized publishers were strongly influenced by Jacobin philosophy. They unceasingly translated and pirated French rationalist books (the printing

¹³ Robert Cooper, *The Immortality of the Soul, Religiously and Philosophically Considered* (London: J. Watson, 1853), p. 76.

¹⁴ Joel H. Wiener, *Radicalism and Freethought in Nineteenth-Century Britain: The Life of Richard Carlile* (Westport, Conn.: Greenwood Press, 1983), p. 46.

¹⁵ Arming again became an issue in 1839. Some prints carried advice on the making of staves, and Holyoake saw many during Birmingham’s Bull Ring Riots: George Jacob Holyoake, *The Life and Character of Henry Hetherington* (2d ed., London: J. Watson, 1849); Holyoake, *Sixty Years of an Agitator’s Life*, 2 vols. (London: T. F. Unwin, 1892), Vol. I, p. 83. While revolutionary Chartists like the dagger-brandishing Julian Harney at the London Democratic Association were rare, arming was worrying enough for questions to be asked in the House: *Hansard Parliamentary Debates*, 3d. ser., Vol. XLVIII (1839), p. 33.

¹⁶ They were beheaded. Thomas Wakley’s house was firebombed by angry supporters wrongly imagining that he was the surgeon who had performed the decapitation. Charles Brook, *Battling Surgeon* (Glasgow: Strickland Press, 1945), pp. 25–30. S. Squire Sprigge, *The Life and Times of Thomas Wakley* (London: Longmans, Green, 1899), Chs. 4–6.

press was indeed proving to be the "true Messiah")¹⁷ which they distributed through pauper press outlets—often at extraordinary personal risk—to reach large plebeian audiences. For instance, two deistic works attaining wide "underground" circulations in Britain were *The Ruins: Or a Survey of the Revolutions of Empires* and *The Law of Nature*, both written during the 1789 Revolution by a deputy to the National Assembly, Constantin François de Volney. These works promoted images of natural law as beneficent, egalitarian, and universal. For Volney, natural law ordained justice by "means of three physical attributes which are inherent in the organization of man," namely, "equality, liberty, property" (and the latter included a commodity important to the lower classes, "the products of [man's] labour").¹⁸ Not only did these *idéologue* works legitimate the political struggle, but their derivation of social virtues from the laws of nature placed science in a privileged position and explains its integration into the radicals' program.

The second, anti-Christian use of science was if anything more pervasive. For half a century infidel polemicists echoed Paine's claim that Christianity had "acted as a barrier to science, that in order to maintain a particular mythology it had persecuted knowledge, and that if man is to be free to realise himself, to understand his position in the universe and to act accordingly, he must break with [it]."¹⁹ The purpose of "Radical Reform in human affairs, the greatest of all human undertakings," Carlile told Francis Place, "is to bring the Spiritual World and all Religion within the boundaries of science."²⁰ Science became a kind of tricolor call to arms. In extreme materialist forms—chemistry, d'Holbachian atomism, Lamarckism—it directly serviced the radicals' anticlericism and in some cases (Lamarckian environmentalism) underwrote the socialists' arguments for female emancipation. Also, while science's egalitarian image and anti-Christian aspect sanctioned political changes, a utilitarian scientific education was necessary to prepare the proletariat for the day of this devolution of power. During the Reform Bill crisis of 1832 Rowland Detrosier told the National Political Union that "political freedom and general ignorance are incompatible." If the "great moral revolution" taking place in society were to be followed by democratic emancipation, then the working classes must prepare for power by versing themselves in political and scientific knowledge. The former might be diffused by abolishing the government tax on newspapers. But there would still be a need for scientific education because political developments were tied to technological innovation: "It may be truly said that politics . . . is but the application of all

¹⁷ Carlile, "Address to Men of Science," p. 109; and Palmer, *Principles of Nature*, p. 83 (both cit. n. 9).

¹⁸ Constantin François de Volney, *The Ruins: Or a Survey of the Revolutions of Empires. To which is added, The Law of Nature* (London: E. Edwards, 1822), *Law*, pp. 4–6, 37–38. *Ruins* was first published in 1791; *Law* in 1793. Palmer, *Principles of Nature*, pp. 51, 55, dismissed "every idea of suspension or violation" of the immutable cosmic laws, equating this with the capriciousness and unnaturalness of monarchic rule. This *idéologue* tradition explains why "science and virtue" were so often rhetorically linked: Volney, *Law*, pp. 39–47; and Palmer, *Principles of Nature* (cit. n. 9), p. 6.

¹⁹ Simon, *Radical Tradition in Education* (cit. n. 9), p. 12.

²⁰ Richard Carlile to Francis Place, 5 Aug. 1841, British Library Add. MS, 35144, fol. 340. One has to beware Carlile's understanding of the word *science*, which occurs frequently in his letters and always with political connotations. To him it meant instruction (to correct the "errors of the theists") or right reasoning (atheist "is not a word of principle, nor of science"): Carlile to G. J. Holyoake, 16 Oct. 1842, Holyoake Correspondence No. 79, Co-operative Union, Manchester (hereafter **Holyoake Corresp.**).

knowledge to the securing of national prosperity and happiness. . . . The discoverer in science is a potential benefactor of his species, and every important discovery applicable to the common wants of life, produces a corresponding change in the social and political relations of mankind."²¹ If workmen were to achieve power through the vote, they must first have the appropriate economic, political, and scientific resources. (Detrosier clearly meant the utilitarian sciences: his examples were constantly drawn from chemistry in the form of dyeing, bleaching, and calico printing, or from geology in the form of mining knowledge, engineering, and so forth.) Only then could the majority rulers ensure increased productivity and better economic relations, enabling a wider distribution of wealth and an end to laboring misery. Hence technological and philosophical knowledge was tactically and practically important in working-class political programs.

The difficulty, as demagogues recognized, lay in actually acquiring knowledge free of middle-class hegemonic values. Revealingly, the Owenites called their lecture rooms "Halls of Science" ("not that we had much science," former Birmingham foundryman George Jacob Holyoake remembered, "merely a preference for it").²² These forums, run by and for artisans, provided socialist alternatives to the mechanics' institutes, which barred political discussion and female participation. Unlike the institutes, the halls were largely autonomous expressions of working-class culture, while the Owenite street literature (which gives a good indication of the science peddled in the halls) replaced the despised bourgeois tracts on "useful knowledge." As propaganda this socialist science had quite a different political value from its bourgeois equivalent. Hence in Owenite projections of society after the establishment of democracy, female emancipation, and civil liberties, science was to retain its cardinal place. In the "new moral world," the libertarian activist Charles Southwell wrote in 1840, men "will cease to make war upon each other, but entirely devote themselves to making conquests upon nature, a task worthy of their mightiest energies." Being "occupied in exploring the yet untrodden paths of scientific enquiry, individuality will

²¹ Rowland Detrosier, *Lecture on the Utility of Political Unions, for the Diffusion of Moral & Political Information amongst the People; On the Necessity for that Information, and on the Political Influence of Scientific Knowledge* (London: J. Brooks, 1832), pp. 5, 8; see also Gwyn A. Williams, *Rowland Detrosier: A Working-Class Infidel 1800–34* (York: St. Anthony's Press, 1965), p. 20.

²² Holyoake, *An Agitator's Life* (cit. n. 15), Vol. I, p. 142. "Science" referred both to Owenite social science and to the natural sciences. Indeed these were inextricable, for cooperators extended to "social relationships . . . the assumptions of physical science," confident in the "discoverability of laws of human action": J. F. C. Harrison, *Robert Owen and the Owenites in Britain and America: The Quest for the New Moral World* (London: Routledge & Kegan Paul, 1969), p. 78. The young Holyoake heard lectures on phrenology, physiology, chemistry, and inductive generalization at Birmingham Mechanics' Institute and at Allison Street in 1836–1839. He taught himself Euclid in 1836 and was teaching it to others at the Unitarian Sunday School the following year. He won the institute's math prize in 1836 and 1838, was elected a committee member, and in 1838 was appointed to conduct the institute's classes; George Jacob Holyoake, "Brief Notes of Lectures" (1838–1839), MS, passim and "Log Book" No. 1, MS, Bishopsgate Institute, London. See also C. W. F. Goss, *A Descriptive Bibliography of the Writings of George Jacob Holyoake with a Brief Sketch of His Life* (London: Crowther & Goodman, 1908), pp. xvi–xxv; and Joseph McCabe, *Life and Letters of George Jacob Holyoake*, 2 vols. (London: Watts, 1908), Vol. I, p. 48. Holyoake quickly became radicalized in these years. He attended lectures on "social religion," "cooperation and responsibility," "advantages of community of property," and so forth in Allison Street ("Brief Notes," passim). He first heard Robert Owen there on 15 June 1836 and was speaking on socialism himself in January 1837 ("Log Book" entries). By 1840 he was assistant secretary to Owen's Central Board and prepared at its request a small work on Euclid for use in schools and the Halls of Science (published only in 1847 as *Mathematics No Mystery*).

cease, nor will our thoughts be bounded within the limits or narrow circles of fanaticism [i.e., Christianity]."²³

THE ORACLE OF REASON AND ANTIDESIGN ARGUMENTS

The spread of atheism accelerated sharply after 1840 as disillusioned socialists adopted a more militant stance. A major reason for the secessions from the Owenite camp and growth of an independent atheist literature at this time was Owen's attempt to register the socialists as Protestant "Rational Religionists" (in an effort to block Anglican legal moves aimed at restricting the socialists' Sunday activities). Many refused to play "the *whore* with the priests,"²⁴ and rather than take a Protestant oath switched to independent activity. There followed a welter of new weeklies articulating more confrontationist aims. These included the pioneering *Oracle of Reason* (1841–1843), Henry Hetherington's *Free-Thinker's Information for the People* (1842–1843), Southwell's *Investigator!* (1843), and Holyoake's *Movement* (1843–1844). Here I will concentrate mainly on the *Oracle*, because it set the precedent for the biological argument and is important for understanding the atheists' use of pirated science.

The *Oracle* was founded in Bristol in 1841 by William Chilton and the rough-hewn Charles Southwell.²⁵ It ran for two years and at the outset declared itself at "WAR NOT WITH THE CHURCH, BUT THE ALTAR; NOT WITH FORMS OF WORSHIP, BUT WORSHIP ITSELF; NOT WITH THE ATTRIBUTES, BUT THE EXISTENCE, OF DEITY."²⁶ It was an uncompromising organ and an "exclusively ATHEISTICAL print." As a rabble-rouser, it was deliberately crude in denouncing that "revoltingly odious Jew production, called BIBLE." Southwell admitted later in his *Confessions of a Free-Thinker* that he had intended the "Jew Book" diatribe to outrage "and, with that view, used terms the most offensive I was able to use."²⁷ The *Oracle*'s editors, like many working-class publishers before them, sought respectability in martyrdom. They were systematically jailed for blasphemy. Southwell was sentenced to twelve months' imprisonment after only the fourth number, whereupon Holyoake in Sheffield took over, "shaking the bones of orthodoxy."²⁸ The London printer Thomas Paterson stepped in on Holyoake's arrest, and on his own incarceration was succeeded by Chilton.

A Bristolian, Chilton was a compositor and then reader on the city's liberal daily, the *Bristol Mercury*. He was described as "a printer, *with brains*"²⁹ and

²³ Southwell, *Essay on Marriage* (cit. n. 11), p. 7.

²⁴ William Chilton to G. J. Holyoake, 26 Dec. 1841, Holyoake Corresp. No. 22. On the "amazing spread of atheism" after 1841 see Charles Southwell, "Sentimental Theists, and Natural Theology," *Movement*, 1843, 1:34.

²⁵ A third partner, John Field, was made of less stern stuff: Charles Southwell, *The Confessions of a Free-Thinker* (London: n.d.), p. 65. Another collaborator was the London engraver Maltus Questell Ryall, who also masterminded Southwell's defense committee in 1841–1842: M. Q. Ryall to Holyoake, 4 Jan. 1842, Holyoake Corresp. No. 24. On the *Oracle* see Royle, *Victorian Infidels* (cit. n. 6), Chs. 2, 3; and McCabe, *Holyoake*, Vol. I, pp. 55–58.

²⁶ Maltus Questell Ryall, "General Views and Policy of the 'Oracle,'" *The Oracle of Reason: Or, Philosophy Vindicated*, 12 Feb. 1842 (hereafter *Oracle*).

²⁷ Southwell, *Confessions*, p. 66.

²⁸ *Ibid.*, p. 76; and George Jacob Holyoake, *The Spirit of Bonner in the Disciples of Jesus* (2nd ed., London, 1842).

²⁹ Southwell, *Confessions*, p. 65. On Chartism see Chilton to Holyoake, 26 Dec. 1841, Holyoake Corresp. No. 22. Holyoake described Chilton as "a cogent, solid writer, ready for any risk, and the only absolute atheist I have known": Holyoake, *An Agitator's Life* (cit. n. 15), Vol. I, p. 142. This

remembered as the extreme atheist of the group. Unlike the older Carlile and many socialist lecturers he sought conciliation with the Chartists. Southwell is better known, having left his frank *Confessions*. From his writings it is apparent that Southwell was more a libertarian freethinker than dedicated Owenite, and that he wielded doctrines like transformism to sanction his antichurch stance rather than to support socialism per se. His *Confessions* provide a candid insight into working-class mores in the 1820s–1840s. He was the youngest of thirty-three children; his father (twice married before) had been a seventy-year-old piano maker at the time he married Southwell's mother, a twenty-year-old servant girl. Southwell himself married twice, lived also with one wife's aunt, and barely managed to escape a bigamous entrapment. He was variously an apprentice piano maker, bookseller, actor, agitator, and British Legion soldier in Spain. He left the service in 1837, became a freethought speaker in London, and in 1840 was appointed a Social Missionary by the Owenite Central Board. He served only a year. As a libertarian he came to distrust Owen's placemen on the Central Board, their truckling to capitalists and Christians. He also tired of the typical "self-complacent" socialist meeting, which mimicked "a bearded Methodist Conference."³⁰ He resigned his "Missionaryship" on being sent to Bristol in 1841 and helped Chilton found the *Oracle* to promote a more aggressively confrontationist atheism. The *Oracle*'s editors, far from compliant socialists, were essentially disillusioned libertarian agitators. Their penny paper sometimes sold 6,000 copies, but it was not a financial success. Continual police harassment was no more than a nuisance. Financial losses and distribution difficulties eventually forced a price rise to twopence and readers deserted it. It closed in debt in 1843, and its mantle was assumed by the *Movement* and eventually by Holyoake's more "agnostic" *Reasoner* (founded 1846).³¹

The *Oracle* took a hard line, deriding even bourgeois reformers and dismissing deism as just another "rank superstition."³² It vilified that poisonous "monster" Priestcraft, while systematically breaching Christianity's defenses of revelation, miracles, and design. In the same way, biblical myths, the deluge and Mosaic days, were pilloried by the *Free-Thinker's Information*, which sprang up to promote criticism of the Bible, arm infidel missionaries with alternative Hindu

statement needs explaining. In the 1840s all the *Oracle* members styled themselves "atheists" as a provocation: Charles Southwell, *The Impossibility of Atheism Demonstrated* (London: J. Watson, n.d.), p. 5. But in the 1850s Southwell and Holyoake preferred the title freethinkers, secularists, theological utilitarians, or universalists (referring to their belief in "Nature self-existent" rather than "caused"): Southwell, *Superstition Unveiled* (London: Truelove, 1854), p. 22. Their migration to a securer skepticism was already evident in the first numbers of the *Reasoner*; indeed, Holyoake advised Charles Babbage to read the paper if he wanted to understand the rationalists' skeptical rather than atheistic beliefs: Holyoake to Babbage, 14 Apr. 1847, BL Add. MS 37193, fol. 484. Looking back, Holyoake evidently considered Chilton the true atheist. For a notice of Chilton's death on 28 May 1855 see *Reasoner*, 1855, 19:87, 94, 155.

³⁰ Southwell, *Confessions*, p. 60. Southwell's irritability with the Owenites is apparent in his *Difficulties of Christianity* (Liverpool: J. Shepherd, [1849]).

³¹ Southwell, *Confessions*, p. 76. The *Oracle*'s 6,000 circulation at its height (if accurate) matched the sales of the more important political papers of the early 1830s, e.g., Bronterre O'Brien's *Destructive* (less than 8,000) and Carlile's *Gauntlet* (less than 5,000). Readership might have reached twenty times these figures: Hollis, *Pauper Press* (cit. n. 8), pp. 118–119. Nonpolitical "useful knowledge" periodicals could achieve massive sales. The Society for the Diffusion of Useful Knowledge's *Penny Magazine* sold 160,000: Joel H. Wiener, *The War of the Unstamped: The Movement to Repeal the British Newspaper Tax, 1830–1836* (Ithaca: Cornell Univ. Press, 1969), p. 171.

³² Preface to Vol. 1, *Oracle*, 1842, 1:iv–v.

THE ORACLE OF REASON: Or, Philosophy Vindicated.

"FAITH'S EMPIRE IS THE WORLD: ITS MONARCH, GOD; ITS MINISTERS, THE PRIESTS;
ITS SLAVES, THE PEOPLE."

First Editor—Charles Southwell, imprisoned for twelve months and fined £100, for Blasphemy in No. 4.
Second Editor—George Jacob Holyoake, imprisoned for six months, for Blasphemy, at Cheltenham.
Third Editor—Thomas Paterson, imprisoned for one month, for Blasphemous Placards, in London.
Readers—George Adams, imprisoned for one month for selling No. 25, in Cheltenham; and
Harriet Adams, his wife, arrested for selling No. 4, in the same town.

No. 91.]

EDITED BY WILLIAM CHILTON.

[PRICE 1D.]

SECOND ARREST OF PATERSON, AND ROBBERY OF HIS SHOP BY THE PRESBYTERIAN THIEVES OF EDINBURGH.

Wake! what, ho! Infidels! thieves! thieves!
look to you homes, your liberties, and your rights!
Thieves! thieves!—*Cicero* (travestied.)

He (god) is a merchant, the balances of *deceit* are
a his hand; he *loveth* to OPPRESS.—*Hosea* xii. 7.

WITH such a monster-god, as an object of
adoration and imitation, we should never be
surprised that christians are the villains we
see them. A moral christian would be a
greater curiosity than a gentle shark—there
could not be, in fact, a particle of morality
in a so-called christian, without his being so
much the less a christian than he who had
none. Neither is this to be wondered at, for

THE GOD OF THE CHRISTIANS IS

A LIAR,

And a lover of lying,

For he sent the people "strong delusions,
that they should believe a lie"—he put "a
lying spirit" into the mouth of the prophets—
"I, the lord god, have deceived that
prophet"—he bade Samuel tell a lie to de-
ceive Saul—and he instigated Jael to de-
ceive Sisera.

THE GOD OF THE CHRISTIANS IS

AN ADULTERER,

And a lover of adultery, incest, and
whoredom,

For Mary, the wife of Joseph, and mother
of Jesus, was with child by god, the *bastard*
Christ being the result—David, a man after
his own heart, was a murderer and adul-
terer, and he found favour in his eyes—god
directed Hosea to take him "a wife of
whoredoms"—Moses, acting under his insti-
tution, directed all the women children that
had not known man by lying with him to be
kept alive for the soldiers—Abraham, his
chosen servant, married his sister—Lot was
eventually saved from destruction by him, and

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his wife enchanted, that he may commit incest
with his own daughters.

THE GOD OF THE CHRISTIANS IS

A MURDERER,

And a lover of bloodshed,

For he murdered the first-born of Egypt—
he slew Onan for not rising up seed to his
brother—he sought to kill Moses, or his first-
born—he burnt many of the people in the
wilderness—he swallowed up 250 for offer-
ing strange fire, and afterwards burnt them
—he sent lions amongst the people, and slew
them—he inspired Jael to deceive Sisera,
and afterwards horribly murder him, for
which bloody act she was declared to be
"blessed above women."

THE GOD OF THE CHRISTIANS IS

A THIEF!

And a lover of thievery,

For he gave Israel favour in the eyes of the
Egyptians, that the Israelites may despoil
them of their jewels of silver and jewels of
gold—he sanctioned and directed the num-
berless robberies perpetrated upon surround-
ing nations by his people—and, during his
human incarnation, stole a donkey.

THE GOD OF THE CHRISTIANS IS

A DEBAUCHEE!

And a lover of drunkenness,

For he made the princes, wise men, captains,
and rulers drunk—he commanded Jeremiah
to order the people to drink and be drunken
—he got drunk himself, and made others
drunk as well, at the feast of Cana—and
Noah and Lot, whom he had spared when
he had murdered thousands of others, both
got drunk and acted indecently, as soon as
their danger was over.

THE GOD OF THE CHRISTIANS IS

A CRUEL TYRANT!

And a lover of tyranny and cruelty,

For he most barbarously tortured the Egyp-
tians, for what he had compelled them to
do—he plagued the people of Israel with
fiery serpents, starved them, and subjected
them to the horrors of thirst—and the man
after his own heart, put men "under saws,
and under harrows of iron, and under axes

Vol. II.

Figure 2. The Oracle of Reason, an illegal penny print promoting atheism, transmutation, and fierce democracy. This front spread appeared after its third editor, Thomas Paterson, had been arrested. Courtesy of the British Library.

mythologies, and provide astronomical and geological facts to controvert Old Testament "truths."³³ Hard-bitten editors, struggling in a period of famine and depression, offered a religion of outright reductionism to the disillusioned masses: "Man, as a part of a whole, or as an atom of matter, is immortal," Carlile had written from prison, but after his body has "evaporated like a dunghill, or a bed of rotten vegetables, that atom can retain no sense of a former existence." Man was but a collection of organized atoms, whose existence, "whose pleasure or whose pain," was a matter of indifference to nature. Chilton offered the same nihilistic thoughts: "Life is nothing and nothing life," a politicized slogan tailor-made for the sea of laboring poor angrily eyeing the islands of gentrified opulence. And again: "Life, or vital function, is nothing more than a certain series

³³ "Mosaic Account of the Creation and Fall," *The Free-Thinker's Information for the People*, [1842], Vol. I, No. 1.

of phenomena matter exhibits.”³⁴ This image gave cynical satisfaction to the insurgent ideologues.

The alleged “proofs of design” supporting the priests’ temporal power were repudiated weekly with ritualistic devotion. Southwell wrote “Is There a God?” in prison to expose the chimera of “absolute creation.” In this mixture of Spinoza and Strauss—materialism and antibiblicism—he denied “that there is ‘evident design impressed upon the universe.’” That eyes were made to see was as ludicrous “as to say that stones were *made* to break heads, legs were *made* to wear stockings, or sheep *made* to have their throats cut.”³⁵ Holyoake combated the “seductive” theology of Paley and the Bridgewater authors in *Paley Refuted in His Own Words* by reasoning that a “personal” designer must ipso facto have been organized, which militated against his omniscience and self-existence. Either there existed a higher-order creator (but this threatened an infinite regress) or Paleyites must break their own axioms and postulate a noncreated existence; but in that case Matter—by definition indestructible—made a better candidate as the self-existent creative ground.³⁶

The existence of suffering was already troubling middle-class liberals beginning their ethical revolt against Christian orthodoxy, but it was made capital evidence by the radical ideologues. “To the Atheist, a moth in the candle’s flame, or a poor fly in the fangs of a spider, is a *proof* that the world could not have been designed by one being, infinitely wise, infinitely good, and infinitely powerful.”³⁷ Pauper journalists, unlike the country parsons with their secure livings who envisaged a “happy” Paleyite nature, asserted that “all nature cries aloud” against the idea of a benevolent deity. “This worse than ridiculous—this vilely pernicious teaching, the atheist rejects with contempt and disgust.”³⁸ It was a fabrication of “goddists,” men living well on tithes extracted from the backbroken poor. Breaking the propagandist image of Paley’s happy world was an integral step to altering the collective perception of the masses. Southwell gave “the loud lie to the most impudent of *assumptions*, that ‘all is for the best,’ in a world which . . . savage men have deluged with crime.” He portrayed nature as forbidding and satanic: why, he asked, had not the gentry’s God “thought proper to design less suffering and more enjoyment, less hypocrisy and more sincerity, fewer rapes, frauds, pious and impious butcheries?”³⁹

³⁴ Carlile, “Address to Men of Science” (cit. n. 9), pp. 98, 132; and Chilton, “Regular Gradation,” *Oracle*, 27 Nov. 1841.

³⁵ Charles Southwell, “Is There a God?” *Oracle*, 19 Mar. 1842. On antidesign see *Oracle*, 12 May and 30 Mar. 1842; “The Creed of Infidelity,” *The Free-Thinker’s Information for the People*, [1843], Vol. II, No. 1; “Chapter on the Creation and Design Questions,” *Investigator!* 1843, pp. 11–14; and Southwell, “Sentimental Theists, and Natural Theology,” *Movement*, 1843, 1:34, 43, 52, 74, 81.

³⁶ George Jacob Holyoake, *Paley Refuted in His Own Words* (2d ed., London: Hetherington, [1847]), pp. v, 16–30. Holyoake wrote this in Cheltenham jail in 1842. It had passed through six editions by 1866. Goss, *Bibliography of Holyoake* (cit. n. 22), p. 3, lists the counterrefutations. On the same subject see “The Principles of Naturalism,” *Movement*, 1843, 1:2.

³⁷ Southwell, “Is There a God?,” *Oracle*, 19 Mar. 1842. By contrast, the Oxford divine William Buckland saw predation ensuring a Paleyite “happy” nature, by preserving the “enjoyment [of] the greatest number,” since carnivores relieved the feeble from suffering while preventing a Malthusian population explosion. Predation was thus consistent with the dispensations of a creative benevolence: William Buckland, *Geology and Mineralogy Considered with Reference to Natural Theology*, 2 vols. (2nd ed., London: Pickering, 1837), Vol. I, pp. 129–134. On middle-class liberal attitudes, see H. R. Murphy, “The Ethical Revolt against Christian Orthodoxy in Early Victorian England,” *American Historical Review*, 1955, 60:800–817.

³⁸ Chilton, “Regular Gradation,” *Oracle*, 11 Nov. 1843.

³⁹ Southwell, “Is There a God?” *Oracle*, 7 May 1842.

SCIENCE AND CLASS ANTAGONISM

These socialists culled their science from freethinkers' miscellanies, plebeian journals (Chambers's was a favorite), phrenological literature, and popular astronomies and geologies.⁴⁰ They also cannibalized "respectable" scientific works, where accessible, scouring the manuals of Charles Lyell, John Herschel, Henry De la Beche, and others for usable material. They held a pragmatic—often an unashamedly instrumental—attitude toward second-hand science. Science for them was what worked politically. Hampered by restricted access to the great body of specialist knowledge (often appallingly ignorant of it—misspelling of names of gentlemen-cultivators like Lyell was common), they incestuously recycled fragments, continuously reworking them in their penny propaganda sheets. The result was a subculture at first making little contact with the gentlemanly science usually studied by historians. Not being encumbered by "professional" concerns—the sort structuring so much middle-class discourse—working-class resisters illustrated more than any other social group the operation of a crudely effective functional ideology of science.

From Carlile through Chilton and the *Oracle* atheists, there was a strong belief that gentlemen naturalists had prostituted their gifts, that the upper classes had hijacked science and incorporated it into the apparatus of class enslavement. The anticapitalist economist William Thompson argued in his *Inquiry into the Principles of the Distribution of Wealth* (1824) that knowledge must no longer be "arrayed" against labor but must reunite with it to promote productivity and a redistribution of wealth. Thompson disputed Mill's proposition that capital should rightly accrue to the middle classes, who, being exempt from manual labor, were favorably placed to achieve "the highest intellectual and moral attainments." Thompson retorted that the removal of political and economic restraints, allowing the operation of the "natural laws of distribution," would (and must) benefit "the community at large." His claim that the workman was due the produce of his labor carried another implication: that with the alleviation of plebeian misery, artisans too would invade the intellectual domain, further increasing political control of their destinies, while widening class participation in science.⁴¹ Carlile's more basic growl, that gentlemen of science "too much crouched to the established tyrannies of Kingcraft and Priestcraft," was repeated time and again.⁴² In Chilton's analysis:

Geology, although . . . bearing on the moral and religious belief of mankind [by demonstrating that fossil life had undergone a *natural* progression], will certainly never

⁴⁰ Owenites allowed a greater role for environmental conditioning than phrenologists. The tensions are exposed in "Phrenological Analysis of Mr Owen's New Views of Society," *Phrenological Journal*, 1824, 1:218–237, and "Phrenology and Mr Owen," *ibid.*, pp. 463–466. But many later socialists were eclectic and borrowed from both camps. Even Owen's son Robert Dale Owen increasingly interested himself in phrenology: Robert Dale Owen, *Neurology: An Account of Some Experiments in Cerebral Physiology* (London: J. Watson, 1842). On the phrenological side, Abram Combe (George's brother) was an Owenite.

⁴¹ William Thompson, *An Inquiry into the Principles of the Distribution of Wealth* (London: Longman, 1824), pp. x–xvi, 274–276. Thomas Hodgskin—proto-Marxian economist, *Morning Chronicle* journalist, and founder of the *Mechanics' Magazine*—believed that laboring claims on technological and economic knowledge would intensify class rivalries as capitalists fought to preserve their rights to intellectual resources: [Thomas Hodgskin], *Labour Defended Against the Claims of Capital* (London: Knight & Lacey, 1825), p. 30; see also Halévy, *Hodgskin* (cit. n. 7), p. 105.

⁴² Carlile, "Address to Men of Science" (cit. n. 9), p. 101.

prosper in this country, as long as, first the science itself, and even scientific specimens, will be a matter of traffic and trade amongst the *savants*, and the higher classes in general—and, second, as long as geologists will so much depend on right reverends, right honourables, &c., in fine, on those who are interested in keeping up the usual common-place *go* in society [i.e., the status quo].⁴³

The confrontationist policy of the atheists led them to place science (“systematized facts”) in opposition to religion (“systematized folly”) for strategic reasons. The polemical value of this stark polarization was clearly appreciated: religion was portrayed allied to tyranny, science to political deliverance. The practicality of science—however questionable its extent in this period—made good demagogic material. As Maltus Questell Ryall wrote in the *Movement*: “Religion consistently followed up would teach us a ‘pater noster’ in a hurricane; science would point to the compass and the helm. Religion would pray for deliverance from plague, pestilence and famine; science would adopt the means, physiologically, economically, and politically to avoid them.”⁴⁴

But projecting science and religion as “natural enemies” made it imperative to explain why in practice they had entered into a “hollow conspiracy” during the “fashionable reign of the Bridgewater treatises.” The “conspiracy” image betrays the laborers’ understanding of why events had departed so far from the prediction of a secular revolution. The question was resolved by asking another: why do so many practitioners of science “ignominiously betray their trust” as “expounders of truth”?⁴⁵ Since the self-constituted guardians of knowledge were preeminently the wealthy middle classes, agitators conceived a class-based reason for the absence of revolution.⁴⁶ The gentlemen scientists were piously prostituting real science in order to share in the rewards from working-class exploitation. Holyoake and Henry Hetherington (editor of the influential *Poor Man’s Guardian*) argued that the clergy (and by extension Anglican savants) had a direct financial interest in the intellectual status quo: the £9 million collected in tithes and taxes would be threatened by secularizing society, disestablishing the church, and democratizing government.⁴⁷ In “The Cowardice and Dishonesty of Scientific Men,” Chilton accused the scientific barons of sacrificing knowledge on the altar of religion to retain their socially privileged position—making science “the disgusting car of vice, which they help to drag through the mire of human ignorance.” They were being treacherous to true science. Eminent naturalists, in

⁴³ William Chilton, “Geological Revelations,” *Oracle*, 29 Aug. 1843.

⁴⁴ Maltus Questell Ryall, “Science and Religion,” *Movement*, 1844, 1:196–197.

⁴⁵ *Ibid.*

⁴⁶ The same “conspiracy” was seen in the enforcement of the blasphemy laws. The *Reasoner* complained that, while Holyoake, Hetherington, and Thomas Paterson were jailed, “no one dreams of prosecuting a patronised Professor [in this case Lyell, whose hundred-thousand-year history of Mississippi deltaic deposition equally contradicted Moses].” It concluded that “blasphemy only belongs to the lower orders”: “The British Association and the Bible,” *Reasoner*, 1846, 1:244–245.

⁴⁷ In Thompson’s social blueprint religions were to be voluntary, civil disabilities lifted, and state subsidies ended. Priests would have to prove they had something “to give to the members of a rational community worth exchanging for the products of labor”: Thompson, *Distribution of Wealth* (cit. n. 41), p. 238. Another reason for local clerical opposition when Holyoake spoke at the Cheltenham Mechanics’ Institute in 1842 (for which he was jailed) was his demand that the clergy should go on half pay during the depression: George Jacob Holyoake, *The History of the Last Trial by Jury for Atheism in England: A Fragment of Autobiography* (London: J. Watson, 1850), pp. 5, 44–45. Hetherington was arrested for refusing to pay the church rate. See his *Cheap Salvation* (2nd ed., London: Hetherington, [1843]). Dissenters and bourgeois radicals were equally opposed to the tithe: Elie Halévy, *The Triumph of Reform 1830–1841* (London: Benn, 1950), p. 130.

league with the political masters whose "interests [are] to keep us in this position," lacked the "honesty" to admit the materialist meaning and subversive implications of real science. "This is the unkindest cut of all; coming as it does, from those who should pour the balm of hope upon the despairing and wounded spirit; instead of which, 'They smile, and murder us while they smile!'"⁴⁸ By claiming that "discoveries" were being "treated like contraband goods, lest the trade and the tithes of the priest be injured," the atheists were attempting to bring wider free-market forces to the aid of "true" science, making it an instrument in the overthrow of "Old Corruption."⁴⁹

Throughout there remained an extraordinary optimism in the power of science, rightly understood, to effect a social transformation. This message was broadcast continuously by radical publishers. Carlile looked to the "regenerative" function of science once slipped from the Christian yoke.⁵⁰ Its social potential was deemed at times to rival the might of economic and technological knowledge; and this too, as the prolabor economist Thomas Hodgskin argued, was breeding a "quiet insurrection" that no "Holy Alliance can put down."⁵¹

CULTURAL AND MORAL RELATIVISM: THE IMPORTANCE OF ENVIRONMENT

Carlileans, Owenites, and Chartists inherited their sensationalist psychology from older Godwinite and Paineite Jacobins, and with this *idéologue* epistemological package came a fundamental belief in the primary influence of the environment as a determinant of form and character. The British radicals, following their Enlightenment heroes, stressed the importance of the correct social molding as a prelude to political change. Their environmental emphasis was all-pervasive. School curricula, most noticeably, reflected their strong belief in cultural relativism. Geography received high priority in radical primary education because it taught that national characteristics were a product of birth and education, indeed that the very mental equipment by which judgments were made was a product of cultural training. Children were taught toleration at Owen's New Lanark school by being made to picture themselves growing up in Hindu or Moslem society and acquiring different sets of cultural peculiarities.⁵² This emphasis persisted in higher-level treatises. Thompson pictured respective cultures inducing quite different moral, legal, and ethical norms through habituation, such that young Christians inducted into Turkish society would soon become passionate believers

⁴⁸ William Chilton, "The Cowardice and Dishonesty of Scientific Men," *Oracle*, 4 June 1842.

⁴⁹ Carlile, "Address to Men of Science" (cit. n. 9), pp. 111, 120.

⁵⁰ Wiener, *Life of Carlile* (cit. n. 14), pp. 111–112. This faith in science was a special case of the belief among the self-improving artisans that "book knowledge" in general could transform the qualities of their lives. While it might not have achieved this, a study of book science did enable the self-improvers to refine their rhetoric and strategies for achieving their secular and class ends; see Vincent, *Bread, Knowledge and Freedom* (cit. n. 2), p. 195.

⁵¹ Hodgskin, *Labour Defended* (cit. n. 41), p. 30; Carlile, "Address to Men of Science" (cit. n. 9), pp. 108–109.

⁵² Robert Dale Owen, *An Outline of the System of Education at New Lanark* (Glasgow: Wardlaw & Cunningham, 1824), pp. 47–49. At New Lanark children were taught a deistic humanitarian religion and sensationalist psychology. Lockean logic remained central to socialist popular instruction. Holyoake decried the scholasticism of the priests (who make "truth the result of the forms of argument, not of scientific evidence") and promoted Locke's philosophy, Owenite environmentalism, scientific materialism, Combeite phrenology, and skepticism: George Jacob Holyoake, *A Logic of Facts: Or Plain Hints on Reasoning* (London: J. Watson, 1848), p. 9. On the rediscovery of popularly controlled schooling in this era and its diverging goals see Johnson, "'Really Useful Knowledge'" (cit. n. 3), p. 75.

in the Prophet.⁵³ Natural history was heavily promoted to teach man's true status as a natural being, while astronomy and chemistry were advocated as a way of supplanting the ancient mythologies with a faith in nature's laws.⁵⁴ The Chartist William Lovett a generation later added human anatomy and geology to reinforce the naturalistic, relativistic, and anticlerical content.⁵⁵ The London representatives of the National Charter Association founded a day school in 1846, under Lovett's superintendence, to teach the secular sciences and other "improving" subjects. Lovett's experiences here encouraged him (although self-taught) to prepare his own *Elementary Anatomy and Physiology*. The book was surprisingly well received as a teaching aid, even though the very act of opening up the human body to plebeian gaze was provocative, given the clerical distaste for human dissection and contemporary fears for the moral consequences of anatomical self-knowledge among the "corruptible" laboring classes.⁵⁶ Owenite and Chartist teaching strategies were designed to demystify medicine and "plebify" knowledge. This in practical terms often meant breaking the physician's pecuniary hold on working-class patients, and with it his social and moral influence, which too often reflected the mores of the middle classes.⁵⁷ The sensationalist psychology, Owenite environmentalism, and cultural relativism inculcated in these schools bred a moral relativism that was deeply worrying to Christian divines. Man, according to socialists, could no more be held accountable for his morals than his character, both of which were formed by circumstance. Therefore he was not "worthy of praise or blame for the convictions which they force upon him."⁵⁸ Moral relativism and necessitarian doctrines negated the dogmas of responsibility and future rewards that the Christian authorities argued held the lower orders in check.

This secular emphasis on geography, natural history, and the environmental determinants of physical and moral structure provided fertile ground for the development of a Lamarckian biology. At the same time, the ethnographic perspective led socialists to endorse accounts of mankind's social progress from barbarism to civilization, interpreted by a liberationist yardstick as a progressive

⁵³ Thompson, *Distribution of Wealth* (cit. n. 41), pp. 279–280. Even the cultural dependence of sexual mores was tackled in Owen's *Moral Physiology* (cit. n. 7).

⁵⁴ Owen, *Education at New Lanark*, pp. 44–46; and Carlile, "Address to Men of Science," pp. 95–96, 131 (cf. Owen, *Education at New Lanark*, p. 34).

⁵⁵ William Lovett and John Collins, *Chartism: A New Organization of the People* (1840; Leicester: Leicester Univ. Press, 1969), pp. 93–94; and Lovett, *Life and Struggles of William Lovett in his Pursuit of Bread, Knowledge, and Freedom* (London: Bell, 1920), Vol. I, p. 147.

⁵⁶ On the clerical distaste see "Medicine and Divinity," *Lancet*, 1830–1831, 1:470–472. The radical *Lancet* had already applauded Birkbeck for using a cadaver to illustrate his anatomy lectures at the London Mechanics' Institute: "London Mechanics' Institution," *Lancet*, 1826–1827, 12:349–350. Lovett's excursion into medicine was encouraged by George Combe and John Elliotson: Lovett, *Life* (cit. n. 55), Vol. II, pp. 370–373, also 326–327, 384–389. In Lovett's view, man's moral deficiency, exhibited in his "class dominations" and workhouse ethic, proves him "defectively taught" and in need of a leveling anatomical education: William Lovett, *Elementary Anatomy and Physiology* (London: Darton, 1851), pp. viii–xix.

⁵⁷ Robert Dale Owen, *Popular Tracts, No. 10: Situations* (New York: Free Enquirer, 1830), p. 89. Owen, attempting to counter the practitioner's influence, understood demystification differently from the Wakleyans. Thomas Wakley too deplored the notion that medicine was too sacred for the "*prophanum vulgus*," but his call for its demystification was, first, an attack on the Latin-shrouded pretenses of the surgical baronets at the College of Surgeons; and, second, designed to destroy plebeian quackery, since vernacularizing the terminology would render medicine intelligible to the "uneducated classes." Unlike Owen's self-help plea, the upshot of Wakley's move was to *strengthen* the bourgeois grip on the profession. "Medicine not a Mystery," *Lancet*, 1837–1838, 1:522–523.

⁵⁸ Ethnicus, *Why am I a Socialist?* (Glasgow: Paton & Love, 1840), p. 7.

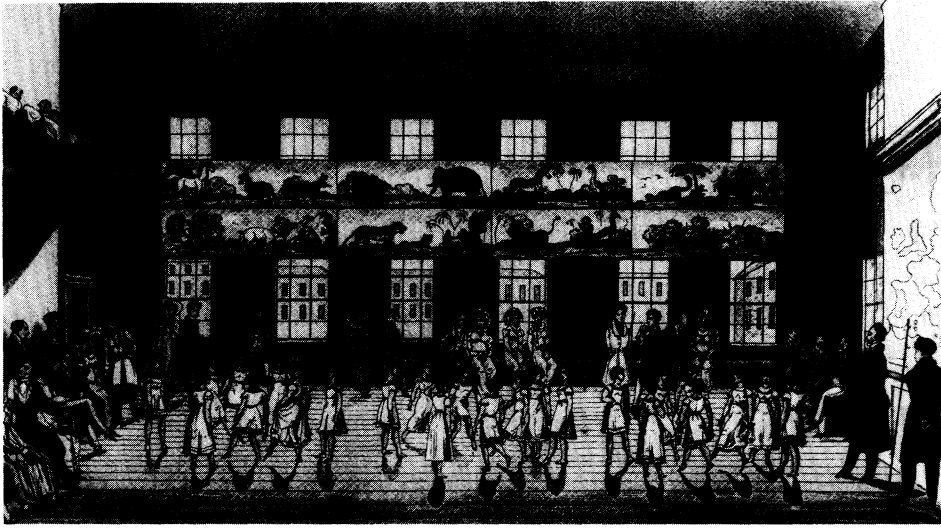


Figure 3. Robert Owen's school at New Lanark, near Glasgow. Note the wall diagrams: natural history and geography were important components in cooperative education. From J. F. C. Harrison, *Robert Owen and the Owenites in Britain and America: The Quest for the New Moral World* (London: Routledge & Kegan Paul, 1969). Courtesy of J. F. C. Harrison.

movement toward cooperation, female emancipation, and secularization.⁵⁹ As we shall see, an upward-striving, environmentally controlled transformism could be used to support the Owenites' doctrine of social perfectibility and legitimate their political policies for attaining a secular, scientifically constrained cooperative society.

Science, then, was depicted as a crucial propagandist and educational tool. Artisans argued that it would prove a liberating force once national educational policies were altered and its bourgeois practitioners shifted their allegiance. Carlyle envisioned a dialectical relationship between rational instruction and political change: given a scientific education, a "Representative System of Government" would inevitably follow. This would then step up state support for science and thus hasten the end of laboring misery.⁶⁰ Thompson too insisted that the reunification of labor and knowledge and the destruction of the capitalist monopolies were compatible only with a majority-rule government. Science in socialist thought was thus integral to strategies for social, political, and religious change. It was of course the latter that concerned the atheists in the 1840s. Chilton believed that the "Augean stable of religion, fouled and polluted by human blood and misery, will yet be swept with the flood of science." The nebular hypothesis and paleontological progression remained grand "facts which support Atheism,"

⁵⁹ This was itself grounded in the Owenite's belief in man's limitless potential for progress: Robert Owen, *An Outline of the Rational System of Society* (Manchester: Heywood, n.d.); and Charles Southwell's exegesis in *Socialism Made Easy* (London: J. Watson, 1840), p. 10. Deviation from this historic progress had been forced by the capitalists' distortion of the laws of distribution of wealth and knowledge, and future advances depended on correcting this: Thompson, *Distribution of Wealth* (cit. n. 4), pp. 275–276.

⁶⁰ Carlyle, "Address to Men of Science" (cit. n. 9), p. 133; Thompson, *Distribution of Wealth*, Chs. 3, 4.

however much the “respectable men,” the Herschels and Lyells, might pale at the prospect.⁶¹

So science was presented as a potential disrupter of the “old immoral world.” Carlile held chemistry to be the queen of the sciences because it trenched so fundamentally on the clergy’s intellectual domain, with its axiom of material indestructibility. His classificatory hierarchy was ideologically grounded—the rationale for ranking a science rested in its potential in the social program. Astronomy and natural history followed closely: the first for its demonstration of cosmic eternity, the second for the humble teaching that we “are of no more importance in the scale of Nature than those myriads of animalcules, whose natural life is but for the space of an hour, or a moment.”⁶² In short, activists held a leveling, necessitarian philosophy and propagated theories of man’s naturalness and material mind. Morality lay at the shrine of science and truth, and the study of nature became the basis for a neo-Enlightenment religion of Matter.

THE SOCIAL AND PHILOSOPHICAL UNDERPINNINGS OF ARTISAN EVOLUTION

For the communitarian socialists humanity as a whole was to be liberated, including at the outset the slaves of the slaves. Owenites demanded female emancipation and an end to “domestic slavery.”⁶³ Women in cooperative society were to be educated in scientific and economic knowledge to enable them to become joint possessors “of the world’s wealth, and an equal partaker in all the delights which flow from mental and moral culture.”⁶⁴ This socialist commitment to a collectivized family life inclined the “party” to a unique exploitation of scientific resources. The “Red Republican” William Thompson was an ardent female emancipationist and promoted Lamarck’s “law” of the inheritance of new characteristics acquired through “the influence of the circumstances” because it provided a mechanism for the stabilization of mental and physical attributes derived from cooperative education. Lamarckism also underwrote an equal education policy. Cooperators deplored women’s status as “mere dependents of men,” deprived of “wealth, power, self-regulation, and useful influence” and “rendered inferior in physical, intellectual and social estimation.” Since improving traits can be inherited from *both* sexes, Thompson told the London Co-Operative Society, all attempts at social molding “must eternally prove abortive, if the females do not partake of every improvement equally with the males.”⁶⁵ So Lamarckism for Thompson justified the cooperators’ attack on the “absolute despotism” of the family, while legitimating their program of environmental manipulation as the means to social progress. Thompson was one of the most influential cooperative

⁶¹ Chilton, “Regular Gradation,” *Oracle*, 9 Apr. 1842.

⁶² Carlile, “Address to Men of Science,” pp. 98, 97, 123, 129, 130.

⁶³ Thompson, *Distribution of Wealth*, pp. 298–299.

⁶⁴ Southwell, *Essay on Marriage* (cit. n. 11), p. 20.

⁶⁵ William Thompson, “Physical Argument for the *Equal Cultivation* of all the Useful Faculties or Capabilities, of Men and Women,” *The Co-Operative Magazine and Monthly Herald*, 1826, 1:250–258, pp. 250, 253, 254; Taylor, *Eve and the New Jerusalem* (cit. n. 11), pp. 24–27, 68–69. Even Darwin in his first evolutionary flush jotted: “Educate all classes . . . improve the women. (double influence) & mankind must improve”. But this must be read in conjunction with Richards’s reassessment of his subsequent retreat from social and environmental causation; Evelleen Richards, “Darwin and the Descent of Woman,” in *The Wider Domain of Evolutionary Thought*, ed. D. Oldroyd and I. Langham (Dordrecht: Reidel, 1983), pp. 57–111, on p. 91.

theorists of the 1820s, and although it is uncertain to what extent his advocacy of Lamarck was acted on by the Owenite caucus, his public debates in Red Lion Square at this time (discussed below) may well have brought socialist transformism to the attention of a wider utilitarian audience.

It was, however, the atheist wing that produced the strongest core of biological Lamarckians: open, consistent, and proud transmutationists who left no doubt that their stance was dictated by their hatred of the Church. To appreciate the atheist Lamarckian zoology promoted in the *Oracle*, *Movement*, and *Reasoner*, we must first understand the radicals' philosophical heritage. The infidels rested their philosophic case on pirated Enlightenment works that themselves grounded political and moral demands in materialist cosmogonies. The most important of these was Baron d'Holbach's uncompromisingly atheistic *System of Nature*, well known from Thomas Davison's cheap edition of 1820. Also immensely influential were deistic works like Palmer's *Principles* and Volney's *Ruins* and *Law of Nature*. These were eagerly reprinted by the pauper presses: Volney was republished in English in 1822, and Carlile put out a new edition of Palmer in 1823. Contemporary works that argued a materialist philosophy of mind were equally exploited; thus William Lawrence's "blasphemous" comparative anatomy lectures were continually pirated by pauper printers.⁶⁶ The impact of all these works was dramatic; citation of them as "authorities" occurs time and again in the street literature. Carlile read d'Holbach's *System* in prison and was converted to its atheistic tenets. These he began feeding into the street culture through extracts in the *Republican*, becoming the first nineteenth-century radical to blend d'Holbach's materialist philosophy with revolutionary rhetoric. The *System* also served socialist purposes. The feminist Anna Wheeler (Thompson's friend and an adept Owenite strategist) gloried in the book's exposure of mankind's "pernicious errors."⁶⁷

The *System* appealed to the working-class radicals because d'Holbach had founded his critique of kingcraft and Christianity on an atomistic physics. As a French libertarian pre-Revolutionary work, the *System* was heralded as uniquely suited to what many radicals saw as British *ancien régime* tyranny. Man and nature were conceived by d'Holbach purely as matter organized; and since "moral man is nothing more than [a] physical being considered under a certain point of view," the laws of morality could be deduced from materialist science. In d'Holbach's Lucretian nature, organization and order were emergent properties wholly explicable in terms of recombinant matter and motion. There was no supernatural being—no "independent" power that kept the whole in motion. Nature was no "heap of dead matter, destitute of peculiar qualities." Her parts were endowed with properties that obliged them to react deterministically, and these exchanges resulted in a necessary order. From these materialist premises d'Holbach—and echoing him the English insurgents—drew sweeping social conclusions. There being no "supernatural powers" responsible for "the formation of things," man must "make one pious, simultaneous, mighty effort, and overthrow

⁶⁶ Alan Charles Kors, *D'Holbach's Coterie: An Enlightenment in Paris* (Princeton: Princeton Univ. Press, 1976); and June Goodfield-Toulmin, "Some Aspects of English Physiology: 1780–1840," *Journal of the History of Biology*, 1967, 2:283–320, see p. 307 n. 41.

⁶⁷ Wiener, *Life of Carlile*, p. 110; and Richard K. P. Pankhurst, *William Thompson (1775–1833): Britain's Pioneer Socialist, Feminist, and Co-Operator* (London: Watts, 1954), p. 72.

the altars of Moloch and his priests."⁶⁸ D'Holbach's demand for the reestablishment of a rational basis for social, political, and moral beliefs appealed to the gamut of radical groups in Britain. For them, this stern Lucretian nature became a higher court, above the jurisdiction of priests. A court which, in enforcing only Nature's immutable laws, overruled the "capricious" proclamations of earthly tyrants.⁶⁹ The revolutionary consequence of d'Holbach's conclusions was seized on, particularly his warning against waiting till the next life to redress the grievances suffered in this. The evils endured by the laboring classes must be remedied by political change.⁷⁰ The secularist Robert Cooper—another former Social Missionary—echoed in 1853 the sort of sentiments that had been rife in the insurgent press for two generations:

[I]t is these delusions [of an immortal soul and compensation in another life] that keep the masses in the mud—that rivet the chains which enslave them, and induce them to remain prostrate at the foot of oppression and misrule. . . . The political potentate knows well that where the mind is free his throne is unsafe. . . . Hence he keeps in play that mighty engine of despotism—priestcraft—to enslave the intellect, to render it weak, bending, and credulous; and, while thus fettered, he and the idle few bask in the sunshine of splendour and power, while the industrious many remain neglected in misery, toil, and despair.⁷¹

Materialists in the nineteenth century increasingly deemphasized matter-in-motion as a cause of qualitative change and invested matter itself with immanent qualities. This transition can be seen in Palmer's *Principles of Nature*. Heavily indebted to d'Holbach, Palmer argued that man must abandon Christianity "and assume a higher and better ground—that of Nature, and the immutability of her laws." He asserted that it was impossible "to conceive of matter without power, or of power without matter." Such a thing as "dead matter" did not exist; "all is alive, all is active and energetic":

[M]atter in its most simple form, may, perhaps, be destitute of intelligence, but when combined and modified in the form of a man, intellect is a uniform consequence. It is impossible to say, how far the properties or qualities of matter may extend in a simple and uncompounded state. . . . There must be in the essence of matter a capacity, when combined in certain forms, to produce specific results. The principle of life must be essentially inherent in the whole system and every particle thereof; but to

⁶⁸ De Mirabaud [D'Holbach], *The System of Nature; or, The Laws of the Moral and Physical World*, 3 vols. (London: Vol. I, T. Davison, 1820; Vols. II and III, R. Helder, 1821), Vol. I, pp. 2, 12–13, 27, 37, 82; Vol. II, p. 185. Helder took over publication on Davison's imprisonment.

⁶⁹ Palmer, *Principles of Nature* (cit. n. 9), p. 55. The pirated literary basis for much of this irreligious mechanical philosophy can be traced to the matter-theory debates at the time of the English Revolution. Pantheists like John Toland, with their hylozoist belief in a spirit-infused matter, argued that a spirit-endowed people required no Anglican intercession with the divine. They were attacked by Newtonian latitudinarians whose cosmology, resting on inert atoms activated by divine fiat, was used to uphold Anglican authority. Margaret Jacob has traced the pantheist literature from the Glorious Revolution to the d'Holbachian High Enlightenment. Since d'Holbach's *System* itself contained fragments cannibalized from Toland's works, we can detect a continuity right into the 1830s. Margaret C. Jacob, *The Radical Enlightenment: Pantheists, Freemasons and Republicans* (London: George Allen & Unwin, 1981); Jacob, *The Newtonians and the English Revolution 1689–1720* (Hassocks, Sussex: Harvester, 1976); and Steven Shapin, "Social Uses of Science," in *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science*, ed. G. S. Rousseau and R. Porter (Cambridge: Cambridge Univ. Press, 1980), pp. 93–139.

⁷⁰ D'Holbach, *System of Nature* (cit. n. 68), Vol. III, p. 27.

⁷¹ Cooper, *Immortality of the Soul* (cit. n. 13), p. 15.

attribute to each particle a specific kind of life analogous to that which is discovered in large compositions of matter, cannot, perhaps, be warranted by the knowledge or experience of nature.⁷²

This is a central tenet of Jacyna's republican "immanentist" tradition in physiology. The strong metaphoric congruence between a self-emerging physical and mental organization and the democratic ideal made a reductionist philosophy attractive to artisan and bourgeois radicals: the sum of the parts made up the whole, and power and sovereignty resided at the base, with the individual. Authority did not delegate downward but was mandated from below. By appealing to materialist nature, enslaved nations might be liberated; princes consulting it would be taught "they are men and not gods; that their power is only derived from the consent of other men."⁷³ Connected with this were republican claims that a sensationalist epistemology and immanentist materialism were the only bases for a true morality, superior (because it rested on a positivist, nonidolatrous base) to the Christian one. The same held for a correct philosophy of life. Only by studying the properties of matter will man discover those physiological laws that highlight the "solemn and important truths on which his happiness" depends.⁷⁴

The social consequences were only too apparent to the Anglican authorities. The opponents of Lamarckism in the 1830s attacked the central premise—that nature had inherent powers that imbued it with self-developing energies. Instead, antidemocrats saw social and natural change as dependent on divine sanction. For them, judicial and natural laws emanated from above; they could not be mandated from below. In the case of natural law the source was God. But atheists saw "no solid reason to believe in a *godhead*, or the eternity of anything but *matter*," which was self-organizing through its own internal impulses.⁷⁵ The inherent power of the mass (matter in physics, the crowd in politics) became the cornerstone of radical working-class philosophy. Eighteenth-century rationalist works like d'Holbach's were given a new directional framework and used to point up the inextricable advance of society and nature. "Change is nature's eternal law," socialists pleaded, and "finality in morals is just as incomprehensible as infinity in physics." Politics, morals, and physics were all subject to the same "ENDLESS PROGRESSION."⁷⁶ This radical juxtaposition of natural and social progress shows that materialist science was being used to sanction a system of new social relations. As David Bloor says, the "is" of nature was being made a justification for the "ought" of politics.⁷⁷

It is not surprising, therefore, that a reductionist biology of emergent organic change dominated the republican, atheist, and prosuffrage street literature. It was axiomatic in the *Oracle*, where it underwrote Chilton's and Southwell's commitment to transmutation. In a forty-eight-part series entitled "Theory of

⁷² Palmer, *Principles of Nature*, pp. 81, iv, 79; and "Essay on the Idea of Power," *Investigator*! 1843, pp. 37–39; see also Cooper, *Immortality of the Soul*, pp. 48–58.

⁷³ D'Holbach, *System of Nature*, Vol. III, p. 108.

⁷⁴ Palmer, *Principles of Nature*, p. 81; and Kors, *D'Holbach's Coterie* (cit. n. 66), pp. 52–53.

⁷⁵ Southwell, "Is There a God?" *Oracle*, 6 Nov. 1841. The Coleridgean opposition to democratic mandating and emergent evolution is explored in Desmond, *Politics of Evolution* (cit. n. 4).

⁷⁶ Southwell, *Essay on Marriage* (cit. n. 11), p. 19; and Maltus Questell Ryall, "Scheme of Endless Progression," *Movement*, 1843, 1:28.

⁷⁷ David Bloor, "Coleridge's Moral Copula," *Soc. Stud. Sci.*, 1983, 13:605–619.

Regular Gradation" (progressive transmutation) in the paper, Chilton admitted that the

theory of a regular gradation, or the change of one mode of natural phenomenon to another, without supernatural interference, is in direct opposition to the almost universally received opinions of all countries and all ages . . . [yet stripped of religious prejudice philosophy must admit] that the inherent properties of "dull matter," as some *bright* portions . . . have designated it, are good and sufficient to produce all the varied, complicated, and beautiful phenomena of the universe.⁷⁸

There was, the *Free-Thinker's Information* said, "a power or energy in *nature*, by which new species are brought into being."⁷⁹ The spontaneous chemical origination of life had taken place "at a period very remote." This was a necessary, deterministic event: matter had been "*compelled*" by physicochemical conditions to take organic form.⁸⁰ The behavior of the emergent animal life was also deterministic and predictable. According to Southwell, "The action of the animal, insect, fish, or grass, is a necessary consequence of its individual and peculiar [organization and] its position and rank in the scale of being."⁸¹

For d'Holbach the "one immense chain" of causation made man himself "nothing more than a passive instrument in the hands of necessity." He was one of the earth's natural productions, "the result of the peculiar laws" of the planet. D'Holbach was not prepared to rule out the continuing origination of "new beings," nor in his view was man some sort of natural culmination. With changing planetary conditions, "the human species will, of consequence, either be changed or will be obliged to disappear."⁸² Palmer too tackled the vexed question of the "origin of the first and most powerful kinds of animals." He believed that the power to produce new life had ceased when planetary conditions stabilized and the earth's relation to the sun reached an equilibrium. He therefore sought a solution to the problem in some prior global arrangement, speculating that a succession of "inconceivable exertion[s]" had resulted in the production of life and the generation of the animal series: "[I]t is probable that Nature has, at different times, made great exertion in the work of creation or production, and that from man down to the lowest insect, a graduated modification of physical energy has been exhibited throughout a past eternity."⁸³

Just as there was a switch in emphasis from motion to immanent power between the time of d'Holbach and the *Oracle* atheists, so d'Holbach's image of nature as a "dynamic chaos" was given a more directionalist emphasis.⁸⁴ This can be seen as his ideas of a planetary eternity and natural production of life were reworked in the street literature. By the 1830s and 1840s this dynamically stable

⁷⁸ Chilton, "Regular Gradation," *Oracle*, 19 Feb. 1842.

⁷⁹ Quoted in *Oracle*, 30 Apr. 1842.

⁸⁰ Chilton, "Regular Gradation," *Oracle*, 19 Feb. 1842. His arguments for spontaneous generation became more empirically grounded as he made contact with Continental sources: William Chilton, "Cuvier and Gradation," *Movement*, 1844, 2:25-27.

⁸¹ Southwell, "Is There a God?" *Oracle*, 30 Mar. 1842.

⁸² D'Holbach, *System of Nature*, Vol. I, pp. 82, 90, 92-95.

⁸³ Palmer, *Principles of Nature* (cit. n. 9), pp. 25-26.

⁸⁴ Quoting Peter J. Bowler, "Evolutionism in the Enlightenment," *History of Science*, 1974, 12:159-183, on p. 164. In 1770 d'Holbach had speculated that mankind's formation might have been coeval with that of the planet. By 1840 writers could substitute Cuvierian progressionist interpretations: "Speculations on Man," *Investigator!* 1843, pp. 27-29.

nature, with productions canceling extinctions, had either come to underscore an anti-Christian Lyellism or, in the case of the *Oracle*, been given a progressive aspect in order to sustain a serial transmutation. Lyell's uniformitarian geology was propagated by Robert Cooper in his *Infidel's Text-Book* because it denied evidence for a beginning and impugned Mosaic cosmogony.⁸⁵ But generally Lyell's steady-state doctrine found little favor, largely because of what it could *not* do: provide a naturalistic analogy for the moral and economic progress attending a political transformation. Such a devolution of moral authority depended on an upwardly mobile, self-empowered nature. So it is the infidels' support for progressive transmutation that will concern us here. In the 1840s the militant atheists were critically aware of the doctrine's serviceability and cultivated it in their struggle for political hegemony.

This was most pointed in the *Oracle*. In his series on "regular gradation" Chilton was adamant that species were not delineated by discrete boundaries; no "fixed laws" marked them out. Instead they "are in a state of continual flux or change." Strata thicknesses and known depositional rates, moreover, confirmed that the "mutation of animal and plant life" took untold millions of years.⁸⁶ To explain the "gradual *change* from simple to complex in the organised world," Chilton applied the Owenite-Lamarckian theory of environmental modification, according to which the developing species "adapted itself to alterations in the surrounding circumstances."⁸⁷ He took his illustrations of ascending fossil sequences from John Phillips's lectures, William Buckland's *Bridgewater Treatise*, De la Beche's manual, and Robert Chambers's *Information for the People* and concluded that "animals were originally produced from the earth in consequence of a favourable condition of matter at the time . . . [and] whenever any material alteration of the locality in which certain animals resided took place, they either accommodated themselves to the different circumstances, or became extinct." So the fine gradation of fossils through succeeding strata was caused by "no other agent in operation but matter."⁸⁸ Although citing Lawrence's lectures, the transformist Robert Grant's works, and Lamarck's *Philosophie zoologique*, Chilton's main source was Lyell's refutation of Lamarckism in *Principles of Geology* (1832), which he turned upside down to prove "the superior *probability*" of the "transmutation of species, or the *blending* of one animal into another, the growing out of, or changing of, one form into another."⁸⁹

This was a provocatively anticreative stance and should be seen as such. Chilton soon admitted that he had published his "theory" precisely because the issue was of such "importance to the cause of materialism."⁹⁰ And since propagandists

⁸⁵ Robert Cooper, *The Infidel's Text-Book* (Hull: R. Johnson, 1846), p. 154. Cooper was clearly singling out the most damaging doctrines. Another he favored was polygenism, according to which the existing races of men "must have originally sprung from *perfectly separate stocks*," because it confuted monogenist Adam and Eve arguments (pp. 158–159).

⁸⁶ Chilton, "Regular Gradation," *Oracle*, 20 Nov. 1841; and "Mosaic Account of the Creation," *The Free-Thinker's Information for the People*, [1842], Vol. I, No. 1.

⁸⁷ Chilton, "Regular Gradation," *Oracle*, 19 Feb. 1842.

⁸⁸ *Ibid.*, 11 June 1842, 14 Oct. 1843.

⁸⁹ *Ibid.*, 8 Jan., 28 May 1842; 12 Aug., 9, 16, 23, and 30 Sept. 1843; 7 and 14 Oct. 1843; and Chilton, "Cuvier and Gradation" (cit. n. 80), p. 27.

⁹⁰ William Chilton, "Vestiges of the Natural History of Creation," *Movement*, 1844, 2:8–12, on p. 8.

like Chilton, Southwell, and Holyoake all insisted on materialism as the "foundation of atheism," transmutation became central to their strategy to achieve wider religious and political liberties. It substituted for the "puerile" idea of "the *creation*, either of matter or its modes."⁹¹ They emphasized the fossil ascent through geological time to controvert the idea of a once-only Creation. And they ridiculed the notion of a perpetually tinkering deity, quoting Julian Hibbert: "It must be dull work to be eternally trundling a wheel-barrow, and perhaps hard work too for an incorporeal Being."⁹² The rocks showed superior species growing out of inferior ones, but, Chilton argued, this was hardly the way that a divine craftsman would have worked. After all, "we do not find a coach-maker, when he has to build a nobleman's carriage, begin by making a mud cart or pair of trucks." Because of life's compliant, accommodative reaction to conditions, Chilton accepted that ascent was not necessarily straightforward. In the light of Lyell's nonprogressionist arguments in *Principles*, he conceded that shifts from imperfect to more perfect organization might even have been irregular and periodic, leading only to an aggregate upward motion. The operative point, though, was that it was a natural process.⁹³

Man was never exempted; indeed, the materialist system was aimed at defying theologians, who puff "men up with the absurd notion that they are an anomaly among animated existences, and in no sense allied to inferior creatures." Chilton projected transmutation as the first philosophic defense against protagonists who demanded: "how can you account for natural phenomena without a god?" (This emphasis on its dialectical value reflected the socialists' policy of engaging Christians in public debate.) His programmatic statements were quite clear: "If atheists can show that matter may make a man . . . theists will waive all other objections to materialism. The object . . . [is] to show the reasonableness of the belief that matter *can* make men and women, and every other natural phenomenon[on]—unassisted, undirected, and uncontrolled." So the *Oracle* atheists were hostile to any idea of an "immaterial, immortal principle" that would set man apart, and quick to seize on any contrary evidence. Thus in 1843 Chilton publicized the discovery of a fossil monkey to confound "those who contend for the (especially!) *divine* origin of man."⁹⁴

More moderate versions of some of these views were also held by the middle-class doctrinaire radicals. Cooper echoed a belief long favored by medical reformers in the private anatomy schools of Edinburgh and London (and by some London University teachers) when he asserted that the cerebral descent from man to polyp indicated a gradual qualitative change in mental development, such that if man were endowed with some supernatural "*essence*," so must the chimpanzee, "sagacious monkey," and so on to the invertebrates.⁹⁵ However, as a

⁹¹ Chilton, "Regular Gradation," *Oracle*, 14 Oct. 1843, 6 Nov. 1841.

⁹² Quoted in Southwell, *Difficulties of Christianity* (cit. n. 30), p. 26. Hibbert was a wealthy rationalist who gave Carlile a total of £7,000 to keep his shops open. "Julian Hibbert," *Reasoner*, 1855, 19:105–106.

⁹³ Chilton, "Regular Gradation," *Oracle*, 11 June 1842; 30 Apr. 1842.

⁹⁴ *Ibid.*, 13 Nov. 1841; 11 Nov. 1843; 26 Feb. 1842; and Chilton, "Geological Revelations," *Oracle*, 29 July 1843.

⁹⁵ Cooper, *Immortality of the Soul*, pp. 71, 98; and "The Supremacy of Man Examined," *Movement*, 1844, 1:212–213. Radical deists in London who advocated a graduated animal chain included Robert Grant at the London University, Thomas King at the Aldersgate Street school, and George

paid socialist lecturer in Edinburgh (and later London), Cooper was far more concerned to point up the atheistic implications of the gradualist tenet. This was to be expected. The medical teachers were employed preparing students for diplomas, and while a naturalistic anatomy might have underpinned their (milder) dissenting ideologies, their lectures usually carried only a subliminal social message. The point is not that working-class polemicists escaped medical etiquette or the social niceties of the classroom but that they expected this anatomical knowledge to work for them in a nonprofessional, political context. It was this Owenite context, with its social-transformist aims and confrontationist attitude toward clerical authority, that provided a more radical framework of meaning. Cooper remained an Owenite to his death, and he articulated this new "meaning" using his paid public platform, exploiting comparative anatomy to justify direct political action.

The group's faith in reductionist science bred an astonishing utopian optimism. Chemists were portrayed as the real "revolutionists," for they had silently undermined priestly dogmas and opened esoteric doors to the forbidden "knowledge of the cause of our existence."⁹⁶ Chilton suggested that, because chemists could break organic matter into its constituent salts, they would one day be able to reconstitute them, writing extravagantly:

If it be our ignorance only which presents a barrier to our forming wheat from the simple elements of which it is known to be composed, and not the want of *supernatural* power, it follows, that an incapacity to make man, also, must result from the same cause. So that here we have strong grounds to hope, that man may ultimately manufacture man from the "raw material," as the market may require, and thus prevent [labor shortages].⁹⁷

By 1844 the atheists were making increasing contact with the issues engaging the Oxbridge liberal Anglicans, a result of greater access to information and increased reader response (intelligence and a steady supply of newspaper reports were by now reaching the *Movement* office).⁹⁸ Thus Chilton was able to exploit Sedgwick's condemnation of Dean Cockburn's scriptural cosmology at the 1844 York meeting of the British Association for the Advancement of Science. Chilton accused Sedgwick of disingenuousness—of destroying the "addle-pated" dean's 6,000-year chronology, undermining the literal Word of Scripture, and approving the nebular hypothesis, while nonetheless continuing to support a notion of creation underwritten by Genesis. If liberal Anglicans no longer accepted the literal Word, how could they remain adamant that animals have arisen, "not by the transmutation of those before existing—but by the repeated operations of cre-

Dermott at the Gerrard Street school. At Edinburgh the radical Robert Knox drew crowds in Barclay's old school, while fellow transcendental anatomist John Fletcher taught in Argyle Square. Cooper also exploited the works of William Lawrence, Sir Thomas Charles Morgan, John Elliotson, and Thomas Southwood Smith to prove that life was dependent on organization and that man's "mission ends with *this* life"; Cooper, *Immortality of the Soul*, pp. 8–11.

⁹⁶ Carlile, "Address to Men of Science" (cit. n. 9), p. 97.

⁹⁷ Chilton, "Regular Gradation," *Oracle*, 7 May 1842.

⁹⁸ The *Movement* was sent cuttings from the *Globe* and *Athenaeum* reporting the Sedgwick-Cockburn *fracas*, and Chilton worked from *Examiner* reviews of the *Vestiges* before seeing a copy of the book. He was now quoting the works of John Barclay, Charles Babbage, Baden Powell, John Pye Smith, and W. T. Brande.

ative power"?⁹⁹ As Charles Gillispie has argued, Sedgwick's brief was to "ennoble" empirical discoveries into conservative morality. This approach was central to antileveling Anglican strategy, in which science underwrote a hierarchical moral cosmos with all eyes lifted toward a benevolent Sustainer. Hence the fury, as Morrell and Thackray note, when *Vestiges* appeared in the wake of the York debate and seemed to point in a different direction: to a distant Creator and deterministic operation of natural law.¹⁰⁰ Chilton was quite aware that the higher design of *Vestiges* was a world removed from the necessitarian materialist cosmogony of the atheists. But the *Movement* propagandists welcomed the best-selling book, treating it as a deistically glossed version of Chilton's theory of regular gradation and prophesying that it "will be the transition state at which the religious world will presently arrive"—after which, "by an easy mutation" "men will glide into atheism."¹⁰¹ With the *Movement* and *Reasoner*, then, came a refining of tactics as correspondence networks provided reader feedback. The need to pry open the crack between geology and Genesis led to better use of the "antiscritptural" data derived from depositional rates and the new geochronological techniques provided by the Lyells and Sedgwicks themselves.¹⁰² This subtle retargeting on contemporary "hot" topics was facilitated by the atheists' growing familiarity with the middle-class scientific literature. To an extent, too, the shift in approach reflected Chilton's and Holyoake's more measured demagogic manner—their retreat from what Carlile called Southwell's "ranting style."¹⁰³

So the doctrine of universal matter with its internal impulses was promulgated by street agitators among the Carlilean infidels and communitarian socialists; and out of this grew a philosophic transformism, according to which "energetic" matter became the font of animated nature. Biological transmutation found a particular stronghold among the atheist ex-Owenites, who put it to propagandist use as a crudely effective anti-Christian doctrine. (The complaints when Chilton's series on regular gradation became esoterically anatomical suggest that readers were prepared to tolerate comparative anatomy in their penny prints only so long as it had a clearly perceived relationship to the ideological struggle. Knowledge among radical educators was what Richard Johnson calls "unintellectualistic"; abstruseness and mystification were incompatible with paving the way to popular sovereignty.)¹⁰⁴ All the members of the *Oracle* collective were consistent, thoroughgoing transmutationists and articulated the doctrine's double liberating purpose. Lamarckian environmental determinism drove out the deity

⁹⁹ William Chilton, "Theory of Regular Gradation," *Movement*, 1844, 1:413–414; Chilton, "God's Words versus God's Works," *ibid.*, pp. 442–444; "Geology and the Bible," *ibid.*, pp. 394–395, 451–453.

¹⁰⁰ C. C. Gillispie, *Genesis and Geology* (New York: Harper & Row, 1959), Chs. 6, 7, esp. p. 210; and Morrell and Thackray, *Gentlemen of Science* (cit. n. 1), p. 245.

¹⁰¹ Chilton, "Vestiges of the Natural History of Creation" (cit. n. 90); and Chilton, "'Materialism' and the Author of the 'Vestiges,'" *Reasoner*, 1846, 1:7–8. Chilton was aware of Chambers's authorship: Chilton to Holyoake, 1 Feb. 1846, Holyoake Corresp. No. 155; Edward Royle, *The Infidel Tradition from Paine to Bradlaugh* (London: Macmillan, 1976), p. 141.

¹⁰² William Chilton, "God's Words versus God's Works," *Movement*, 1844, 2:68–70, 76–79, 89–92; "The British Association and the Bible," *Reasoner*, 1846, 1:244–245. Southwell likewise pitted William Buckland against Scripture, claiming that the "truths of geology are playing the very mischief with the truths of Genesis": "Speculations on Man," *Investigator!* 1843, pp. 7–8.

¹⁰³ Carlile to Holyoake, 16 Oct. 1842, Holyoake Corresp. No. 79; McCabe, *Holyoake* (cit. n. 22), pp. 58, 76.

¹⁰⁴ Johnson, "'Really Useful Knowledge'" (cit. n. 3), pp. 84–85, 94.

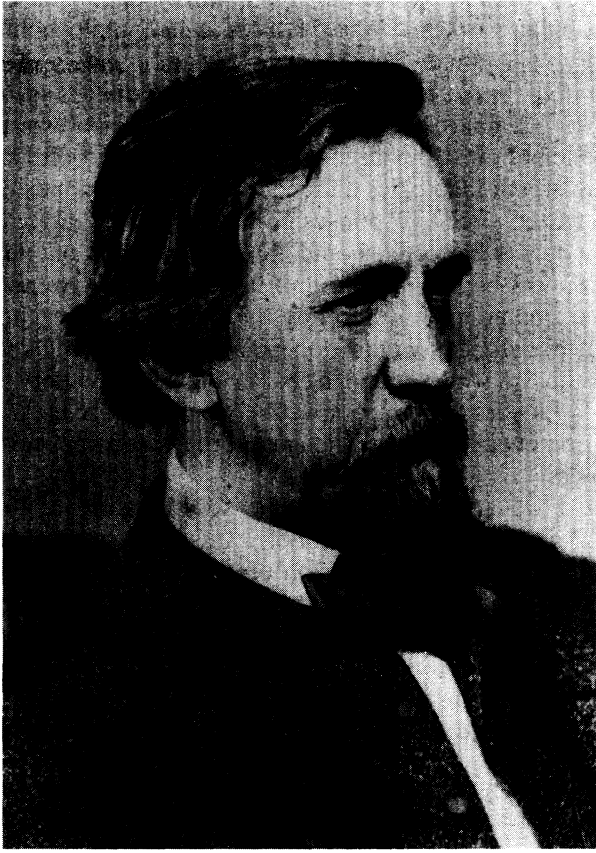


Figure 4. George Jacob Holyoake. Courtesy of the Co-operative Union, Manchester.

and legitimated the republican struggle by providing a model of social ascent power-driven from below. Thus it was a political threat. Just as the blasphemy laws were wielded for political ends by frustrated governments, so artisan anti-Christian science was designed for secular ends—to destroy the intellectual buttresses of Anglican aristocratic power.

This account raises questions about the wider influence of the atheist press as a vehicle for Lamarckian ideas. To answer these we would have to understand the spectrum of working-class attitudes toward the fiery *Oracle* and *Investigator!* and the more tempered *Movement* and *Reasoner*. It is clear, for example, that even some former firebrands hated the *Oracle*'s gutter style. Julian Harney, while showing solidarity in public, was privately saddened by its "ribaldry and disgusting language." Carlile personally loathed the "blackguard" Southwell, his old socialist enemy. Although doing his duty by collecting for Southwell's prison fund, in December 1842 he cancelled his subscription to the *Oracle* (which he never much cared for) and finished with Southwell for good.¹⁰⁵ Carlile and Harney liked Holyoake, however, and saw the more philosophic *Movement* as pointing the way forward.

¹⁰⁵ G. J. Harney to Holyoake, 17 Nov. 1843, Holyoake Corresp. No. 102; and Carlile to Holyoake, 16 Oct. 1842, *ibid.*, No. 79. Chilton he considered "no better"; Carlile to Paterson, 11 Dec. 1842, *ibid.*, No. 88.

More specifically, we still need to know how extensive a knowledge of transmutation really was among radical workers. What I have called philosophic transformism, based on a theory of "animate" matter, was certainly widely promoted in the Carlilean, cooperative, and atheist literature. On the other hand, it is simply not known how Chilton's Lamarckism, conceived as an atheistic strategy, or Thompson's as an emancipationist device, was received by the political factions, many of which held divergent ideologies and made different demands of a polemical science. A study of the social responses to Chambers's *Vestiges*, currently being undertaken by James Secord, should throw new light on this question. Clearly, what appealed to atheists, many out of favor with the Owenite Central Board, might have been treated quite differently by those with diverging goals. It is not hard to see that the atheists would, for example, have provoked hostility from the Christian radicals, who wanted freedom of worship, not its destruction. To put the *Oracle's* Lamarckism in perspective we ultimately need a detailed study of the scientific content of both the unstamped press and apolitical "useful knowledge" penny papers.

There is a related question if we are interested in the social nature of the scientific response to Lamarckism. It concerns the middle classes' awareness of pauper-print science. I will end with a short discussion on the means by which the propertied classes could have become alerted to artisan knowledge and its political meaning.

ARTISANS AND THEIR BETTERS:

POLITICAL CHANNELS FOR SCIENTIFIC CONTACT BETWEEN THE CLASSES

We have seen how a materialist transmutation was integrated into strategies devised to promote secular goals. It was designed to break the "fetters of superstitious prejudice" and support a naturalistic world view in which man was a material product and in which priests, as agents of a repressive state, were deprived of temporal power.¹⁰⁶ But these secular strategies were embedded in wider political programs promoting female emancipation, cooperation, representative government, and redistribution of wealth. As such, socialist transmutation had profound implications for ruling groups defending the paternalist society, restricted franchise, the established church, and capital accumulation among the higher classes. Lamarckism came with heavy political baggage, and interpretations of the determined attacks on it—by Oxbridge divines (Adam Sedgwick, William Whewell, William Buckland), Coleridgeans in the monopolistic medical corporations (J. H. Green, Richard Owen), and wealthy careerists (Lyell)—should be sensitive to its bourgeois-radical and artisan-atheist connections.

Of course, this supposes that the wealthy savants appreciated these radical connections. The collusion of Peelites William Buckland and Richard Owen in their attempt to outmaneuver the London University Lamarckian Robert Grant leaves no doubt that they were aware of the threat from the bourgeois quarter.¹⁰⁷

¹⁰⁶ Chilton, "Regular Gradation," *Oracle*, 7 Oct. 1843.

¹⁰⁷ On the antitransmutatory alliances at the Geological Society see Adrian Desmond, "Interpreting the Origin of Mammals: New Approaches to the History of Palaeontology," *Zoological Journal of the Linnean Society*, 1984, 82:7–16, pp. 9–14; and Desmond, "Richard Owen's Reaction to Transmutation" (cit. n. 5), pp. 34–50. Cf., on alliances at the Zoological Society, Desmond, "The Making of Institutional Zoology in London 1822–1836: Part 2," *Hist. Sci.*, 1985, 23:223–250, pp. 235–241.

Determining the extent of the respectables' knowledge of the fiercer street literature is, however, more difficult. Yet converging lines of evidence do suggest a familiarity. First, many bourgeois medical and political reformers knew the working-class demagogues personally. The (often congruent) social circles of Jeremy Bentham, Francis Place, and George Birkbeck, for example, served "as a link between the working-class agitators and middle-class liberal opinion."¹⁰⁸ Within these circles we see many points of cautious intersection between the bourgeois reformers and labor leaders. This contact was further facilitated by the new improving Whig institutions, the London University and London Mechanics' Institute, as it was by Bentham's house parties and (on the socialist side) by the Red Lion Square Co-Operative Society. In these institutions contacts were mediated by mutual interests in free trade and the abolition of newspaper taxes, tithes, the corn laws, and so on. The public discussions in Red Lion Square, for instance, attracted the younger Benthamites, and the debates in the 1820s between the social Lamarckian William Thompson and prominent utilitarians "left a lasting impression" on spectators like J. S. Mill, the Christian Socialist F. D. Maurice, and John Roebuck.¹⁰⁹ Birkbeck got to know Lovett, Hetherington, Hodgskin, and other activists at the London Mechanics' Institute and was frequently to be seen in Hetherington's printshop in the Strand.¹¹⁰ Bentham's lawyer friends offered to defend Carlile in court "gratuitously" in 1830. And under Bentham's roof Thompson met radical M.P.s, Whig editors, and London University professors.¹¹¹

The secular London University proved something of a reformist melting pot, being of Broughamite origin but attracting radical backing. Its students were no less riotous than those in the private medical schools. In 1830 rebellious groups appalled the school's conservative critics by distributing tricolor leaflets in lecture theaters. A number of bourgeois activists passed through the school at this time, including the National Political Union member and future secretary to the People's Charter Union C. Dobson Collet, who took third prize in the law class in 1833. Robert Owen's fourth son, David Dale Owen, studied chemistry at the University in 1831–1832 before returning to New Harmony and taking up a post as Indiana state geologist. Holyoake himself was sponsored to attend lectures in 1847 and 1849 and met Robert Owen there when the Social Father came to visit a professor and his pupils (one being the physiologist Michael Foster).¹¹² University radicals like the professors of midwifery and comparative anatomy D. D.

¹⁰⁸ Thomas Kelly, *George Birkbeck: Pioneer of Adult Education* (Liverpool: Liverpool Univ. Press, 1957), pp. 167–168.

¹⁰⁹ Pankhurst, *Thompson* (cit. n. 67), pp. 97–99; cf. Harrison, *Owen and the Owenites* (cit. n. 22), pp. 67, 74.

¹¹⁰ Holyoake, *Hetherington* (cit. n. 15), p. 6; Kelly, *Birkbeck*, pp. 83–84, 102–103, 116. On Hodgskin's relationship with Birkbeck, Place, and Bentham see Halévy, *Hodgskin* (cit. n. 7), pp. 34–35, 52, 91, 128.

¹¹¹ Carlile to Francis Place, 28 Jan. 1830, British Library Add. MS 37949, fol. 241; and Pankhurst, *Thompson*, p. 17.

¹¹² Holyoake, *An Agitator's Life* (cit. n. 15), p. 117. On his attendance at Latin, logic, and history classes see George Jacob Holyoake, "Diary," 1847–1852, 9 May 1849, passim, Bishopsgate Institute. While at the London University David Dale Owen gave popular science lectures, which were reported by Robert Dale Owen in the *Crisis*; Walter B. Hendrickson, *David Dale Owen, Pioneer Geologist of the Middle West* (Indianapolis: Indiana Historical Bureau, 1943), p. 16. On Collet see "Collet Dobson Collet," *Reasoner*, 1855, 19:145–146. On the student insubordination see *Medical Gazette*, 1830–1831, 7:117–118.

Davis and Robert Grant were also (along with many private teachers) part of Thomas Wakley's medical-reform circle and were thus provided with an additional channel for communication with the artisan ideologues. Wakley's coterie attacked medical monopoly and promoted progressive science, and its members sported a naturalistic philosophy of mind. They were quite familiar with Continental transformism, since Wakley had published and praised Grant's Geofroyan lectures in the *Lancet* for 1833–1834. (The *Lancet*, which proved a potent organizing force for radical medical opinion, itself started life in 1823 with a ribald tone that placed it “with the very lowest of the political prints of the day.”)¹¹³ Wakley, Grant, and the Gerrard Street radical George Dermott characteristically encouraged plebeian participation in science and medicine.¹¹⁴ They were staunch anti-Malthusians—like their working-class counterparts—and deplored the iniquitous effects of the New Poor Law (as much because the workhouse tender system forced down the G.P. supervisors' pay as that the Bastilles degraded the poor). Wakley himself edited the legal *Ballot* newspaper and chaired the inaugural meeting of the National Union of the Working Classes in 1831.¹¹⁵ He was put up as Radical M.P. for Finsbury by William Cobbett and Joseph Hume and in the Commons spoke against the newspaper tax, New Poor Law, and Lord's Day Observance Bill and for repatriation of the Tolpuddle martyrs and later for the Charter.

So there existed a number of channels for artisan contact with the medical teachers, many of whom—at the University and private schools—had been radicalized by the discriminatory legislation of the unreformed College of Surgeons. William Lawrence's situation, too, provides an interesting case study. In 1822 he had lost copyright control of his lectures on comparative anatomy because of their supposed blasphemous content and been forced to recant his opinions to

¹¹³ Adrian Desmond, “Robert E. Grant: The Social Predicament of a Pre-Darwinian Transmutationist,” *J. Hist. Biol.*, 1984, 17:189–223, p. 203; and J. F. Clarke, *Autobiographical Recollections of the Medical Profession* (London: Churchill, 1874), p. 68.

¹¹⁴ Grant inducted the “distressed” wheelwright's son George Newport free into his Gower Street classes in 1832–1833. Dermott kept his fees low at the Gerrard Street school to undercut the elite hospital teachers, which resulted in accusations of his bringing “tinkers and chimney-sweepers into the profession.” Wakley published the mechanic John Miller's researches on kangaroo embryology (which were critical of Richard Owen—a man disliked by the radicals). On Newport see “Letter from Dr. Marshall Hall,” *Lancet*, 1837–1838, No. 1, 748–749; and Robert E. Grant, “Further Observations on Dr. Hall's Statement Regarding the Motor Nerves of Articulate,” *ibid.*, pp. 897–900. For Dermott's medicopolitics see George Darby Dermott, *A Lecture, Introductory to a Course of Lectures, on Anatomy, Physiology, and Surgery, Delivered at the School of Medicine and Surgery, Gerrard Street, Soho* (London: J. Fellowes, 1833), pp. 20–21. On Miller see *Lancet*, 1837–1838, No. 2, 59–63, 297–301; 1838–1839, No. 1, 744.

Few laborers could afford to indulge in science, or to train themselves in medicine. And had they wanted to, respectable liberals were determined to tax them out: “Tax on Entering the Profession,” *Medico-Chirurgical Review*, 1830, 13:440–441. There were exceptions—autonomous expressions of working-class scientific aspiration. Detrosier ran a “Banksian Society” in Manchester, a collective that could pursue those sciences “too expensive” for the individual artisan. The society concentrated on the accessible sciences (mineralogy, geology, botany, and entomology), its leaders insisting that “our want of riches does not exclude us from the temple of science.” Rowland Detrosier, *The Benefits of General Knowledge; More Especially, the Sciences of Mineralogy, Geology, Botany, and Entomology, Being an Address delivered at the Opening of the Banksian Society, Manchester. On Monday, January 5th, 1829* (London: Cleave, n.d.), pp. 3, 4, 14; Williams, *Detrosier* (cit. n. 21), p. 16; see also Vincent, *Bread, Knowledge and Freedom* (cit. n. 2), pp. 114–116.

¹¹⁵ Lovett, *Life* (cit. n. 55), Vol. 1, pp. 72, 75; and Sprigge, *Wakley* (cit. n. 16), Chs. 26–34. Wakley spoke against the newspaper stamp act at the City Road Hall of Science and helped reduce the duty to one penny in 1836.

retain his post at the Bridewell and Bethlem hospitals. (He wrote to the political satirist William Hone, who had himself appeared in court, commending his "greater courage" in such matters.)¹¹⁶ Carlile pirated and praised Lawrence's offending *Lectures*. But Lawrence became a cautious reformer in later years. And when Carlile willed his body to Lawrence for dissection in 1843, the latter refused it, which suggests that he knew Carlile's views well enough not to risk being associated with them.¹¹⁷ Such instances of social intersection leave little doubt that bourgeois legal and medical reformers were to a large extent aware of the social doctrines and scientific sources of the radical publishers.

Not that many bourgeois reformers were willing to align themselves with the ultras' methods, or oftentimes their goals. Although the reform coordinator Francis Place presented petitions on Carlile's behalf to the M.P. Henry Warburton (who spoke for science, medicine, and radical reform in the House), he was careful to characterize Carlile as "an honest hearted fanatic." Again, the Whig reformer Henry Brougham, promoter of the secular London University, might have campaigned on behalf of Carlile's printworkers, but he still believed their views seditious.¹¹⁸ In 1819, at the height of the crackdown on sedition, Brougham had urged Lord Grey to distance the Whigs from the radicals, to avow "our loyalty, but at the same time our determination to stand by the constitution, and to oppose all illegal attempts to violate it, and all new laws to alter its free nature."¹¹⁹

On the other hand, by the 1840s a rising middle-class generation promoting meliorist doctrines in opposition to orthodox Christian dogmas and prepared to accept a legitimating "developmental" world view welcomed contact with Holyoake, now pursuing more compatible policies in the *Movement* and *Reasoner*. Holyoake's own literary aspirations made conciliation easier, and he sacrificed some working-class support to achieve it. As early as 1841 Chilton had grumbled, "I look with suspicion upon all respectables of society—they are stumbling blocks in the way of honest men. Your being their *pet* is no compliment to your honesty—which, however, I do not suspect, my dear fellow."¹²⁰ The moderate *Movement* gained bourgeois support, and the *Reasoner* was early kept afloat by middle-class cash injections. By the mid to late 1840s Holyoake

¹¹⁶ Lawrence to R. G. Glynn, 16 Apr. [1822 or 1823], Royal College of Surgeons; and Owsei Temkin, "Basic Science, Medicine, and the Romantic Era," in *The Double Face of Janus and Other Essays in the History of Medicine* (Baltimore: Johns Hopkins Univ. Press, 1977), pp. 345–372, on p. 357.

¹¹⁷ "Introduction," *Investigator!* 1843, p. 2. A "Dr. Granger" (R. D. Grainger?) did dissect Carlile after dissociating himself from the "speculative opinions of the deceased." Many freethinkers had a horror of churchyard burial. Southwell's dying wife insisted on being dissected after her death and made her husband swear that he would watch: Southwell, *Confessions* (cit. n. 25), pp. 40–42. Holyoake, *An Agitator's Life* (cit. n. 15), p. 189, believed that the freethinkers' habit of leaving their bodies to science was actually counterproductive, because of the public hostility to medical schools following the resurrectionist scandals.

¹¹⁸ Place to Henry Warburton, 22 Feb. 1831, British Library Add. MS 35149, fol. 22; Carlile to H. P. Brougham, 10 June 1825, Brougham Papers 16205, University College London; Wiener, *Life of Carlile* (cit. n. 14), p. 97, n. 13.

¹¹⁹ Henry P. Brougham, *The Life and Times of Henry Lord Brougham*, 3 vols. (London: Blackwood, 1871), Vol. II, p. 351.

¹²⁰ Chilton to Holyoake, 26 Dec. 1841, Holyoake Corresp. No. 22. Many ultras snubbed the bourgeois reformers, "humanity-mongers, who would make the millions *comfortable slaves*," sneered Lovett and Collins, *Chartism* (cit. n. 55), p. 56.

was in close contact with the rationalists grouped around the *Westminster Review*. He was on cigar-smoking terms with G. H. Lewes and knew Harriet Martineau and F. W. Newman. He was shortly to contribute to the *Leader*, along with Herbert Spencer, George Eliot, Thornton Hunt, and J. A. Froude, and to join its staff.¹²¹ This inevitably resulted in a two-way diffusion of ideas, and the *Reasoner's* successful readership drive among the literary freethinkers left them exposed to a form of atheistic transmutation more trenchant than anything in Chambers's fashionable *Vestiges*.

Personal contact, then, provides prima facie evidence that the bourgeois reformers and literary radicals were familiar with the artisans' arguments. But we could take an alternative approach and analyze the social reactions to transmutation. This evidence suggests that wealthy conservative teachers too were aware of working-class demands. Coleridge—promoting a coalition of professional and gentrified classes under the aegis of his “National Church”—complained bitterly of what he called the “Ouran Outang” theology touted in mechanics' institutes.¹²² His medical disciple J. H. Green conspicuously rested his antitransmutatory and antidemocratic arguments on the same philosophic base. He insisted that power for change could only emanate from “above”—from God in the event of organic progression, from the king in the case of constitutional reform.¹²³

Respectable geologists were equally concerned to distance themselves from the flaming democrats—often in such a way as to leave little doubt of their familiarity with the radicals' meliorist rhetoric. The gentlemanly Charles Lyell loathed “mob-rule” and union attempts to destabilize society. (Violence was never far away; his sisters had actually been threatened by gangs of “reformers” during the Reform Bill crisis.) The faith in human “dignity” that informed Lyell's social and religious outlook entered *Principles of Geology* as an antileveling insistence on mankind's high estate, and a timely reminder to rebellious workers that man's lot was divinely instituted. He argued that a naturalist seduced by “visionary” Lamarckism would slide on a downward path:

[H]e gives the rein to conjecture, and fancies that the outward form, internal structure, instinctive faculties, nay, that reason itself, may have been gradually developed from some of the simplest states of existence,—that all animals, that man himself, and the irrational beings, may have had one common origin; that all may be parts of one continuous and progressive scheme of development from the most imperfect to the more complex; in fine, he renounces his belief in the high genealogy of his species,

¹²¹ On Holyoake's growing contacts, see the letters from J. S. Mill, Richard Cobden, G. H. Lewes, Harriet Martineau, F. W. Newman, etc., in the Co-operative Union Library; and Royle, *Victorian Infidels* (cit. n. 6), pp. 87, 93.

¹²² Samuel Taylor Coleridge, *On the Constitution of the Church and State according to the Idea of Each* (1830; London: Dent, 1972), p. 51. David Bloor discusses Coleridge's antiradicalism in “Hamilton and Peacock on the Essence of Algebra,” in *Social History of Nineteenth-Century Mathematics*, ed. H. Mehrtens, H. Bos, and I. Schneider (Basel/Stuttgart/Boston: Birkhäuser, 1981), pp. 202–231, see pp. 207–217.

¹²³ Desmond, *Politics of Evolution* (cit. n. 4). There were even occasions of direct contact between gentlemen Tories and the radical atheists. Thus, Robert Bransby Cooper—brother of Sir Astley Cooper and uncle of the Guy's surgeon Bransby Blake Cooper, who had taken Wakley to court in 1828—was a senior magistrate in Cheltenham, where Holyoake was jailed. Cooper and his son, the prison chaplain, tried to convert Holyoake during his incarceration. Presented with a copy of William Paley's *Natural Theology*, Holyoake responded by writing *Paley Refuted*; see Holyoake, *History of the Last Trial* (cit. n. 47), pp. 15–16. On the Coopers see Bransby Blake Cooper, *The Life of Sir Astley Cooper, Bart.*, 2 vols. (London: Parker, 1843).

and looks forward, as if in compensation, to the future perfectibility of man in his physical, intellectual, and moral attributes.¹²⁴

Lyell was warning against throwing over mankind's high estate for socially reformist tonics. Earthly improvement was no substitute for divine redemption, and the radicals' meliorist promises—of heaven on earth when rank and privilege were abolished—threatened sinister social and religious consequences.

So the spread of transmutationist ideas among working men was desperately worrying to the authorities. But it was not only working *men*; by undermining the patriarchal family, socialism touched a particularly raw nerve. Thompson and Southwell, indeed all cooperators, were adamant that women should not be barred from access to knowledge, and these propagandists used Lamarckian arguments to justify female education as a step toward the creation of a socialist society. Women were acknowledged to have played a crucial role in the Owenite program and to have retained an active presence in the Halls of Science. So it is not surprising that the anonymous *Vestiges* should have been so denigrated by Adam Sedgwick and David Brewster for appealing to women.¹²⁵ The serpent was tempting Eve, and through her poisoning the family and respectable society. (It is of no matter that the author of *Vestiges* turned out to have been, not an Owenite, but a gentler Combeite reformer, Robert Chambers.) Once we understand the contemporary class uses of science and the overwhelming social threat from "below," we begin to appreciate the political worries of Chambers's conservative and clerical critics. Too often have Sedgwick's outbursts about the collapse of civil society following the spread of transmutation been dismissed as histrionics. In truth, because radical Lamarckism came wrapped in the moralistic language of all Owenite-radical literature, it sparked the same kind of basically emotional response. Indeed, Sedgwick's fears for social collapse no more than matched the insurgents' rhetorical initiatives. Since they had already juxtaposed fierce cooperative, emancipationist, and antichurch ideas, which certain demagogues then underpinned by a d'Holbachian-Lamarckian biology, a Cambridge divine could have been left in no doubt of the leveling threat to his privileged society.

CONCLUSION

John Laurent has shown how strongly evolutionary ideas were entrenched in mechanics' institutes after mid century, how they became enmeshed in Fabian

¹²⁴ Charles Lyell, *Principles of Geology*, 3 vols. (London: Murray, 1832), Vol. II, pp. 20–21; see also Leonard Wilson, *Charles Lyell: The Years to 1841* (New Haven: Yale Univ. Press, 1972), p. 320; and *Life, Letters, and Journals of Sir Charles Lyell*, ed. Mrs. K. Lyell, 2 vols. (London: Murray, 1881), Vol. I, pp. 291–292. Lyell visited New Harmony during his first American tour (1846), and was David Dale Owen's guest there for several days during the second tour: Hendrickson, *David Dale Owen* (cit. n. 112), p. 69.

¹²⁵ Michael Ruse, *The Darwinian Revolution: Science Red in Tooth and Claw* (Chicago: Univ. Chicago Press, 1979), pp. 130–131. Sedgwick first thought that a woman had written *Vestiges* and deplored this snatching at "the fruit of the tree of knowledge": J. W. Clark and T. M. Hughes, *The Life and Letters of the Reverend Adam Sedgwick*, 2 vols. (Cambridge: Cambridge Univ. Press, 1890), Vol. II, p. 85. The issues of transmutation, human dissection, and women's participation commingled in Sedgwick's indictment of *Vestiges*, in which he warned "our glorious maidens and matrons" against soiling "their fingers with the dirty knife of the anatomist," suggesting that he was aware of the socialist/Chartist terrain transmutation was expected to operate in: [Adam Sedgwick], "Natural History of Creation," *Edinburgh Review*, 1845, 82:1–85, p. 3.

socialist rhetoric, and how in many cases Kropotkin's mutual-aid thesis rather than Darwinian individualism became a labor credo.¹²⁶ It is now apparent that the linking of Lamarckian determinism and cooperative programs was demonstrable in Owenite and atheist working-class contexts much earlier in the century—before the *Origin*, and before *Vestiges*. I have argued the advantages of setting this early anti-Malthusian transmutation against a framework of emerging industrial relations. This was done that we might better appreciate its social distinctiveness, compared to, say, Darwin's Malthusian theory, with its weak-to-the-wall thesis so abhorrent to the poor. Their own progressionist d'Holbachian doctrines, by contrast, provided a potent legitimation of artisan demands for democratic change. These demands might not have been met, but this aspect of their science at least was not at fault.

¹²⁶ John Laurent, "Science, Society and Politics in Late Nineteenth-Century England: A Further Look at Mechanics' Institutes," *Soc. Stud. Sci.*, 1984, 14:585–619, see pp. 601–608.