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Corresponding interests: artisans and gentlemen in nineteenth-century natural history

ANNE SECORD*

Early nineteenth-century natural history books reveal that British naturalists depended heavily on correspondence as a means for gathering information and specimens.¹ Edward Newman commented in his *History of British Ferns*: ‘Were I to make out a list of *all* the correspondents who have assisted me it would be wearisome from its length.’² Works such as William Withering’s *Botanical Arrangement* show that artisans numbered among his correspondents.³ However, the literary products of scientific practice reveal little of the

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1 Naming correspondents as discoverers or informants in natural history texts did not detract from the author. Rather, it served to enhance the reliability of the information if associated with a reputable person and to deflect any challenge over the accuracy of information away from the author to the source of the information. For an analysis of this procedure, see Anne Larsen, ‘Not Since Noah: The English Scientific Zoologists and the Craft of Collecting, 1800–1840’, Princeton University Ph.D. thesis, 1993, 183–95.

Studies of natural history correspondence networks include, *ibid.*, ch. 7; Emma Spary’s analysis of André Thouin’s correspondence network in ‘Making the Natural Order: The Paris Jardin du Roi, 1750–1795’, Cambridge University Ph.D. thesis, 1993; Jacob W. Gruber and John C. Thackray, *Richard Owen Commemoration*, London, 1992; Dorinda Outram (ed.), *The Letters of Georges Cuvier*, Chalfont St Giles, 1980; D. E. Allen, *The Naturalist in Britain: A Social History*, London, 1976, 20–1; James Rodger Fleming, *Meteorology in America, 1800–1870*, Baltimore, 1990, 64–6; Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America*, Chapel Hill, 1992, 25–6, 34–6, 79, 126; Nancy G. Slack, ‘Charles Horton Peck, bryologist, and the legitimization of botany in New York State’, *Memoirs of the New York Botanical Garden* (1987), 45, 28–45; Susan Sheets-Pyenson, ‘Geological communication in the nineteenth century: the Ellen S. Woodward autograph collection at McGill University’, *Bulletin of the British Museum (Natural History) Historical Series* (1982), 10, 179–226.

2 Edward Newman, *A History of British Ferns, and Allied Plants*, 2nd edn, London, 1844, p. xxxii. The names of Newman’s correspondents, including artisans, appear only at the places their information is used, unlike the first edition (London, 1840), in which Newman did list those who had helped him at the beginning of the book (pp. xxxiii–xxxiv).

3 The names of two artisan botanists, George Caley and William Evans, appear in a list of correspondents at the beginning of William Withering, *A Systematic Arrangement of British Plants: With an Easy Introduction to the Study of Botany*, 4th edn, 4 vols., London, 1801, i, p. v. Even though the names of these artisans would have

workings of such correspondences and how or why they were sustained. An exchange of letters is maintained if the interests of both recipient and writer are satisfied. Withering's book tells us only that his interests were served by his correspondents; it allows us to say nothing with certainty about the interests of those who wrote to him. Published texts effectively hide the means by which the author determined the veracity of distant correspondents and also the way these informants demonstrated their credibility.

Correspondence, as part of the work of natural history, had to satisfy the same criteria of reliability as other aspects of scientific practice. Steven Shapin has emphasized the essential role of trust in science and the association of trustworthiness with gentlemen well into the nineteenth century. Gentlemen were reliable sources of information because they were 'disinterested'; ideally, their independence meant that they had no reason to lie.⁴ In the early nineteenth century, the recognition and regulation of the difficulty of presenting social and moral status in epistolary form is apparent from 'secretaries' or letter-writing manuals of the period. Like conduct and appearance of the body, letters 'should exhibit a picture of the mind'. Copybook samples of letters reflected a strict social hierarchy in which correspondents knew their place and consequently the extent of their operations within society.⁵

Problems concerning credibility arose when the moral status of correspondents was unknown or the nature of the social interaction was ambiguous. Anne Larsen has shown how the early nineteenth-century community of naturalists largely overcame these problems by developing an almost formulaic mode of correspondence, which served to establish the trustworthiness of a writer proposing an exchange of specimens, books or ideas. Codes of etiquette were followed that indicated a correspondent's respectable status.⁶ On the other hand, where the social difference between correspondents was great, as in the case of a gentleman employing a collector or negotiating the purchase of specimens from a dealer, the interaction was rendered socially unambiguous by the cash nexus. Of course, the reliability of this form of exchange was never guaranteed, but both

been unfamiliar to most readers, their lowly status is reflected by their designation as 'Mr' as opposed to 'Esq.' Similarly, later in the century Henry Baines, *The Flora of Yorkshire*, London, 1840, 130–1, distinguished between 'S. Gibson' and 'J. Nowell' (two working men) and 'W. Wilson, Esq.' and 'Sir W. J. Hooker'.

4 Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, Chicago, 1994. For the role of trust in different cultural contexts, see Diego Gambetta (ed.), *Trust: Making and Breaking Cooperative Relations*, Oxford, 1988. For gentlemanly ways of going on in nineteenth-century science, see Jack Morrell and Arnold Thackray, *Gentlemen of Science: Early Years of the British Association for the Advancement of Science*, Oxford, 1981; Jan Golinski, *Science as Public Culture: Chemistry and Enlightenment in Britain*, Cambridge, 1992; Martin Rudwick, *The Great Devonian Controversy: The Shaping of Scientific Knowledge among Gentlemanly Specialists*, Chicago, 1985; James A. Secord, *Controversy in Victorian Geology: The Cambrian–Silurian Dispute*, Princeton, 1986.

5 Despite urging that letters be written in an 'easy, familiar and engaging language', *The Complete Young Man's Companion*, Manchester, 1811, 32, advised that 'regard must be had to the rank and character of the persons to whom they are addressed; we must write to superiors with humility, modesty, decency, and respect: to equals with all the affability of innocent and virtuous friendship, in the same manner as if we were conversing together; and to inferiors with that tenderness which should distinguish our character, as men and Christians'.

6 Larsen, op. cit. (1), 307–40. The most usual way this was done was by a separate letter of introduction from a naturalist known to both sender and recipient or by the correspondent mentioning the name of a mutual scientific acquaintance.

sides understood the nature of the transaction and the status of each party was clearly demarcated by it.

In contrast, this paper explores the role of correspondence in a highly ambiguous social relationship; one that went against the forms of interaction assumed in etiquette and letter-writing manuals, and for which such guides would have been appealed to in vain. I shall consider how those correspondents whose low social status did not mark them out as disinterested free agents operated as such in natural history correspondence networks governed by gentlemanly notions of exchange.

It might be thought that paucity of evidence precludes investigation of working-class correspondents, especially in cases where there are no extant letters to an author. On the contrary, the knowledge that natural history depended on correspondence networks can be put to historical use. The names of many artisans and their geographical location can be found in nineteenth-century heroic biographical accounts of working-men naturalists. Such biographies would not exist had these artisans had no contact with gentlemen naturalists. By looking at the most likely local contacts for an artisan naturalist and then following out the most probable lines of communication from these sources, a surprising amount of information can be obtained.

My discussion focuses on a group of artisan entomologists, zoologists and predominantly botanists, concentrated in north-west England, from which Withering's and Newman's artisan correspondents came.⁷ Of course, there remains much that is not known about these particular working men. For example, although some express religious or political views, it is not possible to draw any general conclusions regarding such matters with respect to the practice of working-class natural history. The total number of artisan naturalists in any particular period is difficult to determine. What is more important for analysing their correspondence is the knowledge that in the north-west, artisan natural history was a communal pursuit. Artisans from the villages around Manchester as well as Manchester itself, but also from north Lancashire and border towns in Yorkshire, Cheshire and Derbyshire, met together regularly. This natural history network was largely oral and, deriving its sense of community from artisanal values developed in the workplace, entirely male.⁸

The collective values of artisan culture, together with those held by the community of gentlemen naturalists, will be brought to bear in my analysis of letters that passed between these two groups. I shall suggest how and why artisans entered into natural history correspondence with gentlemen and the ways in which such exchanges served the interests of both groups. Letters, I argue, reveal that cross-class management in natural history was a delicate matter. Finally, I consider the significance artisans attached to correspondence within their own natural history networks.

⁷ The most extensive biographical account of these artisans is James Cash's *Where There's a Will, There's a Way! or, Science in the Cottage: An Account of the Labours of Naturalists in Humble Life*, London, 1873. However, the middle-class ideology of individual self-help underlying Cash's portrayal of working-men naturalists has led David Vincent, *Bread, Knowledge and Freedom: A Study of Nineteenth-Century Working Class Autobiography*, London, 1981, 173, to claim, with regard to this same group of artisan naturalists, that 'there is little evidence of much personal contact between educated and self-educated botanists or geologists'.

⁸ See Anne Secord, 'Science in the pub: artisan botanists in early nineteenth-century Lancashire', *History of Science* (1994), 32, 269–315.

USES OF CORRESPONDENCE

By the beginning of the nineteenth century, as David Vincent has pointed out, 'paper was as much a part of the artisan's world as beer'.⁹ Elsewhere I have discussed the importance of beer in the circulation of artisan scientific knowledge; paper remained a more unusual means of participating in a network.¹⁰ Networks, or circuits of communication, were not unfamiliar in working-class culture: pubs operated as houses of call for tramping artisans following prescribed routes and were repositories of information about itinerant entertainers and lecturers as well as news gleaned from travellers.¹¹ Methodism also provided experience of a network with its emphasis on preachers' circuits, large outdoor gatherings and small classes organized by local leaders.¹² What increased literacy and use of correspondence offered artisans, therefore, was not so much the creation of information networks but rather the massive extension of pre-existing artisanal circuits of information.

In 1792 artisans and tradesmen established the best-known early radical society – the London Corresponding Society – with the aim of attaining parliamentary reform. At the opening meeting, eight pence was put towards paper for corresponding with like-minded groups across the country in order that 'the number of... Members be unlimited'. Such an ambition was possible because an active correspondence between provincial and metropolitan leaders allowed geographical distance to be overcome.¹³

This network largely consisted of letters passing between leaders of different districts. Local rank-and-file members, many of whom may have been illiterate, received political information and maintained their community in small meetings. Even among those able to read the contents of a communication, there were probably few capable of composing and writing a letter. There is, however, evidence that artisans and rural labourers saw communication by letter as a useful means of conveying their grievances. In these cases, letters were sent to local figures of authority and were either signed in such a way as to signify a communal complaint, or written in the names of representational figures such as General Ludd and Captain Swing. These letters, violent and threatening but also deferential, as E. P. Thompson has pointed out, served to overcome social distance.¹⁴

Thus, by the end of the eighteenth century, letter-writing and correspondence networks were employed within artisan culture to transcend both geographical space and social distance. None the less, letter-writing remained a rare activity for any individual artisan before the introduction of the penny post in 1840. As scarcity of work increasingly divided

9 David Vincent, *Literacy and Popular Culture, England 1750–1914*, Cambridge, 1989, 137.

10 Secord, op. cit. (8).

11 Eric Hobsbawm, 'The tramping artisan', in *Labouring Men: Studies in the History of Labour*, London, 1968, 34–63; Brian Harrison, *Drink and the Victorians*, Pittsburgh, 1971, 49–52.

12 R. F. Wearmouth, *Methodism and the Working-Class Movements of England 1800–1850*, London, 1937. The organization of both the radical reform movement and Chartism was based on the Methodists' organizational structure.

13 E. P. Thompson, *The Making of the English Working Class*, London, 1980, 19, 133, 147, 149, 153, 162–3, 165. Once the authorities perceived the potential political power of this correspondence network, the London Corresponding Society was condemned as seditious.

14 E. P. Thompson, 'The crime of anonymity' and 'Appendix' in Douglas Hay, Peter Linebaugh, John G. Rule, E. P. Thompson, Cal Winslow, *Albion's Fatal Tree: Crime and Society in Eighteenth-Century England*, London, 1977, 255–340.

working-class families, the volume of letters grew, but the heavy financial burden of receiving a letter tended to curb the frequency with which even close family members wrote to one another. For those inclined to be correspondents there were few visible signs that the postal service itself was a network: only major towns had post offices and there was no regular delivery service in many areas of the country.¹⁵ In 1813, the artisan botanist George Caley had to walk six miles from Chadderton to Manchester in order to post a letter.¹⁶ When possible, however, artisans did not utilize the expensive postal system.¹⁷ Instead, letters were carried by friends and travellers and often were held back until someone could effect the delivery by hand.

In contrast, the middle and upper classes increasingly used the postal system as a means of communication. By 1819, the British sent nine times as many letters as the French, which, the *Edinburgh Review* claimed, showed ‘the share which friendship, social intercourse, and the heart, have in the excess of English over French correspondence’.¹⁸ The emphasis on sympathy is important for it alerts us to the fact that the stock examples of social interaction encapsulated in letter-writing manuals offer little guidance for the ways in which correspondence actually worked and the ends it served.¹⁹ In the early 1820s, a *Family Cyclopaedia* promoted letter-writing on the grounds that ‘this medium of communication forms, next to social, personal intercourse, one of the most agreeable interchanges of intellectual ideas which can possibly be invented’. ‘Rules have been laid down for the writing of letters’, the author continued, ‘but the best rules are those which are prompted by nature, civility, and good manners’.²⁰ In 1840, the year that the penny post was introduced, with hopes for the success of the new system dependent on increased working-class use of the post, the Society for the Diffusion of Useful Knowledge bluntly stated that ‘Correspondence is the offspring of advanced civilization.’²¹

There was, however, little to suggest how the epistolary form could be used to exchange intellectual goods between polite and plebeian groups. Indeed, the very possibility of such an exchange would have seemed preposterous to many in the educated classes.²² And yet, as indicated at the beginning of this paper, we know that correspondence proved to be an

15 Vincent, op. cit. (9), 32–52; David F. Mitch, *The Rise of Popular Literacy in Victorian England: The Influence of Private Choice and Public Policy*, Philadelphia, 1992, 43–50; F. M. L. Thompson, *The Rise of Respectable Society: A Social History of Victorian Britain 1830–1900*, Cambridge, Mass., 1988, 358–9.

16 George Caley to James Dickson, 13 April 1813, Botany Library, Natural History Museum, London, Banksian Collection Manuscript, Robert Brown Correspondence, vol. 1, letter 110.

17 When possible, the upper classes also avoided payment. Before 1840, peers and MPs had the privilege of franking their own letters and would often (illegally) offer this favour of free postage to their friends. See Howard Robinson, *The British Post Office: A History*, Princeton, 1948, 113–18, 282–3.

18 *Edinburgh Review* (1819), 32, 377.

19 Amanda Vickery, ‘Women of the Local Elite in Lancashire, 1750–c. 1825’, University of London Ph.D. thesis, 1991, 128, notes that the marked differences in courtship letters of an eighteenth-century couple and those of a couple in the early nineteenth century are certainly not derived from letter-writing manuals, which hardly change between 1740 and 1840.

20 James Jennings, *The Family Cyclopaedia; Being A Manual of Useful and Necessary Knowledge*, 2 vols., London, 1821, ii, 712–13.

21 *The Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (1840), 18, 453.

22 For reasons as to why this would have been so regarded, see Steven Shapin and Barry Barnes, ‘Head and hand: rhetorical resources in British pedagogical writing, 1770–1850’, *Oxford Review of Education* (1976), 2, 231–54.

extremely effective method of interaction between artisans and gentlemen in early nineteenth-century natural history. Arguments that the scientific content of letters alone effected this cannot be supported. Martin Rudwick cautions that ‘scientific letters need careful interpretation... even if the contents were formally the same, the style and manner were invariably adapted to the particular recipient’. Arguing that letters were used to enhance the writer’s credibility, Rudwick points out that the rhetoric employed ‘was not a stylistic “extra” tacked onto the scientific content of a letter: it *was* that content itself, in the only form in which it could be effectively communicated’.²³

THE CHARACTER OF A GENTLEMAN

For gentlemen naturalists, correspondence was enormously time-consuming and expensive.²⁴ Correspondents (even highly respected naturalists) had to be chosen with care. The botanist Robert Brown involved himself in ‘no continued correspondence’ and, as cryptogamic specialist Dawson Turner complained, was tardy in responding to letters.²⁵ Yet both Brown and Turner mourned the death of the German botanist Daniel Matthias Heinrich Mohr, ‘the most liberal & pleasant of correspondents’.²⁶ In 1818, the cryptogamist William Jackson Hooker was pleased to acquire ‘a new Muscological correspondent’, a German botanist who had sent him ‘some most beautiful & quite new Mosses’. This contrasts with his complaint, some three years earlier, of the Swiss physician and botanist Johann Jacob Römer who was ‘a plague of a correspondent even to a man of leisure’.²⁷

Maintaining useful exchanges was a continual problem and the rewards and disappointments were unpredictable. In 1826, Sir James Edward Smith, President of the Linnean Society of London, confessed that on receiving a parcel of plants from an unknown correspondent he exclaimed:

‘more letters to answer! the more I write, the more I receive!’ – I had not, for some minutes, courage to open it. – But when I did, how was my tone changed! Instead of idle questions – *Ervum tetraspermum* sent as a new *Lathyrus* – &c, &c, I found such an assemblage of rarities & novelties as have rarely met my eyes; accompanied with so much excell^t. intelligence & such kind offers, as made me put every thing else aside.²⁸

23 Rudwick, op. cit. (4), 432–3. Rudwick refers to exchanges between élite geologists during the course of a controversy and distinguishes such correspondence from the deferential letters of amateurs, who, by restricting their letters to supposedly factual matters, show ‘their tacit acceptance of their proper place within the scientific world’. I argue below that the same analysis applies to deference itself.

24 It was a naturalist, J. E. Gray, who claimed to be the first to come up with the idea of a penny post in 1834 (DNB).

25 C. A. Agardh, ‘Ueber die Versammlung zu Cambridge. Charakteristik Robert Brown’s’, *Flora oder allgemeine botanische Zeitung* (1833), 2, 531–42. Quotations taken from a manuscript translation signed ‘C. A. Agardh, Lund, 15. Aug. 1833’, British Library, Robert Brown Correspondence, Add. MSS 32441, ff. 202–7. Dawson Turner to Robert Brown, 28 August 1809, British Library, Robert Brown Correspondence, Add. MSS 32439, ff. 296–7.

26 Dawson Turner to Robert Brown, 24 November 1808, British Library, Robert Brown Correspondence, Add. MSS 32439, ff. 272–3.

27 W. J. Hooker to Robert Brown, 8 November 1818 and 21 October 1815, British Library, Robert Brown Correspondence, Add. MSS 32440, ff. 203–4, ff. 87–8.

28 J. E. Smith to William Wilson, 10 May 1826, Warrington Library, William Wilson Correspondence, MS 54a.

In contrast, Hooker, who was to become well known as a ‘most admirable correspondent’, complained of the Sicilian plants he received from the naturalist and writer William Swainson in 1819. They were ‘such trash’, he grumbled, ‘that I did what I rarely do with a botanical parcel *grudged* the payment of the carriage’.²⁹ Earlier he had delayed writing to the nurseryman James Dickson because ‘it is really a hard task to wade through so much trash as he has given me & upon which I must pass my opinion’.³⁰

Natural history correspondence networks developed out of personal contacts, introductions by friends, employment of travelling collectors, and the establishment of paid natural history posts. Confined largely to the middle and upper classes, these networks reflected the hierarchical structure of English society. This was clearly perceived by the Swedish botanist, Carl Adolph Agardh, who in 1833 stated that Professor John Stevens Henslow had ‘created Botany in Cambridge’. ‘The peculiar circumstances of England have contributed much to this’, Agardh claimed, ‘for collections may be much more easily formed there than in other countries by those who have many connections’.³¹ Agardh’s remarks point to an important factor in English natural history: it was the elaborate etiquette of polite society that allowed the emergence of networks because it enabled one to know who to trust. When the social status or ‘connections’ of a correspondent were not known, time and effort had to be invested in negotiations regarding exchanges.

Claims, therefore, that correspondence rendered natural history a ‘classless’ pursuit are false. This is not to deny that some social groups were enabled to participate only through the medium of letters, but, rather, that class (like gender) was continually being confronted in correspondence and was not by this means made irrelevant or invisible.³² The reasons that made correspondence the means by which anyone could participate in natural history were the very reasons that made it problematic. Letters had no ‘place’, no social status, no way in which their contents were manifestly ‘authentic, safe, and valuable’, *unless* the writer chose to give this information.³³ Sometimes the writer’s name alone did this work. Henslow, after all, was ‘Universally esteemed on account of the acknowledged excellence of his character’.³⁴ But what if you were not one of those populating the ‘universe’ of the botanical élite, did not possess the social status or education that implied adherence to polite codes of conduct and had no ‘connections’? Above all, what if your ‘character’ was not obvious?

In the early nineteenth century the increasingly powerful middle classes challenged the notion of respectability deriving solely from social rank with their emphasis on morality,

29 M. J. Berkeley to William Wilson, 9 June 1843, Botany Library, Natural History Museum, London, William Wilson Correspondence, vol. 2; W. J. Hooker to Robert Brown, 2 February 1819, Botany Library, Natural History Museum, London, Banksian Collection Manuscript, Robert Brown Correspondence, vol. 1, letter 226.

30 W. J. Hooker to Robert Brown, 25 November [before 1818], Botany Library, Natural History Museum, London, Banksian Collection Manuscript, Robert Brown Correspondence, vol. 1, letter 223.

31 Agardh, *op. cit.* (25).

32 For the most overt claim that natural history was ‘classless’, see Lynn Barber, *The Heyday of Natural History, 1820–1870*, New York, 1980, ch. 2, especially 35–7.

33 Adi Ophir and Steven Shapin, ‘The place of knowledge: a methodological survey’, *Science in Context* (1991), 4, 3–21, on 11.

34 Agardh, *op. cit.* (25).

sobriety, duty and work. By mid-century, they had redefined a gentleman and polite society. Not so much property or birth but character came to define a gentleman. The emphasis on character was not particular to the early nineteenth century; what was new was that character increasingly denoted possession of certain highly valued moral qualities.³⁵ Since character, Samuel Smiles declared in 1859, 'is moral order embodied in the individual' and constituted 'a rank in itself', even the 'poor man may be a true gentleman'. It is 'character', Smiles insisted, that 'creates confidence in men in high station as well as in humble life' for above all other qualities, 'the Gentleman is truthful'.³⁶ Smiles's definition was the culmination of a half-century in which character was invoked to imply conformity to an agreed moral code.³⁷

The stress on moral qualities, the increasing number of undisputed gentlemen engaging in the 'trade' of journalism, for example, the extension of gentlemanly status to industrial entrepreneurs: all these contributed to the difficulty of defining precisely who was a gentleman and what constituted gentlemanly behaviour.³⁸ The dilemma was neatly put by Dion Boucicault in the concluding speech of his popular comedy of manners, *London Assurance*, in 1841:

Bare-faced assurance is the vulgar substitute for gentlemanly ease; and there are many who, by aping the *vices* of the great, imagine that they elevate themselves to the rank of those whose faults alone they copy. No, sir! The title of gentleman is the only one *out* of any monarch's gift, yet within the reach of every peasant. It should be engrossed by *Truth* – stamped with *Honour* – sealed with *good-feeling* – signed *Man* – and enrolled in every true young English heart.³⁹

It was the assumption that behaviour reflected character that underlay the nineteenth-

35 Stefan Collini, *Public Moralists: Political Thought and Intellectual Life in Britain*, Oxford, 1991, especially ch. 3; Andrew St George, *The Descent of Manners: Etiquette, Rules & the Victorians*, London, 1993; Marjorie Morgan, *Manners, Morals and Class in England, 1774–1858*, London, 1994. Of course, the aristocracy and landed gentry, who were undisputedly of gentle birth, continued to emphasize their pedigrees as the sign of their social distinction. None the less, they too were increasingly *judged* by their character. As the *Family Cyclopaedia*, op. cit. (20), i, 547, pointed out: 'A nobleman, or even a king, may, or may not be a gentleman.' For the shift towards moral evaluations within the social elite during the eighteenth century, see G. J. Barker-Benfield, *The Culture of Sensibility: Sex and Society in Eighteenth-Century Britain*, Chicago, 1992.

36 Samuel Smiles, *Self Help; With Illustrations of Character and Conduct*, London, 1859, ch. 13, 'Character – the true gentleman', 314, 328, 316, 329.

37 There were many ways of judging and developing character in the early nineteenth century. These ranged from the dominant view (culminating in Smiles's work) that character enabled one to rise above circumstances to the Owenites' diametrically opposed notion that circumstances form character, as well as phrenological schemes for developing character as revealed by one's cranial bumps, and various systems of physiognomy. This variety simply attests to the widespread preoccupation with sound individual and national character.

38 Collini, op. cit. (35), 30–2. See also St George, op. cit. (35), 37–44; Michael Curtin, *Propriety and Position: A Study of Victorian Manners*, New York, 1987, 101–25; Richard Sennett, *The Fall of Public Man*, New York, 1974, 153, 165–8. An example of the difficulty of judging gentlemanly status is provided by Charles Darwin's reaction to the news that Warren de la Rue, a manufacturing stationer, already FRS and member of the Council of the Royal Society, had been blackballed during the 1855 election of members to the Philosophical Club of the Royal Society: 'I am ... very sorry about De la Rue: he does not appear like a gentleman, but all that he says at the Council seems very gentlemanlike & nice: I would not have the blackballing of such a man on my conscience for a couple of hundred guineas: what a mortification for him.' *The Correspondence of Charles Darwin* (ed. F. Burkhardt and S. Smith), Cambridge, 1989, v, 330.

39 Dion Boucicault, *London Assurance* (The full original text (1841). Adapted and edited by Ronald Eyre), London, 1971, 87.

century preoccupation with conduct. The relation between the two 'allowed for moral judgment to be made on social grounds'.⁴⁰

The endless discussions of manners, however, were primarily concerned with how gentlemen appeared to one another and the maintenance of polite society. Being able to judge the true character of others was critical for a gentleman, as his rank *within* his own social class was determined by his 'connexions'. Edward Lytton Bulwer observed in 1833: 'there are far finer and more numerous grades of dignity in this country than in any other... Nobody being really fixed in society, except the *very* great'.⁴¹ In 1842, an article on politeness in *Bradshaw's Manchester Journal* pointed out that 'the rules established as to the external conduct of men in society' were confined to 'behaviour towards those who are considered to be in the rank of gentlemen...no system of politeness...is established...for our behaviour to those of a lower station'. In suggesting a code of conduct in dealing with social inferiors, *Bradshaw's Journal* continued:

It is not meant, that in our transactions with men of a very low station... we are to behave, in all respects, as to those who are in the rank of gentlemen. The thing is impossible, and such men do not expect it.⁴²

Thus, it appears that in the practice of daily life, possession of the moral qualities that constituted good character enabled someone from the lower orders only to get on with gentlemen, not to become one.⁴³ The application of moral judgement to social conduct did not result in describing non-gentlemen as gentlemen but rather in displacing the language of class with descriptions such as the 'deserving poor' and 'respectable artisans'.⁴⁴ As Stefan Collini points out, the term 'gentleman' remained 'a, perhaps the, central category of social discrimination'.⁴⁵

MORAL ECONOMIES OF EXCHANGE

As natural history correspondence networks grew, standards of honour were not always maintained. There is evidence that correspondence (unlike face-to-face social interaction) allowed some of the mores of polite society to be abused by its own members. Social rank was not an infallible guide to character. Gentleman naturalists could and did indulge in ungentlemanly behaviour. In 1843, H. Bellamy of Plymouth was willing to exchange specimens with the bookseller Roberts Leyland of Halifax despite 'unfairness &

⁴⁰ St George, op. cit. (35), 33.

⁴¹ Edward Lytton Bulwer, *England and the English* (ed. Standish Meacham), Chicago, 1970, 31–2.

⁴² *Bradshaw's Manchester Journal* (1841), 1, 180–2. During the class conflict of the 1840s, increasing attention was drawn to the fact that there was very little interaction between the working class and the higher classes of society.

⁴³ St George, op. cit. (35), 7, argues that 1832 was the point when 'etiquette gave way to manners and became a class-based set of rules for admitting oneself and keeping others out'. Despite the popular genre of biographies charting the rise of successful men from obscure and humble beginnings, the number of men who actually achieved this was small.

⁴⁴ Geoffrey Crossick, 'From gentlemen to the residuum: languages of social description in Victorian Britain', in *Language, History and Class* (ed. Penelope J. Corfield), Oxford, 1991, 150–78, on 160–2.

⁴⁵ Collini, op. cit. (35), 30. Both M. Jeanne Peterson, *Family, Love, and Work in the Lives of Victorian Gentlewomen*, Indiana, 1989, and Leonore Davidoff, *The Best Circles: Society Etiquette and the Season*, London, 1986, also make the point that the distinction between gentlefolk and the rest of society was the most pronounced division in the Victorian social hierarchy.

dishonesty experienced from similar correspondents, (two of whom are among the elite of the scientific world).⁴⁶ Leyland himself experienced ‘the failure of all gentlemanly feeling and conduct’ in a conchologist who had not provided information in return for valuable specimens. Another shell collector, Susanna Corrie, admitting ‘a similar mis-adventure having once happened to myself’, sympathized with Leyland and could only hope that ‘the person in question should mend his manners’.⁴⁷

Clearly, honesty was not always assured even between gentlemen naturalists. Occasional cheating, however, did not upset a network and any perceived threat to the system was eliminated by rapidly informing others of the untrustworthiness of a particular person. Because the exchanges enacted via correspondence networks were based on the assumption that a gentleman kept his word, those few gentlemen who deemed any resulting damage to their reputation would be small or worth it, could easily cheat.⁴⁸ None the less, these occasional lapses did not undermine the belief that the ‘*disinterestedness*’ of a gentleman’s situation was ‘the basis of his truth-telling’.⁴⁹ Similarly, once gentlemen moved outside their immediate spheres there were other, deeply-rooted social assumptions at play. Operatives and artisans, according to *The Gardener’s Magazine* of 1829, were occupied with only two ideas: ‘getting and expending’. The middle class was also warned about ‘the peculiar situation of menials and dependants, and the cunning, craft, and low and vulgar artifices, which such situations necessarily engender’.⁵⁰ It was this image of the working class that seemed most inimical to the culture of the scientific élite.

How, then, could artisans, whose social status did not lead gentlemen to suppose that they were trustworthy, enter into a natural history correspondence network? Moral integrity was essential for networks to function, for they held together only if there was mutual trust over exchanges of information and specimens. It therefore seems most probable that ‘character’ was seen as the way to establish credibility. That this could be applied to artisans was due to the increased emphasis on strength of character as the moral

46 H. Bellamy to Roberts Leyland, 7 November 1843, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/36. In the event, Bellamy did not engage in the proposed exchange as he did not possess sufficient duplicate specimens to do Leyland ‘justice’. Instead he offered to give Leyland some specimens in return for a donation to the Plymouth Natural History Society.

47 Susanna Corrie to Roberts Leyland, 13 December n.y., Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/74.

48 The risks were usually thought low when dealing with social inferiors or foreigners, for example, who had little power in a network to challenge a gentleman and who were unlikely to encounter the gentleman face-to-face.

49 Shapin, *op. cit.* (4), 83, 212, 223–7, 237–8. Similarly, Mario Biagioli, ‘Galileo the emblem maker’, *Isis* (1990), 81, 230–58, on 258, has shown that in seventeenth-century natural philosophy, being ‘disinterested – that is, not having one’s mind clouded by the idols of the marketplace – was a prerequisite for having credibility’. This ideal persisted in early nineteenth-century science, and according to Agardh, *op. cit.* (25), found its apotheosis in the botanist Robert Brown who, he reported, ‘appears in deed and impulse to be *science* only, and not *person*... Without vanity and without ambition, but nevertheless conscious of his own greatness, he publishes his writings, not to instruct the world, but to illustrate and advance the Science. It is indifferent to him whether they are read by the multitude, but it is not indifferent to him whether they are worthy of science and incorporated with it.’

50 J. C. Loudon, ‘Notes and reflections made during a tour through part of France and Germany, in the autumn of the year 1828’, *The Gardener’s Magazine* (1829), 5, 113–25, on 123; *Family Cyclopaedia*, *op. cit.* (20), i, 196, whose ideal reader belonged to a middle-class family with an income of £400 a year (p. xii).

will to rise above circumstances.⁵¹ As the surgeon and zoologist Edward Turner Bennett maintained in 1822:

With me a man of character is respectable whatever may be his rank in life, and one who collects with a view to Science and not to Profit I should esteem as an Entomologist.⁵²

His message is clear: it was possible to join the networks of natural history only if gentlemanly codes of conduct were followed.

From the point of view of gentlemen naturalists, artisans had to display their character before being admitted into correspondence networks.⁵³ Standard natural history texts made it obvious that naturalists corresponded regularly with one another; following this practice, artisan naturalists frequently *initiated* correspondences. Unlike middle- and upper-class naturalists, who would write to propose exchanges with one another, artisans almost always opened a correspondence with a gentleman by sending a specimen and usually asking for confirmation of its identity in return. If the specimen proved to be valuable, a gentleman might maintain the correspondence in the hope of receiving further desirable specimens. For artisans, such a correspondence provided access to information otherwise inaccessible because of social and geographical distance.

The exchange – information for specimens – was scientifically honourable because the specimen, though serving the different interests of both sender and recipient, also had an identity as a gift. The gentlemanly practice of regarding objects of exchange as gifts was of great importance for scientific reasons as it was taken to be the clearest expression of the disinterestedness of the parties involved. In addition, the reciprocal obligations associated with gifts ensured the continued circulation of natural history objects and information.⁵⁴ Indeed the social relations resulting from scientific gift exchange accounted for its widespread practice in natural history.⁵⁵ Any breakdown of this mechanism of

⁵¹ Smiles, *op. cit.* (36), 154–5.

⁵² E. T. Bennett to Roberts Leyland, 22 May 1822, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78.

⁵³ I am not suggesting that an artisan consciously set out to display his character in these natural history letters, although being judged by character would not have been unfamiliar in the world of work. A man's 'character' was encapsulated in letters of recommendation to prospective employers and was known to be a reference to his moral worth.

⁵⁴ I draw on anthropological literature for much of this analysis. Crucial to understanding the functioning of natural history exchange networks is the demonstration by Marilyn Strathern, *The Gender of the Gift*, Berkeley, 1988, 221, that gift exchange is 'the circulation of objects in relations in order to make relations in which objects can circulate'. Pierre Bourdieu, *Outline of a Theory of Practice* (tr. Richard Nice), Cambridge, 1977, 171, argues that gift exchange is distinguished from the circulation of commodities by the 'sincere fiction of a disinterested exchange', represented by the lapse of time between a gift and counter-gift. Given the epistemological importance of disinterestedness in science, we can understand the imperative for the circulation of natural history objects and information to be regarded as gift exchanges. Bourdieu allows us to appreciate why the lack of a counter-gift was regarded as tantamount to 'stealing' the original 'gift'. For further discussion of the exaggerated contrast between 'gift' and 'commodity', see Nicholas Thomas, *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific*, Cambridge, Mass., 1991, 14–22, and Arjun Appadurai, 'Introduction: commodities and the politics of value', in *The Social Life of Things* (ed. A. Appadurai), Cambridge, 1986, 3–63.

⁵⁵ Much of the literature on correspondence networks, cited in note 1, also details exchanges of specimens, etc. Robert E. Kohler, *Lords of the Fly*, Chicago, 1994, ch. 5, analyses the 'moral economy' of *Drosophila* exchanges in early twentieth-century American laboratories. Warren O. Hagstrom, 'Gift giving as an organizing principle in science', in *Science in Context* (ed. Barry Barnes and David Edge), Cambridge, Mass., 1982, 21–34, argues for the persistence of gift exchanges in modern scientific practice.

exchange threatened not only the means of judging whether knowledge was valid, but also the sense of community upon which the circulation and extension of knowledge depended. Liberality with regard to specimens was therefore one of the main ways in which participants were recognized as worthy members of the community of naturalists. And although the context of natural history exchanges may have been unfamiliar to artisans, the maintenance of similarly communal ties through giving and receiving was integral to working-class culture. Ranging from the support provided by trade unions, for example, to gifts of food and money to those in distress within a community, working-class mutual aid functioned on the basis that those who gave expected, when they were in need, to become recipients themselves.⁵⁶ Gift exchanges thus satisfied the codes of conduct of both gentlemen and artisans.

A gentleman naturalist could trust an artisan who collected specimens for reasons other than mere profit. This is not to suggest that monetary deals did not have their place in natural history; dealers were always an important source of specimens. But within knowledge-making sites such as learned societies and with regard to knowledge claims generally, the gentlemanly ethos was vigorously maintained and ‘traders in science’ were not welcome.⁵⁷ A request for money would have led a gentleman to doubt an artisan’s motives; but equally, from the perspective of the artisan, payment would have comprised his claim to be a worthy participant in natural history, since such money-based exchanges were not part of its proper practice.

Artisans brought their notions of skill, bound up with the idea of an honourable trade and fair exchange, to bear on the craft of natural history.⁵⁸ Through a display of taxonomic skill, they could claim to be part of the wider community of naturalists with whom they shared the ‘mystery’ of natural history. The mystery of a craft – that corpus of knowledge that was the collective property of the trade – was central to artisanal notions of community. This community was protected and maintained by workers who regarded their labour in terms of ‘the moral categories of custom’ rather than ‘the economic categories of the market’.⁵⁹ Artisan naturalists therefore scrupulously guarded their scientific honour by rejecting payment for specimens; instead, as recognition of their display of scientific skill, they wanted information, specimens and acknowledgement in return, just as gentleman naturalists expected and received.

⁵⁶ John Belchem, *Industrialization and the Working Class: The English Experience, 1750–1900*, Aldershot, 1990, 33.

⁵⁷ Adrian Desmond, ‘The making of institutional zoology in London 1822–1836: Part I’, *History of Science* (1985), 23, 153–85, on 176–7. Paul Lucier, ‘Scientists, Salesmen, and Swindlers: Geology, Chemistry, and the Rise of Scientific Consulting in the American Industrial Revolution, 1830–1870’, Princeton University Ph.D. thesis, 1994, shows how early scientific consultants had to overcome the persistent belief that selling services was a corruption of scientific ideals.

⁵⁸ For further development of this argument, see Secord, *op. cit.* (8), 291–4.

⁵⁹ Patrick Joyce, *Visions of the People: Industrial England and the Question of Class 1848–1914*, Cambridge, 1991, 90. See also Clive Behagg, *Politics and Production in the Early Nineteenth Century*, London, 1990, ch. 3. Similarly, rural workers regarded customary dues such as gleaning and the harvest home as part of their rights in return for their labour. See Bob Bushaway, *By Rite: Custom, Ceremony and Community in England 1700–1880*, London, 1982, ch. 4. For the perseverance of ‘customary prices’ well into the 1880s (even at times when the product cost more to make than it was sold for), see Thompson, *op. cit.* (13), 260–1.

Usually, gentlemen willingly complied in order that the trust they placed in artisans was not put at risk by market interests. In this way, artisans were accorded gentlemanly attributes.⁶⁰ By showing sensitivity to an artisan's pride, and awareness that payment in return for specimens reduced an artisan's role to that of a mere tradesman, gentlemen also safeguarded their own scientific interests.⁶¹ None the less, unusual delicacy was shown by the Reverend Samuel Taylor of Liverpool on learning that the Manchester warehouseman Edward Hobson was unemployed following the 1826 trade depression. Conveying the sorrow of the 'Rev^d. Gentleman' at hearing the news, Hobson's friend James Hampson continued:

I was directed to tell you to send Mr. Taylor any very fine specimens of British Mosses you may possess...for which you are to *make your charge*, which will be immediately and with pleasure paid. He observed farther, when you were better or more agreeably circumstanced, he should with great pleasure receive any botanic *present* from you.⁶²

By telling Hobson that he would accept specimens as a gift once Hobson's economic status had improved, Taylor intended a compliment, implying that he expected Hobson to act – like a gentleman naturalist – in a disinterested way.

Artisans themselves were often very aware of the notion of specimens as gifts that required favours in return. Like gentlemen, working men cultivated correspondence with those most likely to have the sorts of specimens and information they wanted. When Roberts Leyland of Halifax asked for specimens of a new moss discovered by the operatives John Nowell, John Hauworth and William Greenwood of Todmorden, Hauworth stated that his stock was nearly exhausted, but that Greenwood 'being anxious to introduce himself to so valuable a correspondent...has taken the liberty to enclose you a few specimens'.⁶³ Hauworth, himself, paid one shilling and sixpence to procure birds' eggs and nests for Leyland. Even in this case, when a cash reimbursement would have been entirely appropriate, Hauworth declared that rare specimens of birds' eggs or shells in return 'would be more prized than money'.⁶⁴

Other than the enclosure of specimens, a working-man's character was further displayed through his correspondence with a gentleman. He might mention contacts he had,

60 Conversely, Michael Shortland, 'Darkness visible: underground culture in the golden age of geology', *History of Science* (1994), 32, 1–61, on 28–37, argues that gentlemen field geologists had to assume the attributes of labourers in their investigation of caves; they consequently had to re-establish their gentlemanly status in their published works.

61 In some situations, however, gentlemen used payment in order to safeguard their scientific interests. The working-class mesmerist S. T. Hall was mortified when he was treated as a tradesman by Lord Morpeth, who sent him a fee for his mesmeric services and never accepted Hall's wish to be treated on equal terms. See Alison Winter, 'Mesmerism and popular culture in early Victorian England', *History of Science* (1994), 32, 317–43, on 335.

62 James Hampson to Edward Hobson, 5 July 1827, Botany Department, Manchester Museum, Edward Hobson's Botanical Correspondence, 138 (emphasis mine).

63 John Hauworth to Roberts Leyland, 12 February 1837, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78. The value of the moss in question was clear to the men as they had already sent some to the bryologist William Wilson. They had little left because Wilson had been 'desirous that we send him a good supply. And owing to his kind liberality in sending us a good number of species of very rare British mosses we have acted in accordance to his wishes' (ibid.).

64 John Hauworth to Roberts Leyland, 16 October 1837, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78.

including other artisans who were already known to the naturalist in question. In this, artisan correspondence resembled that of the upper classes. The impoverished John Sim, who had been a herdsboy then militia man in Perth, Scotland, took the 'liberty' of sending a moss to the gentleman bryologist William Wilson of Warrington because 'my worthy friend Mr. John Nowell of Todmorden' (an operative well known to Wilson) was uncertain of its identity. Sim applied for help from Wilson 'not from want of interest in this most beautiful and interesting race of plants but from being a very poor man and unable to procure any work upon British Bryology'.⁶⁵

Sim's self-introduction also highlights the most striking difference between the letters of artisans and those of gentlemen: namely, that artisans often included biographical information involving direct reference to their personal circumstances.⁶⁶ This was in fact the only way in which an artisan could identify himself. In artisan culture, status and worth derived not from who you were but from what you did. Or, rather, who you were was equated with the skill you possessed. Hence the artisanal practice of associating people with their craft rather than their names; the joiner Thomas Whittaker, for example, was commonly known as 'Tom Joiner'.⁶⁷ From a gentleman's perspective, these personal disclosures were taken to demonstrate an artisan's candour about his own social station as well as suitable deference for the status of gentlemen naturalists. William Wilson, for example, was impressed by the 'entirely self taught' handloom weaver and botanist John Martin, who 'so exactly avoided the opposite extremes of fawning an abject humility, and half learned impudence'. Martin confessed his poverty 'without shame' and his first letter was 'unstudied & open hearted'.⁶⁸

The Reverend Samuel Taylor's direct reference to Hobson's financial difficulties was not therefore an unusual aspect of Hobson and Taylor's relationship. On the contrary, because gentlemen insisted that science be pursued in a disinterested way, they believed artisans demonstrated that they *were* disinterested through reference to personal circumstances which would normally be assumed to indicate otherwise. This is all the more striking because artisans were using a medium of communication that could effectively be used to

65 John Sim to William Wilson, 15 August 1864, Botany Library, Natural History Museum, London, William Wilson Correspondence, vol. 10. Mentioning other artisan naturalists was more common later in the nineteenth century as they became better known through natural history publications. Had he known of Nowell and Wilson's acquaintance no other way, Sim would have seen Nowell's name in Wilson's *Bryologia Britannica*, London, 1855, which he was loaned for a short period.

66 Gentlemen, of course, did this implicitly by mentioning 'connections' or by relying on letters of introduction, which established them as people whose word could be trusted. Perhaps it was abuses to the system that led to more explicit statements concerning gentlemen later in the century. In 1861, Robert Davies introduced Peter Inchbald (well known to several naturalists) to William Wilson, with whom Inchbald hoped he might 'occasionally communicate... by letter', explicitly stating that Inchbald 'is in independent circumstances' (Robert Davies to William Wilson, 9 July 1861, Botany Library, Natural History Museum, London, William Wilson Correspondence, vol. 4).

67 *Manchester Guardian*, 21 December 1850, 5. Whittaker's trade as a joiner is given in *The Gooseberry Growers' Register*, Blackley, 1850, 183.

68 William Wilson to W. J. Hooker, 19 July 1831, Royal Botanic Gardens, Kew, Directors' Correspondence, vol. 6, letter 346. In this case, Wilson's opinion was based on a meeting with Martin as well as on his letter and specimens. In addition, Wilson's servant, who had been taught by Martin at Sunday School, testified to Martin bearing 'an excellent character' within his own community.

hide the circumstances of the writer.⁶⁹ Artisans made reference to their personal circumstances in order to explain why they had to apply to gentlemen for assistance. Correspondence, in fact, accentuated class differences in order to establish credibility.

How, then, did artisans overcome the consequences of revealing their social status and adopt the role of 'naturalist' rather than that of weaver, shoemaker or blacksmith in their interaction with gentlemen? In analysing this issue, it can be seen why the practice of natural history has been regarded as transcending class and represented as open and democratic. Artisans could not correspond with gentlemen naturalists unless they were familiar with Linnaean nomenclature rather than common plant and animal names which varied from place to place and often involved dialect words. The accessibility of the Linnaean system enabled even uneducated participants to *share* a classificatory language. By this means, artisans and their social superiors could exchange scientific information without class getting in the way. It is difficult to overemphasize the importance of this at a time when class division was perpetuated by theories of language. Grammar, moral worth and class were interconnected because language was believed to reveal the mind: as late as the 1840s it was thought that vulgar language indicated that one was morally and intellectually unfit to participate in polite culture.⁷⁰ Refined language, however, had the power to 'transcend... nature, class, and identity'.⁷¹ It is in this sense that the Linnaean nomenclature allowed artisans to participate in natural history.⁷²

Having revealed personal circumstances, social differences between artisans and gentlemen naturalists were then minimized by the use of a standardized taxonomic apparatus. Thus the weaver and gardener John Mellor could communicate in written form without the aid of standard grammar or spelling and at a time when he admitted 'I ham in hast' because of the ease with which he employed Linnaean names.⁷³ It was precisely because the use of 'hard to be acquired' scientific names was essential 'in running the race of science', that an '*unlearned* student' deplored changes in ornithological nomenclature. His concern was not hostility towards new classificatory systems but, rather, 'anxiety for the establishment of an undisputed and *fixed* nomenclature'.⁷⁴

69 Letters were successfully used in this way by the 'literate swindler', especially after the introduction of the penny post. Kellow Chesney, *The Victorian Underworld*, Harmondsworth, 1972, 289, notes: 'A well-drafted letter in an educated hand still carried a strong presumption that the writer must be a respectable man, and it was a fine way of obtaining things on false pretences.'

70 Olivia Smith, *The Politics of Language 1791–1819*, Oxford, 1984, especially 4–5. See also Vincent, *op. cit.* (9), 82.

71 Smith, *op. cit.* (70), 22.

72 I do not mean to imply that classificatory systems themselves transcend class and identity. With respect to the Linnaean system, recent work has revealed its social and political underpinnings and uses. See Janet Browne, 'Botany for gentlemen: Erasmus Darwin and *The Loves of the Plants*', *Isis* (1989), 80, 593–621; Londa Schiebinger, 'The private lives of plants: sexual politics in Carl Linnaeus and Erasmus Darwin', in *Science and Sensibility: Gender and Scientific Enquiry, 1780–1945* (ed. Marina Benjamin), Oxford, 1991, 121–43; Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation*, London, 1992, 24–35.

73 John Mellor to Roberts Leyland, [20 May n.y.], Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78.

74 Carlo Cyffin, 'Correspondence to the editor', *Analyst* (1835), 3, 289–90. I am grateful to Gordon McOuat for this reference. For an analysis of debates over nomenclature and the 'value' of names, see Gordon McOuat, 'Species, rules and meaning in early nineteenth-century natural history', *Studies in History and Philosophy of Science* (forthcoming).

However, the ability to participate by the use of uniformly understood terms did not mean that issues of class and social power disappeared.⁷⁵ Unlike other scientific disciplines in which lowly assistants were 'invisible' in published accounts, authors of natural history texts maintained and conferred authority by making the names of all contributors extremely visible. None the less, the social status of participants was apparent from the titles they were given – 'Mr', no title at all, or descriptive phrases such as 'an intelligent operative' for those of low social standing, and 'Esq.' or titles of profession or honour further up the social hierarchy.⁷⁶

For their part, artisans made clear the responsibility they felt should be shown by those with the power to publish scientific works. The weaver botanist Martin, who had 'a considerable tinge of the Lancashire dialect', made plain his view that botanical accuracy was more important than correct use of the English language. After complaining to Wilson of the 'injury' he had received from the 'bad figures' in Sowerby and Smith's *English Botany*, especially that of a sedge, *Carex elongata*, 'to which neither Sir J. E. Smith in his English Flora nor Professor Hooker in his British Flora refers!', he defiantly concluded his letter: 'I shall make no apology for bad writing, bad grammar, or bad anything, for if such men as Sir J. E. Smith & D^r. Hooker have their imperfections, well may I have mine!'⁷⁷

DEFERENCE, INDEPENDENCE AND OBLIGATION

By emphasizing their personal circumstances, artisans revealed to gentlemen why correspondence was the only means by which they could obtain information and/or specimens. George Crozier, saddler in Manchester, wrote to the expert Wilson on the grounds that in trying to complete his moss collection on which he had been 'industriously engaged in my leisure hours', he had gone as 'far as it is practicable for a man to do in my station of life'. Despite the aid of the shoemaker botanist Richard Buxton, Crozier still had some mosses 'too hard for us to make out at all events we do not like to be possessive without some higher authority'.⁷⁸

⁷⁵ As Pierre Bourdieu, *Language and Symbolic Power* (tr. Gino Raymond and Matthew Adamson), Cambridge, Mass., 1991, 242, points out, 'even if the specifically symbolic power of naming constitutes a force which is relatively independent of other forms of social power', it is never completely independent of the social positions of the parties involved in the struggle for the preservation or transformation of a particular field.

⁷⁶ For the invisibility of assistants, see Shapin, *op. cit.* (4), ch. 8; Otto Sibum, 'Reworking the mechanical value of heat: instruments of precision and gestures of accuracy in early Victorian England', *Studies in History and Philosophy of Science* (in press). I have derived evidence of the status of informants in natural history texts primarily from botanical literature, but see Larsen, *op. cit.* (1), 190–2, for the same process in operation in entomological publications.

⁷⁷ John Martin to William Wilson, 19 June 1831, Warrington Library, William Wilson Correspondence, MS 53. For the comment about Martin's speech, see William Wilson to W. J. Hooker, 15 October 1831, Royal Botanic Gardens, Kew, Directors' Correspondence, vol. 6, letter 347.

⁷⁸ George Crozier to William Wilson, 30 April 1843, Warrington Library, William Wilson Correspondence, MS 52. From the way in which Crozier described his circumstances to Wilson, it would be difficult to tell that not only had Crozier supplied Wilson with specimens in the past but was also known personally to him. The only indication of this in the letter is Crozier's statement that knowing Wilson's 'kindness & willingness to help in times of need I have made bold to submit a few specimens to you begging you will have the kindness to look them over & write your opinion of them'.

The difficulty for artisans in ‘making out’ specimens lay in the inaccessibility of collections and expensive natural history monographs essential for the process of classification.⁷⁹ Private collections were kept in the homes of gentlemen and many so-called public collections were available only to members of the learned societies in which they were kept. Museums and libraries were rarely open to the working class. Until 1838 the problem was particularly acute in Manchester. The naturalist John Edward Gray of the natural history department of the British Museum deplored the exclusive nature of the Museum of the Manchester Natural History Society. It was this, he claimed, that led to his receiving requests from artisans in Manchester to compare ornithological specimens with those in his care:

Some of these persons, who generally appeared to be workmen, stated, as an excuse for what they considered an intrusion on my time, that they, or their friends, could not make the comparisons in their own town, though its museum contained a good collection of British birds, &c., as no resident was allowed to visit the Museum but members of the society, and that the members were elected by ballot, so that there was no hopes of their being admitted, even if they could afford to pay the subscription.⁸⁰

From the perspective of artisans, the only ‘public’ resources available to them were, in effect, the élite naturalists *themselves*. Like the master of a craft, an expert naturalist was believed to have a duty to pass on his knowledge. As William Bentley, blacksmith in Royton, wrote to Hooker in 1846:

It is with some little diffidence that I approach you through the medium of this paper...but we tiny labourers in the extensive field of Botany have no one else upon whom to look, we consider you as the father of the Science to whom must be submitted all our difficulties.⁸¹

Three years earlier Bentley had applied to Hooker (by this time ‘Sir William’ and Director of Kew Gardens) for information on books and microscopes, begging him to pardon his ‘assurance in presuming to address a Gentleman of your rank and celebrity in Society’. Bentley’s deferential opening paragraph was carefully composed and, possibly inadvertently, copied twice at different points in his letter. Its tone and Bentley’s expression that he feared Hooker’s engagements were ‘such as to preclude the possibility of a reply’, were designed precisely to prompt a response. Bentley’s sentiments and expectations are better revealed in a postscript crammed in at the bottom of his letter: ‘write if possible at your earliest convenience no room for appologies’.⁸²

79 Sometimes geographical distance alone presented the same problem for gentlemen. One of the reasons Hooker gave in the 1830s for wanting to leave Glasgow, where he had amassed an enormous private herbarium, was that ‘so little use is made by others of my extensive collections & Library’ (W. J. Hooker to Robert Brown, 13 February 1838, British Library, Add. MSS 32441, ff. 328–9). Close to London, Hooker’s collections would become more useful because of the ease of access.

80 John Edward Gray, ‘Some remarks on museums of natural history’, *Analyst* (1836), 5, 273–80, on 274. I am grateful to Gordon McOuat for this reference. The Manchester Natural History Museum did not admit non-members until 1838, when visitors were allowed in for one shilling, and school children and members of the working class for sixpence each (Benjamin Love, *Manchester As It Is*, Manchester, 1839, 125).

81 William Bentley to W. J. Hooker, 21 January 1846, Royal Botanic Gardens, Kew, Directors’ Correspondence, vol. 24, letter 62.

82 William Bentley to W. J. Hooker, 20 February 1843, Royal Botanic Gardens, Kew, Directors’ Correspondence, vol. 19, letter 86. Letter-writing manuals advised readers never to use a postscript when writing to a superior.

The role of deference in artisan correspondence with gentlemen is not so much indicative of artisans' sense of scientific inferiority as of a complex functioning of moral obligations between social classes. Patrick Joyce argues that in order to understand the dialectical nature of deference, not only do we need to look at those who exercised authority but also 'we need to know what deference meant to the object of the "deferential relationship"'. Deference is 'the social relationship that converts power relations into moral ones, and ... establishes stabilisation by means of the superordinate's ... management of the opposing tensions of differentiation from and identification with the subordinate'. Deference, in short, 'was seen to be the natural exchange for paternalism'.⁸³

Although Joyce's arguments are developed as part of his analysis of the social stability of the factory in mid-nineteenth-century Lancashire, there are closer links to the role of artisans in correspondence networks than might at first appear. The paternalism of factory owners fostered deference through a sense of community making possible the identification of worker and master. In natural history one of the main ways in which a sense of community was produced and maintained was through correspondence networks. Once writing a letter – even though the interaction involves only two people – is viewed as participation in a community, there is much in Joyce's analysis that is relevant to interpreting Bentley's letter. Bentley acknowledged the large social divide between himself and Hooker – a gentleman of 'rank and celebrity in Society' – and made explicit Hooker's paternalistic role in the community of natural history by referring to him as the 'father' of botany. By reminding Hooker of his role, Bentley clearly indicated the moral obligation Hooker was under to respond.

But Bentley's deferential tone did not necessarily imply dependence, which Joyce argues was the 'bedrock' of deference.⁸⁴ Artisans were renowned for their independence and Bentley's deference to Hooker is not perhaps so much indicative of subservience as an 'understanding' of the mutual obligations and reciprocal interests that artisans believed should obtain between masters and men in the same craft.⁸⁵ In this sense, artisans invited

83 Patrick Joyce, *Work, Society and Politics: The Culture of the Factory in later Victorian England*, Brighton, 1980, 92–4.

84 Joyce, *op. cit.* (83), 80. Joyce cautions that deferential behaviour in the 1840s should not be regarded as the 'embourgeoisement' of sections of the working class nor as passive acceptance of the difference in social ranks, by claiming that 'deference was an aspect of the class relationship ... with sufficient power ... greatly to erode the consciousness of conflict but never to displace it' (p. xvi). Neville Kirk, *The Growth of Working Class Reformism in Mid-Victorian England*, London, 1985, 18, points out that Joyce's underestimation of the independence of workers and his close attention to paternalistic employers has led to his accepting 'a view of social reality as presented from the big house'. For a similar critique of paternalism leading to a description of social relations as seen from above, see E. P. Thompson, *Customs in Common*, London, 1991, 21–4. Richard Price, *Labour in British Society*, London, 1986, 11, argues that: 'it is the presence of differing quantities and types of "subordination" and "resistance", of "class consciousness" and "class co-operation", of "hegemonical" influences and "independence", that composes the character of the wider structures of social relations ... The trick for the historian is to see how they operated as a process without losing sight of the historical transience of their particular forms.'

85 Clive Behagg, *op. cit.* (59), 71–8. 'Understandings' were collective, unwritten, informal work practices based on custom and central to work organization, which reveal 'a labour-oriented perception of social order' (*ibid.*, 123). See also Patrick Joyce, 'Work', in *The Cambridge Social History of Britain 1750–1950* (ed. F. M. L. Thompson), 3 vols., Cambridge, 1990, ii, 165–6.

gentlemen naturalists to behave as part of the working community because they depended on the labour of field naturalists. Bentley's independence is borne out by his recommending – albeit 'with all deference' – improvements Hooker could make to his botanical work to render it more accessible to beginners. Although Bentley did provide Hooker with information about rare plants, his deferential tone may also have been due to his acting as the representative of several artisans embarking on the study of mosses who wanted information about Hooker's cryptogamic books. 'I am', he told Hooker, 'made the drudge of our small knot of young would be Botanists'.⁸⁶ This contrasts with Hobson's characterization of himself and some fellow artisans as 'pretty much Masters' of botany.⁸⁷ Most letters from artisans display their expertise in finding, and knowing that they had found, rare or new specimens.⁸⁸

No matter what the meaning of deference to the deferential object, Joyce is certainly right that the moral significance of a deferential relationship was effective only if both sides thought the other was playing the game. Failure on the part of gentlemen to fulfil what artisans saw as their moral obligations quickly resulted in the disintegration of deference.⁸⁹ It is, of course, at such moments that the power relations underlying the moral ones become most apparent. This is particularly clear in an extraordinary exchange of letters between the farrier and weaver George Caley and Sir Joseph Banks in the 1790s. This correspondence has been characterized by David Mabberley as 'a stormy and sometimes almost insolent one'.⁹⁰ However, it is important to analyse the function of Caley's rudeness of manner and the way in which Banks managed the situation. Thus, we shall see, while Bentley's letters of the 1840s *appear* more deferential than those of Caley, this impression is misleading.

Ignorant of the gentlemanly etiquette of letter-writing, Caley, fired with enthusiasm for botany and entomology, wrote directly to Banks in 1795 asking for botanical employment, which, he claimed, 'would raise my spirits to the highest pitch'. 'As for my bringing up I hope you will excuse, which was in the stables and... quite reverse to the study of nature.'⁹¹ In response, Banks offered Caley several gardening posts in London botanic gardens to prepare, as Caley understood it, for botanical travel abroad at government expense. Although Caley left his job after a couple of years, declaring it to be a useless

86 William Bentley to W. J. Hooker, 21 January 1846, Royal Botanic Gardens, Kew, Directors' Correspondence, vol. 24, letter 62. There is almost the hint that writing to Hooker was regarded as a chore. Bentley was probably secretary of the artisan Royton Botanical Society before becoming president in 1848.

87 Draft letter from Edward Hobson to Joseph Henderson, 18 April 1826, Botany Department, Manchester Museum, Edward Hobson's Botanical Correspondence, 141.

88 Natural history collecting and taxonomy rank so low in the scientific pecking order – possibly because of the democratic nature of the Linnaean system – that it is important to stress how much knowledge was needed in order to recognize specimens that were different or interesting. As indicated earlier, botanists like Sir J. E. Smith had little patience with those who sent him common specimens believing them to be something new. For a discussion of whether natural history collecting is science, see James R. Griesemer and Elihu M. Gerson, 'Collaboration in the Museum of Vertebrate Zoology', *Journal of the History of Biology* (1993), 26, 185–203, on 202.

89 Joyce, *op. cit.* (83), 93–4.

90 D. J. Mabberley, *Jupiter Botanicus: Robert Brown of the British Museum*, London, 1985, 40.

91 George Caley to Joseph Banks, 7 March 1795, Botany Library, Natural History Museum, London, Dawson Turner Correspondence (DTC), 9, 201–2.

training for botanical collectors, he none the less believed that Banks betrayed his trust by selecting someone else to go on a voyage to Botany Bay. Caley was particularly disappointed because, he claimed, he had refused an offer from another prospective patron on the grounds that his acceptance would have caused 'great offence' to Banks. Writing from Lancashire, Caley used the medium of a letter to express himself in a way he could never have done in a face-to-face interaction. 'I am going to tell you the injury that you have done me', he declared to Banks.

You, that are a person of a great character, who I always understand was at the head of Science, its chief promoter, You that visited unknown parts with the immortal Cook, You that I fully depended upon, as the fittest person to put my hard gained knowledge into execution, You I looked upon as the properest person of judging the few abilities that I am endowed with, has done me more injury than any other man living! – nay, I may truly say, than all mankind besides.⁹²

Having earlier told Banks that he did 'not wish for any more interest than what merit will entitle me to',⁹³ Caley's attack again made plain the terms of his relationship with his patron. In challenging Banks to make amends for the injury he had caused, Caley explicitly taunted Banks to recognize his botanical skill: 'I scorn to be entitled by interest alone'.⁹⁴

Despite Caley's threat that it was in his power to 'degrade' Banks's character, this was a challenge that Banks could safely ignore. Caley was not a gentleman, and had no power whatsoever to dishonour a Baronet, President of the Royal Society and friend of King George III. Indeed, by taking up the challenge of a social inferior Banks would have dishonoured himself. Caley, however, as his insistence that he be judged by his botanical talents alone implies, did not expect his attack to be regarded as a challenge from a social equal. Rather, his exchange with Banks can be seen as the natural history equivalent of the threatening letters of the labouring poor reminding the rich of their duties. As E. P. Thompson pointed out in his analysis of these letters, 'the imprecations and the vehemence are the other side to the medal of deference'.⁹⁵ In the end, Caley performed valuable service as Banks's personal collector in the unruly convict colony of New South Wales in a position that satisfied the honour of both parties.⁹⁶ Banks could not have more clearly indicated the vast gulf separating Caley from aristocratic society than when thanking Philip Gidley King,

92 George Caley to Joseph Banks, 23 August 1798, Botany Library, Natural History Museum, London, DTC, 11, 37–43.

93 George Caley to Joseph Banks, 12 July 1798, Botany Library, Natural History Museum, London, DTC, 11, 6–8.

94 George Caley to Joseph Banks, 23 August 1798, Botany Library, Natural History Museum, London, DTC, 11, 37–43.

95 E. P. Thompson, *op. cit.* (14), 306. Caley, unwilling to suffer any more 'injury', issued an ultimatum to Banks: 'if you do not answer this letter within ten days... I shall consider you as not acting in a proper manner, and shall think myself at liberty... and, if ever I am able... I will return you the money which you have given me, even the postage of the letters' (George Caley to Joseph Banks, 23 August 1798, Botany Library, Natural History Museum, London, DTC, 11, 37–43).

96 Caley's refusal to train in botanic gardens made it impossible for Banks to recommend him for government support. In exchange for complete freedom to collect as he saw fit, Caley remained ten years in Parramatta in a position and at a wage (15 shillings a week) that no gentleman would have tolerated. For the social conditions of New South Wales at this time, see Robert Hughes, *The Fatal Shore*, New York, 1988.

Governor of New South Wales, for bearing with Caley's behaviour. Had Caley 'been born a Gentleman', Banks remarked to King, 'he would have been shot long ago in a Duel'.⁹⁷

Caley was notorious for not possessing 'politeness of manner' as he himself acknowledged.⁹⁸ However, even much later in the nineteenth century, artisans had effective ways of reacting when they felt unfairly treated. Here perhaps the medium of a letter allowed them more freedom to do so than face-to-face interaction. As individual artisans became known as useful providers of information and specimens in particular localities through natural history networks, they risked exploitation. In 1865 the religious working man John Sim, well known for his botanical discoveries, saw through the requests of the London specimen supplier Frederick Brocas. The near destitute Sim complained that Brocas wrote to him

repeatedly under the guise of being very pious & using a deal of very flattering compliments, but as he for ever was on the begging system I began to suspect the sincerity or rather validity of his pious pretensions... I had a begging letter again from him lately requesting me in very plain terms to collect some rare plants in my neighbourhood & send him, not in small quantity but in Hamperfuls... his request met with a very cold reception... I abhor complaining begging Christians.⁹⁹

Most artisans would have shared Sim's views and his attitude to letter writing in general. The social superiority of their correspondents was not sufficient to make working men lose sight of their own interests. As Sim stated: 'I never correspond with anyone merely for the sake of correspondence or exchange of compliments, if my correspondent cannot derive benefit from my letters nor I from his I discontinue it – time is too precious to be spent in trifling & useless correspondence.'¹⁰⁰

As well as resisting exploitation, artisans were rarely subservient in matters of natural history. While thanking Wilson for sending him a specimen in the midst of a dispute over the classification of sedges, the blacksmith Samuel Gibson stated that he could not send the plant Wilson requested in return. He had only two left but, he offered, 'should you ever be in this part and call on me I shall take pleasure in shewing it to you'.¹⁰¹ Similarly, artisans keeping specimens for fellows artisans would not give them up if a gentleman requested them. Thus the increasingly deferential tone of artisans' letters to gentlemen

⁹⁷ Joseph Banks to Philip Gidley King, 29 August 1804, Botany Library, Natural History Museum, London, DTC, 15, 73–8. Duelling was an expression between equals of an aristocratic code of honour. See V. G. Kiernan, *The Duel in European History: Honour and the Reign of Aristocracy*, Oxford, 1988. Banks's reply to Caley's initial attack, 27 August 1798, Botany Library, Natural History Museum, London, DTC, 11, 44–5, put Caley firmly in his place and was the epistolary equivalent of the 'thrashing' gentlemen were supposed to administer to their social inferiors in lieu of a duel (Harold Perkin, *The Origins of Modern English Society 1780–1880*, London, 1969, 274).

⁹⁸ George Caley to Joseph Banks, 12 July 1798, Botany Library, Natural History Museum, London, DTC, 11, 6–8.

⁹⁹ John Sim to William Wilson, 4 January 1865, Botany Library, Natural History Museum, London, William Wilson Correspondence, vol. 10.

¹⁰⁰ John Sim to William Wilson, 19 August 1864, Botany Library, Natural History Museum, London, William Wilson Correspondence, vol. 10.

¹⁰¹ Samuel Gibson to William Wilson, 21 July [1842], Warrington Library, William Wilson Correspondence, MS 52. Gibson lived in Hebden Bridge, a substantial distance from Wilson's residence in Warrington.

around the middle of the nineteenth century did not mean that their behaviour was any more submissive.

STATUS AND THE GIFT

As many artisans experienced de-skilling and exploitation by the ‘middlemen’ of merchant capitalism in the early nineteenth century, they had their own compelling reasons to establish the trustworthiness of gentlemen.¹⁰² Usually artisans did not write to eminent naturalists unless they had a new or interesting specimen to send, had exhausted other sources of information and, in the period before the penny post, could afford to pre-pay the postage costs normally paid by the recipient. The latter expense not only indicated respect for a gentleman naturalist and an unwillingness to be in someone’s debt when asking for a favour, but also ensured that gentlemen did not refuse letters because they came from unknown correspondents.¹⁰³ However, an artisan stood to lose more than the financial outlay of sending a letter. He risked appropriation of any new discovery; exploitation; or merely being ignored. When a gentleman responded generously, an artisan was palpably relieved.

Gentlemen usually sent artisans larger quantities of specimens than they received, thus emphasizing by the disproportionate ‘gift exchange’ not only their disinterestedness but also the dependency of artisans. Moreover, gentlemen acquired credit in this way from others in the scientific élite, being seen both as gracious figures in their roles as patrons as well as keepers of the boundaries surrounding scientific authority. The gentlemanly etiquette of gift exchange, however, while useful for determining the character of naturalists, was one of the ways in which the links in natural history networks were rendered most fragile. This was particularly true for artisans who had small and variable amounts of time and money. None the less, it was not solely economic inequality that produced fragility. Natural history correspondence networks were fragile because gift exchanges involve complicated power relations. Marilyn Strathern argues that in a gift economy, ‘those who dominate are those who determine the connections and disconnections created by the circulation of objects’.¹⁰⁴ Although subject to far more practical constraints than gentlemen, artisans too could wield power in this way. I shall focus on two correspondences to illuminate these points.

Edward Hobson, the warehouseman in Manchester, corresponded with Hooker from 1815 to 1830; and William Helme, cotton operative in Preston, had a brief exchange of letters with the Reverend William Kirby between late 1820 and early 1821.¹⁰⁵ A comparison

102 For artisans’ attitudes towards middlemen, see Joyce, *op. cit.* (85), 165; I. J. Prothero, *Artisans and Politics in Early Nineteenth-Century London*, Folkestone, 1979, 336.

103 Gentlemen, of course, received many letters from unknown correspondents. However, other signs would have indicated the lowly status of artisan correspondents: quality of paper and ink, penmanship and, before the advent of envelopes, the seal of a letter.

104 Strathern, *op. cit.* (54), 167.

105 Although William Helme, John Nowell and Jethro Tinker were factory workers, they had originally been handloom weavers. John Rule, ‘The property of skill in the period of manufacture’, in *The Historical Meanings of Work* (ed. Patrick Joyce), Cambridge, 1987, 99–118, on 115, stresses that artisan attitudes persisted into new work contexts and that such men can be regarded as ‘factory artisans’.

indicates the limitations and rewards involved. Hobson sent Hooker a new moss in 1815 and it was this that 'produced a correspondence'.¹⁰⁶ Initially, it was Hooker who was anxious that the connection be maintained. He was relieved to receive a reply to a parcel he had sent several months earlier, telling Hobson that he feared 'that something had happened which would prevent my receiving plants from you in future'.¹⁰⁷ Hobson continued to supply mosses to aid Hooker's preparation of the *Muscologia Britannica* of 1818, requesting specimens in return and engaging Hooker in discussions of the identification of plants. This was greatly aided by Hooker's move to Glasgow in 1820 because Hobson's employer made regular trips to the town and was willing to carry parcels on their behalf. Eventually Hooker encouraged Hobson to issue, in two volumes, sets of dried mosses arranged according to Hooker's monograph. Hooker extended his patronage by actively promoting Hobson's work.¹⁰⁸

Postal costs combined with the intricacies of gentlemanly etiquette posed particular problems for Helme, who opened his correspondence with Kirby with a request for help with insect identification.¹⁰⁹ 'You will, I hope, pardon me for presuming to trouble you', he wrote, 'as I am only a poor man of little learning, by trade a cotton-weaver, with a wife and a family of small children; but... have made myself acquainted with many of the natural productions of this neighbourhood'.¹¹⁰ After hearing that the 'first entomologist of our country' was willing to help, Helme sent both insect and plant specimens to Kirby but was ever anxious about minimizing the costs of receiving anything in return. He eventually conceded to Kirby that 'our great distance will not admit of such correspondence'.¹¹¹

Helme's admission came at a striking point in their exchange. The onus was on Helme to send insects of particular interest to Kirby who, as recipient, would be responsible for paying for the carriage of the parcel. However, Helme held back precisely for this reason. He had just received a parcel from Kirby, the postage for which, it appears from the tone of Helme's letter, had been prepaid. Helme could not afford to pay for the carriage of a box to Kirby. Moreover, he knew that anything he sent would put Kirby under an obligation to respond with yet more specimens. Helme therefore closed off this possibility by referring to the contents of Kirby's box as 'presents particularly instructive to me' and offering only his 'sincere thanks' in return.¹¹²

106 William Wilson's 'Greenfield Memoranda', on the back of a letter from Mr Christy, 14 June 1832, Warrington Library, William Wilson Correspondence, MS 52.

107 W. J. Hooker to Edward Hobson, 27 October 1816, Botany Department, Manchester Museum, Edward Hobson's Botanical Correspondence, 153.

108 Hobson's sets of mosses (*Musci Britannici* (exsiccatae), 2 vols., Manchester, 1818, 1822), were announced in W. J. Hooker and Thomas Taylor, *Muscologia Britannica; Containing the Mosses of Great Britain and Ireland, Systematically Arranged and Described*, London, 1818, p. x; 2nd edn, London, 1827, pp. xxvi-xxvii.

109 The correspondence between Helme and Kirby is known only from the extracts of letters from Helme published in John Freeman (ed.), *The Life of the Reverend William Kirby*, London, 1852, 357-63. Freeman mistranscribed Helme's name as 'Holme'. Letters in other manuscript collections are clearly signed 'Helme' and an obituary in the *Manchester Guardian*, 19 April 1834, 3, also bears this name.

110 Freeman, op. cit. (109), 357.

111 Freeman, op. cit. (109), 358, 362.

112 Freeman, op. cit. (109), 362.

By considering specimens and information as gift exchanges, gentlemen naturalists extended the obligation of all members of a correspondence network to behave in like manner. However, gentlemen implicitly recognized that an artisan's capacity to give at all was a form of power; gentlemen's ability to give more than artisans not only encouraged the continuation of exchanges, but also served as a mechanism of control. Just as gentlemen often made clear the status of artisans in publications, disproportionately large gifts required a response from artisans acknowledging their relative status. Even after exchanging letters and specimens with Hooker for several years and having received recognition from leading botanists for his sets of dried moss specimens, Hobson responded to a parcel of books and plants from Hooker by telling him:

I find myself at a very great loss to express my sensation or find words to thank you for the present you have sent me and shall think myself for ever unable to make you a return that will in the least mitigate or Lessen the debt I shall be under to You for it.¹¹³

In contrast, as we have seen, Kirby's liberality did not produce a continued exchange with Helme. Nor does it indicate that Kirby dominated the exchange. Mario Biagioli has shown, albeit in a different historical context, that when the recipient of a patron's gift was unable to reciprocate, the gift acted as a sort of monument to the patron. By identifying the recipient with the giver, these gifts conferred status, identity and credibility. Biagioli further suggests that such considerations might be applied to 'early modern collectors' displaying often-unimpressive specimens they had received from their patrons in their natural history museums'.¹¹⁴ It was for similar reasons, I believe, that Helme, though admitting his inability to continue his correspondence, was so pleased with his 'present' from Kirby. It is even possible that Helme had not intended a continued exchange of specimens, for he had asked Kirby only for any 'cast-away duplicates', telling him 'they would be extremely acceptable, as coming from your cabinet; let them be good or bad, common or uncommon'.¹¹⁵

CONCLUSION

Artisan natural history correspondence provides a window onto class relations in a period during which there was increased scrutiny of social relations within polite society as well as the emergence of class conflict. Despite differing views of character formation and moral obligations, conduct was taken to be the means by which 'embodied moral order' was

113 Draft letter from Edward Hobson to W. J. Hooker, n.d., Botany Department, Manchester Museum, Edward Hobson's Botanical Correspondence, 159.

114 Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism*, Chicago, 1993, 40–1 and n. 101.

115 Freeman, op. cit. (109), 361. In 1822, Helme found a new contact nearer home in Roberts Leyland: 'your proposition of us keeping A little correspondence meets with my direct approbation and shall feel great pleasure in communicating and exchanging duplicates with you as I have been told... that you are an Assiduous collector of Plants Insects and shell &c which studys are the same with me' (William Helme to Roberts Leyland, 24 November 1822, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78).

displayed. In most historical evidence, behaviour or conduct appears in highly mediated forms.¹¹⁶ My aim has been to explore how we might recover the behaviour that constituted class relations between artisan and gentlemen naturalists in a community in which correspondence was the primary form of social interaction. Élite naturalists judged artisan correspondents by their epistolary behaviour: in assessing the character of these artisans they often had no more to go on than the same piece of paper that faces the historian.¹¹⁷

In looking at correspondence between artisans and gentlemen it is possible to show how issues of class were managed in order to satisfy the interests of both groups. Correspondence reveals that the ways in which artisans acquired credit were also the means by which the status of elite naturalists was maintained. However, by using exchanges of letters to illuminate class relations, it is important not to lose sight of the ways in which artisan naturalists regarded such correspondences. One danger of focusing only on those artisans who corresponded with gentlemen is that it leads to a consideration of the interests of artisans in individual terms. This obscures the way in which the contacts some artisans had with the scientific elite were communally regarded as just another link (albeit a very useful one) in their own networks. The following exchange makes this clear. When Jethro Tinker, cotton operative in Stalybridge, was unable to name 'a Fungi' sent to him by Hobson's employer Joseph Eveleigh, he sent it on to Leyland in Halifax. If Leyland was unable to identify the specimen, Tinker suggested it be sent to the blacksmith Samuel Gibson, who, he told Leyland, 'could either give it a name or is in Correspondence with D^r Hooker'.¹¹⁸ Although there certainly were solitary working-men naturalists, the sustenance of the enthusiasm for natural history throughout much of the nineteenth century by Lancashire working men lay in the strength of their own natural history community.¹¹⁹

I therefore do not mean to imply that the worth and validation of artisan natural history rested on exchanges with gentlemen and that it was these contacts that fashioned the identity of artisan naturalists. Rather, to artisans, the significance of such correspondence was not so much the creation of their identity as naturalists, but acknowledgement of roles they had already fashioned for themselves in their own natural history networks.¹²⁰ The full extent to which artisans regarded themselves as naturalists is best revealed by their correspondence with one another. In contrast to Hooker's admiration of Hobson being based partly on his knowledge of him as a packer in a warehouse and Helme's self-

116 This is particularly apparent in Joyce, *op. cit.* (83), 95, where the difficulty of evaluating the nature of the 'deferential response' lies in the lack of evidence.

117 In his study of Galileo's self-fashioning, Biagioli, *op. cit.* (114), ch. 1, carries out an 'epistolary anthropology' in order to analyse the patron/client relationship. In such cases, however, both patron and client were aware of the etiquette employed (hence the skill required of the client in establishing a relationship), unlike the interaction between artisans and gentlemen naturalists.

118 Jethro Tinker to Roberts Leyland, 22 June 1834, Calderdale Central Library, Halifax, Roberts Leyland Correspondence, SH: 7/JN/B/66/78.

119 The solitude of Scottish working-men naturalists is not just a reflection of the ideological bias of Samuel Smiles's biographies of men like Thomas Edward and Robert Dick. For the communal nature of artisan botany in Lancashire, see Secord, *op. cit.* (8).

120 Even Bentley's letter to Hooker, *op. cit.* (86), written on behalf of 'would be Botanists' indicated that artisans believed themselves capable of becoming botanists.

presentation to Kirby as a 'poor man of little learning', when Helme wrote his first letter to Hobson, he addressed him simply as a 'brother Botnist'.¹²¹

To artisans, exchanges of letters with eminent naturalists provided tangible evidence of their scientific skill and signalled acceptance by a wider community of their right to practice natural history. Artisans' pride in such correspondence was not misplaced, nor should it be diminished, because the significance to gentlemen was different.

121 William Helme to Edward Hobson, [25 March 1817], Botany Department, Manchester Museum, Edward Hobson's Botanical Correspondence, 138.