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"A little people but exceedingly wise"? Taming the ant and the savage in nineteenth-century England'

Introduction

Operating from different philosophical assumptions, Arthur O. Lovejoy and Michel Foucault have acknowledged the rise of 'biology' as coterminous with a major shift in world-view.¹ A concern with the processes and deep structure of life arose as Romanticism displaced the classical episteme. The latter, we are told, sought timeless universal laws through the application of deterministic and ahistorical reasoning. The Romantic, however, placed faith in a historicist examination of unique human observations and constructs. Some historians of Romanticism have concluded that the Romantics' tragic flaw was the belief that their methodology could be applied to all fields of knowledge, including science. As Hans Eichner has warned, we must equally resist the temptation to repeat the classical hubris. Rather than focusing exclusively on 'biology' as a neologism for the 'temporalization of nature', this paper seeks to explore continuity and change through a consideration of nineteenth-century animal behaviour studies. After all, the etymology of 'biology' forges links with 'biography'. And, as John Durant has pointed out, ethology is founded upon a sentiment similar to C.G. Leroy's declaration to discover 'the complete biography of every animal'. Although entomology and entomologists played a significant role in this enterprise, their contributions were often problematic. Endowed with an alien morphology, insects highlighted the inherent tensions between animality and humanity that plagued studies of animal behaviour.²

Throughout the nineteenth century, ants and bees were discussed at length in professional scientific journals, in various periodicals of the new higher journalism, in popular lectures to working men and women, in travel

1. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences*, English translation (London: Tavistock, 1970); and Arthur O. Lovejoy, *The Great Chain of Being: A Study in the History of an Idea* (1936; rept. Cambridge, Mass: Harvard Univ. Press, 1964). In addition, see Joseph A. Caron, "'Biology' in the Life Sciences: A Historiographical Contribution", *History of Science*, 27 (1988), 223-68.

2. Hans Eichner, 'The Rise of Modern Science and the Genesis of Romanticism', *PMLA*, 97 (1982), 8-30 (esp. 25); John R. Durant, 'Innate Character in Animals and Man: A Perspective on the Origins of Ethology', in *Biology, Medicine and Society 1840-1940*, ed. Charles Webster (Cambridge: Cambridge Univ. Press, 1981), pp. 157-92.

narratives, and in didactic children's primers. As naturalists and other commentators explicitly acknowledged, glass hives and artificial ants' nests were Lilliputian islands. They offered a transcendent and synchronic view of nature: a miniature world that could be endued with social and cultural meanings. And in the late nineteenth century, a convergence of biology and social theory played a prominent role in British thought. The publication of the *Origin of Species* was the single greatest factor behind this convergence. Like anthropology, however, myrmecological texts were not necessarily explicit statements of social Darwinism. They drew upon Enlightenment rationalism and its distinctions between instinct and reason; and they drew upon the concerns of ethnographers and physical anthropologists to delineate the customs, habits, and morphology of multifarious species, 'races', 'tribes', or varieties of ants. Like travel narratives, they often offered readers an exotic mixture of themes such as sex and slavery. As the minima of sentient beings, ants were subsumed in the social evolutionists' naturalistic, developmental framework of the history of humankind and civilization. Whereas social evolutionists denigrated non-European native peoples under the rubric of 'savage', they elevated the ant as a 'small people but exceedingly wise'. Both processes, of course, revealed more about the cultural values of the observer than the observed. Drawn from a plurality of contexts, this paper examines anthropomorphic discussions of slavery, agriculture, and gender amongst social insects. Rather than characterizing these accounts as the preserve of extra-scientific popular literature, I conclude by reflecting on the role of anthropomorphism and anthropocentrism in systematic studies of animal behaviour.

Slavery

In 1810, Genevan naturalist Pierre Huber (1777-1840) first described the manner in which Amazon (Legionary, Rufescent) Ants (*Polyergus rufescens*) launch concerted raids on the nests of Ash-coloured Ants (*Formica fusca*) to purloin pupae of the worker caste of the latter species. Taken back to their captors' nest, where they develop into their perfect form, these foreign ants assume all the duties necessary for the daily functioning of the resultant mixed community. Huber contended that, in his leisurely evening stroll of June 1804, he had stumbled upon 'a phenomenon ... opposed to what the manners of insects and other animals have hitherto offered us'; for the Amazons, a colony of soldiers, 'have but one object in their excursions, that of stealing the young from an industrious race, and making slaves of them...'. The natural history of ants revealed a 'prominent ... feature in the history of man...'.³ Following the example of William

3.P. Huber, *The Natural History of Ants*, trans. J.R. Johnson (London: Longman, Hirst, Rees, Orme, and Brown, 1820), pp. xxii, 248-345. Huber actually observed that the Amazon ants

Kirby (1759-1850) and William Spence (1782-1860), Huber's English translator, J.R. Johnson, endowed the slave ant with further cultural meaning or significance. He explained:

I shall take the liberty, when speaking of the dark Ash-coloured Ant [*Formica fusca*], occasionally to use the appellation of Negro, or Negro Ant; a term not inapplicable, when we consider the dark colour of this species, and the situation it holds in the colony, of providing for and administering to, the wants, &c. of the Amazons.⁴

This established a significant precedent for nineteenth-century discussions of ant slavery. Moreover, Huber identified the slave-making propensity in another European species of ants, the Sanguine Ant (*Formica sanguinea*). In 1854, Frederick Smith (1805-1879), entomological Assistant to the Keeper of the Zoological Collections of the British Museum (Natural History), published the first notice of the slave-making activities of the Sanguine Ants in England, after observing them in Hampshire.⁵ This report piqued the interest of Charles Darwin, who made his own exciting discovery in early 1858. He informed J.D. Hooker (1817-1911):

I had such a piece of luck at Moor Park: I found the rare Slave-making Ant [*Formica sanguinea*], & saw the little black niggers [*F. nigra*] in their Master's nests.⁶

After sending specimens to Smith for confirmation, Darwin began a series of observations on ants that lasted from May 1858 to July 1859.

In the *Origin*, Darwin evoked 'slave-making' in ants as an example of the modification of *instincts* by natural selection. By contrasting the different degrees of dependence on slaves in *Polyergus rufescens* and

captured pupae and larvae (p. 250).

4.J.R. Johnson in Huber, op. cit. (3), p. 252 f.n. For Kirby's and Spence's 'priority' in the use of 'negro ant', see Sir James A.H. Murray, ed., *A New English Dictionary* (Oxford: Clarendon Press, 1908), s.v. 'Negro, 7. In special uses, as negro ant, a blackish ant ...'.

5.Frederick Smith, 'Essay on the Genera and Species of British Formicidae', [Read 4 December 1854], *Transactions of the Entomological Society of London*, new series, 3 (1854-56), 95-135 (98-99). In a letter to Rev. William Farren White (1832-1899), dated 7 March 1878, Smith stated that he observed the slave-making instinct in the summer of 1843. See Rev. W.F. White, "'A Little People," But "Exceeding Wise"', *Leisure Hour* (1880), 698.

6.Charles Darwin, *The Correspondence of Charles Darwin*, eds. Frederick Burkhardt and Sydney Smith (Cambridge: Cambridge Univ. Press, 1983 sqq.), vii (1991), CD to J.D. Hooker, 6 May [1858], pp. 89-90. In addition, see: Frederick Smith to CD, 26 February 1858, pp. 36-37; CD to Frederick Smith, [before 9 March 1858], p. 44; and CD to Emma Darwin, [25 April 1858], p. 80. Darwin considered himself a slave to his work and his wife, and referred to himself as Emma's 'nigger'. As a term of endearment, Emma addressed him as 'My dearest N [nigger]'. See Ralph Colp Jr., "'Confessing a Murder": Darwin's First Revelations about Transmutation', *Isis*, 77 (1986), 9-32 (25 f.n. 59).

Formica sanguinea, he constructed a naturalistic developmental framework. Ancestral ants, he argued, had initially raided other nests for pupae as a food source. By chance, some of these pupae developed into their perfect worker form, and began to perform their instinctive tasks in the foreign nest. Because their presence benefited the entire colony, the gradual process of natural selection manifested itself in an increasing tendency to make raids on the nests of foreign species for the sole purpose of procuring slaves. Eventually - as in the case of *Polyergus rufescens* - an ant species developed to the point of being 'abjectly dependent on its slaves'.⁷ By 1861 Darwin was advising Henry Walter Bates (1825-1892) that 'every one cares about ants - more notice has been taken about slave-ants in the *Origin* than of any other passage'.⁸

One of the most intriguing aspects of Darwin's discussion on the 'slave-making instinct' was his attempt to delimit the metaphoric implications of his use of words such as 'slaves' and 'masters'. A long-time supporter of the anti-slavery movement, he yearned to 'see that greatest curse on Earth Slavery abolished'.⁹ The abolition of the slave trade throughout the British Empire in 1807, and the passage of the Act of Emancipation in 1833 did not obliterate the existence of the institution or its practices. The British and Foreign Anti-Slavery Society continued to campaign against the slavers of the Southern states of the U.S.A. Contemporaneous with Darwin's investigation of ants was the American religious revival, which some persons in Britain perceived to portend the abolition of slavery. The subsequent outbreak of the American Civil War highlighted the struggle between the North and South in terms of Union versus Slavery. And just as the Civil War drew to a close, the Governor Eyre controversy in Jamaica sent a rift through the Darwinian circle of scientific naturalists and beyond. Under these circumstances, Darwin had to be careful not to naturalize the human institution of slavery.¹⁰

7. Charles Darwin, *The Origin of Species by Means of Natural Selection* (1859; rept. London: Penguin Books, 1985), pp. 243-47 (247).

8. Charles Darwin to H.W. Bates, 25 September 1861, in Charles Darwin, *More Letters of Charles Darwin*, eds. Francis Darwin and A.C. Seward, 2 vols. (London: John Murray, 1903), ii, pp. 196-97.

9. Charles Darwin to Asa Gray, 5 June [1861], the Library, Gray Herbarium, Harvard University, quoted in Ralph Colp Jr., 'Charles Darwin: Slavery and the American Civil War', *Harvard Library Bulletin*, 26 (1978), 471-89 (473). Darwin, op. cit. (7), p. 244, broached the subject: 'Although fully trusting to the statements of Huber and Mr. Smith, I tried to approach the subject in a sceptical frame of mind, as any one may well be excused for doubting the truth of so extraordinary and odious an instinct as that of making slaves'. See Gillian Beer, 'Darwin's Reading and the Fictions of Development', in *The Darwinian Heritage*, ed. David Kohn (Princeton: Princeton Univ. Press, 1985), pp. 562-63.

10. See: William Baker, 'William Wilberforce on the Idea of Negro Inferiority', *Journal of the History of Ideas*, 31 (1970), 433-40; Derek Jarrett, *The Sleep of Reason: Fantasy and Reality from the Victorian Age to the First World War* (New York: Harper & Row, 1988), pp.

German freethinker Ludwig Büchner accorded slavery pre-eminence in his study of ants because 'all that has been told retires into the background as to psychological significance in the intellectual life of these animals, when we find or remember that the ants ... for an unknown length of time have had a politico-social institution which had played and still plays a great part in the history of human nations and civilization'. Büchner's materialist, evolutionary agenda encouraged him to take a more hyperbolic anthropomorphic approach to ants than most nineteenth-century naturalists, but his emphasis on slavery was not untypical.¹¹ The *Westminster Review's* discussion of ant slavery illustrated the ambiguous position of ants as miniature objects and as microcosms of human society:

Among the habits and customs of some species of ants is one which we dare not set down as a mark of civilization lest we should incur the censure of the Anti-Slavery Society....it is at least a curious coincidence that the slaves most frequently selected are *black* ants....¹²

In its short review of the *Origin*, American pro-slavery supporter Courtney Jenkins's *Catholic Mirror* (Baltimore) noted the same 'curious coincidence'.¹³ Although he was careful not to engage in such explicit parallels, Darwin perpetuated a similar comparison through one avenue

75-78; Frank M. Turner, 'Victorian Scientific Naturalism and Thomas Carlyle', *Victorian Studies*, 18 (March 1975), 325-43; and J.P. Parry, *Democracy and Religion: Gladstone and the Liberal Party, 1867-1875* (1986; rept. Cambridge: Cambridge Univ. Press, 1989), pp. 74-75.

11. Ludwig Büchner, *Mind in Animals*, trans. Annie Besant (London: Freethought Publishing Company, 1880), pp. 136-63 (136). Although the title suggests greater scope, this book deals almost entirely with the social insects (ants, bees, termites, and wasps); two short chapters are devoted to beetles and spiders. Büchner's choice of arthropodal exemplars of animal intelligence served a polemical purpose: 'our intellectual vanity will have to submit to bitter humiliation and rebuke in contemplating the proceedings - or the societies and deeds - of these unjustly despised, but yet, in spite of their minuteness, wonderful creatures' (p. viii). To place Büchner in his German context, see Alex Büchner, 'Introduction. The Life of Ludwig Büchner', in Ludwig Büchner, *Last Words on Materialism*, trans. Joseph McCabe (London: Watts & Co., 1901), pp. ix-xxiv; and Frederick Gregory, *Scientific Materialism in Nineteenth Century Germany* (Dordrecht: R. Reidel Publishing Company, 1977), pp. 100-21. After meeting Büchner at the first international gathering of freethinkers in Brussels in 1880, Annie Besant received permission to translate his works for the Freethought Publishing Company, which she and Charles Bradlaugh had established in 1877. Committed to either monism or materialism, freethinkers deployed Darwinism almost exclusively to attack the notion that mind was an ethereal spiritual substance unique to man alone. See Anne Taylor, *Annie Besant: A Biography* (Oxford: Oxford Univ. Press, 1992), pp. 61-161; and Edward Royle, *Radicals, Secularists and Republicans: Popular Freethought in Britain, 1866-1915* (Manchester: Manchester Univ. Press, 1980), esp. pp. 1-22, 94-96, 170-73.

12. 'Ants', *The Westminster Review*, new series, 61 (1882), 346-83 (358-59). In addition, see Florence Horatio Suckling, *The Ant* (London: Humanitarian League Office, 1897), p. 14.

13. 'The Origin of Species' [review], *The Catholic Mirror*, 18 February 1860, p. 4. [I thank Bill Astore for this reference.]

of his research. In both his private letters, and in the *Origin*, he distinguished the ants as household - and not field - slaves. In the *Descent of Man*, he employed the same distinction among human slaves in the Southern States to support his evolutionary theory of 'the formation of races'.¹⁴ W.F. Kirby (1844-1912), Smith's successor at the Natural History Museum, drew similar parallels:

it seems to be to some extent a matter of colour, the slave-holding ants being generally red or reddish, and the slaves brown or black; in fact, the ants keep negroe slaves, as most of the white races of man who are in contact with negroes, and have not yet outgrown the custom.¹⁵

Throughout the nineteenth century, negro slavery underpinned much of the ideologically charged discussions on race.

Intellectuals pursued various strategies to contain the unpleasant associations with human slavery. After lauding the social-democratic tendencies of the Ant Republic, Büchner thwarted cries of inconsistency by justifying the existence of slavery through reference to the use of slaves in the 'democratic republics' of Classical antiquity. Furthermore, he credited the ants with greater 'humanity' in their methods of enslavement; for they only captured pupae, which 'have never tasted the condition and the sweetness of freedom'.¹⁶ Through his own observations of *Polyergus rufescens*, John Lubbock (1834-1913) verified Huber's observation that these ants depended completely upon their slaves for survival. Without them, they were incapable of even feeding themselves. Lubbock concluded that this was 'a striking lesson of the degrading tendency of slavery'. He reiterated, however, one of the standard justifications for slavery in his discussion of the character of different species of ants. Naturally, the slave ant 'is, as might be expected, extremely timid'; and the slave-making ant 'is, perhaps, bravest of all'.¹⁷ Robert Mann (1817-1886), in contrast, contended that 'slavery' was a complete misnomer, when applied to ants. Equipped with a natural propensity to carry something, ants, he asserted, would be inclined to carry off pupae if they strayed fortuitously into a

14. Darwin, *Correspondence*, op. cit. (6), vii (1991), CD to J.D. Hooker, 13 [July 1858], pp. 129-31; and Frederick Smith to CD, 30 April 1859, pp. 87-88. Idem., *The Origin of Species and the Descent of Man*, 6th (1872) and 2nd (1874) edns. respectively (New York: Modern Library, 1936), p. 554; and George W. Stocking Jr., *Victorian Anthropology* (New York: The Free Press, 1987), p. 63.

15. W.F. Kirby, *Marvels of Ant Life* (London: S.W. Partridge & Co., 1898), p. 102.

16. Büchner, op. cit. (11), pp. 136-37.

17. John Lubbock, *Ants, Bees, and Wasps: A Record of Observations on the Habits of the Social Hymenoptera*, 17th edn. (London: Kegan, Paul, Trench, Trübner & Co., 1915), pp. 82, 26-27; idem., *Chapters in Popular Natural History* (London: National Societies Depository, 1882), pp. 35, 19-20; and idem., 'On the Habits of Ants', *The Fortnightly Review*, new series, 27 (March 1877), 292, 290.

foreign nest. Once home, 'their simple code of ethics' would guide them to nurse and rear these 'babies' as if they were their own. As superintendent of education (1859-1866) and emigration agent (1866-1886) for Natal, Mann was sensitive to the dangerous ambiguities implicit in the metaphorical language surrounding the literature on ants.¹⁸

Agriculture

As part of a much older literary tradition than ant slavery, formicarium granaries provided the single greatest impetus to nineteenth-century myrmecological investigations. Virgil (70-19 B.C.), Horace (65-8 B.C.), Pliny (A.D. 23-79), and an array of other Classical authors credited ants with the foresight to hoard up winter stores of grain in the summer. The biblical wisdom of Solomon supported the Classical texts, for *The Proverbs* enjoined:

Go to the ant, O sluggard;
consider her ways, and be wise.
Without having any chief,
officer or ruler,
she prepares her food [meat] in summer,
and gathers her sustenance [food] in harvest.¹⁹

As part of the eighteenth-century rejection of scholasticism, British and Northern European naturalists refuted the notion that ants stored grain. Observation and experimentation upon their respective indigenous ants proved the contrary. Yet the growth of the British Empire, and the concomitant desire to acquire and describe foreign species, generated a degree of caution. By the mid-eighteenth century, the idea of different geographical regions, with unique faunas and floras, was an integral part of the intellectual armoury of British naturalists. William Gould and Kirby and Spence, therefore, qualified their denial of formicarium granaries in England with an acknowledgement that 'foreign' or 'exotic' ants might amass magazines of provisions.²⁰

Evidence gathered by a colonial official in India supported their suspicions, and confirmed the truth of the Classical texts. In 1834, Lieutenant-Colonel W.H. Sykes communicated his observations to the

18.[Robert James Mann], 'Sir John Lubbock on Ants and Bees', *The Edinburgh Review*, 156 (1882), 377-409 (381-82). On Mann, see *British Biographical Archive* (London: K.G. Saur), 736: 427.

19.*Prov.* 6.6-8. See, also, *ibid.*, 30.25.

20.Rev. William Gould, *An Account of English Ants* (London: A. Millar, 1747), pp. 92-93; William Kirby and William Spence, *An Introduction to Entomology*, 7th edn. (London: Longman, Brown, Green, and Longmans, 1856), pp. 313-14; and Janet Browne, 'A science of empire: British biogeography before Darwin', *Revue d'histoire des sciences*, 44 (1992), 451-75 (esp. 455-56).

Entomological Society of London. Several years earlier, he had witnessed a species of ants - *Atta providens* - which stored grain, and dried it after the monsoons. Followed by the Rev. F.W. Hope's ambiguous use of this information to defend the *Proverbs*, Sykes's communication opened the floodgates to the subsequent literature on the harvesting ants of dry tropical and warm temperate regions of the world. Most notably, the Rev. Henry Christopher McCook (1837-1911) and John Traherne Moggridge (1842-1874) authored books on the harvesting ants of Texas and southern France, respectively, in the 1870s.²¹ As the *Westminster Review* perceptively acknowledged, the changing interpretations of the agricultural habits of ants appealed to the 'sceptical age' of the late nineteenth century. In a strange twist of irony, empirical evidence, from the periphery of the Empire, vindicated biblical and Classical sources of information. Even more ironic, the same intellectuals who affirmed biblical accounts cited this apparent foresight of ants as confirmation of the insects' possession of 'greater wisdom than was ever contemplated by Solomon'; they were 'almost on a par with the human race'.²²

Gender

Discussions of insect sex and gender proved equally fraught with metaphorical ambiguities. Whereas eighteenth- and early nineteenth-century commentators grappled with the role of the queen in the beehive or the ant colony, attention shifted to the 'workers' after about 1850. A queen had been a challenge to both patriarchalist theories of government and to the republican sentiments of Revolutionary France. Consequently, it was almost universally reinterpreted as the 'mother' of the hive or of the colony.²³ In the early decades of the nineteenth century, however, the question of gender became increasingly complex. Detailed anatomical investigations of the worker or neuter bees and ants affirmed that they were

21. Lieut.-Col. W.H. Sykes, 'Descriptions of new Species of Indian Ants', *The Transactions of the Entomological Society of London*, 1 (1834), 99-107 (esp. 103); Rev. F.W. Hope, 'On some Doubts respecting the OEconomy of Ants', *ibid.*, 2 (1837-1840), 211-13; Henry Christopher McCook, *The Natural History of the Agricultural Ant of Texas* (Philadelphia: Academy of Natural Sciences of Philadelphia, 1879); *Proceedings of the Entomological Society of London for the Year 1871*, pp. xlvii-xlviii; and J. Traherne Moggridge, *Harvesting Ants and Trap-Door Spiders. Notes and Observations on their Habits and Dwellings* (London: L. Reeve & Co., 1873), pp. 2-69.

22. 'Ants', *op. cit.* (12), pp. 347-48.

23. See Jean-Marc Drouin, 'L'image des sociétés d'insectes en France à l'époque de la Révolution', *Revue de Synthèse*, 4 (1992), 333-45, for his fascinating study of the changing fortunes of the 'queen' bee in Revolutionary France. In addition, see Frederick R. Prete, 'Can Females Rule the Hive? The Controversy over Honey Bee Gender Roles in Beekeeping Texts of the Sixteenth-Eighteenth Centuries', *Journal of the History of Biology*, 24 (1991), 113-44.

infertile or 'imperfect' females. This fact became especially significant when the commentators of genteel Victorian society confronted a perceived increase in the number of unmarried women. Employing the census statistics for 1851, Harriet Martineau raised the alarm; over half a million 'redundant' women faced no hope of marriage. In the 1850s and 1860s, a plethora of articles and pamphlets addressed the 'spinster problem'.²⁴

As social commentators and early feminists struggled to redefine woman's role in society, interpretations of gender relations amongst the social insects became laden with ideological significance. Inching towards an open espousal of conservative politics, the *Saturday Review* carried a critical review of a paper by Bessie Parkes in late 1859. Entitled 'Queen Bees or Working Bees?', the review vehemently challenged Parkes's plea for education and vocational training for middle-class girls as a palliative measure for the 'spinster problem'. Such action, claimed the reviewer, would reduce women to 'androgynous' workers; and would subvert their true destinies as married, dependent queens, who fulfilled their reproductive roles.²⁵ Although he purposely conflated the sex of the worker bee, Darwin came to the same conclusion. Contemplating the personal pros and cons of marriage in 1838, he decided:

My God, it is intolerable to think of spending one's whole life like a neuter bee, working, working, working, and nothing after all. - No, no won't do. - Marry, marry, marry.²⁶

Less than one year later, Darwin forsook the intolerable life of a neuter and married his first cousin, Emma Wedgwood.

In marked contrast, Ellice Hopkins, who played a central role in forging the sexual politics of the social purity movement, observed that among ants

sterile females...belonged to that despised class of 'old maids' by which so much useful work is done in the human as well as the insect world. It would seem as if suppressed instincts of sex in nature were intended to

24.[Harriet Martineau], 'Female industry', *The Edinburgh Review*, 109 (April 1859), 293-336. See Michael Anderson, 'The Social Position of Spinsters in Mid-Victorian Britain', *Journal of Family History*, 9 (Winter 1984), 377-93, for a quantitative analysis of the 1851 census statistics as they pertain to single women. On 'redundant women' in Victorian England, see Jane Lewis, *Women in England 1870-1950* (Sussex: Wheatsheaf Books, 1984), pp. 3-14; and Martha Vicinus, *Independent Women* (London: Virago, 1985), pp. 1-45.

25.'Queen Bees or Working Bees?', *Saturday Review of Politics, Literature, Science, and Art*, 8 (November 1859), 575-76.

26.Charles Darwin's rough notes, quoted in H.E. Litchfield, *Emma Darwin, Wife of Charles Darwin: A Century of Family Letters*, 2 vols. (Cambridge: Cambridge Univ. Press, 1904), i, p. 392.

supply the finest potential energy or stored-up force....²⁷

After a detailed exposition of the multifarious industries of these sterile females, Hopkins turned her attention to the males:

The male apparently plays that distressingly subordinate part which Nature seems to assign to him in the insect world, and which makes one wonder by what action of the environment on his feeble endowments he has developed his preposterous pretensions in higher circles.²⁸

The ants, she noted, simply starved the males after they had fulfilled their reproductive function. The male bee was not so lucky; he faced assassination by 'infuriated spinsters'. Politically conservative Florence Fenwick Miller (b. 1854), a committed advocate for the enfranchisement of women, was equally contemptive of the male bees. She, however, concentrated on their lazy existence as free-loaders. Never leaving the hive or sharing the burden of work, the drones luxuriated on the honey produced by the workers. 'Perhaps...', decried Miller, 'the hive is analogous to human society in that the male sex has the best part of existence, the most comfortable and favourable lot...'.²⁹ The queen, who was really just 'the mother of the hive', fulfilled an 'eminently useful' reproductive role, 'but it must be deadly dull to be a queen bee'.³⁰ Always the most ideologically unsubtle of commentators, Büchner contended that the superiority of the female ant 'must raise the envy of the boldest champions of human female emancipation'.³¹ For the Rev. McCook, ants failed to evoke such sentiments. Enamoured by the ants' attention to personal cleanliness, he romanticized about myrmecological sex appeal:

There are women who remind us of insects in their faculty of moving unmarred amid the current defilements of daily duty. They will pass to the parlor from kitchen, nursery, or sewing-room with no adjustment of toilet but a discarded apron or turned down sleeves, yet quite sweet and presentable. But there are women, high and low, and men innumerable, of a different pattern. With

27. Ellice Hopkins, 'On Ants', *The Contemporary Review*, 37 (June 1880), 941-55 (943). In addition, see Rosa M. Barrett, *Ellice Hopkins: A Memoir* (London: Wells Gardner, Darton & Co., 1907); and Edward J. Bristow, *Vice and Vigilance: Purity Movements in Britain Since 1700* (Dublin: Gill and Macmillan, 1977), esp. pp. 94-104.

28. Hopkins, op. cit. (27), pp. 945-46.

29. Florence Fenwick Miller, 'Insect Communists', *The National Review*, 15 (May 1890), 392-403 (397). For biographical information, see the *British Biographical Archive* (London: K.G. Saur), 767; 318-23. For Miller's political conservatism, see her *Readings in Social Economy* (London: Longman's Green, and Co., 1883), esp. pp. 20, 72-76.

30. Miller, 'Insect Communists', op. cit. (29), pp. 395-97.

31. Büchner, op. cit. (11), p. 60.

insects, however, the type of dainty tidiness is the absolute rule.³²

Less certain of the gender models which social insects provided, L. and M. Wintle resorted to obfuscation. Their children's primer of 1884 was a collection of six moralistic tales about personified animals. At the beginning of the book, the authors claimed that the sixth story, which focused on the habits of bees, was 'strictly in accordance with the facts of Natural History'. This particular story was the autobiography of a worker bee. Significantly, it was entitled, 'Mrs. Bee'[emphasis mine].³³

Alien empires?

Ant slavery, agriculture, and gender were just three prominent examples of the nineteenth-century myrmecological mixture of nature and culture. The ambiguity of the word 'social' in the appellation 'social insect' encapsulated the tensions inherent in the literature on ants, bees, and wasps. Natural theologians, social evolutionists, and neo-Darwinians all applied varying degrees of anthropocentric and anthropomorphic attributes to these tiny insects. Descriptions of insect societies performed the same function as European travel and exploration writing; it produced self-affirmation and self-definition through likeness and unlikeness. In the introduction to his account of the ants of France, myrmecologist P.A. Latreille (1762-1833) implored readers to consider the similarities:

Most travellers believe that it is their duty to inform the public of the very remarkable things that they have seen in the regions through which they have travelled. I have sought to inform myself about a remarkably good nation by the type of individuals which compose it, by their variety, their multitude, their industry; a nation which we count as one of our most bothersome enemies, which lives with us, and of whose history we are ignorant. Would I also not have the right to publish an account of my voyages; to relate what I have seen or what I believe that I have seen?³⁴

Both travel narratives and literature on miniature or microscopic worlds were beyond the realm of common experiences and perceptions. Whereas travel narratives miniaturized and interiorized 'contacts with the

32.H.C. McCook, *Nature's Craftsmen: Popular Studies of Ants and Other Insects* (New York and London: Harper & Brothers, 1907), p. 54.

33.L. and M. Wintle, 'Mrs. Bee', in their *Books for Young Readers* (London: George Bell and Sons, 1884), pp. 81-108.

34.Pierre-André Latreille, *Essai sur l'histoire des fourmis de la France* (1798; rept. Paris: cité des Science et de l'Industrie/ Champion-Slatkine, 1989), p. 8, quoted in Drouin, op. cit. (23), 334.

imperial frontier', the microscope revealed a miniature frontier amidst the material world.³⁵ These two frontiers merged on the title pages of David Livingstone's (1813-1873) *Missionary Travels* (1857) and H.W. Bates's (1825-1892) *Naturalist on the River Amazons* (1863), which featured a magnified tsetse fly and a magnified Sauba ant, respectively.

Thomas Belt's *Naturalist in Nicaragua* (1874) provides a cogent illustration of the common ground between travel narrative and myrmecological observation. Born into a middle-class Novocastrian family in 1832, Thomas Belt acquired the requisite experience in Australia and Nova Scotia to establish himself as a practical and consulting mining engineer. Between 1868 and 1872, he directed the operations of the Chontales Gold Mining Company in Nicaragua. Since his early days as a member of the Tyneside Naturalists' Field Club, he was also an avid botanist and entomologist.³⁶ As his numerous contributions to natural history illustrated, Belt was the epitome of imperial science; he combined natural history with the quest for commercially exploitable resources. Proudly proclaiming an inventory of 300 different species of Longicorn beetles and 25 new species of butterflies, his achievements as a collector were a testament to European values of accumulation.³⁷ Upon his return to the smoke and stench of Newcastle, he took pride in the knowledge that, one day, England would 'no longer be the smithy of the world, but the centre of the science, philosophy, literature, and art of the Anglo-Saxon race - that race whose sons all over the globe will then look up to her with loving reverence as the mother of nations, the colonizer of the world, the pioneer of freedom, progress, and morality'.³⁸ As a knowledgeable, English naturalist, who had stepped into the Garden of Eden and reduced chaos to order, Thomas Belt perceived himself to be a pioneer of Britain's imperial progress.

Dedicated to H.W. Bates, who oversaw its publication, *The Naturalist in Nicaragua* took *The Naturalist on the River Amazons* as its exemplar. Consequently, it was a 'Humboldtian' travel narrative with an unabashed

35. Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection* (1984; rept. Durham: Duke Univ. Press, 1993), pp. 40-41, 146; Mary Louise Pratt, *Travel Writing and Transculturation* (London: Routledge, 1992), pp. 1-37; and Graeme Gooday, "'Nature" in the Laboratory: Domestication and Discipline with the Microscope in Victorian Life Science', *British Journal for the History of Science*, 24 (1991), 307-41 (320-25).

36. Thomas Belt, *The Naturalist in Nicaragua* (London: John Murray, 1874). See the excellent, brief biography of Thomas Belt (1832-1878) in the *British Biographical Archive* (London: K.G. Saur), 93: 306-10. A reprint from R. Welford, *Men of mark 'twixt Tyne and Tweed* (1895), it includes a comprehensive bibliography of Belt's publications. In addition, see [Sidney Lee], 'Belt Thomas', *DNB* (London, 1908), ii, p. 204.

37. Pratt, op. cit. (35), pp. 30-36; and Belt, op. cit. (36), pp. 378-80.

38. Belt, op. cit. (36), p. 389.

Darwinian programme.³⁹ Belt's extensive observations on ants were in a vein different from his collection and classification of beetles and butterflies. As a curious antithesis of the non-European inhabitants, ants lent support to the doctrine of mental and social evolution. Belt, therefore, described them as clean, industrious, disciplined, intelligent, and respectful of their dead; they were the realization of Thomas More's (1478-1535) Utopia. As a demonstration of their intelligence and of his prowess as a naturalist, Belt offered an explanation of the leaf-cutting ants' persistent acquisition of leaves. Unlike Bates, who contended that the ants used the leaves to dome the roofs of their subterranean nests, he asserted that they employed the leaves as a manure upon which to cultivate a minute white fungus. 'Mushroom growers and eaters', ants were ingenious and diligent farmers.⁴⁰

In contrast to their entomological co-inhabitants, the indigenous people of Nicaragua were, according to Belt, filthy, 'innately lazy', intellectually inferior, and immoral. They defiled the graves of their ancient ancestors, and 'passed away as they lived, without a record or memorial'. The Indian, Belt declared, 'may indulge in indolence and sloth; and so he vegetates and drops into his grave'. Surrounded by fertile land, which might yield anything that a person cared to cultivate, the indigenous people 'were content to live in squalid poverty rather than work'. Ideologically enmeshed in European expansionism and exploitation, the denigration of the native and the elevation of the ant were fundamental adjuncts to the construction of an evolutionary continuum between man and animal.⁴¹

Insects and non-European savages both served as objectified and culturally distant 'others'. Working within a developmental framework, nineteenth-century social anthropologists used ethnographic parallels to discern vestiges of their primitive ancestors in contemporary savages. In opposition to the degenerationist assumptions of biblical anthropologists, social evolutionists, like John Lubbock, deployed savages as the 'missing

39. Belt, op. cit. (36), dedication and p. 6. Susan Faye Cannon, 'Humboldtian Science', in her *Science in Culture: The Early Victorian Period* (New York: Dawson, 1978), pp. 73-110, argues that many early nineteenth-century scientists fashioned their methodology and techniques after 'scientific traveller' Alexander von Humboldt. I apply the term Humboldtian very loosely, however, because Belt did not truly engage in rigorous quantitative analyses of nature.

40. Belt, op. cit. (36), pp. 17-29, 71-84 (79-81); and Henry Walter Bates, *The Naturalist on the River Amazons*, 2 vols. (London: John Murray, 1863), i, pp. 23-33 (26-27); ii, pp. 350-66. Mention of cleanliness and funeral rites was a staple of nineteenth-century myrmecological literature. In a society concerned with unsanitary urban conditions and recurring epidemics, sanitation and disposal of corpses were practically and emotionally intimate issues. See John Morley, *Death, Heaven and the Victorians* (London: Studio Vista, 1971). See Mark Harrison, 'Tropical Medicine in Nineteenth-Century India', *British Journal for the History of Science*, 25 (1992), 299-318 (309-10), for the ideological uses of sanitation and 'dirty' indigenous peoples.

41. Belt, op. cit. (36), pp. 63-65, 167-70, 194-95, 245.

link' between apes and nineteenth-century European man. Notoriously, Lubbock denigrated savagery to emphasize its evolutionary proximity to animality. He, therefore, denied savages the possession of religion.⁴² At the same time, his edifice of evolutionary progress rested upon a belief in the psychic unity of animal, savage, and European man. The savage, the ant, and the bee were perfectible; they could be 'civilized', 'domesticated' or 'tamed'.⁴³ Thus, John Lubbock, renowned arm-chair 'intellectualist' anthropologist, embarked upon his studies of social insects with the intention of *taming* some bees.⁴⁴ And in 1872, he created a sensation at the annual meeting of the British Association for the Advancement of Science when he presented a wasp that he had tamed. *Punch* likened him to a flea-tamer, and then proposed him for Lord Lieutenant of Ireland; for he could surely 'pacify the Irish hornets' nest'. Like the flea-tamer, Lubbock brought the yawning infinity of the unseen insect world under his dominion. He established the continuity of mental evolution between animal and human; and affirmed the superior rationality of nineteenth-century European man, by demonstrating his control over nature. Upon its death - after nine months in the company of Lubbock - *Nature* accorded the wasp an obituary. It came to rest on a pin - the *object* of a collection - in the British Museum (Natural History). Evolutionary anthropologists and biologists grappled with the ambiguous relationship between objectified nature and the subjective

42. John Lubbock, *The Origin of Civilisation and the Primitive Condition of Man. Mental and Social Condition of Savages* (London: Longmans, Green, and Co., 1870), p. 1; Stocking, op. cit. (14), pp. 154-55; John Burrow, *Evolution and Society: A Study in Victorian Social Theory* (1966; rept. Cambridge: Cambridge Univ. Press, 1981), pp. 10-16; Peter Rivière, 'Editor's Introduction', to John Lubbock, *The Origin of Civilisation and the Primitive Condition of Man* (1870; rept. London: Univ. Of Chicago Press, 1978), pp. xxxiv-xxxvi; Idus L. Murphree, 'The Evolutionary Anthropologists: The Progress of Mankind. The Concepts of Progress and Culture in the Thought of John Lubbock, Edward B. Tylor, and Lewis H. Morgan', *Proceedings of the American Philosophical Society*, 105 (1961), 265-300 (esp. 272-82); and Neal C. Gillespie, 'The Duke of Argyll, Evolutionary Anthropology, and the Art of Scientific Controversy', *Isis*, 68 (1977), 40-55. Both Stocking (p. 153), and Gay Weber, 'Science and Society in Nineteenth Century Anthropology', *History of Science*, 12 (1974), 260-83 (281), discern similarities between 'arm-chair anthropology' and some of Lubbock's myrmecological observations. In general, there are many similarities between Prichardian ethnology and 'anecdotalist' comparative psychology.

43. The "'primitive" like the "unconscious" is rather frightening, and I think these scholars wanted to tame it, to domesticate it'. Clifford Geertz, 'Notions of Primitive Thought: Dialogue with Clifford Geertz', in Jonathan Miller, ed., *States of Mind* (Toronto: Methuen, 1983), pp. 192-210 (200). In addition, see Charles Darwin, *Voyage of the Beagle* (1839; rept. London: Penguin Books, 1989), p. 172, for his description of the natives of Tierra del Fuego: 'I could not have believed how wide was the difference, between savage and civilized man. It is greater than between a wild and domesticated animal, in as much as in man there is a greater power of improvement'.

44. 'I painted 12 bees green & am going to see if I can tame them'. Wednesday, 14 May 1873, John Lubbock, Diary, 1872-1879, Supplementary Avebury Papers, British Library, Add. MSS. 62681, f. 44.

experiences of consciousness inherent in both the observer and the observed.⁴⁵

Conclusion

In his presidential addresses of 1895 and 1896 to the Folk-Lore Society, banker and author Edward Clodd defined the relationship between evolutionary anthropology and biology. He forcefully outlined his methodological vision for the folklorist:

His method is that of the biologist. Without bias, without assumptions of relative truth or falsity, he searches into origins, traces variations, compares and classifies, and relates the several families to one ordinal group.⁴⁶

A founder of the Folk-Lore Society (1878), Clodd was a self-proclaimed 'anthropological folklorist'. Openly spurning the philological methodology of Max Müller's comparative mythology, Clodd adopted the social evolutionism of E.B. Tylor. Specifically, he drew upon Tylor's explication of 'survivals'. Underpinned by a belief in the psychic unity of man, 'survivals' - or the superstitions of the 'illiterate', 'some poor servant girl', or 'the countryman' - were relics of primitive beliefs and customs, which linked together contemporary Europeans and savages, and primitive man. A prolific popularizer of scientific naturalism, Clodd promoted folklore as the delineation of the development of 'ideas from the lowest and grossest animism to the higher philosophy', witnessed in 'man's gradual ascent from savagery through barbarism to civilization'.

Although on occasions notorious for his condemnation of the superstitions behind spiritualism and 'dogmatic' Christian ritual, Clodd was not original in his pursuit of the 'psychical side of anthropology'. But his presidential addresses of 1895 and 1896 grappled with a significant facet of mental evolutionism and psychic unity. In particular, Clodd wished to avoid a conflation of comparative psychology and animism. In the same address in which he acknowledged that animals possessed minds and souls,

45. Lubbock, *Ants*, op. cit. (17), pp. 315-16; idem., *Chapters*, op. cit. (17), pp. 70-71; Horace G. Hutchinson, *Life of Sir John Lubbock, Lord Avebury*, 2 vols. (London: Macmillan & Co., 1914), i, pp. 141-42; Florence Horatio Suckling, *Our Insect Helpers: Wasps, Bees, Etc.* (London: Humanitarian League Office, 1896), p. 5; 'A Philosopher's Pet', *Punch, or the London Charivari*, 63 (7 September, 1872), 97; 'Notes', *Nature*, 7 (20 March 1873), 391; and Tim Ingold, "The Architect and the Bee: Reflections on the Work of Animals and Men", in his *The Appropriation of Nature: Essays on Human Ecology and Social Relations* (Manchester: Manchester Univ. Press, 1986), pp. 16-39. For the semiotics of the flea circus, see Stewart, op. cit. (35), p. 56.

46. Edward Clodd, 'Presidential Address', *Folk-Lore*, 7 (1896), 35-60 (41); idem., 'Presidential Address', *ibid.*, 6 (1895), 54-81 (56, 76, 68). In addition, see Richard M. Dorson, *The British Folklorists: A History* (London: Routledge & Kegan Paul, 1968), esp. pp. 248-57.

he quoted David Hume as an antecedent authority for his definition of animism. '[T]here is', stated Hume, 'a universal tendency among mankind to conceive all beings like ourselves, and to transfer to every object those qualities with which they are familiarly acquainted, and of which they are intimately conscious'.⁴⁷ In his address to the Third International Congress for the History of Religions at Oxford in September 1908, Clodd returned to animism and mental evolution. The first third of his paper drew upon comparative anatomy and comparative psychology to demonstrate 'unbroken mental development' from animal to man. But he inserted an important caveat: 'while ... we animalise man, we must avoid the extreme of humanising the animal'. As an example of such an error, Clodd noted the Rev. Henry Christopher McCook's description of the funeral habits of certain agricultural ants. McCook and Mary Treat had noted that these ants provided different funeral rites and burial grounds for their own species, and for those of the slaves that they kept. 'We must not', implored Clodd, 'thereupon build a theory that the ant has made a distinction between consecrated and unconsecrated Ground!' He then continued:

The power to detect relatives from strangers lies in the marvellous acuteness of the antennae, or organs of smell, of this insect, whose brain, to quote Darwin, is, in certain respects, 'more wonderful than the brain of man'.⁴⁸

Although he wanted to maintain the intelligence of lower animals such as ants, Clodd wished to avoid a comparative psychology which resembled culturally atavistic animism. Never very rigorously argued, this distinction may be the one small glimmer of originality in the intellectual career of an otherwise Kiplingesque 'first-rate second-rate man'.

By the late nineteenth century, however, self-described comparative psychologists grappled with anthropocentrism and anthropomorphism. Significantly, this was not part of a programme to expunge potential pitfalls from the realm of a nascent secular ideology of scientific naturalism. As Alan Costall has argued, C.L. Morgan's canon of 1894 was not conceived as the extirpation of anthropomorphism, but as an attempt to place it on sound scientific footings. Anthropomorphism was not the preserve of extra-scientific popularizers.⁴⁹

47. David Hume, *The Natural History of Religion*, in his *Works* (1826), vol. iv, p. 446, quoted in Clodd, 'Presidential Address', *Folk-Lore*, 7 (1896), 46.

48. Edward Clodd, 'Pre-Animistic Stages in Religion', *The Fortnightly Review*, new series, 85 (1909), 1125-34 (1127-28).

49. Alan Costall, 'How Lloyd Morgan's Canon Backfired', *Journal of the History of the Behavioral Sciences*, 29 (1993), 113-22; Steven Shapin, 'Science and the Public', in *Companion to the History of Modern Science*, ed. R.C. Olby et al. (London: Routledge, 1990), pp. 990-1007; and Roger Cooter and Stephen Pumfrey, 'Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture',

Dating back to at least Aristotle, studies of animal behaviour have been inextricably entangled in continuous debates about distinctions between animality and humanity. Writing in the Lovejoyan history of ideas tradition, George Boas traced a significant facet of these debates. He coined the word 'theriophily' to identify a persistent mode of thought which acknowledged admiration for the character and behaviour of animals. As a minor variant on Primitivism, this elevation of animality had ancient origins, but it rose to prominence in sixteenth-century France as one manifestation of the books of paradoxes. According to Boas, Descartes conceived his mechanization of animals as part of a sustained attack on theriophily. But, with the rise of sensationalism and scientific zoology in the eighteenth century, an anti-Cartesian approach to animal behaviour emerged. Investigations into animal anatomy and physiology provided the necessary wondrous material for a resurgence of theriophily. Although fault can be found with Boas's progressive, intellectualist history of the elevation of animality, from Aristotle to Lorenz, the heuristic of theriophily provides a useful reminder of the persistence of anthropomorphism and anthropocentrism.⁵⁰

In 1986 the World Archaeological Congress on 'Cultural Attitudes to Animals' sought common ground for anthropologists and biologists (and others). Tim Ingold contended that 'the contradiction between the human as a species of animal and humanity as a condition *opposed* to animality [was] playing havoc with anthropological and archaeological thinking'.⁵¹ Ingold has campaigned to free discussions of human beings and non-human animals from anthropocentrism and ethnocentrism. Recognition of ontological equality is essential for the realization of this goal. Significantly, Ingold encourages an awareness of humans and other animals as co-participants, 'as centres of perception and action, in a continuous life process'.⁵² Although I do not desire to argue the merits of such a perspective, I do wish to acknowledge the perpetuation of an important historical dilemma within this proposed resolution of the human/animal and culture/nature dichotomies. The relativity of *perception* has long posed a

History of Science, 32 (1994), 237-67.

50. George Boas, *The Happy Beast* (1933; rept. New York: Octagon Books, 1966); and idem., 'Theriophily', in *Dictionary of the History of Ideas*, ed. Philip P. Wiener, 4 vols. (New York: Charles Scribner's Sons, 1973-74), iv (1973), pp. 384-89. In addition, see John Sparks, *The Discovery of Animal Behaviour* (London: BBC, 1982); and James Rachels, *Created from Animals: The Moral Implications of Darwinism* (Oxford and New York: Oxford Univ. Press, 1991).

51. Tim Ingold, 'Preface to the Paperback Edition', in *What is an Animal?*, ed. idem. (1994; rept. London and New York: Routledge, 1988), pp. xviii-xxiv (xx).

52. Ingold, op. cit. (51), p. xxiv. See, also, idem., 'An Anthropologist looks at Biology', *Man*, new series, 25 (1990), 208-29; and R.H. Hinde, 'A Biologist looks at Anthropology', *ibid.*, 26 (1991), 583-608.

challenge for anthropologists, biologists, psychologists, and historians. Lubbock, for instance, explained the importance of his fascination with the senses of insects:

The familiar world which surrounds us may be a totally different place to other animals. To them it may be full of music which we cannot hear, of colour which we cannot see, of sensations which we cannot conceive. To place stuffed birds and beasts in glass cases, to arrange insects in cabinets, and dried plants in drawers, is merely the drudgery and preliminary of study; to watch their habits, to understand their relations to one another, to study their instincts and intelligence, to ascertain their adaptations and their relations to the forces of Nature, to realise what the world appears to them; these constitute, as it seems to me at least, the true interest of natural history, and may even give us the clue to senses and perceptions of which at present we have no conception.

From this point of view the possibilities of progress seem to me almost unlimited.⁵³

Estonian-born Jacob von Uexküll raised this to a methodology at the turn of the twentieth century.⁵⁴ These attempts to retrieve the perceptible world of the insects and other animals provide useful insights. In the late twentieth century, for example, history is contingent and disordered. Through hindsight, we attempt to order the past, but we do so with the realization that we can never recapture the perceptible world of the historical actors. Borrowing L.P. Hartley's phrase, environmental historian David Lowenthal has proclaimed that 'the past is a foreign country'.⁵⁵

A fine line separates the retrieval of perceptible worlds from the imposition of multifarious biases. Morgan's canon was, therefore, an attempt to regulate these boundaries. More recently, N. Tinbergen has acknowledged the balance of intuition, empathy, and anthropomorphism required for the naturalistic study of animal behaviour. Birds, he maintains,

53. John Lubbock, *The Pleasures of Life. Part II*, 2nd edn. (London: Macmillan and Co., 1889), pp. 242-48. For background on Lubbock's work on sensory physiology, see J.F.M. Clark, "'The ants were duly visited': Making Sense of John Lubbock and the Senses of Social Insects", *British Journal for the History of Science*, 30 (1997), forthcoming.

54. See 'Special Issue: Jakob von Uexküll's *The Theory of Meaning*', *Semiotica*, 42 (1982), 1-87; Jakob von Uexküll, 'A Stroll Through the Worlds of Animals and Men: A Picture Book of Invisible Worlds', in *Instinctive Behaviour: The Development of a Modern Concept*, trans. and ed., Claire H. Schiller (London: Methuen & Co., 1957), pp. 5-80; and W.H. Thorpe, *The Origins and Rise of Ethology: The Science of the Natural Behaviour of Animals* (London: Heinemann Educational Books, 1979), pp. 54-59.

55. David Lowenthal, *The Past is a Foreign Country* (Cambridge: Cambridge Univ. Press, 1985). See, also, Tim Ingold *et. al.*, '1992 Debate: The past is a foreign country', in *Key Debates in Anthropology*, ed. Tim Ingold (London and New York: Routledge, 1996), pp. 199-248.

have been prominent subjects of ethological studies because they 'are on the one hand sufficiently highly developed to make their behaviour seem a special, challenging phenomenon...but on the other hand are less likely than, for instance, monkeys to be identified with ourselves'.⁵⁶ In contrast, size and morphology have conspired against the apparent relevance of the investigation of the insect world. Writing in 1909, entomologist H. Maxwell Lefroy identified the inherent impediments to a proper understanding of insects:

the senses, the instincts, the modes of expression of insects are so totally diverse from our own that there is scarcely any point of contact. In the case of mammals, of birds and to some extent of reptiles, we have in the eyes, in the feathers and in the movements, a clue to their feelings, to the emotions that sway them, to the motives that guide their actions; in insects we have none, and the great index of insect feeling, the antenna, has no counterpart in higher animals, and conveys nothing to our uninformed brains.⁵⁷

In a sense, the history of entomology is one of a struggle to overcome estrangement from humanity. J.B.S. Haldane, Edward O. Wilson, and Christopher O'Toole have persuasively perpetuated the image of the insect world as an alien one; and have invited us to visit it and learn.⁵⁸ Most often, however, social insects have provided entomology with the required common ground with humanity. 'The formation of organised societies by some kinds of Insects', explained David Sharp, 'is a phenomenon of great interest, for there are very few animals except man and Insects that display this method of existence'.⁵⁹ Often driven by an anthropocentric scientific agenda, anthropomorphic descriptions of social insects have been an integral part of the entomological enterprise.

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56.N. Tinbergen, 'Ethology', in *Scientific Thought 1900-1960*, ed. R. Harré (Oxford: Clarendon Press, 1969), pp. 238-68 (239).

57..H. Maxwell-Lefroy (Assisted by F.M. Howlett), *Indian Insect Life, A Manual of the Insects of the Plains (Tropical India)* (Calcutta and Simla: Thacker, Spink & Co., 1909), p. 3.

58.J.B.S. Haldane, 'Possible Worlds', in his *Possible Worlds and Other Essays* (1927; rept. London: Chatto and Windus, 1937), pp. 260-86; Edward O. Wilson, 'The Evolutionary Significance of the Social Insects', in *Insects, Science & Society* (New York and London: Academic Press, 1975), pp. 25-31; and Christopher O'Toole, *An Exploration of the Lives of Insects: Alien Empire* (London: BBC Books, 1995).

59.David Sharp, *Insects*, 2 pts. (London: Macmillan and Co., 1895-99), i (1895), p. 85.